Competitiveness of SMEs within automotive industry clusters in the Czech Republic and Slovakia

Diploma Thesis

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Abstract

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This thesis deals with two automotive clusters, namely Moravian Silesian Automotive Cluster and Automotive Cluster Slovakia. The main objective is to determine key factors of integration processes into automotive clusters, affecting competitiveness of involved SMEs and the clusters as self-standing entities. The theoretical part provides insight into current state of automotive industry in the Czech and Slovak Republic, insight into clusters in these two countries and into their competitiveness. Practical part includes complex analysis of companies' sample economic performance to determine quantitative financial aspects of integration processes into automotive clusters and questionnaire research for identification of qualitative factors affecting the competitiveness of SMEs and selected automotive clusters. Obtained findings are discussed and conclusions are made in the final parts of the thesis.

Keywords

Automotive cluster, competitiveness, economic performance, Economic Value Added INFA

Abstrakt

Němcová, R. *Konkurencieschopnosť malých a stredných podnikov v rámci klastrov automobilového priemyslu v Českej republike a na Slovensku.* Diplomová práca. Brno: Mendelova univerzita v Brne, 2016.

Táto práca sa zaoberá dvoma automobilovými klastrami, a to Moravskoslezským automobilovým klastrom a Automobilovým klastrom Slovensko. Hlavným cieľom je určiť kľúčové faktory integračných procesov v automobilových klastroch, ktoré ovlpyvňujú konkurencieschopnosť zainteresovaných malých a stredných podnikov a klastrov ako samostatných jednotiek. Teoretická časť poskytuje pohľad na súčasný stav automobilového priemyslu v Českej a Slovenskej republike, pohľad na klastre v týchto dvoch krajinách a na ich konkurencieschopnosť. Praktická časť obsahuje komplexnú analýzu ekonomickej výkonnosti vzorky podnikov, za účelom určenia kvantitatívnych finančných aspektov integračných procesov automobilových klastrov a dotazníkový prieskum na identifikovanie kvalitatívnych faktorov, ktoré ovplyvňujú konkurencieschopnosť malých a stredných podnikov a vybraných automobilových klastrov. Získané poznatky sú prediskutované a závery sú vytvorené v konečných častiach práce.

Kľúčové slová

Automobilový klaster, konkurencieschopnosť, ekonomická výkonnosť, Ekonomická pridaná hodnota INFA

Table of Contents

List of Tables

List of Figures

1 Introduction and objective of the thesis

1.1 Introduction

Automotive industry is an important sector, as well as economic pillar, in more European countries with the Czech and Slovak Republic included. Automotive sector in the Czech Republic is based on three main carmakers which are Škoda Auto from Volkswagen Group, Toyota Peugeot Citroën Automobile and Hyundai Motor Manufacturing Czech. Production of vehicles in this country exceeded one million units already in year 2010 and it is still growing. Slovakia outperformed the level of one million produced vehicles in the last year, 2015. It has three main car factories, namely Volkswagen, PSA Peugeot Citroën and KIA Motors. New addition to the car factories in Slovakia is British carmaker Jaguar Land Rover, which begins the construction of factory in this year, 2016, while the first cars should be produced in 2018. As global competition is continuously increasing, automotive industry requires constant creativity, innovations and high-technology development. In order to increase the competitiveness, clusters, as concentrations of car manufacturers, suppliers, research institutions and universities are being established. Clusters, which often consist of small and medium enterprises, bring several benefits, for example accelerated innovations or increased productivity. For a new established enterprise, cluster can help to faster growth and recognition, as a company is near its competitors and associated industries. I will look closer into the two automotive clusters in the Czech and Slovak Republic and find out how their existence influence competitiveness of member enterprises and clusters as self standing entities.

1.2 Objective of the thesis

The main objective of this diploma thesis is to determine key factors of integration processes into automotive clusters affecting the competitiveness of involved small and medium enterprises and the clusters as self-standing entities. In order to fulfil the main aim of the thesis, two partial objectives are set. First one is to identify the key factors of competitiveness and economic performance of selected clusters by elaborating complex analyses of companies, samples´ economic performance to determine the quantitative financial aspects of integration processes into automotive clusters using accessible financial statements and other corporate financial data resources. In the second one I will identify qualitative factors affecting the competitiveness and economic performance of both, SMEs and automotive clusters, by employing the secondary and questionnaire research. Research will be aimed also on comparison with industry averages´ performance and identification of interrelations between economic performances of observed subjects and entering the cluster.

2 Theoretical part

This diploma thesis places the main attention to automotive clusters, namely Moravian-Silesian Automotive cluster in the Czech Republic and Automotive Cluster Slovakia. I will begin with introduction of clusters in general. Following subchapters will include description of automotive industry in the Czech and Slovak Republic, presentation of Moravian Silesian automotive cluster and Automotive cluster Slovakia in details, definition of small and medium enterprises and their position in Europe and I will also include subchapter about competitiveness and its measurement.

2.1 Clusters

"*A cluster is a geographic concentration of related companies, organizations, and institutions in a particular field that can be present in a region, state, or nation. Clusters arise because they raise a company's productivity, which is influenced by local assets and the presence of like firms, institutions, and infrastructure that surround it*" *(*Harvard Business School, ©2016*).* Clusters are increasing productivity and operational efficiency, they encourage innovations and also they help in commercialization and new business creation. These are the main concepts of clusters stated by The Institute for Strategy and Competitiveness based at the Harvard Business School. Michael E. Porter, University Professor and the director of this Institute, is an influential economist who contributed largely in developing the field of competitive strategy as well as in the area of clusters and their competitiveness. In his book "*On Competition*" he defines cluster as follows: "*A cluster is a geographical proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and externalities*" (Porter, 2008, p.215).

There is also specific group of European Commission focusing on clusters. The European Union Cluster Portal defines clusters as „*groups of specialised enterprises – often SMEs – and other related supporting actors that cooperate closely together in a particular location. In working together SMEs can be more innovative, create more jobs and register more international trademarks and patents than they would alone.*" Participation of small and medium enterprises leads to more innovations and more growth. According to European Commission, 150 clusters out of 2000 statistical clusters in Europe belong to world-class with regards to their size, focus, employment and specialisation (The European Commission, ©2016).

Cluster creates strong ties between its members. Cooperation with various institutions and organizations is crucial. There are five characteristics which are typical for effective and well running clusters. First one is a need for dynamic competitiveness which is created by entering of new firms. Second characteristic is effort for continuous improvements and progress, which is stimulated by local rivalry for a purpose of gaining a prestige. Third typical feature is deep cooperation

with institutions, which means that companies have better access to more modern and more specialized factors of production. Clusters which are properly run also strengthen their bonds with related industries, they share new technological advancements or common talents. The last trait is proximity of sophisticated and demanding customers. It is absolutely essential, that members of cluster understand how important the cooperation with all cluster's members is and at the same time they would maintain appropriate level of competitiveness between each other. Cluster shouldn't be understood as an association of entrepreneurs because the aim of cluster isn't to create strong market structure or to get a public funds, as a way of saving its own expenses, and neither it isn't created for the promoting of own interests. The wrong functioned clusters are ineffective and inefficient and therefore the usage of public funds from state or the region would be a waste of funding resources. Concept of cluster will fail if there is no collaboration in knowledge sharing, no innovations, no use of high technology, no common goal and sometimes also in cases when processes or positions of members within cluster are not set (Stejskal, 2011).

In 2004, The Cluster Policies Whitebook was published. It captures the challenges and opportunities that arise during development of clusters and its main focus is on cluster policies. In this work authors describe seven vital elements of clusters as following: "***Geographical concentration****: firms locate in geographic proximity due to hard factors, such as external economies of scale, as well as soft factors such as social capital and learning processes.* **Specialisation:** *clusters are centred around a core activity to which all actors are related.* **Multiple actors:** *clusters and cluster initiatives do not only consist of firms, but also involve public authorities, academia, members of the financial sector, and institutions for collaboration.* **Competition and co-operation:** *this combination characterises the relations between these interlinked actors.* **Critical mass:** *is required to achieve inner dynamics.* **The cluster life cycle:** *cluster and cluster initiatives are not temporary short-term phenomena, but are ongoing with long-term perspectives.* **Innovation***: firms in clusters are involved in processes of technological, commercial and/or organisational change*" (Andersson, Schwaag Serger, Sörvik, Wise Hansson, 2004, p.13). It is not necessary that all above mentioned aspects will be present, however innovation is very important element for cluster to be efficient and beneficial.

2.1.1   Strength and lifecycle of clusters

Among the focuses of the European Commission belong innovation, growth and improvement of European's economy competitiveness. One unit of The European Commission is The European Cluster Observatory. It is an access point for necessary data regarding clusters in Europe, such as statistical information, analysis, cluster policy or cluster mapping. The European Cluster Observatory provides so called European Cluster Panorama, which aim is to give an update on the statistical mapping of clusters in Europe and it also provides correlation analysis with the main indicators of competitiveness. Cluster Panorama from October 2014 describes how cluster strength can be determined. There are four

components: size, specialization, productivity and dynamism. Number of employees or enterprises creates the size component. Size of industries and regions differs and therefore there is second feature which is specialisation. In order to measure specialization, the Location Quotient is used, which is calculated as a ratio of region's employment and the whole European employment across all regions in a specific industry. If the result is above one, it implies high regional specialisation. The third feature is employee productivity because productivity among European countries largely differs and it can be captured through average wages of employees. The last indicator of the strength of the cluster measured by employment growth is dynamism and it indicates the competitiveness level. For the each one of these four aspects will be given a star if a specific region places in the top 20 percent in Europe. According to Cluster mapping tool, Moravian Silesian region reaches three stars in automotive sector and in Slovak Republic, the west region, reaches two stars in automotive sector. These two regions are regions where the Czech and Slovak automotive clusters are based in (Ketels, Protsiv, 2014).

Further, I would like to focus on the lifecycle of clusters. Same as in the case of enterprises, clusters also go through several stages during their existence. The four basic stages are introduction, growth, maturity and decline. Regarding creation phase and organization of clusters there are two basic approaches, bottom-up approach and top-down approach. In the case of bottom-up approach, creation of cluster is connected with the natural need for closer regional cooperation or cooperation between businesses. Later on, as the strength of cooperation increases, the need for deeper organization increases as well. This approach leads to creation of so called natural clusters. Top-down approach leads to creation of designed clusters. In this case, creation of clusters is initiated and organized by representatives of state administration and it is crucial to develop social capital in order to strengthen intention of clustering, to create mechanism for building a trust and then to create a vision and mission of a cluster (Pavelková and collective, 2009).

In 2007, Max-Peter Menzel and Dirk Fornahl presented a model that describes movements of cluster through the life cycle. They describe four stages of cluster life cycle: emerging cluster, growing cluster, sustaining cluster and declining cluster. These stages are distinguished according to quantitative, qualitative, direct and systemic dimensions. Direct quantitative dimension captures size expressed by number of organizations, actors and employees. Direct qualitative dimension includes knowledge, skills, competencies or organizational forms. Impacts of quantitative and qualitative dimensions are not only direct, but they can have also impacts on other parts of cluster. This is called a systemic dimension which explains how companies and organizations within one cluster are interconnected and how they influence each other. Systemic quantitative dimension includes understanding of cluster and ability to make collective action, with another words utilization of the size. The fourth combination of two dimensions is systemic qualitative dimension and it focuses on exercising of

diversity, taking advantage of cooperation or value chains. Assigning cluster into a particular stage can be in some cases complicated, when cluster is currently in transition, which means that one member of cluster is still in earlier stage and other members managed to move faster into more advanced stages of life cycle (Menzel, Fornahl, 2007). In the following table is Menzel and Fornahl summary of all four life cycle stages.

Table 1: Life cycle stages

Emerging Cluster		
	Quantitative	**Qualitative**
Direct	Few companies and employees	Quite heterogeneous
Systemic	Hardly perceivable, few possibilities for collective action	Scarce possibilities for interaction

Growing Cluster		
	Quantitative	**Qualitative**
Direct	Increasing employment	Focusing
Systemic	Growing perception, collective actions, institution building	Open and flexible networks

Sustaining Cluster		
	Quantitative	**Qualitative**
Direct	Stagnation	Focused competencies, strong regional bias
Systemic	The cluster shapes the region	Open networks take advantage of synergies and external knowledge

Declining Cluster		
	Quantitative	**Qualitative**
Direct	Decline in number of companies and in employment	Strong focus on a narrow trajectory
Systemic	Negative sentiments regarding the cluster lobbying	Closed networks impede adaptability of the cluster

Source: Reworked according to Jena Economic Research Papaers, Cluster Life Cycles - Dimensions and Rationales of Cluster Development, M.P. Menzel, D.Fornahl, 2007

2.2 Automotive industry in the Czech and Slovak Republic

In Paris 1919 was founded the OICA, Organisation Internationale des Constructeurs d'Automobiles, in English called The International Organization of Motor Vehicle Manufacturers. The main aim and mission of this organization is to support interests of manufacturers, assemblers and importers of vehicles. The OICA publishes various statistics, including production statistics. On the figure below is visible the growing trend of amount of produced vehicles in the Czech and Slovak Republic.

Figure 1: Number of produced motor vehicles from 2004 till 2015
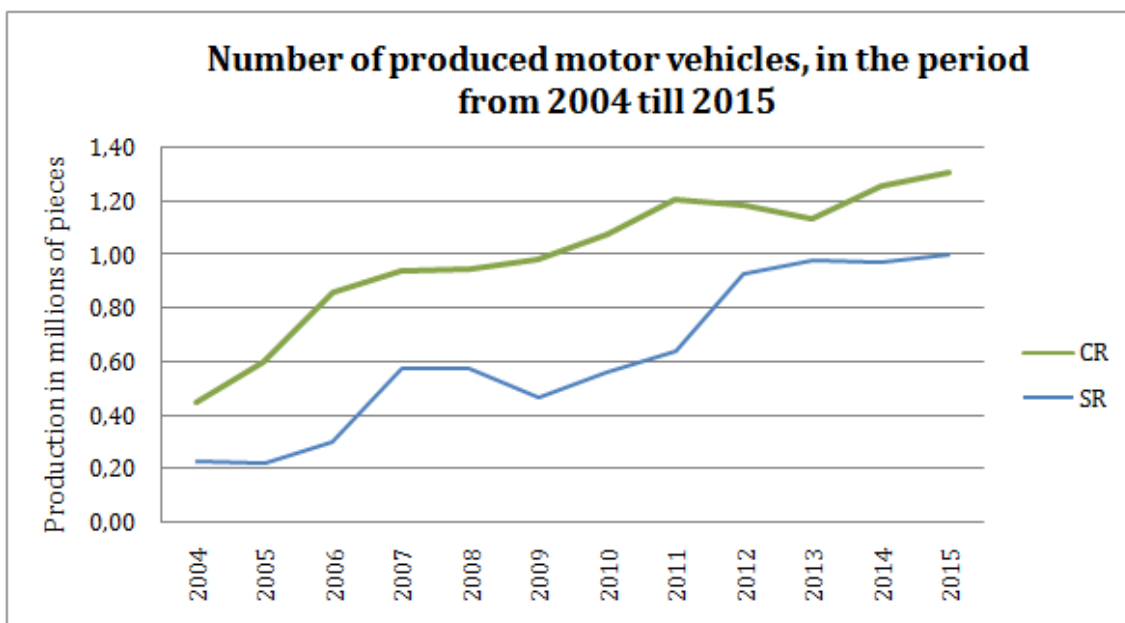
Source: OICA, Production statistics, edited by author

For the Czech Republic there has been slight decline in the amount of produced vehicles in year 2012 and 2013, compared with the previous years. According to OICA statistics, there was a decline in production of motor vehicles from year 2011 to 2012 by -1.7% and by -3.9% from year 2012 to 2013. On the other side, the largest growth was recorded in year 2006 where the change compared with previous year 2005 was 41.3 %. The Czech Republic has crossed the line of one million motor vehicles produced per year already in year 2010. In case of Slovak Republic is observed a slight year-on-year decline of vehicles production in year 2005 and then later in year 2009 when production declined by 19.9 %. For the Slovak Republic was notable year 2007 when the volume of production compared with previous year increased by 93.3 % (International Organization of Motor Vehicle Manufacturers, ©2016). Last year, 2015, is the first year for Slovakia, when it crossed its production over the 1 million pieces. In general, the Czech Republic is a

greater producer of motor vehicles than Slovakia, however population in these two countries should also be taken under consideration. Therefore on the following figure is presented amount of vehicles produced per 1,000 inhabitants.

Figure 2: Number of produced motor vehicles per 1,000 people from 2004 till 2015
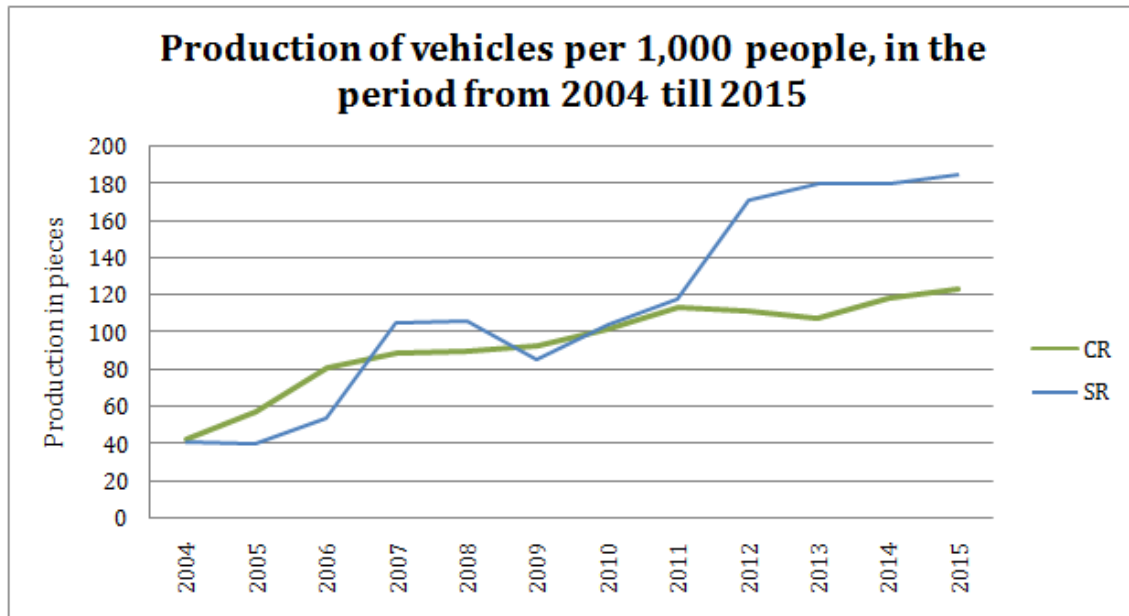
Source: OICA, edited by author

Amount of vehicles produced per 1,000 inhabitants, in both countries, is very similar until year 2011. Since this year, Slovak Republic records large increase in production per 1,000 people. To be precise, in 2015 Slovakia reaches production of 184.64 vehicles per 1,000 inhabitants, while the Czech Republic produced 123.66 vehicles per 1,000 inhabitants in year 2015.

2.2.1   Automotive industry in the Slovak Republic

Slovakia is a country which is well known in the world for its car production. According to SARIO, Slovak Investment and Trade Development Agency, it produces more cars than Italy and Poland together and Slovakia is in the top twenty of car producers in the world. This leading status is accomplished mainly due to presence of three world automotive companies, namely Volkswagen Slovakia in Bratislava, PSA Peugeot Citroën Slovakia in Trnava and Kia Motors Slovakia in Žilina. In addition to three big car producers, there is also large high quality suppliers' network consisting of about 300 suppliers, operating close to automotive plants. These are for example suppliers of engines, engines parts, steering wheels, interior modules, dashboards, break systems, fuel tanks, windows and many others. Concentration of these suppliers is high especially in the west and north-west regions around cities Bratislava, Žilina, Trnava, Martin or Nitra, mainly along the two highways D1

and R1 (SARIO, 2015). As mentioned in the previous chapter, from year 2006 to 2007 there was change in the amount of vehicle production by 93.3% which means increase from 295,391 to 571,071 vehicles. That year, 2007, was also the year when Slovakia got on the first place in the world, in production of vehicles per 1,000 inhabitants (SARIO, 2007). Nowadays, automotive industry is a number one industry in Slovakia and it has the largest share on Slovakia's GDP creation, approximately 12%. Automotive industry production creates 43% of Slovakia's total industrial production. The three biggest car producers in Slovakia employ 80,000 people and there is 200,000 people employed directly or indirectly by this industry (SARIO, 2015).

Previous year 2015 was important for Slovakia and Slovak automotive industry. On December 2015, after agreement between Slovak government and the British automotive company, Jaguar Land Rover confirmed opening of new manufacturing units in Slovakia. This will be the fourth world class automotive company in Slovakia. The CEO of Jaguar Land Rover, Ralf Dieter Speth, confirmed the investment in the amount of 1.1 billion British pounds. At the same time, Slovak government agreed to subsidies on tangible and intangible assets for Jaguar Land Rover in the amount of 130 million Euro, which is about 9% of announced investment. The first vehicles should be produced at the end of 2018. It is expected that the new facility built in Nitra will employ about 2,800 people and the factory will have initial capacity of 150,000 vehicles (Jaguar Land Rover, ©2015).

2.2.2   Automotive industry in the Czech Republic

The Czech Republic with its car production of more than 1 million pieces per year, since year 2010, belongs to leaders in automotive industry. In 2015, the Czech Republic had a record year as it produced, according to OICA, 1,303,603 motor vehicles. This country is known for a very long engineering tradition, skilled labour force, good infrastructure and it is also one of the leading European centres of R&D activities. Automotive industry in this country gives employment to more than 150,000 people and it creates more than 20% of manufacturing output and also more than 20% of the Czech export. It contributes approximately by 7.40% to Czech GDP. There are three main car producers in the Czech Republic: Škoda Auto (Volkswagen group), Toyota Peugeot Citroen Automobile (Toyota/PSA joint venture) and Hyundai Motor Manufacturing Czech. The Czech Republic is also a place with large number and high quality automotive suppliers. CzechInvest, Investment and Business Development Agency, has a database of automotive suppliers in the Czech Republic and it consists of almost 900 companies. 56 out of 100 world top automotive suppliers are based in the Czech Republic (CZECH INVEST, 2015).

2.3 Moravian-Silesian Automotive cluster

Moravian-Silesian Automotive cluster (hereinafter referred to as "MSAC") was established in September 2006 by 22 founding members. The seat of MSAC is situated in the business incubator in Ostrava. The aim is to support innovations and

increase competitiveness of member companies, institutions and entrepreneurs in the region. The benefits for cluster members are provided and kept through development of human resources, trade relations as well as through research and development activities. There are also other advantages that members of this cluster will receive, such as easier, faster and usually free of charge access to information from cluster management, cluster members or supporting institutions, which otherwise would be not possible or very difficult to obtain for business as single entity. Small and medium enterprises will have stronger voice when being part of a cluster. MSAC maintains a close cooperation with state organizations for example Czech Invest, Ministry of Industry and Trade and Regional development agency Ostrava. During the period of ten years, this cluster has enlarged from 22 members to 70 members nowadays. There is a number of projects where MSAC is a part of. For example project "Powder Injection Moulding" where two universities and four companies of MSAC developed and implemented injection powders technologies for elements in automotive industry. A year after project "CERADA" began with the aim to strengthen potential in research and innovations for automotive or aerospace industries. In 2012 started a "Project Integrator of R&D". This project is one of the main duties of cluster management these days. It is controlled by highly qualified external project leader who is managing the outcomes. The four dominant areas of R&D are plastics, high-strength materials, laboratory support and moulds, tools and equipment. The most recent project of MSAC is named "POSPOLU" and it is developing cooperation between businesses and schools. In the first stage, MSAC is concentrated on work experience, practical training or internships of teachers in the companies. What this project intents to achieve is to find ways of deeper cooperation between companies and schools as well as place attention on quality development. 4 businesses and 90 students from 9 schools were part of pilot verification of schools and businesses cooperation (Moravian Silesian Automotive cluster, ©2014). In the following table are presented all current members of MSAC:

(Table begins on the next page)

Table 2: List of Moravian Silesian automotive cluster members

			SOLEA CZ, production association
100% Rework	Fortex- AGS, a.s.	One3D s.r.o.	
Anamet, s.r.o.	Galvan CZ, s.r.o.	PFEIFFER Vacuum Austria GmbH	Secondary Vocational School Jablunkov
Argutec, s.r.o.	GP Quality Management, s.r.o.	PHA CZECH s.r.o.	Secondary Technical School- Vítkovice
Batz Czech s.r.o.	GRIOS, s.r.o.	PKS servis spol. sr.o.	Secondary School of Technical Fields Havířov - Šumbark
Brano Group, a.s	HallaVisteon Climate Control Corp	PRO NORTH CZECH, a.s.	SWELL, spol. sr.o.
Brembo Czech s.r.o.	Hayes Lemmerz Czech, s.r.o.	Proact Czech Republic, s.r.o.	TOP Function
Brose spol. sr.o.	HM PARTNERS s.r.o.	Protocom, s.r.o.	TŘINECKÉ ŽELEZÁRNY, a.s
Centre of Excellence Prague, s.r.o.	Ing. Petr Gross, s.r.o.	RB SOU autoopravárenské s.r.o.	TÜV SÜD Czech, s.r.o.
COMTES FTH, a.s.	KARLA spol. s r.o.	Remarkplast, s.r.o.	United Polymers, s.r.o.
Continental Automotive	KLEIN automotive s.r.o	RMT, s.r.o.	Tomas Bata Unversity in Zlín
CROMODORA WHEELS, s.r.o	Koma Commercial, s.r.o.	ROSSIGNOL TechnologyCZ, s.r.o.	Varroc Automotive Systems, s.r.o.
CTS Corporation	KOMAS, spol. sr.o.	SCOVECO, s.r.o.	VorKon Engineering, s.r.o.
ČVUT Praha	LAKOVNA HAJDÍK s.r.o.	Association for the Development of the Moravian Silesian region	Secondary and Higher Vocational School Kopřivnice
DYTRON s.r.o.	LAMMB technology, s.r.o.	Schoeller Allibert, s.r.o.	VŠB-Technical University Ostrava
Eduard Mikeš	MAZETA, spol. sr.o.	SimulPlast, s.r.o.	VÚHŽ a.s.
Erich Jaeger, s.r.o.	MetalPlast Lipník n. B. a.s	SLAVÍK - Technické plasty, s.r.o	University of West Bohemia in Plzen

(Table continues on the next page)

Exact Systems Czech Republic s.r.o	MGL s.r.o.	SMARTPLAST, s.r.o.	
FLTC Europe a.s.	MS technik spol. sr.o.	SMC Industrial Automation CZ s.r.o.	

Source: Moravian Silesian Automotive cluster, edited by author

2.3.1 Statutes of Moravian-Silesian Automotive cluster

Interconnected branches of automotive industry, suppliers and companies working in this specialized field, educational or non-profit organizations, service providers as well as individuals are in the region represented by a cluster which is a legal entity. There is a possibility to establish other branches of cluster in the region and they would be represented by legal personality. The exact version of MSAC statutes is available on the official website of MSAC. MSAC states the following mission and vision of a cluster: "*Creating conditions and promoting competitiveness members for sustainable development of the region. Cluster's vision is to become the integrator of companies, educational and research institutions and other stakeholders whose activities support the development of the automotive industry in the region*" (Moravian Silesian Automotive Cluster, ©2014). Any company, organization, association, legal or natural person connected with automotive industry can become a member of a MSAC if it is consistent with above written mission. Another condition which is necessary to fulfil in order to become a member of MSAC is to adopt Code of Ethics, payments for services and also membership fees. For the each one of cluster member, Code of Ethics is a moral obligation and non-complying with The Code of Ethics means violation of the mission as well as violation of the interest of MSAC. Membership fee is paid annually in the amount of 1,000 CZK. Together with subsidies, grants and payments for services that cluster provides it creates the main source of funds for implementing cluster's task. Activities of MSAC are not focused on gaining profit, it is a non-profit organization (Moravian Silesian Automotive Cluster, ©2014).

MSAC has three authorities. The supreme body of the cluster is The General Assembly which is gathered at least once per year. Each member of MSAC has a right to attend General Meeting and the presence of at least one third of cluster members is crucial for The General Assembly to be a quorum. Functions and duties which fall under the competence of general meeting include approving of the mission, goals, budget, amount of membership fees as well as approving of changes regarding amount of payments for services. They elect and also dismiss the Executive Board and the Supervisory Board of MSAC. Furthermore, the role of general meeting is making decision about excluding members from the cluster or decision about cancelling the cluster. Simple majority of present members is sufficient for resolutions to pass. There are only few exceptions, such as cancelling the cluster, when the two-thirds majority of members must be present. Notes made during the general meeting have to be distributed among all cluster members within 30 days.

All activities of the MSAC are directed by The Executive Board which is a cluster's statutory body. It consists of seven members selected by The General Assembly, from either the members of the cluster, or from the executive section of a cluster. From these seven members The Executive Board will elect two vice presidents, one president and it will appoint also The Executive Director. Members of The Executive Board are carrying out their duties for the period of three years, until the new board election. Meetings of the board are happening at least four times per year and it will reach quorum when absolute majority of its members will be present. In order to make a decision there is a need for simple majority of present members. A special case, when two-thirds majority of present members is essential, includes for example decisions on appointing or dismissing The Executive Director or the decision about proposing elimination of cluster members. Roles and functions of The Executive Board cover areas such as implementing goals and missions of the cluster according to proposals of Statutes of the MSAC and the General Meeting, suggesting the amount of payments for services provided by members of the cluster for a calendar year, processing annual reports, financial statements and other reports or making decision about acceptance of new members into the cluster. The Executive Board is also suggesting amendments to the Statutes or approving remuneration of the Executive Director. The General Meeting elects three members that create the third authority, The Supervisory Board. The Supervisory Board is elected for period of three years, it elects the President who is responsible for managing board's activities. Members of the Supervisory Board can be also present at the meetings of The Executive Board. Responsibilities of the board include reviewing books, documents and annual accounts of the Cluster. (Moravian Silesian Automotive Cluster, ©2014)

2.4 Automotive Cluster Slovakia

Year 2007 was a year when Automotive Cluster West Slovakia was established in Slovak city Trnava. This name was changed in 2013 to current name Automotive Cluster Slovakia (hereinafter referred to as "ACS"). There were only two founding members of ACS, namely City of Trnava and Self Governing Region Trnava. Since the establishment, cluster enlarged to current 37 members. The mission of ACS is to promote development of subcontractors within automotive industry. Also it provides help to assure competitiveness of cluster members at home as well as abroad. The ACS states three objectives. The first one is to become a trusted partner not only for members but also for regional, national and international authorities. Second objective is aimed at connecting production requirements with academic and scientific research environment. The last stated objective of ACS is to help small and medium enterprises to become successful in markets abroad and to engage in international projects focused on innovation and technology transfer (Automotive Cluster Slovakia, ©2016).
Automotive cluster Slovakia leads and cooperates on several projects supported also by the European Union. Project "Fast In Charge" which ended only recently in

September 2015 was focused on promotion of equalizing electrified vehicles in urban environment. Research was focused on the need for improvements in infrastructures with the main objective to create simpler and more convenient charging solutions. It should then lead to wider use of electrified vehicles by larger public. This project has run for period of three years by collaboration of ACS, University in Bulgaria and organizations from France, Spain, Greece and Italy. Another project of ACS is a "PD Portal" which is a portal for cooperation between research and business sector. The aim is to increase involvement of business sector to collaborate with research areas when transforming outputs of applied research into technological processes and production lines for automotive industry. The last project I will mention is called "Automotive without border*s"*. This project is implemented by Automotive Cluster Slovakia and Moravian-Silesian Automotive Cluster. Aim is to support development of human capital skills according to market requirements, create new kinds of cooperation between secondary technical schools and enterprises and as well improve cluster management with centre of attention giving to membership increase of small and medium enterprises. As a part of Automotive without borders, there have been organized courses in Ostrava focused on business intelligence, logistics and benchmarking manufacturers. In Trnava were organized classes about personal quality, change management process or about lean tools in the process of production or services (Automotive Cluster Slovakia, ©2016). The following table includes all current members of ACS as stated on the official website.

Table 3: List of Automotive Cluster Slovakia members

Automotive Group SK s.r.o.	Klauke Slovakia s.r.o.	RTU EUROPE s.r.o	Trenkwalder
c2i s.r.o	Kvant spol. s.r.o.	SAV – Polymer institute	TSU Piešťany š.p.
Carl Zeiss spol, s.r.o.	MAKINO spol. s r. o.	SimPlan Optimizations s.r.o.	Trnava Self - Governing Region
CCN Casting s.r.o.	MAPRO Slovakia s.r.o	Slovak - German Chamber of Industry and Commerce	The University of Ss. Cyril and Methodius
CRT-ELECTRONIC, spol. s.r.o.	Matador Industries a.s.	Služba Nitra, s.r.o.	Institute of Materials & Machine Mechanics of Slovak Academy of Sciences

(Table continues on the next page)

Dipex spol. s.r.o.	Faculty of Materials Science and Technology in Trnava	Secondary vocational school Senica	WIGO s.r.o
Emerson a.s., Branson	City of Trnava	Secondary technical school Múszaki Szakkozépiskola Galanta	Association of mechanical Engineering of SR
FORM Engineering s.r.o.	Profi Tlač, Pavol Skubeň	Stuba Green Team	
Get On Bratislava	ProPsy - RWS, s.r.o.	Švec a spol. s r.o.	
Inekon Systems, s.r.o.	Qintec s.r.o.	Technodat, CAE-systémy, s.r.o.	

Source: Automotive Cluster Slovakia, edited by author

2.4.1   Statutes of Automotive Cluster Slovakia

Automotive cluster Slovakia is an organization which is supporting continuous education, development and technological innovations in a region based on partnership. Legal form of ACS is voluntary association of legal entities. The seat of automotive cluster Slovakia is in the city Trnava. ACS is independent and non-political. To the main activities belong providing support to firms and organizations that are active mainly in automotive sector in the areas of science, research and development, education, marketing activities and other areas which bring economic growth and ensure competitiveness. ACS ensures increase in the amount of innovations and technological capacities for cluster members. Another activity is arranging cooperation with foreign partner organizations and with support funds. ACS also creates conditions for developing new job positions and therefore halting the outflow of educated people. It creates conditions for new investors in the innovation and high-tech areas. There is developed collaboration with schools regarding regulating teaching areas to be in line with requirements of future employers. The core mission and objectives of ACS, as stated in the Statutes, is building modern and high prestigious base for automotive industry, ensuring cooperation between cluster members, increasing competitiveness, supporting new technologies or collaborating with schools, universities and research centres for the purpose of realization of cluster projects. Another part of cluster mission is improvement of economic results of cluster members, offering counselling services to the cluster members, as well as to the public, in the form of seminars oriented on cluster politics and problematic connected with automotive industry. ACS consists of three types of membership and the condition for becoming a member is written application in which the applicant has to agree with Statutes and binds itself to fulfil duties resulting from membership of ACS. First type of membership is founding

members, which are Trnava City and Self Governing Region Trnava. Second type is associate members. These are the legal entities which fulfilled conditions for becoming a member and their membership was approved by the Governing Board. They have a right to vote in General Meeting and also they can formulate opinions, suggestions and comments. The third types of members are created by honorary members. These are the legal entities that have special merits on supporting region development or these can be people from other regions or foreign countries who cooperate with ACS. Honorary membership is approved and granted by the General Meeting and proposed by the Governing Board. Membership of ACS can be cancelled if member voluntarily decides to withdraw from ACS. However this can be done only in the time when it will not cause any harm to other cluster members. ACS membership will be cancelled in case of strong or repeated violation of duties derived from being an ACS member (Automotive Cluster Slovakia, ©2016).

Next, I would like to mention membership fees which differ from fees in the Czech Republic. Two founding members paid one-time financial deposit in the amount of 6,638.78 Euro. The annual fee for founding members is 5,000 Euro. Membership fee for associate members differs according to the amount of employees in a company and according to turnover. Legal entity which employs 50 or less than 50 employees and has a net turnover for the last closed accounting period not more than 10 million Euro or it is a non-profit organization or non-profit association will pay an annual membership fee of 200 Euro. Higher membership annual fee in the amount of 1,660 Euro will pay legal entity which employs more than 50 and less than 250 employees and its net turnover for last closed accounting period don't exceed 50 million Euro. The last amount of 3,320 Euro is meant as an annual membership fee for legal entities employing more than 250 people and having net turnover for the last closed accounting period more than 50 million Euro. With regards to honorary members, there are no obligatory membership fees they are required to pay.

Authorities of ACS are the General Meeting, the Governing Board, the Supervisory Board, technical director and economic director. All authorities need to keep records of their meetings and save them. The General Meeting is the highest authority of ACS and is convened by a chairman of the General Meeting at least once per year. Chairman of the General Meeting is a chairman of the Governing Board and the vice-chairman is a vice-chairman of the Governing Board. The General Meeting shall have a quorum when at least one founding member and at least one third of associate members are present at the meeting. In order to reach the resolution, it is necessary to have consent of absolute majority of present members with voting right. Founding members have a right of veto which is possible to enforce within ten days since adopting a resolution of the General Meeting. The General Meeting is not public and its main duties include setting out the main areas of activities, granting honorary membership based on the proposal of the Governing Board, deciding about cancellation of ACS or approving the rules of procedures. The Governing Board is an executive body of ACS. It is composed of founding members' representatives. Each founding member nominates three

representatives in its own discretion and each of these representatives has one vote. The Governing Board is convened by a chairman at least once per year. It will reach a quorum when at least two representatives of each founding member are present at the meeting. For adopting a resolution, consent of absolute majority of votes of all Governing Board members is required. The Board is authorized to carry out all activities which are not in the exclusive competence of the General Meeting. Same as in the case of the General Meeting, meetings of the Governing Board are also not public. Statutory authority of ACS is technical and economic director. They act in the name of cluster in all matters and they represent ACS outside of cluster. Technical director is appointed by city of Trnava and Economic director is appointed by Self-governing region Trnava. Both these directors are obliged to be present at the Governing Board meetings and they are entitled to come up with suggestions, comments, opinions or objections. The last authority I would like to mention is the Supervisory Board. It is an inspection authority which is composed of five members, one representative for each of two founding members and three members selected by the Governing Board. Term of office is two years. Within the scope of the Supervisory Board falls for example control management and control of efficient use of resources, control of compliance with statutes or examine the accounts. The full version of ACS statutes is available in Slovak language on the official website of ACS (Automotive Cluster Slovakia, ©2016).

2.5 Small and medium enterprises

Small and medium sized enterprises (hereinafter referred to as SMEs) are defined according to staff headcount and financial ceilings. The European Commission's definition of SMEs is characterized in EU recommendation 2003/361 as follows: "*The category of micro, small and medium-sized enterprises (SMEs) is made up of enterprises which employ fewer than 250 persons and which have an annual turn-over not exceeding EUR 50 million, and/or an annual balance sheet total not exceed-ing EUR 43 million*" (EUR-Lex, 2003). An enterprise is any entity which performs economic activity, regardless its legal form. It involves self employed people, part-nerships, associations or family businesses. SMEs create 99% of all enterprises in the European Union and they are subject to support programmes offered by the EU (The European Commission, ©2016). I will in more details concentrate on SMEs in the Czech and Slovak Republic.

The Ministry of Industry and Trade in the Czech Republic places a great at-tention to the development and support of SMEs. The last available report for year 2014 was released in September 24th 2015. For the purpose of presenting position of SMEs in the Czech economy, I have selected several information from the last available report:

> ➢ ratio of SMEs on the overall number of active business entities in 2014 was 99.84 %,

> ➢ business activity was performed by total of 1,124,380 legal and natural persons with number of employees below 250, while the number of natural persons doing business activity was 877,519 and number of legal entities was 246,861,
> ➢ in 2014, the ratio of SMEs employees to the total of employees in business sector in Czech Republic was 59.39%,
> ➢ share of added value of SMEs on overall added value was 53.11% (Czech Ministry of Industry and Trade, ©2015).

The report on development and support of SMEs also describes situation in all Czech regions separately. Moravian-Silesian region, the region of Czech automotive cluster, is known for its good innovation infrastructure. This region is a place of number of universities, research centres or business incubators where SMEs are focusing mainly on information and innovation technologies, automotive industry or top high-technologies. Investments in the region are growing and the most famous sectors are vehicles manufacturing, engineering or metal processing industry. An investment growing is connected with growing activities of SMEs in this region. In order to increase competitiveness of SMEs in this region, they are using funds from the European Union. Since year 2007, in this region, was approved over 1,500 projects of SMEs for value of 10 billion CZK while amount of 8 billion CZK was refunded. With regards to success of funds disbursement, this region belongs to top three regions in the Czech Republic (Czech Ministry of Industry and Trade, ©2015).

Slovak Ministry of Economy also gives attention to SMEs. According to last report from year 2012, SMEs are the main pillar of Slovak economy. The share of SMEs on overall number of all business entities is 99.90%, they provide jobs for 71.80% of active labour force in business economy and they create 55.10% of added value. The total amount of small and medium sized enterprises in Slovakia was 551,608, out of which 70.20% were entrepreneurs, natural persons and 29.80% were legal persons (Slovak Ministry of Economy, ©2012). The more recent analyse of Slovak SMEs, from year 2014, is elaborated by Ing. Tomas Jeck, PhD. from the Institute of Economic Research SAS. It focuses on issues related to SMEs in the Slovak Republic and it compares them with selected developed economies in the Europe. Report also points out that the status of SMEs in Slovakia is slightly different than in the European Union. According to Slovak Statistical Office, in September 2014 were registered 161,192 SMEs in total, with following structure: 90.50% micro enterprises, 7.80% small enterprises and 1.70% of medium enterprises. From the point of view of job creation, the share of Slovak SMEs was higher than in the EU. There was also higher share of value added in Slovak SMEs compared with the EU. Productivity of labour is the area, where Slovak economy significantly lags behind the European Union level, in all sizes of enterprises. Regarding export of Slovakia, there is a low share of SMEs on overall export. In year 2011 SMEs created only 26% of total export. This low representation of SMEs in export is typical not only for Slovakia, but also for all countries of Vysegrad Group, the

Czech Republic included. Slovakia is however successful in the area of establishing new enterprises. Number of newly established enterprises per 1,000 inhabitants reached positive year-on-year increases from year 2004 until 2012, with only one exception of year 2009. By looking only at this indicator, Slovakia reached 7th rank among European Union countries in 2012 (Institute of Economic Research SAS, 2014).

2.6 Competitiveness

Cambridge Academic Content Dictionary defines competitiveness as "*the ability of a business, a country, or a person to compete*" (Cambridge Business English Dictionary, ©2016). The Global Competitiveness Report 2015-2016 of the World Economic Forum interprets this term as: "*the set of institutions, policies and factors that determine a country's level of productivity. The level of productivity, in turn, sets the level of prosperity that can be reached by an economy*" (Schwab, Sala-I-Martín, 2015, p.4). The European Commission recognizes great importance of competitiveness due to its role in job creation, development of businesses and overall growth in Europe. It is crucial for small and medium enterprises. The Commission is supporting competitiveness through specific recommendations or innovation policies. It also monitors competitiveness in European Union member states and analyzes impact of policies. The main aim of countries of the European Union is to make sure that they benefit from business friendly environment or good infrastructure, that they have access to markets and resources such as materials, energy, qualified labour or finance resources. At the same time, enterprises in the EU should support research and innovation processes, make adequate investments and produce goods in a sustainable way (The European Commission, ©2016). Another definition of term competitiveness is described in the glossary of statistical terms of the Organisation for Economic Co-operation and Development (hereinafter referred to as OECD) as "*a measure of a country's advantage or disadvantage in selling its products in international markets*" (OECD, ©2014). Competitiveness can be understood on microeconomic or macroeconomic level. Originally, this term was linked to microeconomic level, to the firm's strategy, to competitive advantage that firms gained by own, unique way of production. On microeconomic level, competitiveness is connected with the ability of firms to compete, make a profit or to grow. Explanation of competitiveness on macroeconomic level is associated with national or regional competitiveness. It is concerned with the influence of firms' competitiveness on the competitiveness of the regions, state or the economy as a whole (Pavelková and collective, 2009). Ms. Pavelková points out that region or a state doesn't need to be competitive only because it has a sufficient number of competitive firms. There is a necessity of firms' interaction with other organisations and institutions. "*From the macroeconomic point of view, establishing clusters is a very important and effective instrument of regional politics*" (Pavelková and collective, 2009, p. 27). Clusters are increasing competitiveness, economic perform-

ance of businesses, supporting innovations and therefore enhancing economic growth.

2.6.1   Measuring the competitiveness

Nowadays, many countries in the world are focusing on competitiveness and that is the reason why also many organizations and institutions focus on the same, with the goal to measure national competitiveness of countries around the world. One of such an organization is The World Economic Forum (hereinafter referred to as "The WEF"). It is an independent, impartial, international organization for public-private cooperation. The WEF annually publishes its Global Competitiveness Report which is focused on key factors of economic growth as well as on the level of countries prosperity. Since year 2004 this organization uses the Global Competitiveness Index to evaluate performance of countries. The last available report is for years 2015-2016 and it covers competitiveness performance of 140 countries with Czech and Slovak Republic included. At first I would like to clarify what The Global Competitiveness Index is. It was developed by Xavier Sala-i-Martín, a Catalan-American economist who is a professor at Columbia University, and the Forum. This Index consists of 114 indicators which are all related to productivity and are further arranged into 12 following pillars:

1. institutions
2. infrastructure
3. macroeconomic environment
4. health and primary education
5. higher education and training
6. goods market efficiency
7. labour market efficiency
8. financial market development
9. technological readiness
10. market size
11. business sophistication
12. innovation

Additionally, there are three sub indexes created from above 12 pillars, based on three main development stages which are: basic requirements subindex (first four pillars mentioned above), efficiency enhancers subindex (pillars number 5 to number 10 pillar) and innovation and sophistication factors subindex (pillar 11 and 12). In order to calculate the Global Competitiveness Index, different weights need to be assigned to the three sub indexes. The higher weights are assigned to the pillars which are more important for particular country, taking under consideration the specific stage of development. To be more precise, according to the Index, countries which are in the first stage of development compete based on their factor endowments which mean mainly natural resources and low skilled labour. Firms have low productivity, low prices, they sell elementary commodities and this keeps them competitive. They focus on the well functioning of first four pillars. With the increase of competitiveness and productivity, countries will move to sec-

ond development stage. In this stage it is necessary to improve efficiency of production. Competitiveness at this stage is driven by pillars 5 to 10. For the third stage it is crucial to be innovative and come up with products, services or production which will be either new or unique or both at the same time. This includes pillar 11 and 12 (Schwab, Sala-I-Martín, 2013).

Both, the Czech Republic and Slovakia are advanced economies. The most recent Global Competitiveness Index Rankings of 2015-2016 places Czech Republic on the 31st position out of 140 countries. This means improvement from period 2014-2015 when it was on 37th place out of 144 countries and advancement from period 2013-2014 when the rank was 46 out of 148 countries. Czech Republic is in the innovation driven stage and three most problematic factors for doing business are inefficient government bureaucracy as number one problem, corruption on the second place and policy instability on the third rank. According to last report created by World Economic Forum, Slovakia reached lower ranking compared to Czech Republic and it is on the 67th position. This position means increase from rank 75 in 2014-2015 and change from 78th position in 2013-2014 periods. Likewise Czech Republic, Slovakia is in the third development stage which is innovation driven. Three most problematic factors for doing business are corruption, second is inefficient government bureaucracy and the third factor are tax rates (Schwab, Sala-I-Martín, 2015).

National competitiveness is also measured by IMD World Competitiveness Centre in Switzerland. The competitiveness scoreboard includes ranking for 61 economies with Czech Republic being on the 29th place and Slovakia on the 46th place in year 2015. Compared with previous year, in 2015 Slovakia improved by one position on the rank and the Czech Republic moved up by four positions (IMD World Competitiveness Center, ©2015).

In order to measure and understand competitiveness on the regional level, The European Commission has developed the Regional Competitiveness Index (hereinafter referred to as RCI). RCI is built upon the methodology created by the World Economic Forum and the first RCI was published in year 2010. This index shows strengths and weaknesses of 276 EU regions which belong under classification NUTS 2 (Nomenclature of territorial units for statistics) valid from 1st January 2015. These are the basic regions for the application of regional policies. In some European Union countries exists a large gap in regional competitiveness which can be damaging for competitiveness of a nation because the overall competitiveness of a country is dependent on the performance of its all regions. Slovakia, together with Romania and France, are mentioned by the European Commission as an example of countries where the gap between the capital region and the second most competitive region is very wide (The European Commission, ©2013). The last Regional Competitiveness Index published in 2013 includes observations of seven regions in Czech Republic and four regions in Slovakia. The best position in Czech Republic achieved region Prague and Central Bohemia with rank number 96. The least competitive region according to RCI is north-west region with rank 180. The most competitive region in Slovakia is Bratislava region which placed on 78th posi-

tion and the region with lowest competitiveness is region East Slovakia on the 229th position (Annoni, Dijkstra, 2013). As it is mentioned above, in Slovakia there is a huge gap, 112 positions, between the capital region and the second most competitive region which is West Slovakia region with rank 191. In the Czech Republic the difference is 67 positions while the second most competitive region, north-east region has rank 164.

2.6.2   Regional competitiveness

The concept of competitiveness is not important only on the national level but recently it was extended also to the regional level as it has great impact on regional development. Compared with the past, when the regional policy was focused on being more competitive by drawing attention of competitive firms abroad, these days the aim is to make firms more competitive domestically. Therefore the greater weight is now placed on the regional factors. OECD in co-operation with the Swedish Agency for Economic and Regional Growth is currently developing the Regional Strategy Study which will be aimed at cluster and regional strategies. The main focus will be on developing of regional specialisation of three sectors, including automotive sector (OECD, ©2016). There are several reasons why the competitiveness on regional level is being more discussed recently. Ms. Pavelková talks about four reasons. The first one is that regions are becoming to be a greater driving force of an economy and there is being created still more clusters, in various fields of specialization. Second reason is relocating of manufacturing activities as well as scientific research activities to the areas with more suitable conditions, for example with cheaper labour force. On the regional level there are no macroeconomic stabilizers such as wage flexibility or exchange rates devaluation. On the contrary, movement of capital and labour can be a huge threat to the regions. The last, fourth fact is that competitiveness of regions is also influenced by regionalization of public policies. It means that coordination and decision making activities are moved to regional level (Pavelková and collective, 2009).

In my diploma thesis I am focusing on two regions, Moravian-Silesian region in Czech Republic and West Slovakia region. According to the Regional Competitiveness Index from year 2013, the Moravian-Silesian region is on the 176th rank out of 262 regions. From the seven observed regions in Czech Republic, this region is the fifth most competitive one. In Slovak Republic the region West Slovakia is the second most competitive region out of four observed regions and according to RCI it has the 191st position. The great difference compared to Czech Republic can be observed. Even the West Slovakia region, which is the second most competitive region in Slovakia, is less competitive than fifth most competitive region in Czech Republic by 14 ranks. By comparing the RCI from year 2013 with year 2010 it is observed that the competitiveness of Moravian Silesian region improved by 20 ranks and competitiveness of region West Slovakia declined by 11 ranks (Annoni, Dijkstra, 2013).

2.6.3   Competitiveness of businesses within one cluster

The basic components of clusters are enterprises, however, integration of another subjects are necessary in order for a cluster to become competitive and able to create innovations. There are four basic groups of subjects which are unified within clusters: enterprises, public administration authorities, scientific research organizations and universities and others, for example financial institutions. Clusters should be open, which means that new members can enter the cluster and existing members can exit it. All members should be independent in their decision making. There is not set a precise number of how many members should cluster have, in order to work efficiently, but it is important that a cluster director and project managers run the cluster in an efficient way. Financial institutions are usually most active at the early stages of cluster creation. At this point of time are also important institutions that support innovations and business such as technology park or business incubators. Very important role have also universities and scientific research centres. They have a strong background and resources which serve as place for scientific-industrial cooperation. The willingness of universities to cooperate of course differs with different states and regions (Stejskal, 2011). Ms. Pavelková in her book on clusters and their influence on company's performance adds to the definition of cluster neologism "*co-opetition*" which describes situation when independent companies and institutions as members of one cluster cooperate with each other and at the same time they are each other competition (Pavelková and collective, 2009, p.18).

3 Methodology

In order to fulfil the main objective of the diploma thesis, there are proposed two partial objectives. First one is aimed at identifying the key factors of economic performance and competitiveness of selected clusters. Quantitative financial aspects of integration processes into automotive clusters will be determined through complex analysis of economic performance of selected member companies of clusters. For this purpose I will analyse financial statements data of enterprises, available at the Business registry. I will work with Benchmarking diagnostic system of financial indicators INFA, which is available on the official website of the Czech Ministry of Industry and Trade. This system is a result of cooperation between the Ministry of Trade and Industry and the academic sphere, particularly with Doc. Ing. Inka Neumaierova, CSc and Ing. Ivan Neumaier, who are the authors of INFA methodology[1] (The Ministry of Industry and Trade of the Czech Republic, 2012). This system and INFA methodology helps enterprises to verify their financial health and to compare themselves with the industry average, with the worst or the best enterprises within industry. In order to find out value of an enterprise, INFA methodology is focusing on three basic groups. The first one is creation of earning power, calculated as a ratio of earnings before interest and taxes (hereinafter referred to as EBIT) and assets. It allows to have a look at what an enterprise can produce regardless the capital origin and level of taxation. Second group is a division of EBIT among lenders, government and owners in form of interests, taxes and net profits. The last, third group is relation between assets and liabilities represented by financial stability. Benchmarking diagnostic system works with two classifications, OKEČ classification for older data until year 2008 and CZ-NACE classification for current data from year 2007. From both classifications I have selected manufacturing of motor vehicles.

An important point of achieving objectives of my diploma thesis was to identify a year when enterprises entered the cluster so that I can compare changes of particular indicators before and after entering the cluster. In order to obtain this information, I have interviewed project managers of Moravian-Silesian Automotive cluster as well as Automotive Cluster Slovakia.

The sample of enterprises was constituted regarding the following conditions:

> ➢ entry into the cluster at least two years after establishment of the company,
> ➢ entry into the cluster in 2011 or sooner, in order to have data series for at least three years, after entering the cluster. In case the last available data in Business registry are for year 2013, the entry into the cluster should be 2010 or sooner,

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[1] INFA methodology is available on the web of the Ministry of Industry and Trade of the Czech Republic: http://www.mpo.cz/cz/infa-cznace-metodika.pdf

> ➢ company has less than 250 employees,
> ➢ company has an annual turnover not exceeding 50 million Euro.

In order to determine main indicators which influenced entering the cluster, I will give attention to three periods, same in all observed companies. These periods will be:

> ➢ comparison of two years preceding the year when enterprises entered automotive cluster,
> ➢ comparison of two years immediately following the entry into cluster and
> ➢ comparison of first year after entering the cluster with the last year, for which data are available.

I will determine which indicators meant the greatest impact on economic performance for above mentioned periods.Priorities for economic analyzing have enterprises, which provided me with answers on questionnaire survey.

By using values of INFA Spread obtained from benchmarking diagnostic system, I will find out whether there is statistically significant difference between INFA Spread values before enterprises entered the cluster and values of INFA Spread after enterprises joined the automotive cluster. For this purpose I will use paired t-test.

The second partial objective is aimed at qualitative factors affecting the competitiveness and economic performance. In order to identify qualitative factors affecting competitiveness and economic performance of SMEs and automotive clusters, I have employed a questionnaire research. The following research questions are set to meet given objectives of the diploma thesis:

> ➢ Which factors affect the competitiveness of "clustered enterprises"?
> ➢ Is there a dependency between economic performance of enterprise and entering the cluster?
> ➢ Which changes made SMEs inside the company in order to improve their economic performance?

Answers obtained from filling in the questionnaire survey will be processed by the factor analysis.

3.1 Decomposition of INFA Spread

For the purpose of finding out the key facors influencing economic performance I will decompose the value of INFA Spread into single components, according to following relations and formulas. INFA Spread is defined as a difference between return on equity (herein after reffered to as ROE) and alternative cost of equity (hereinafter reffered to as r_e). The main aim of enterprises is to maximize the value

of INFA Spread, or at least the value of INFA Spread should be positive, because in that case investments into the company brings more than alternative investment. Only in case of positive INFA Spread value, the company creates value for its shareholders (Máče, 2006).

$$Spread = ROE - r_e \qquad (1)$$

All the factors which influence value of ROE and r_e, are factors influencing overall value of an enterprise. Threfore I will further decompose value of both INFA Spread components. ROE is an indicator of profitability and it measures ability of an enterprise to create profit from investments provided by shareholders. To analyze and calculate ROE I will use INFA methodology and its following formulas:

$$ROE = \frac{EAT}{EBT} * \frac{\frac{EBIT}{A} - (IR * (\frac{E + BL + B}{A} - \frac{E}{A}))}{\frac{E}{A}} \qquad (2)$$

On the above equation (2) are visible the main components and their influence on ROE.

$\frac{EAT}{EBT} =$ stands for ratio of Net profit, ratio of earnings after taxes, and earnings before taxes. This ratio calculates a tax burden. The higher the ratio is, the more positive impact on ROE it brings.

$\frac{EBIT}{A} =$ stands for ratio of EBIT and assets, also known as return on assets (hereinfafter referred to as ROA). It represents earning power of enterprise. With higher values of ROA, the values of ROE will also grow.

$IR =$ stands for interest rate. Lower interest rate will have positive influence on ROE.

$\frac{E + BL + B}{A} =$ stands for sum of equity, bank loans and bonds, divided by assets. The lower this ratio, the more positive impact on ROE it will bring.

$\frac{E}{A} =$ stands for ratio of equity and assets. The inverted value of this ratio presents financial leverage. Financial leverage can have

either positive or negative impact on ROE values (Máče, 2006).

$$IR*(\frac{E+BL+B}{A} - \frac{E}{A}) =$$

after subtracting ratio of equity and assets from the sum of equity, bank loans and bonds, and the difference is multiplied by interest rate, the obtained result represents interest expenses. Interest expense can be then subtracted from ROA and the obtained result is return on assets with using earnings before taxes. Increase of interest expense has a negative impact on return on assets.

Further decomposition of ROA, which indicates creation of earning power, can be conducted according to following equation:

$$\frac{EBIT}{A} = \frac{EBIT}{R} * \frac{R}{A} \tag{3}$$

$$\frac{EBIT}{R} =$$

stands for profit margin and it shows what part of revenues will be reflected on net profit, interest rate and taxes.

$$\frac{R}{A} =$$

stands for assets turnover and it measures what amount of revenues can enterprise produce by using its own assets (Máče, 2006).

Enterprise creates value for its owners only in case when value of ROE is higher than value of r_e. Alternative cost of equity represents a return on equity which could be achieved by investing into the alternative investment opportunity. It can be calculated as a sum of the risk free rate (hereinafter referred to as r_f) and risk premium. r_f represents return on risk-free assets such as government bonds. Risk premium can be further break down to four components which are:

➢ risk premium on financial structure (hereinafter referred to as $r_{FINSTRU}$), which arises from capital structure,
➢ risk premium on financial stability (hereinafter referred to as $r_{FINSTAB}$), which arises from the possibility of not repaying own obligations,
➢ premium on entrepreneurial risk (hereinafter referred to as r_{ER}),
➢ risk premium for lower liquidity of shares or size of the enterprise (hereinafter referred to as r_{LA}).

Formula for calculation of r_e is then following:

$$r_e = r_f + r_{FINSTRU} + r_{FINSTAB} + r_{ER} + r_{LA} \tag{4}$$

Elements of r_e are enumerated according to INFA methodology. Value of r_f is calculated as a 10-year government bond yield, its exact value will be calculated by and obtained from benchmarking diagnostic system. This system also offers calculation of values r_{LA} ,but only for the new, CZ-NACE classification. For years 2006 and years preceded this year, the value of r_{LA} will be calculated as follow:

when sum of equity, bank loans and bonds <=100 mill. CZK, then r_{LA}=5%
when sum of equity, bank loans and bonds >= 3 bill. CZK, then r_{LA}=0%
when 100 mill. CZK < sum of equity, bank loans and bonds < 3 bill. CZK, then

$$r_{LA} = \frac{(3 - (E + BL + B))^2}{168.2} \tag{5}$$

while E+BL+B is value in billions of CZK.
Another component of re is $r_{FINSTRU}$ and it is calculated as a difference between r_e and weighted average cost of capital (hereinafter referred to as WACC). It is important to specify constraints:

when r_e= WACC, then $r_{FINSTRU}$ =0%
when $r_{FINSTRU}$ >10%, then the value of $r_{FINSTRU}$ =10%
when value of r_e<WACC, then r_e=WACC

For calculation of $r_{FINSTRU}$ it is also recommended to limit values of interest rates which should be equal or higher than 0 % and lower or equal than 25 %. Limitations are also needed for ratio of net profit and EBT which should not exceed 100% and neither it should be lower than 0%. For calculation of WACC I will use formula which has been adjusted in INFA methodology to following form:

$$WACC = \frac{\frac{E + BL + B}{A} * r_e + \frac{NP}{EBT} * IR * (\frac{E + BL + B}{A} - \frac{E}{A})}{\frac{E}{A}} \tag{6}$$

$r_{FINSTAB}$ characterizes relation between assets and liabilities. It is connected to liquidity L3.

when L3 <= 1, then $r_{FINSTAB}$ = 10%
when L3 >= 2.5, then $r_{FINSTAB}$ = 0%
when 1 < L3 < 2.5, then $r_{FINSTAB}$ will be calculated according to following equation:

$$r_{FINSTAB} = \frac{(2.5 - L3)^2}{(2.5 - 1)^2} * 0.1 \tag{7}$$

The last component of cost of equity is premium on entrepreneurial risk which is linked to indicator of earning power EBIT/A.

when $\frac{EBIT}{A} > \frac{E + BL + B}{A} * IR$, then r_{ER} = minimum value in the industry.

According to recommendation for individual application of methodology, for the minimum value of r_{ER} will be used average value of industry, which is available on the website of the Czech Ministry of Industry and Trade[2] (Ministry of Industry and Trade, ©2005).

when $\frac{EBIT}{A} < 0$, then r_{ER} = 10%

when $0 < \frac{EBIT}{A} < \frac{E + BL + B}{A} * IR$, then r_{ER} will be calculated according to following formula:

$$r_{ER} = \frac{(\frac{E + BL + B}{A} * IR - \frac{EBIT}{A})^2}{(\frac{E + BL + B}{A} * IR)^2} * 0.1 \tag{8}$$

Values of ROE, r_e and r_f can be used for classification of enterprises into several categories. INFA methodology divides enterprises according to EVA INFA creation into four groups:

➢ enterprises creating values, which means that ROE > r_e. This group represents the best enterprises within industry,
➢ enterprises which have value of ROE in the interval r_f < ROE <= r_e. This group represent very good enterprises within industry,
➢ profitable enterprises which have value of ROE in the interval 0 < ROE <= r_f. This group represents enterprises which are profitable within industry,
➢ Loss making enterprises or enterprises with negative equity within industry.

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[2] Average industry values of r_{ER} are available on: http://www.mpo.cz/cz/ministr-a-ministerstvo/analyticke-materialy/default.html

3.2 INFA Economic Value Added

In the empirical part, Economic Value Added for selected companies will be calculated. Economic Value Added, usually referred to as EVA, is a relatively new value indicator of businesses financial performance. EVA is a registered trademark of consulting firm Stewart & Co. The main idea of EVA INFA is that own invested capital has to bring higher benefit, than is the cost of this capital. The result of EVA INFA shows the economic profit which is an extra profit acquired by investing into the company, compared to alternative investment. It shows us the value that was generated for shareholders and can be invested into the further development of company and therefore into the adding to company's value (Máče, 2006). For calculation of EVA INFA I will use benchmarking diagnostic system of financial indicators INFA, which provide me values of INFA Spread, and the value of equity which will be obtained from the balance sheets of particular enterprises. Therefore, formula for calculation of EVA INFA is following:

$$EVA = (ROE - r_e) * E \qquad (9)$$

3.3 Decomposition of aggregated indicators

After obtaining values from benchmarking diagnostic system for calculating Spread values, I will determine impact of analytical indicators on aggregated indicator. Index method is usually a method used for decomposition of aggregated indicator to more analytical indicators. The change can be expressed either by a difference or by an Index. Indexes answer on the question asking about how many percents is the value of an indicator smaller or greater than value of another indicator (Synek, Kopkáně, Kubálková, 2009). General formula for decomposition of three partial elements of synthetic indicator is following:

$$I_X = \frac{X_1}{X_0} = \frac{a_1 b_1 c_1}{a_0 b_0 c_0} = \frac{a_1 b_0 c_0}{a_0 b_0 c_0} * \frac{a_1 b_1 c_0}{a_1 b_0 c_0} * \frac{a_1 b_1 c_1}{a_1 b_1 c_0} \qquad (10)$$

By the above equation (10) can be calculated the overall change in percentage. For calculation of total change in absolute values I will use this formula:

$$\Delta X = X_1 - X_0 = (a_1 b_1 c_1 - a_1 b_1 c_0) + (a_1 b_1 c_0 - a_1 b_0 c_0) + (a_1 b_0 c_0 - a_0 b_0 c_0) \qquad (11)$$

where the value from the first part determines absolute impact of *c* on total change, value from second part determines absolute impact of *b* and the value from third part determines absolute impact of factor *a* on overall change. Above mentioned index method can be used in case when there is multiplicative relation between analytical indicators such in the case of ROE decomposition. When there is an additive or a differential relation between partial indicators, the relative

growth of synthetic indicator will break down to the ratios of the absolute increases of partial indicators (Synek, Kopkáně, Kubálková, 2009).

3.4 Statistical verification of partial results

For the owners of an enterprise it is desirable, that INFA Spread value, as a difference between ROE and r_e, will be maximized, at least, it should reach positive values. The reason is that only when INFA Spread value is positive, investments of owners bring more, than alternative investment would bring them. I will use this indicator for statistical testing, to find out whether there is a statistically significant difference between INFA Spread values before and after entering the cluster. For this purpose I will use paired sample t-test. This test is used to determine whether the mean of dependent variable is the same in two related samples. First samples will consist of INFA Spread values of selected enterprises before they become member of cluster and second samples will be the same companies and their INFA Spread values in particular years after entering cluster. Following hypothesis will be set:

H_0: Mean of two paired samples are equal
H_1: Means of two paired samples are not equal.

I will select significance level to be 5%. In order to calculate the value of t-statistics, the following formula can be used:

$$t = \frac{\overline{d}}{SE(\overline{d})} \tag{12}$$

where $\overline{d}$ stands for the mean difference between two samples,
    SE stands for standard error of the mean difference and can be calculated:

$$SE(\overline{d}) = \frac{s_d}{\sqrt{n}} \tag{13}$$

where s_d stands for standard deviation of differences
    n stands for number of observations.

Value of t-statistics will be then compared with value from the table of t_{n-1} distribution. This will give me a p-value for the paired t-test. Calculation of paired t-test will be performed in Excel, through analysis tool "t-test: Paired two sample for means". When p-value >0.05, I will not reject the null hypothesis. On the other hand, when the p-value < 0.05, I will reject the null hypothesis. According to p-value, I will conclude whether there has been any significant change in INFA Spread values after enterprises entered cluster. There are several assumptions for performing paired t-test which include that only matched pairs can be used to per-

form this test, variance of two samples is equal and normal distribution is assumed. These assumptions will be checked prior to performing paired t-test (Statistics Solutions, ©2016).

3.5 Questionnaire research

Conducted questioannaire survey consists of 16 questions. Eleven questions require answers to be marked on the scale one to ten, where 1 stands for strongly disagree and 10 stands for completely agree. Four questions are open ended and the last question provides space for enterprises to express themselves, in case they have any additional comments. The list of questions included in the questionnaire survey can be found in the attachment A of this thesis. Questionnaire survey was created and distributed through Mendel University server umbrela.mendelu.cz in Slovak and Czech language. Version for members of Slovak automotive cluster included one more question regarding the date of entry into the cluster. The reason for this extra question is that I wasn't able to persuade project manager from ACS to provide me with this information. Questionnaire survey in Czech and Slovak language was sent out to the CEO's of enterprises which are members of automotive clusters.

3.5.1   Factor analysis

Factor analysis is widely used statistical technique which often has application for example in social sciences, marketing, operations research or other fields. Factor analysis is a multivariate technique used for examination of internal links and relationships. It is a method for reduction of original variables. In factor analysis it is assumed that every entered variable can be explained as a linear combination of several common hidden factors and one specific factor and the aim is to explain dependency of variables (Meloun, Militky, 2004). Factor analysis is a technique used in cases when there is a large number of observed variables. For performing of factor analysis was utilized software STATISTICA. There are several methods for factor extractions, for example communalities=multiple R^2, maximum likelihood factors, centroid method and other. In my thesis I will work with communalities=multiple R^2 method. This is a frequently used method for estimating communalities for factor analysis. Communalities for particular variable are calculated as a sum of the squared loadings for this variable. In this extraction method, before factoring, diagonal of the correlation matrix is calculated as the multiple R^2 of the particular variable with all other variables (StatSoft, ©2015). The initial estimates of factors tend to be difficult to explain, because most of the factors are correlated with more variables. As the main aim of factor analysis is to identify meaningful factors, rotation of factors is an important transformation of original factors, which will be then easier to explain (Meloun, Militky, 2004). From the various offered rotation strategies for factor analysis, most commonly used varimax rotation of the normalized factor loadings was selected. This rotation strategy maximizes variances of the squared normalized factor loadings across variables for every factor.

In order to decide how many factors will be retained it is possible to use for example Guttman-Kaiser criterion or a Cattell's Scree test. According to Guttman-Kaiser Criterion I will extract factors which will have eigenvalues higher than one. Eigenvalues measure amount of variation in total sample accounted for by each factor. When selecting the Scree test, in order to determine how many factors to retain, it is suggested to identify point where continuous drop of eigenvalues will level off and this is the point that indicates number of extracted factors. After determining the number of factors I will examine factor loadings of particular variables. Factor loadings represent correlations between original variables and its factor. Variables that will have value of factor loadings higher that 0.7 will be then selected as being a component of particular factor (StatSoft, ©2015).

4 Empirical part

The following chapter is devoted to performing my analysis and presenting results for two observed clusters: Moravian Silesian Automotive Cluster and Automotive Cluster Slovakia. For selected enterprises I will at first identify and analyze development of INFA Spread values compared to industry averages, development of EVA and classification of enterprise into groups according to EVA INFA creation. Next I will conduct decomposition of INFA Spread value and make conclusion about indicators with greatest impacts on this indicator. In the following step, the values of INFA Spread from all selected enterprises will be statistically tested in order to analyze whether there is a statistically significant change in these values after enterprises entered the cluster. In the last part of empirical analysis will be evaluated results of questionnaire survey by using factor analysis.

4.1 Economic performance of Moravian Silesian Automotive Cluster

For my empirical analysis of economic performance I have selected seven enterprises which are current members of Moravian-Silesian Automotive cluster. In the table below you may see the names of enterprises, date of company's establishment, date of entry into the automotive cluster and number of employees according to last available data. In the analysis of the first company I will show pyramidal decomposition of value INFA Spread graphically, for the next analysis I will present data in the tables. The exact dates of entry of Czech enterprises into MSAC are to be found in the attachment B of this diploma thesis.

Table 4: List of companies selected for analysis of economic performance in MSAC

Name of the company	Date of establishment	Date of entry into cluster	Number of employees
MGL s.r.o.	10.12.1991	12.8.2008	22
MetalPlast Lipník n. B. a.s	17.3.1994	15.12.2009	103
GRIOS s.r.o.	30.8.1995	7.11.2006	50
CROMODORA WHEELS s.r.o	27.9.2006	29.2.2008	217
Ing. Petr Gross s.r.o.	18.4.2001	14.10.2008	169
KOMAS spol. sr.o.	9.11.1992	12.7.2006	112
SimulPlast, s.r.o.	4.9.2007	14.12.2010	4

Source: Project Management of MSAC and Business registry, edited by author

4.1.1   Economic performance of Moravian Silesian Automotive Cluster's members

MGL s.r.o.

Company MGL s.r.o. was founded for the purpose of manufacturing parts for aerospace industry, however its production was later extended also to automotive, electronics and building industries. Nowadays, production in automotive industry creates a significant part of overall production. MGL s.r.o. decided to join the automotive cluster two years after the cluster was established. On the spider graph below it is shown how the value of Spread developed since year 2005 until 2013, with comparison to the average of industry.

Figure 3: Values of INFA Spread for company MGL s.r.o. compared to average values of INFA Spread in industry
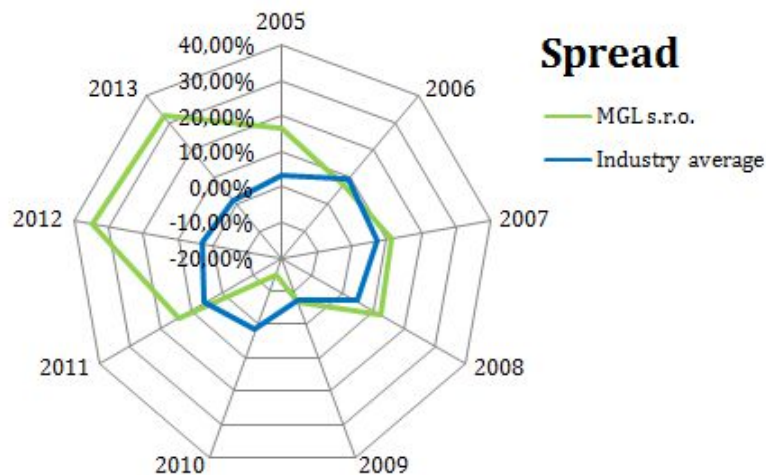
Source: Own processing using data of benchmarking diagnostic system

On the above spider graph is shown that values of Spread for company MGL s.r.o. were quite similar compared to industry average from years 2006 until 2010, when the Spread of the company dropped to -14.96%. This value is the lowest from the observed years and it could be caused by the greater impact of financial crisis on this company. In the following year 2011 is observed large increase by 29%. Increase of Spread value by 20.62% continued in year 2012 and it reached exactly 34.66%. The last observed year 2013 recorded only slight decrease to 31.89%. On the next graph is shown how the values of Spread influenced development of EVA INFA.

Figure 4: Development of EVA INFA for period 2005-2013, company MGL s.r.o.
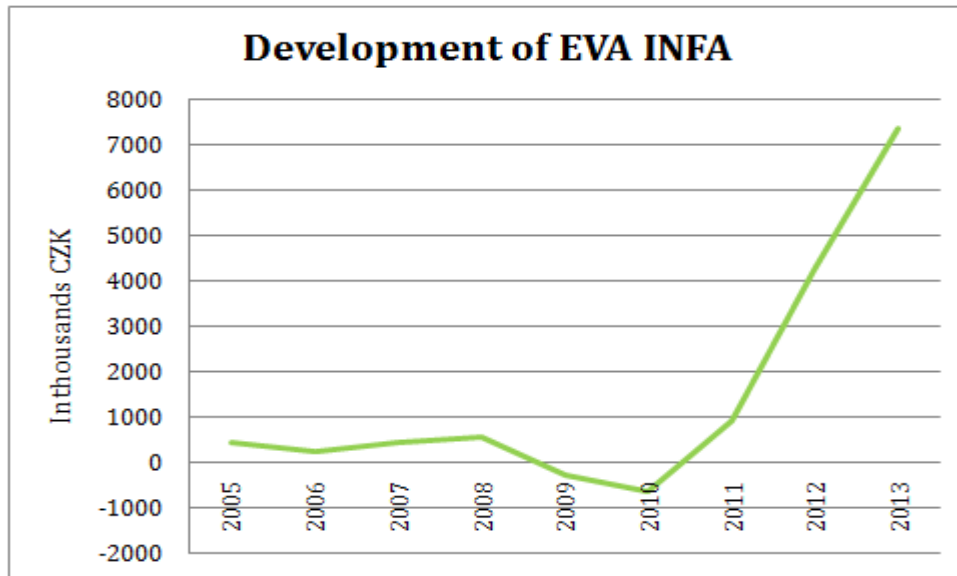
Source: Own processing using data of benchmarking diagnostic system and business registry

Values of EVA INFA were continuously growing since year 2010, approximately 2 years after MGL s.r.o. joined the cluster. In year 2013, the value that was generated for shareholders reached amount of 7,358,940 CZK. In order to classify MGL s.r.o. according to EVA INFA creation, into one of four groups I provide Figure 5 which contains three indicators: ROE, r_e and r_f.

Figure 5: Comparison of values ROE, r_e and r_f for period between 2005 ad 20113, company MGL s.r.o.
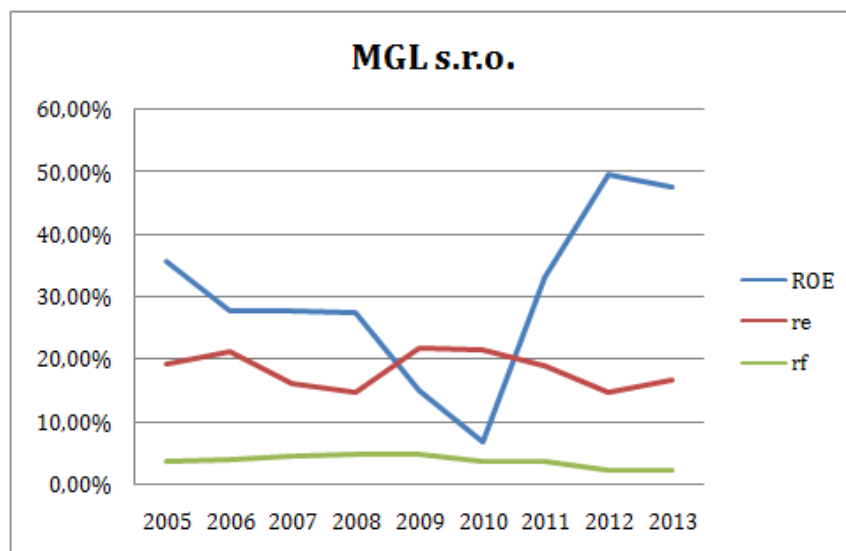
Source: Own processing using data of benchmarking diagnostic system

By examining values of three indicators included in Figure 5, I can conclude that MGL s.r.o. hasn't been a loss making enterprise for period between 2005-2013 because the value of ROE indicator hasn't dropped below the level of zero or even below the level of r_f. Except two years, 2009 and 2010, ROE has been greater than r_e, which suggest that MGL s.r.o. creates value and it belongs to the group of best enterprises within industry.

Following Figure 6 presents results of Spread decomposition and analyses particular indicators, with the aim to determine which of these indicators had the greatest impact on the overall change of Spread, and therefore on the value of EVA INFA. I am examining two years preceding entering into the cluster, years 2006 and 2007 and my results are shown on pyramidal decomposition below:

Figure 6: Pyramidal decomposition of INFA Spread for period 2006 and 2007, company MGL s.r.o.
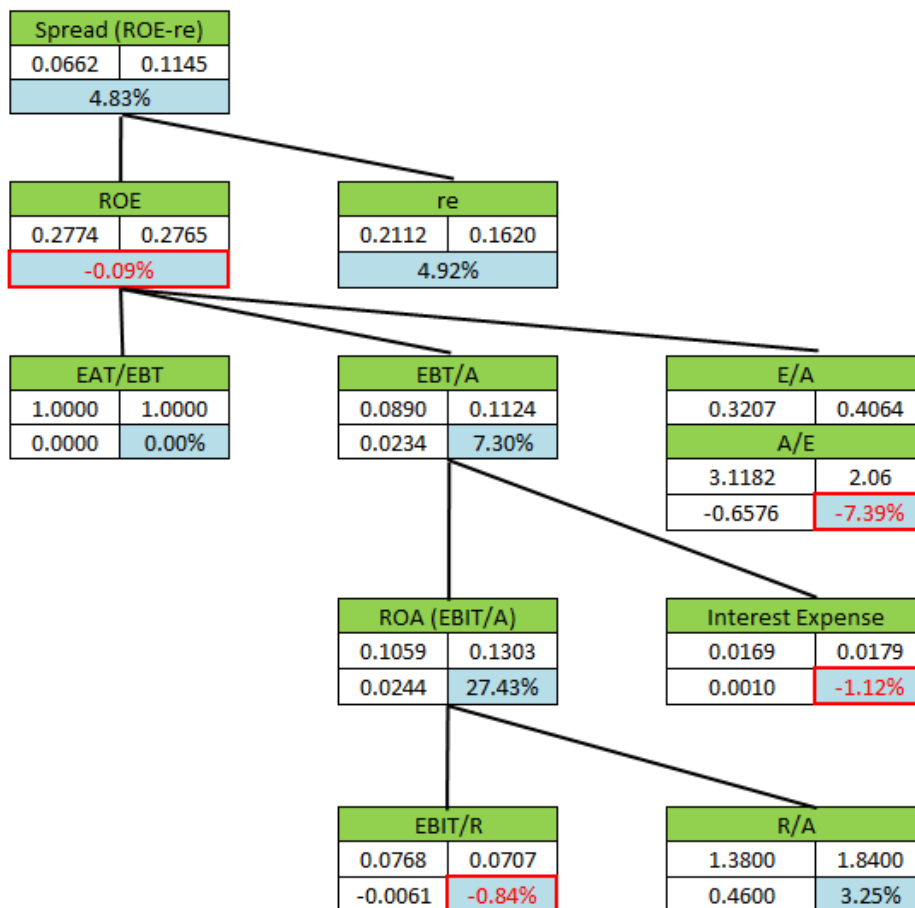
Source: Own processing using data of benchmarking diagnostic system

There has been an increase in Spread from year 2006 till 2007 by 4.83%. This change was caused mainly by decrease of alternative cost of equity by 4.92% which had positive impact on Spread. Only the slight yearly decrease on return on

equity was caused by the increase of return on assets with using of earnings before taxes. This ratio had impact of 7.30% on the change of ROE, however the impact of financial leverage was -7.39%, which almost zeroed the overall change of return on equity. The reason for increase of EBT/A ratio was particularly increase of return on assets which had positive influence of 27.43%, while increase of interest expense had negative impact on ROE. On the following figure can be observed how the alternative cost of equity was decomposed to five elements.

Figure 7: Decomposition of alternative cost of equity for period 2006 and 2007, company MGL s.r.o.
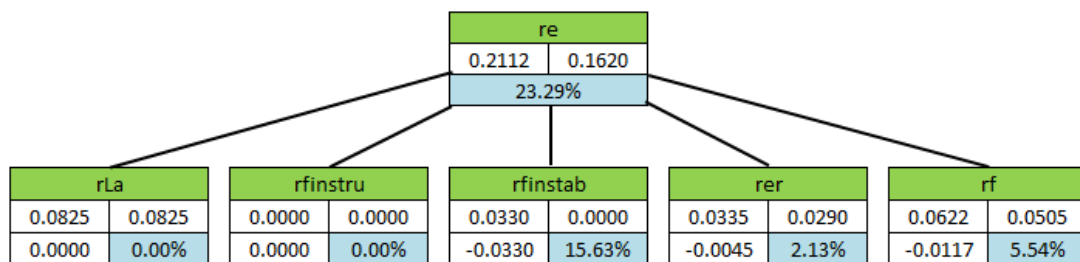
Source: Elaborated by author

Decrease of alternative cost of equity was influenced by three components, out of which the greatest impact on the change had a decrease of risk premium on financial stability, which had positively influenced change of r_e by 15.63%.

In the next tables I provide results of decomposition for two periods: year 2009 compared with year 2010, which are two years following the entry into the cluster, and comparison of year 2009 with the last year for which data are available, in this case year 2013.

Table 5: Decomposition of INFA Spread for period 2009 and 2010, company MGL s.r.o.

	Spread	ROE	re	EAT/EBT	EBT/A	A/E	ROA	Interest Expense	EBIT/R	R/A
2009	-0.0682	0.1499	0.2181	1.0000	0.0364	4.1135	0.0514	0.0149	0.0409	1.2600
2010	-0.1496	0.0663	0.2159	1.0000	0.0165	4.0128	0.0493	0.0327	0.0324	1.5200
Change	-0.0814	-0.0836	-0.0022	0.0000	-0.0199	-0.1007	-0.0021	0.0178	-0.0085	0.2600
Impact	-8.14%	-8.36%	0.22%	0.00%	-8.19%	-0.17%	-5.76%	-48.90%	-1.07%	0.84%

Source: Own processing using data of benchmarking diagnostic system

In the two years following the entry into the cluster is observed a greater decrease of return on equity, as in two years preceding the entry, which had negative impact of 8.36% on the Spread value. Level of taxation had, as in the previous case, no influence on decline of indicator ROE. The change was caused primarily by decline of return on assets with using earnings before taxes by 2 percentage points, which had negative impact of 8.19% on the change of ROE. On the table above can be

seen, that there has been a large yearly increase of interest expense which affected the EBT/A ratio negatively, by 48.90%.

Table 6: Decomposition of alternative cost of equity for period 2009 and 2010, company MGL s.r.o.

	re	rLa	rfinstru	rfinstab	rer	rf
2009	0.2181	0.0750	0.0000	0.0147	0.0600	0.0684
2010	0.2159	0.7500	0.0000	0.0348	0.0447	0.0614
Change	-0.0022	0.0000	0.0000	0.0201	-0.0153	-0.0070
Impact	1.01%	0.00%	0.00%	-9.22%	7.02%	3.21%

Source: Elaborated by author

In the Table 6 is observed slight decrease of alternative cost of equity, which had positive impact on the Spread value. This change was influenced by increase of the risk premium on financial stability with negative impact of 9.22% on r_e and decrease of premium on entrepreneurial risk and risk free rate, which had together positive impact on decrease of alternative cost of equity by 10.23%.

Table 7: Decomposition of INFA Spread for period 2009 and 2013, company MGL s.r.o.

	Spread	ROE	re	EAT/EBT	EBT/A	A/E	ROA	Interest Expense	EBIT/R	R/A
2009	-0.0682	0.1499	0.2181	1.0000	0.0364	4.1135	0.0514	0.0149	0.0409	1.2600
2013	0.3189	0.4754	0.1665	0.8040	0.3272	1.7300	0.3365	0.0093	0.2181	1.5400
Change	0.3871	0.3255	-0.0516	-0.1960	0.2907	-2.3062	0.2851	-0.0056	0.1722	0.2800
Impact	38.71%	32.55%	5.16%	-2.94%	96.15%	-60.66%	782.37%	15.43%	22.33%	6.11%

Source: Own processing using data of benchmarking diagnostic system

From year 2009 until 2013 the value of Spread increased by 38.71%. This change was positively influenced by increase of ROE by 32.55% and also positively influenced by decrease of alternative cost of equity by 5.16%. The greatest impact on the change of ROE from the three sub indicators had EBT/A ratio with its positive impact of 96.15%. On the other hand, the greatest negative impact had decrease of financial leverage by 2.31 percentage points which had impact on ROE of -60.66%. Interest expense, as a part of EBT/A decomposition changed during the four years only slightly. In contrary, the impact of ROA on the change of EBT/A was exactly 782.37%. Return on assets changed by 28.51 percentage points and it was effected by increase of both sub indicators, profit margin had impact of 22.33% and the asset turnover had smaller impact of 6.11%.

Table 8: Decomposition of alternative cost of equity for period 2009 and 2013, company MGL s.r.o.

	re	rLa	rfinstru	rfinstab	rer	rf
2009	0.2181	0.0750	0.0000	0.0147	0.0600	0.0684
2013	0.1665	0.0750	0.0000	0.0000	0.0527	0.0388
Change	-0.0516	0.0000	0.0000	-0.0147	-0.0073	-0.0296
Impact	23.66%	0.00%	0.00%	6.74%	3.35%	13.57%

Source: Elaborated by author

Alternative cost of equity for period from 2009 till 2013 decreased by 5.16 percentage points. The impact of risk premium on lower liquidity of shares or size of the enterprise is zero, same as in previous two cases. The highest positive impact of 13.57% on the decrease of r_e has a risk free rate.

MetalPlast Lipník n. B. a.s

Company MetalPlast Lipník n. B. a.s is focused on development and manufacturing of products connected with technologies such as metal sheet stamping, plastic injection moulding, stamping fibre materials in the heat and others. This enterprise joined the cluster in December 2009, which was three years after cluster establishment.

Figure 8: Values of INFA Spread for company MetalPlast Lipník n. B. a.s compared to average values of INFA Spread in industry
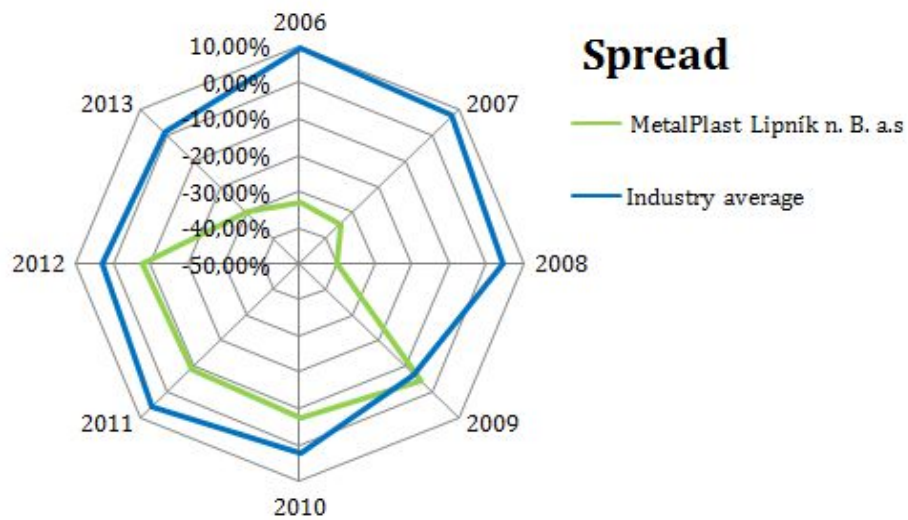
Source: Own processing using data of benchmarking diagnostic system

For the whole examined period from year 2006 till 2013, enterprise was having negative values of Spread. Except year 2009, it was lagging behind the industrial average. Although the values of Spread were negative for the entire observed pe-

riod, since 2009 when the company joined the cluster, values of Spread increased approximately by 25%.

Figure 9: Development of EVA INFA for period 2006-2013, company MetalPlast Lipník n. B. a.s
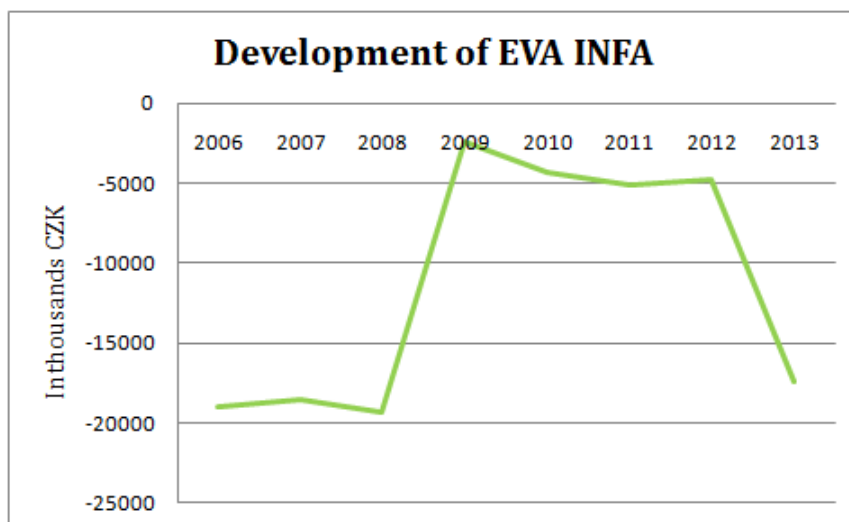
Source: Own processing using data of benchmarking diagnostic system and business registry

Negative values of Spread had negative impact on development of EVA INFA during observed period of time. EVA INFA had the highest value of -2,338,910 CZK reached in year 2009 and the lowest value in preceding year 2008, when EVA INFA has fallen to -19,321,000 CZK.

Figure 10: Comparison of values ROE, r_e and r_f for period between 2006 and 2013, company MetalPlast Lipník n. B. a.s
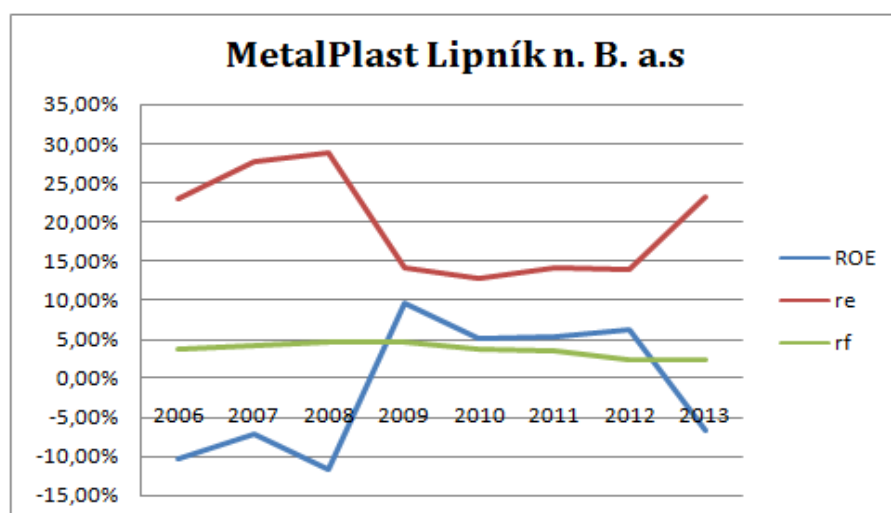
Source: Own processing using data of benchmarking diagnostic system

In the Figure 10 is depicted how ROE developed during the eight years time, compared to r_e and r_f indicators. It allows me to classify this company for the years 2006 -2008 and 2013 into loss making companies, because of ROE values being lower than zero. The remaining years 2009-2012 have return on equity higher than risk free rate and at the same time lower than alternative cost of equity. Therefore during this period of time, MetalPlast Lipník n. B. a.s would be classified into second group, which create very good enterprises within the industry.

Decomposition of value Spread for one period before entering into the cluster and two periods after entry into the cluster are presented in the following tables.

Table 9: Decomposition of INFA Spread for period 2007 and 2008, company MetalPlast Lipník n. B. a.s

	Spread	ROE	re	EAT/EBT	EBT/A	A/E	ROA	Interest Expense	EBIT/R	R/A
2007	-0.3483	-0.0722	0.2762	0.7460	-0.0593	1.6329	-0.0500	0.0093	-0.0298	1.6800
2008	-0.4049	-0.1171	0.2878	0.9098	-0.0776	1.6584	-0.0649	0.0127	-0.0453	1.4300
Change	-0.0566	-0.0449	0.0116	0.1638	-0.0183	0.0255	-0.0149	0.0034	-0.0155	-0.2500
Impact	-5.66%	-4.49%	-1.16%	-1.59%	-2.72%	-0.18%	-25.14%	-5.81%	-2.60%	1.13%

Source: Own processing using data of benchmarking diagnostic system

The first period of 2007 and 2008 depicts decline in Spread by 5.66 percentage points which is mainly caused by decline of ROE which had impact of -4.49% on the decline of Spread. Indicators with greatest impacts on return on equity are return on assets with using earnings before taxes, with its negative impact of -2.72% and level of taxation with also negative impact on change of ROE in the extent of -1.59%. ROA as a ratio of EBIT and assets decreased from year 2007 to 2008 and it influenced change of EBT/A by -25.14%. Interest expense has increased by 0.34% which had negative impact of -5.81% on the change of EBT/A.

Table 10: Decomposition of alternative cost of equity for period 2007 and 2008, company MetalPlast Lipník n. B. a.s

	re	rLa	rfinstru	rfinstab	rer	rf
2007	0.2762	0.0446	0.0830	0.0300	0.0830	0.0356
2008	0.2878	0.0410	0.0826	0.0440	0.0826	0.0376
Change	0.0116	-0.0036	-0.0004	0.0140	-0.0004	0.0020
Impact	-4.20%	1.30%	0.14%	-5.07%	0.14%	-0.72%

Source: Elaborated by author

In the two years preceding the entry into the cluster, alternative cost of equity increased, which represents negative impact on the change of Spread. Two factors had negative impact on the change of r_e and these were risk premium on financial

stability and risk free rate, while $r_{finstab}$ is indicator with the greatest impact out of positive and negative impacts.

Table 11: Decomposition of INFA Spread for period 2010 and 2011, company MetalPlast Lipník n. B. a.s

	Spread	ROE	re	EAT/EBT	EBT/A	A/E	ROA	Interest Expense	EBIT/R	R/A
2010	-0.0771	0.0509	0.1280	1.0000	0.0355	1.4337	0.0415	0.0060	0.0237	1.7500
2011	-0.0869	0.0535	0.1404	0.8652	0.0374	1.6554	0.0413	0.0040	0.0215	1.9200
Change	-0.0098	0.0026	0.0124	-0.1348	0.0019	0.2217	-0.0002	-0.0020	-0.0022	0.1700
Impact	-0.98%	0.26%	-1.24%	-0.69%	0.23%	0.72%	-0.56%	5.78%	-0.39%	0.37%

Source: Own processing using data of benchmarking diagnostic system

Period following immediately after entering the cluster is marked with decline of Spread by 0.98%, influenced mainly by increase of alternative cost of equity. Financial leverage and EBT/A had positive impact on the ROE change, while change of tax leverage had negative impact of -0.69% on the return on equity. Interest expense decreased by 0.20 percentage points, which lead to positive impact of 5.78% on the return on assets with using of earnings before taxes.

Table 12: Decomposition of alternative cost of equity for period 2010 and 2011, company MetalPlast Lipník n. B. a.s

	re	rLa	rfinstru	rfinstab	rer	rf
2010	0.1280	0.0500	0.0000	0.0130	0.0279	0.0371
2011	0.1404	0.0500	0.0000	0.0269	0.0284	0.0351
Change	0.0124	0.0000	0.0000	0.0139	0.0005	-0.0020
Impact	-9.69%	0.00%	0.00%	-10.86%	-0.39%	1.56%

Source: Elaborated by author

Alternative cost of equity, from year 2010 till 2011, increased by 1.24% which was caused by influence of three indicators out of which two had negative impact and one positive impact. Risk premium on financial stability increased by 1.39% which had negative effect of -10.86% on change of r_e. Risk free rate decreased and therefore positively influenced change of alternative cost of equity.

Table 13: Decomposition of INFA Spread for period 2010 and 2013, company MetalPlast Lipník n. B. a.s

	Spread	ROE	re	EAT/EBT	EBT/A	A/E	ROA	Interest Expense	EBIT/R	R/A
2010	-0.0771	0.0509	0.1280	1.0000	0.0355	1.4337	0.0415	0.0060	0.0237	1.7500
2013	-0.2980	-0.0664	0.2316	1.0000	-0.0362	1.8328	-0.0298	0.0064	-0.0138	2.1500
Change	-0.2209	-0.1173	0.1036	0.0000	-0.0717	0.3991	-0.0713	0.0004	-0.0375	0.4000
Impact	-22.09	-11.73%	-10.36%	0.00%	-10.28%	-1.45%	-200.83%	-1.21%	-6.56%	-0.55%

Source: Own processing using data of benchmarking diagnostic system

In the last observed period is seen how the value of Spread decreased by 22.09%. All indicators included in the decomposition of Spread value, except level of taxation with no change, had negative impact on the change of Spread. Impact of ROE in the amount of -11.73% was caused mainly by decrease of EBT/A ratio. Decomposition of EBT/A ratio shows great negative impact of -101.43% of ROA and only a slight negative impact of interest expense which was caused by increase of interest expense by 0.04%. Further breakdown of ROA indicates that profit margin decline by 3.75% had influenced decline in ROA by -6.56%, while impact of increased asset turnover was only -0.55%.

Table 14: Decomposition of alternative cost of equity for period 2010 and 2013, company MetalPlast Lipník n. B. a.s

	r_e	r_{La}	$r_{finstru}$	$r_{finstab}$	r_{er}	r_f
2010	0.1280	0.0500	0.0000	0.0130	0.0279	0.0371
2013	0.2316	0.0500	0.0000	0.0363	0.1185	0.0268
Change	0.1036	0.0000	0.0000	0.0233	0.0906	-0.0103
Impact	-80.94%	0.00%	0.00%	-18.20%	-70.78%	8.05%

Source: Elaborated by author

In the comparison of year 2010 with year 2013 the largest impact on the change of alternative cost of equity has the premium on entrepreneurial risk with impact in amount of -70.78%. $r_{finstab}$ increased during three years period by 2.33% and therefore it had also negative impact on change of r_e. The only positive impact is observed in risk free rate, due to decrease of r_f by 1.03%.

GRIOS s.r.o.

Grios s.r.o. is a company established in year 1996 and it specializes in the wire production. Since 2003, this company gives more attention to automotive industry, particularly on production of sunshade frames or seat and headrest reinforcements. Grios s.r.o. is one of the founding members of MSAC. It entered the cluster eleven years after its establishment. According to last available information from 2014, this company has 50 employees.

Figure 11: Values of INFA Spread for company Grios s.r.o. compared to average values of INFA Spread in industry
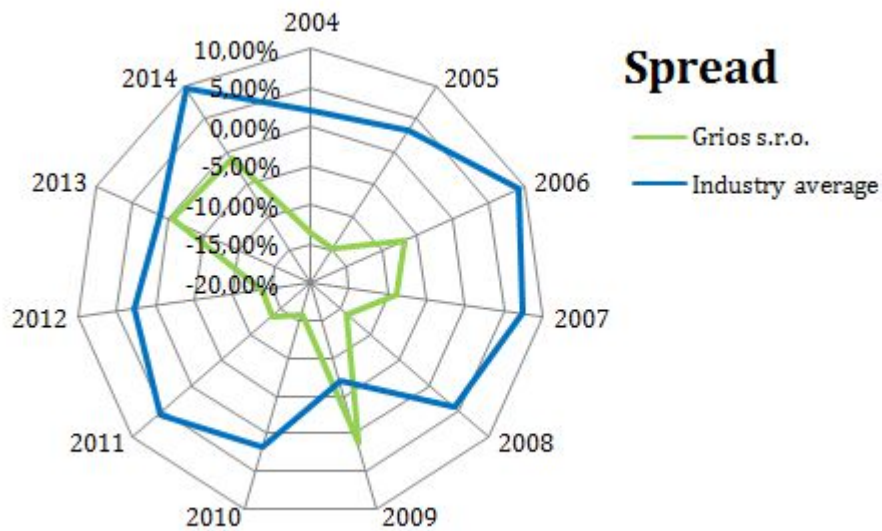
Source: Own processing using data of benchmarking diagnostic system

Grios s.r.o. reached negative Spread values, at the same time lower than industry average, for every observed year, except year 2009 when Spread was positive as well as higher than the average of the industry. The lowest Spread of -15.71% was reached in year 2010, which is four years after company entered automotive cluster.

Figure 12: Development of EVA INFA for period 2004-2014, company Grios s.r.o.
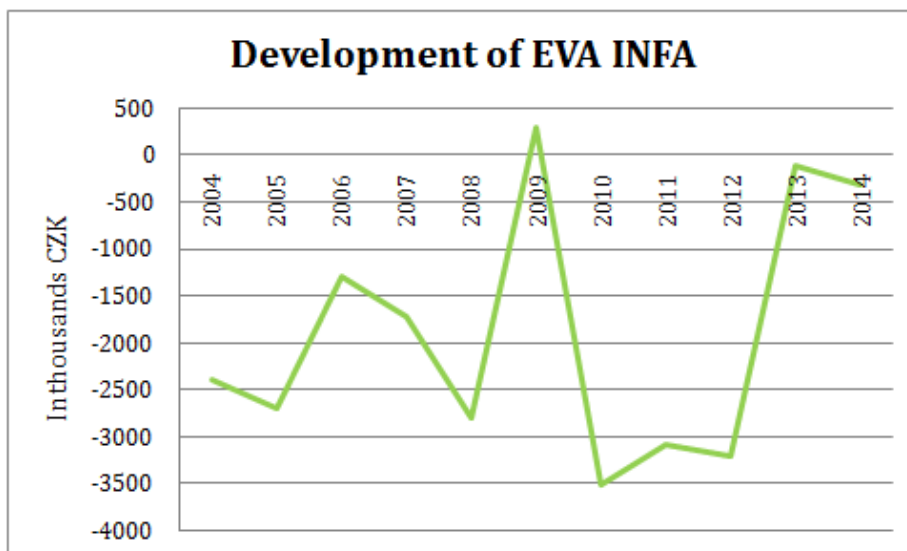
Source: Own processing using data of benchmarking diagnostic system and business registry

The only positive value of EVA INFA in the amount of 298,930 CZK was achieved in year 2009. On the other side, three lowest values are observed in years 2010-2012 when EVA INFA was below -3,000,000 CZK.

Figure 13: Comparison of values ROE, r_e and r_f for period between 2004 and 2014, company Grios s.r.o.
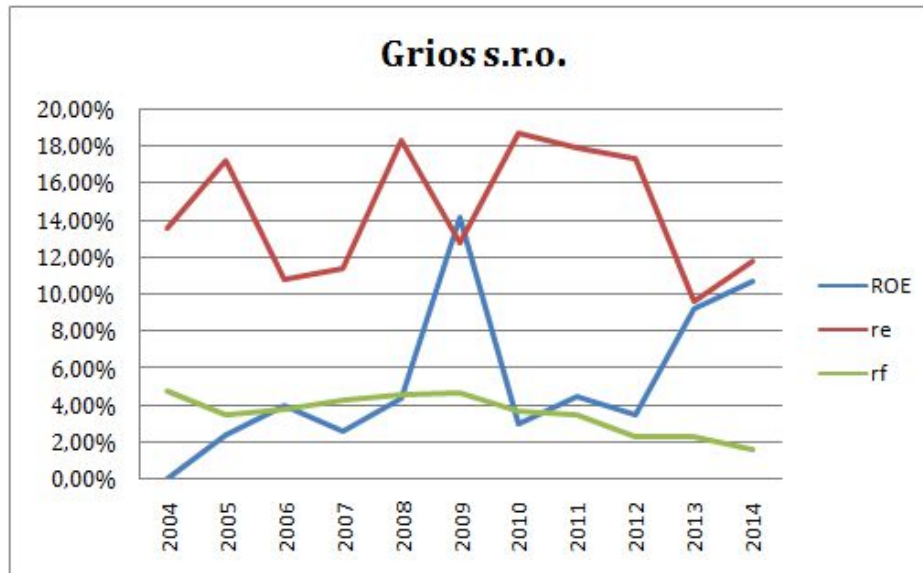
Source: Own processing using data of benchmarking diagnostic system

For the period 2004-2014, indicator ROE hasn't fall below zero, therefore during this time period, it hasn't belonged to group of loss making companies. Only for a short period of time, year 2009, it could be classified as one of the best enterprises within industry. From 2004 until 2008, not taking under consideration the slightly higher value of ROE in 2006, the company had ROE lower than r_f and therefore it belonged to the third group of profitable enterprises. During the years 2011 and forward, return on equity was greater than r_f and it falls under the second group of very good enterprises within industry.

Following six tables include decomposition of Spread for three periods observed in each of selected companies.

Table 15: Decomposition of INFA Spread for period 2004 and 2005, company Grios s.r.o.

	Spread	ROE	re	EAT/EBT	EBT/A	A/E	ROA	Interest Expense	EBIT/R	R/A
2004	-0.1357	0.0001	0.1358	0.2500	0.0002	1.7109	0.0009	0.0007	0.0011	0.8000
2005	-0.1486	0.0240	0.1726	0.9499	0.0146	1.7316	0.0476	0.0330	0.0600	0.7500
Change	-0.0129	0.0239	0.0368	0.6999	0.0144	0.0207	0.0467	0.0323	0.0589	-0.0500
Impact	-1.29%	2.39%	-3.68%	0.03%	2.33%	0.03%	19,974.34%	-13,833.53%	4.71%	-0.30%

Source: Own processing using data of benchmarking diagnostic system

In two years preceding the entry of Grios s.r.o. into cluster, the value of Spread decreased by -1.29% which was caused by increase of return on equity by 2.39 percentage points and increase of alternative cost of equity by 3.68%. On the above period is visible extremely high impact of return on assets and interest expense. ROA increased by 4.67% which had positive impact of 19,974.34% on the change of EBT/A ratio. Increase of interest expense by 3.23% negatively influenced change of EBT/A by -13,833.53%.

Table 16: Decomposition of alternative cost of equity for period 2004 and 2005, company Grios s.r.o.

	re	rLa	rfinstru	rfinstab	rer	rf
2004	0.1358	0.0500	0.0000	0.0284	0.0094	0.0480
2005	0.1726	0.0350	0.0000	0.0600	0.0530	0.0246
Change	0.0368	-0.0150	0.0000	0.0316	0.0436	-0.0234
Impact	-27.10%	11.05%	0.00%	-23.27%	-32.11%	17.23%

Source: Elaborated by author

Increase of alternative cost of equity was positively influenced by decrease of risk premium for lower liquidity of shares or size of the enterprise and also by decrease of risk free rate. Negative effect had increase of risk premium on financial stability and increase of entrepreneurial risk premium.

Table 17: Decomposition of INFA Spread for period 2007 and 2008, company Grios s.r.o.

	Spread	ROE	re	EAT/EBT	EBT/A	A/E	ROA	Interest Expense	EBIT/R	R/A
2007	-0.0890	0.0255	0.1145	0.9669	0.0143	1.8382	0.0151	0.0008	0.0165	0.9200
2008	-0.1394	0.0435	0.1829	0.6707	0.0251	2.5806	0.0394	0.0143	0.0587	0.6700
Change	-0.0504	0.0180	0.0684	-0.2962	0.0108	0.7424	0.0243	0.0135	0.0422	-0.2500
Impact	-5.04%	1.80%	-6.84%	-0.78%	1.33%	1.25%	169.37%	-94.20%	3.88%	-1.47%

Source: Own processing using data of benchmarking diagnostic system

Two years following the entry shows lower impact of ROA and interest expense. Interest expense increased, which negatively influenced return on assets with using of earnings before taxes. ROA increased as well, by 2.43% which had positive impact of 169.37% on the change of EBT/A ratio. Overall change of Spread was negative, as there was a decrease by 5.04 percentage points, influenced mainly negative impact of increased alternative cost of equity.

Table 18: Decomposition of alternative cost of equity for period 2007 and 2008, company Grios s.r.o.

	re	rLa	rfinstru	rfinstab	rer	rf
2007	0.1145	0.0500	0.0000	0.0020	0.0225	0.0400
2008	0.1829	0.0500	0.0000	0.0180	0.0409	0.0740
Change	0.0684	0.0000	0.0000	0.0160	0.0184	0.0340
Impact	-59.74%	0.00%	0.00%	-13.97%	-16.07%	-29.69%

Source: Elaborated by author

Risk premium on financial structure and risk premium for lower liquidity of shares or size of enterprise had no impact on change of r_e from year 2007 till 2008. The other three components of alternative cost of equity had all negative impact on alternative cost of equity. Risk free rate had highest negative impact, followed by entrepreneurial risk premium and risk premium on financial stability having lowest negative impact on change of r_e.

Table 19: Decomposition of INFA Spread for period 2007 and 2014, company Grios s.r.o.

	Spread	ROE	re	EAT/EBT	EBT/A	A/E	ROA	Interest Expense	EBIT/R	R/A
2007	-0.0890	0.0255	0.1145	0.9669	0.0143	1.8382	0.0151	0.0008	0.0165	0.9200
2014	-0.0112	0.1072	0.1185	0.8202	0.0577	2.2634	0.0727	0.0149	0.0456	1.5900
Change	0.0778	0.0817	0.0040	-0.1467	0.0434	0.4252	0.0576	0.0141	0.0291	0.6700
Impact	7.78%	8.17%	-0.40%	-0.39%	6.54%	2.01%	401.48%	-99.00%	2.68%	3.06%

Source: Own processing using data of benchmarking diagnostic system

The last observed period shows positive change of Spread from year 2007 till 2014. Increase of Spread by 7.78% is positively influenced by growth of ROE and only slightly negatively influenced by 0.40% increase of r_e. In this decomposition, ROA and interest expense indicators have again a strong influence on EBT/A ratio with impact values of 401.48% and -99.00%.

Table 20: Decomposition of alternative cost of equity for period 2007 and 2014, company Grios s.r.o.

	re	rLa	rfinstru	rfinstab	rer	rf
2007	0.1145	0.0500	0.0000	0.0020	0.0225	0.0400
2014	0.1185	0.0500	0.0000	0.0000	0.0380	0.0300
Change	0.0040	0.0000	0.0000	-0.0020	0.0155	-0.0100
Impact	-3.06%	0.00%	0.00%	1.75%	-13.54%	8.73%

Source: Elaborated by author

As in previous case of r_e decomposition, only three out of five components of alternative cost of equity had impact on its change, while in this period, there is only one indicator with negative impact of -13.54%, which is entrepreneurial risk pre-

mium. Although the other two components had positive impact on r_e, the total impact is lower than impact caused by change of r_{er}.

Cromodora Wheels s.r.o.

Cromodora Wheels is one of the leader enterprises in wheel production. It is producing wheels of different sizes, surface finishes, monoblock and two pieces wheels by using low pressure and flow forming casting technologies. This company has decided to enter the automotive cluster in year 2008, which is about 1.5 year after its establishment. According to last available information it employs 217 people.

Figure 14: Values of INFA Spread for company Cromodora Wheels s.r.o. compared to average values of INFA Spread in industry
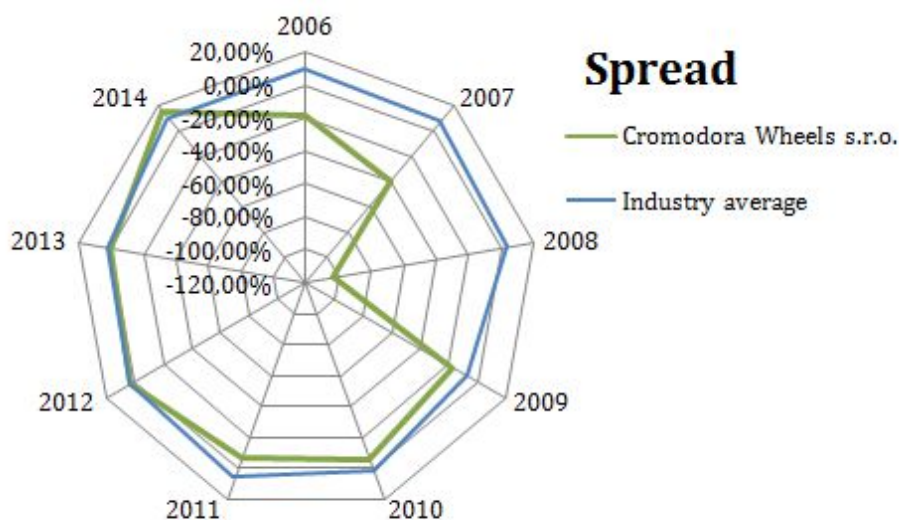
Source: Own processing using data of benchmarking diagnostic system

Year of establishment of Cromodora Wheels s.r.o. and its following two years are marked with great lagging behind the industry average. In 2007, Spread of this company was -39.98% which is 47.27 percentage points lower than industry average. In year 2008 the difference between Cromodora Wheels and industry average was even higher, exactly 106.97 percentage points. Situation changed in 2009 when Spread of the company significantly increased from -102,63% to -16.71%. In following years the gap between company and industry average was continuously decreasing, while in the last observed year the Spread of company actually exceeded the Spread of the industry. It can be concluded that since Cromodora Wheels entered the cluster, its Spread equalized with the industry average and there has been no huge lagging behind the industry, as in the years preceding the entry.

Figure 15: Development of EVA INFA for period 2006-2014, company Cromodora Wheels s.r.o.
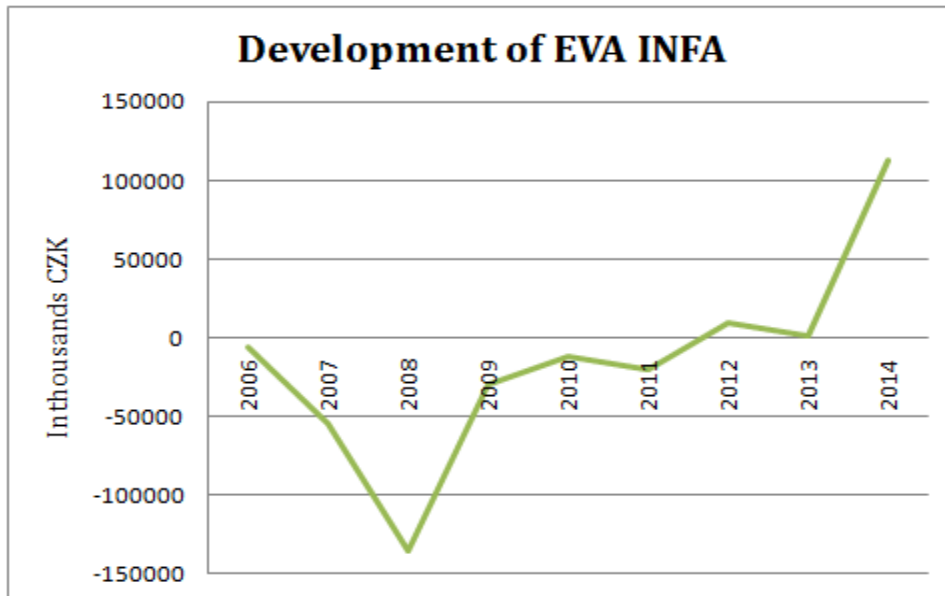
Source: Own processing using data of benchmarking diagnostic system and business registry

As development of Spread, EVA INFA was also growing since year 2008. Due to high amount of company's equity, EVA INFA increased from its lowest level in 2008 to 113,099,722 CZK in year 2014.

Figure 16: Comparison of values ROE, r_e and r_f for period between 2006 and 2014, company Cromodora Wheels s.r.o.
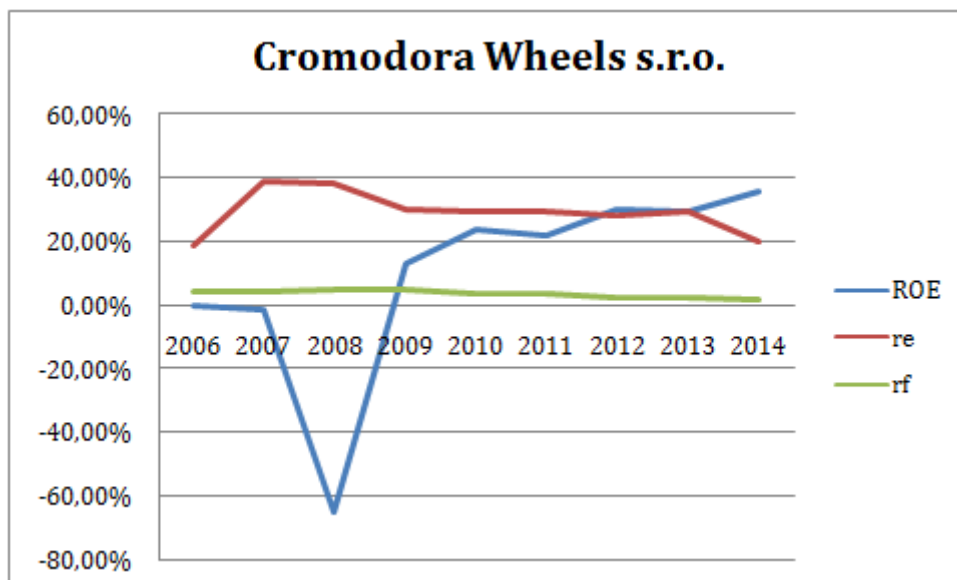
Source: Own processing using data of benchmarking diagnostic system

Since establishment of this enterprise, until 2008, company belonged to the fourth group of loss making enterprises. Already in year 2009 it moved two groups up to very good enterprises within automotive industry and in the last year, 2014, it created value and belonged among the best enterprises in automotive sector.

I the next tables I present decompositions of value Spread and values of indicators for particular years.

Table 21: Decomposition of INFA Spread for period 2006 and 2007, company Cromodora Wheels s.r.o.

	Spread	ROE	re	EAT/EBT	EBT/A	A/E	ROA	Interest Expense	EBIT/R	R/A
2006	-0.1892	-0.0015	0.1877	1.0000	-0.0015	1.0000	-0.0015	0.0000	-0.8627	0.0000
2007	-0.3998	-0.0127	0.3871	1.0133	-0.0036	3.5273	-0.0027	0.0009	0.0000	0.0000
Change	-0.2106	-0.0112	0.1994	0.0133	-0.0021	2.5273	-0.0012	0.0009	0.8627	0.0000
Impact	-21.06%	-1.12%	-19.94%	0.00%	-0.21%	-0.91%	-80.00%	-56.88%	-0.12%	0.00%

Source: Own processing using data of benchmarking diagnostic system

In company Cromodora Wheels s.r.o. the value of Spread decreased from year 2006 till year 2007. This negative change was caused by decrease of ROE and increase of r_e, while alternative cost of equity had higher impact of -19.94%. Negative change of return on assets with using of earnings before taxes is caused mainly by decrease of ROA with using EBIT, which had impact of -80.00% on the change of EBT/A ratio. Interest expense increased from years 2006 to 2007, which lead to also negative impact on EBT/A ratio in the value of -56.88%.

Table 22: Decomposition of alternative cost of equity for period 2006 and 2007, company Cromodora Wheels s.r.o.

	re	rLa	rfinstru	rfinstab	rer	rf
2006	0.1877	0.0500	0.0000	0.0000	0.1000	0.0377
2007	0.3871	0.0440	0.1000	0.1000	0.1000	0.0428
Change	0.1994	-0.0060	0.1000	0.1000	0.0000	0.0051
Impact	-106.23%	3.20%	-53.28%	-53.28%	0.00%	-2.72%

Source: Elaborated by author

Entrepreneurial risk premium hasn't changed from 2006 till 2007, therefore it had no impact on change of r_e. Risk premium for lower liquidity of shares or size of enterprise decreased by 0.60% which had positive impact on change of r_e. Both, risk premium for financial structure and risk premium for financial stability increased from 0% to 10% which lead to negative impact of -53.28% on the change of alternative cost of equity.

Table 23: Decomposition of INFA Spread for period 2009 and 2010, company Cromodora Wheels s.r.o.

	Spread	ROE	re	EAT/EBT	EBT/A	A/E	ROA	Interest Expense	EBIT/R	R/A
2009	-0.1671	0.1333	0.3004	1.0000	0.0239	5.5648	0.0464	0.0224	0.0702	0.6600
2010	-0.0541	0.2411	0.2952	1.0000	0.0546	4.4131	0.0694	0.0148	0.0689	1.0100
Change	0.1130	0.1078	-0.0052	0.0000	0.0307	-1.1517	0.0230	-0.0077	-0.0013	0.3500
Impact	11.30%	10.78%	0.52%	0.00%	17.07%	-6.29%	96.02%	32.06%	-0.09%	2.41%

Source: Own processing using data of benchmarking diagnostic system

After Cromodora Wheels entered the cluster, value of Spread increased by 11.30 percentage points. Increase of Spread was caused by growth of ROE and small decline of r_e. Level of taxation had no impact on the change of ROE, while EBT/A ratio had impact of 17.07% on the change of ROE. Financial leverage decreased from 2009 till 2010 which had negative impact of -6.29% on the change of ROE. Interest expense and return on assets had positive impact on change of return on assets with using earnings before taxes, while ROA had greater impact of 96.02%.

Table 24: Decomposition of alternative cost of equity for period 2009 and 2010, company Cromodora Wheels s.r.o.

	re	rLa	rfinstru	rfinstab	rer	rf
2009	0.3004	0.0438	0.0000	0.1370	0.0548	0.0644
2010	0.2952	0.0450	0.0960	0.0916	0.0270	0.0356
Change	-0.0052	0.0012	0.0960	-0.0454	-0.0278	-0.0288
Impact	1.60%	-0.39%	-32.00%	15.13%	9.27%	9.60%

Source: Elaborated by author

Small decrease of r_e by 0.52% was caused by increase of two indicators $r_{finstru}$ and rLa and decrease of three components $r_{finstab}$, r_{er} and r_f. Highest positive impact had $r_{finstab}$ and highest negative impact had $r_{finstru}$.

Table 25: Decomposition of INFA Spread for period 2009 and 2014, company Cromodora Wheels s.r.o.

	Spread	ROE	re	EAT/EBT	EBT/A	A/E	ROA	Interest Expense	EBIT/R	R/A
2009	-0.1671	0.1333	0.3004	1.0000	0.0239	5.5648	0.0464	0.0225	0.0702	0.6600
2014	0.1564	0.3588	0.2024	1.0000	0.1780	2.0153	0.1857	0.0077	0.1278	1.4500
Change	0.3235	0.2255	-0.0980	0.0000	0.1541	-3.5495	0.1393	-0.0148	0.0576	0.7900
Impact	32.35%	22.55%	9.80%	0.00%	85.74%	-63.19%	581.53%	61.71%	3.80%	10.10%

Source: Own processing using data of benchmarking diagnostic system

In the comparison of one year after entry into the cluster with last available year, which in this case is 2014, is visible growth of Spread by 32.55%. Main reason for this growth is increase of return on equity by 22.55%. Growth of ROE was influenced by increase of EBT/A ratio and decrease of financial leverage. EBT/A ratio

was affected largely by increase of ROA which lead to impact of 581.53%. Interest expense decreased and therefore it had positive impact of 61.71% on the EBT/A ratio. Farther decomposition of EBIT/A ratio shows that asset turnover growth had impact of 10.10% on the change of ROA, while increase of profit margin had smaller impact of 3.80%.

Table 26: Decomposition of alternative cost of equity for period 2009 and 2014, company Cromodora Wheels s.r.o.

	re	rLa	rfinstru	rfinstab	rer	rf
2009	0.3004	0.0440	0.0000	0.1370	0.0550	0.0644
2014	0.2024	0.0290	0.0000	0.1180	0.0350	0.0200
Change	-0.0980	-0.0150	0.0000	-0.0190	-0.0200	-0.0440
Impact	32.62%	4.99%	0.00%	6.32%	6.66%	14.65%

Source: Elaborated by author

In five years time, from 2009 till 2014, alternative cost of equity decreased by 9.80%. Risk premium on financial structure has no impact on this change, while the other four components have all positive impacts on r_e change. The greatest impact in value of 14.65% had decrease of risk free rate.

Ing. Petr Gross s.r.o.

Ing. Petr Gross s.r.o. is an enterprise focused on injection moulding. Its production ranges from home appliances, electrical devices to automotive industry while they produce vehicle lighting parts. This company joined the automotive cluster two years after MSAC was established.

Figure 17: Values of INFA Spread for company Ing. Petr Gross s.r.o. compared to average values of INFA Spread in industry
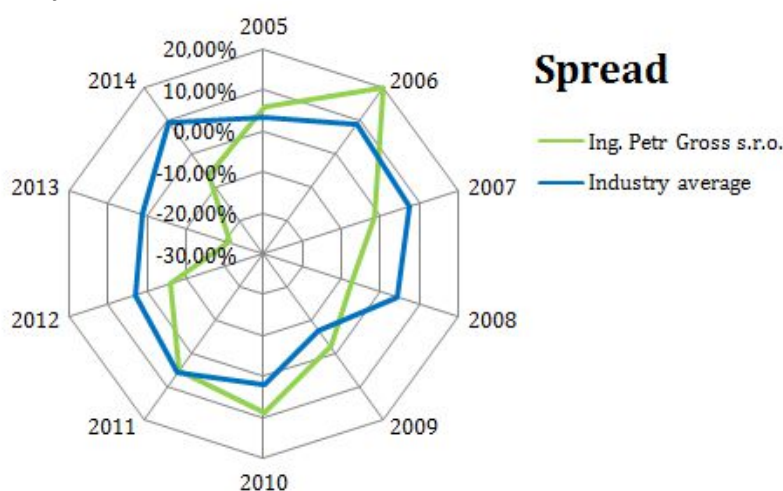
Source: Own processing using data of benchmarking diagnostic system

Spread values of Ing. Petr Gross s.r.o. were fluctuating in a similar way as automotive industry average. Differences between company and industry were moving, before entering the cluster, from 2.26 to 10.84 percentage points. After entering the cluster, these differences decreased, while in years 2009 and 2010 Spread of the company was higher than the industry average. After year 2011 when the Spread values almost equalled, Spread of the company decreased again below the level of automotive industry.

Figure 18: Development of EVA INFA for period 2005-2014, company Ing.Petr Gross s.r.o
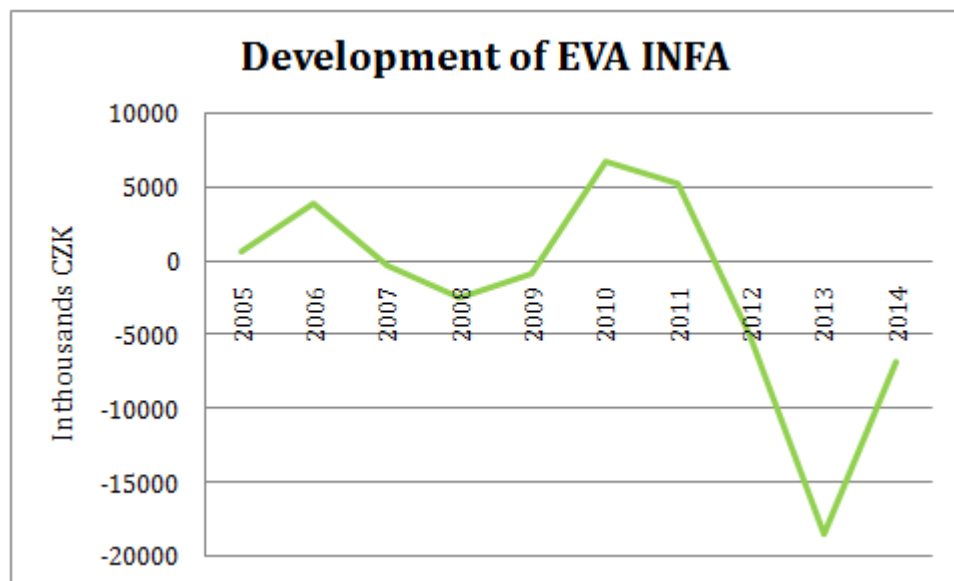
Source: Own processing using data of benchmarking diagnostic system and business registry

Economic value added for company Ing. Petr Gross s.r.o. reached positive values during years 2005, 2006, 2010 and 2011. Decline of Spread and with that connected decline of EVA INFA between periods of 2007-2009 can be caused by financial crises which could have greater negative impact on this company, than on other companies within industry. However, there is a large drop from year 2011 and 2012 which continued until 2013 when maximum negative value of EVA INFA in amount of 18,521,000 was achieved.

Figure 19: Comparison of values ROE, r_e and r_f for period between 2005 and 2014, company Ing. Petr Gross s.r.o.
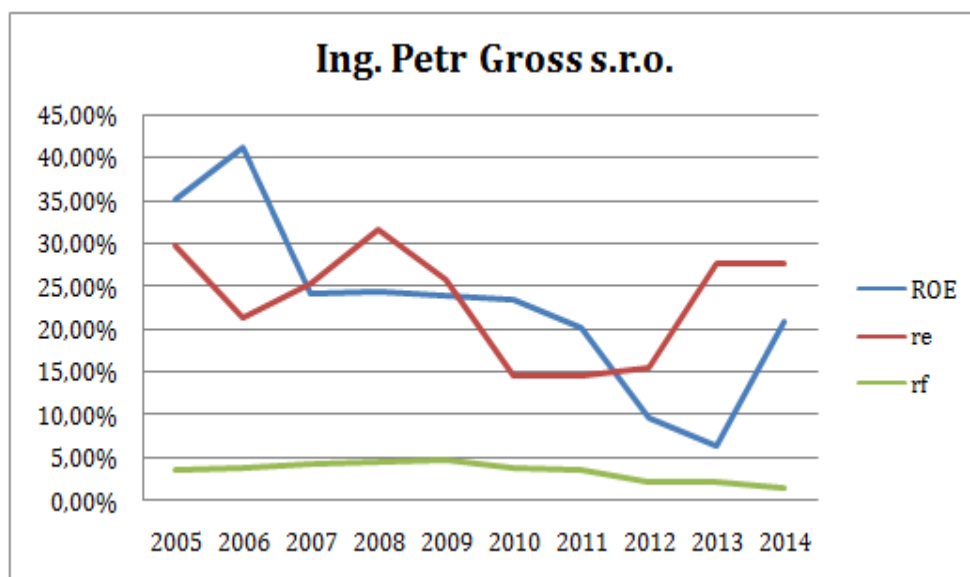
Source: Own processing using data of benchmarking diagnostic system

Above described company has kept its ROE above zero level and as well above level of r_f for the whole observed period from 2005 till 2014. Level of return on equity and alternative cost of equity was changing every two to three years which means that company's classification is changing in almost same intervals from group of best enterprises within industry creating value, into the group of very good enterprises within automotive industry.

I will next examine decomposition of Spread and impacts of particular indicators on the Spread changes.

Table 27: Decomposition of INFA Spread for period 2006 and 2007, company Ing. Petr Gross s.r.o.

	Spread	ROE	re	EAT/EBT	EBT/A	A/E	ROA	Interest Expense	EBIT/R	R/A
2006	0.1984	0.4125	0.2140	0.6801	0.2941	2.0623	0.2996	0.0055	0.1206	2.4800
2007	-0.0137	0.2407	0.2544	0.6801	0.1893	1.8692	0.1952	0.0059	0.1050	1.8600
Change	-0.2121	-0.1718	0.0404	0.0000	-0.1048	-0.1931	-0.1044	0.0004	-0.0156	-0.6200
Impact	-21.21%	-17.18%	-4.04%	0.00%	-14.69%	-2.49%	-35.50%	-0.12%	-3.87%	-6.51%

Source: Own processing using data of benchmarking diagnostic system

Two years prior to company's entry into the cluster are marked with Spread decline by 21.21%. This decline is caused mainly by decrease of return on equity by 17.18 percentage points. Alternative cost of equity had likewise negative impact on the change of Spread, in the value of -4.04%. Out of three indicators, the greatest impact on the change of ROE had ROA with using earnings before taxes. The reason

for decline of EBT/A is decrease of ROA with using earnings before taxes and interests by 10.44% and slight increase of interest expense. Profit margin, as well as asset turnover decreased from year 2006 till 2007, which negatively influenced change of EBIT/A ratio.

Table 28: Decomposition of alternative cost of equity for period 2006 and 2007, company Ing. Petr Gross s.r.o.

	re	rLa	rfinstru	rfinstab	rer	rf
2006	0.2140	0.0500	0.0000	0.0800	0.0463	0.0377
2007	0.2544	0.0500	0.0000	0.1170	0.0375	0.0499
Change	0.0404	0.0000	0.0000	0.0370	-0.0088	0.0122
Impact	-18.88%	0.00%	0.00%	-17.29%	4.11%	-5.70%

Source: Elaborated by author

Alternative cost of equity increase was influenced by three, out of five components. r_{La} and $r_{finstru}$ had no impact on the change of r_e, $r_{finstab}$ and r_f had negative impact and r_{er} had positive impact on the increase of alternative cost of equity.

Table 29: Decomposition of INFA Spread for period 2009 and 2010, company Ing. Petr Gross s.r.o.

	Spread	ROE	re	EAT/EBT	EBT/A	A/E	ROA	Interest Expense	EBIT/R	R/A
2009	-0.0209	0.2378	0.2587	0.8000	0.1643	1.8093	0.1756	0.0113	0.1014	1.7300
2010	0.0881	0.2347	0.1466	0.8090	0.1763	1.6458	0.1890	0.0127	0.1413	1.3400
Change	0.1090	-0.0031	-0.1121	0.0090	0.0120	-0.1635	0.0134	0.0014	0.0399	-0.3900
Impact	10.90%	-0.31%	11.21%	0.27%	1.75%	-2.33%	8.16%	-0.86%	6.90%	-5.51%

Source: Own processing using data of benchmarking diagnostic system

In the years following the entry into the cluster, Spread value increased by 10.90 percentage points. Main reason behind the Spread increase was decrease of alternative cost of equity by 11.21%. The main effect of -2.33%, on the change of ROE, had decrease of financial leverage. Increase of EBT/A was caused primarily by increase of EBIT/A ratio, while increase of interest expense had only impact of -0.86%. Out of two indicators effecting ROA, profit margin had greater positive impact than asset turnover negative impact.

Table 30: Decomposition of alternative cost of equity for period 2009 and 2010, company Ing. Petr Gross s.r.o.

	re	rLa	rfinstru	rfinstab	rer	rf
2009	0.2587	0.0500	0.0000	0.1100	0.0477	0.0510
2010	0.1466	0.0500	0.0000	0.0330	0.0265	0.0371
Change	-0.1121	0.0000	0.0000	-0.0770	-0.0212	-0.0139
Impact	43.33%	0.00%	0.00%	29.76%	8.19%	5.37%

Source: Elaborated by author

In the two years following the entry into the cluster, r_e decreased due to three indicators. Risk premium on financial stability had the greatest impact of 29.76%. Entrepreneurial risk premium and risk free rate had also positive influence on r_e, while r_{La} and $r_{finstru}$ had no impact on alternative cost of equity, same as in two years preceding the entry into cluster.

Table 31: Decomposition of INFA Spread for period 2009 and 2014, company Ing. Petr Gross s.r.o.

	Spread	ROE	re	EAT/EBT	EBT/A	A/E	ROA	Interest Expense	EBIT/R	R/A
2009	-0.0209	0.2378	0.2587	0.8000	0.1643	1.8093	0.1756	0.0113	0.1014	1.7300
2014	-0.0668	0.2095	0.2763	0.8118	0.1006	2.5648	0.1088	0.0082	0.1107	0.9800
Change	-0.0459	-0.0283	0.0176	0.0118	-0.0637	0.7555	-0.0668	-0.0031	0.0093	-0.7500
Impact	-4.59%	-2.83%	-1.76%	0.35%	-9.35%	6.17%	-40.66%	1.91%	1.61%	-8.30%

Source: Own processing using data of benchmarking diagnostic system

By comparing first year after joining cluster with year 2014, decline in Spread value is observed. Both, ROE and r_e had negative influence on this change, with ROE having the greater negative impact. Only slight positive impact of level of taxation is seen in this observation. Another positive impact on ROE had increase of financial leverage due to increase of ratio by 75.55 percentage points. The greatest impact was negative and caused by decrease of EBT/A. Return on assets decreased by 6.68% which lead to impact of -40.66% on decrease of EBT/A.

Table 32: Decomposition of alternative cost of equity for period 2009 and 2014, company Ing. Petr Gross s.r.o.

	re	rLa	rfinstru	rfinstab	rer	rf
2009	0.2587	0.0500	0.0000	0.1100	0.0477	0.0510
2014	0.2763	0.0473	0.0000	0.1520	0.0445	0.0325
Change	0.0176	-0.0027	0.0000	0.0420	-0.0032	-0.0185
Impact	-6.80%	1.04%	0.00%	-16.24%	1.24%	7.15%

Source: Elaborated by author

In spite of decline of three risk premiums, alternative cost of equity during 2009 and 2014 increased by 1.76%. Risk premium on financial stability increased by 4.20%, which was the only reason for increase of r_e.

KOMAS, spol s.r.o.

Company Komas has many years of experience in the production of pressed parts for automotive industry. Among the main customers of this company belongs Škoda, Volkswagen or Bentley. It is one of the founding members of Moravian Silesian automotive cluster and in 2014 it employed 112 people.

Figure 20: Values of INFA Spread for company Komas,spol s.r.o. compared to average values of INFA Spread in industry
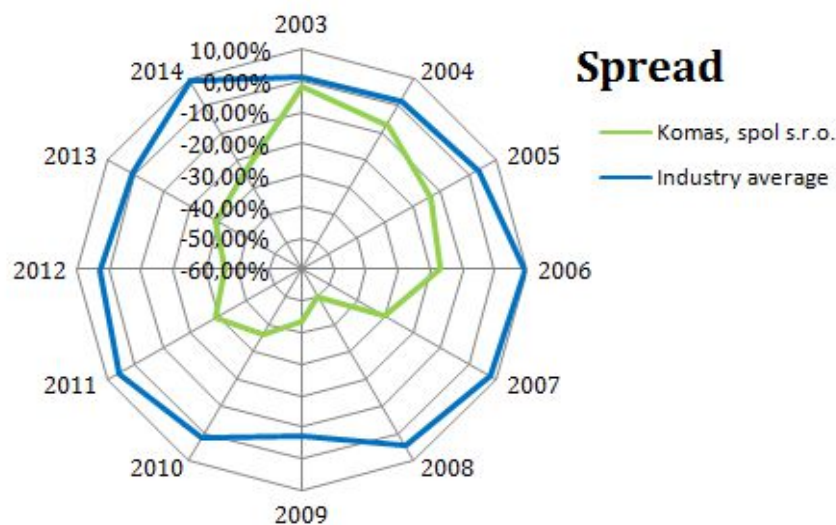
Source: Own processing using data of benchmarking diagnostic system

On the above spider graph it is shown that Spread of analysed company has been below the industry average for the entire examined period of twelve years, with no exception. Spread was not only lower, but also negative. It was continuously decreasing from year 2003 until 2008 when it reached its lowest value of -50.21%. After this year the values were slightly growing but they didn't get above -24.45% which is the last value of Spread in year 2014.

Figure 21: Development of EVA INFA for period 2003-2014, company Komas, spol s r.o.
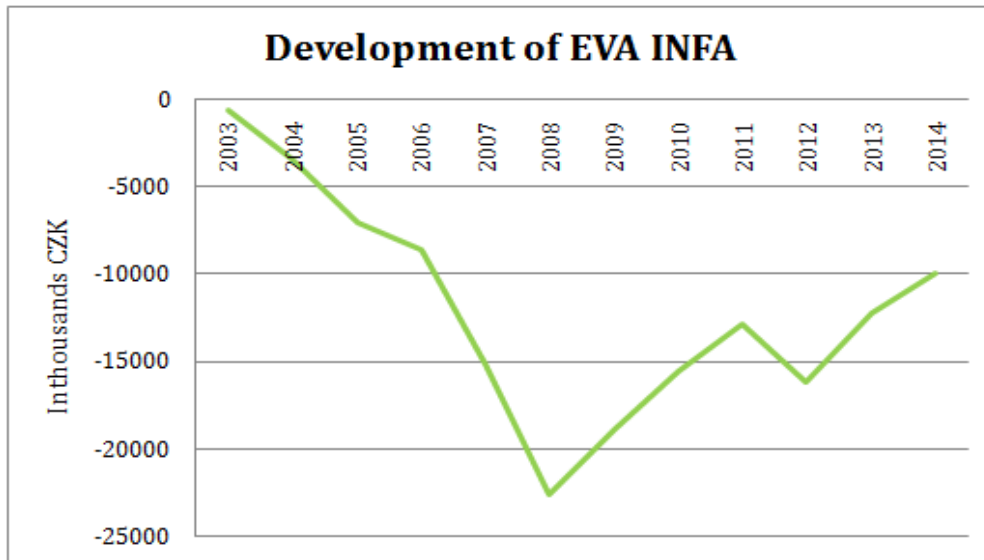
Source: Own processing using data of benchmarking diagnostic system and business registry

In the above Figure 21 is depicted development of EVA INFA which is negative for the entire period of twelve years. 2008 is the year of lowest economic value added, while the first observed year 2003 had EVA INFA closest to 0. Since 2008 is seen increased trend of EVA INFA, with fallback in 2012 and followed with further EVA INFA increase.

Figure 22: Comparison of values ROE, r_e and r_f for period between 2003 and 2014, company Komas, spol s.r.o.
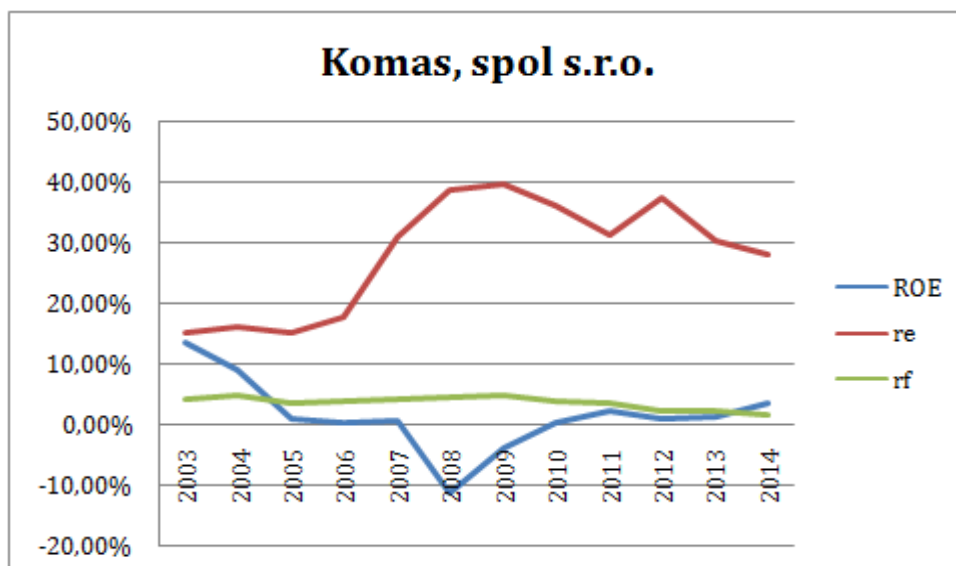
Source: Own processing using data of benchmarking diagnostic system

On the Figure 22 is shown how alternative cost of equity is greater than ROE for the whole observed period which means that company Komas hasn't belonged to the first group of best enterprises within industry. For the period from 2005 till 2007 the value of ROE was lower than risk free rate, but above zero, which suggest classification of company into the third group of profitable enterprises. In the following years 2008 and 2009, Komas belonged to loss making companies and since 2010 till 2013 it moved one group up to profitable enterprises. In the last year 2014 and in the first two years 2003 and 2004, company belonged to the second group of very good enterprises within industry.

In the following six tables are presented results of Spread decomposition for three different periods.

Table 33: Decomposition of INFA Spread for period 2004 and 2005, company Komas spol, s.r.o.

	Spread	ROE	re	EAT/EBT	EBT/A	A/E	ROA	Interest Expense	EBIT/R	R/A
2004	-0.0710	0.0876	0.1586	0.9792	0.0557	1.6075	0.0594	0.0037	0.0499	1.1900
2005	-0.1427	0.0087	0.1513	0.9515	0.0048	1.8886	0.0160	0.0112	0.0163	0.9900
Change	-0.0717	-0.0789	-0.0073	-0.0277	-0.0508	0.2811	-0.0434	0.0074	-0.0336	-0.2000
Impact	-7.17%	-7.89%	0.73%	-0.25%	-7.77%	0.13%	-77.98%	-13.32%	-4.00%	-0.33%

Source: Own processing using data of benchmarking diagnostic system

In the two years preceding the entry into the cluster, decline of Spread was influenced by decrease of ROE and decrease of r_e. On the change of ROE acted two indicators negatively and one positively. The more influential negative indicator was EBT/A and indicator with positive impact of 0.13% was financial leverage. Decline of EBT/A ratio was caused mainly by decrease of ROA by 4.34%. Interest expense increased and therefore it negatively influenced change of EBT/A.

Table 34: Decomposition of alternative cost of equity for period 2004 and 2005, company Komas spol, s.r.o.

	re	rLa	rfinstru	rfinstab	rer	rf
2004	0.1586	0.0330	0.0000	0.0720	0.0156	0.0380
2005	0.1513	0.0380	0.0000	0.0610	0.0193	0.0330
Change	-0.0073	0.0050	0.0000	-0.0110	0.0037	-0.0050
Impact	4.60%	-3.15%	0.00%	6.94%	-2.33%	3.15%

Source: Elaborated by author

Alternative cost of equity decreased from 2004 till 2005 by 0.73%. Decrease of r_e was influenced by four indicators. Two indicators, r_{La} and r_{er} had negative impact on the change and two indicators, $r_{finstab}$ and r_f had positive impacts, while values of

positive impacts prevailed. The greatest influence on the change of alternative cost of equity had risk premium on financial stability.

Table 35: Decomposition of INFA Spread for period 2007 and 2008, company Komas spol, s.r.o.

	Spread	ROE	re	EAT/EBT	EBT/A	A/E	ROA	Interest Expense	EBIT/R	R/A
2007	-0.3032	0.0047	0.3079	1.0000	0.0023	2.0198	0.0200	0.0177	0.0195	1.0300
2008	-0.5021	-0.1148	0.3873	1.0000	-0.0533	2.1529	-0.0333	0.0200	-0.0326	1.0200
Change	-0.1989	-0.1195	0.0794	0.0000	-0.0557	0.1331	-0.0533	0.0024	-0.0521	-0.0100
Impact	-19.89%	-11.95%	-7.94%	0.00%	-11.24%	-0.71%	-2290.53%	-101.06%	-5.37%	0.03%

Source: Own processing using data of benchmarking diagnostic system

In the observation of two years after company joined the cluster is visible decrease of Spread by 19.89%. This decrease is caused by decline of ROE and increase of r_e, while ROE had greater negative impact on the change of Spread. Farther decomposition of ROE suggests that the indicator with greatest influence on ROE is EBT/A with impact of -11.24%. Interest expense and ROA acted negatively on the EBT/A ratio, with ROA having greater impact on the EBT/A change.

Table 36: Decomposition of alternative cost of equity for period 2007 and 2008, company Komas spol, s.r.o.

	re	rLa	rfinstru	rfinstab	rer	rf
2007	0.3079	0.0986	0.0000	0.0970	0.0403	0.0720
2008	0.3873	0.0986	0.0000	0.1200	0.0630	0.1057
Change	0.0794	0.0000	0.0000	0.0230	0.0227	0.0337
Impact	-25.79%	0.00%	0.00%	-7.47%	-7.37%	-10.95%

Source: Elaborated by author

Decline in alternative cost of equity was caused by increase of three components, $r_{finstab}$, r_{er} and r_f, out of which the risk free rate growth had the strongest negative impact on the change of alternative cost of equity. Risk premium for lower liquidity of shares or size of the enterprise and risk premium on financial structure had no impact on r_e as the value remained zero in both observed years.

Table 37: Decomposition of INFA Spread for period 2007 and 2014, company Komas spol, s.r.o.

	Spread	ROE	re	EAT/EBT	EBT/A	A/E	ROA	Interest Expense	EBIT/R	R/A
2007	-0.3032	0.0047	0.3079	1.0000	0.0023	2.0198	0.0200	0.0177	0.0195	1.0300
2014	-0.2445	0.0344	0.2789	1.0000	0.0147	2.3348	0.0285	0.0138	0.0289	0.9800
Change	0.0587	0.0297	-0.0290	0.0000	0.0124	0.3150	0.0085	-0.0039	0.0094	-0.0500
Impact	5.87%	2.97%	2.90%	0.00%	2.51%	0.46%	365.28%	167.88%	0.97%	-0.14%

Source: Own processing using data of benchmarking diagnostic system

During 2007 and 2014 the value of Spread increased. ROE and r_e had both positive and very similar impact on the change. Level of taxation remained zero, financial leverage increased, which positively influenced ROE, and EBT/A ratio also increased. EBT/A ratio had the strongest impact on the change of ROE with its 2.51%.

Table 38: Decomposition of alternative cost of equity for period 2007 and 2014, company Komas spol, s.r.o.

	re	rLa	rfinstru	rfinstab	rer	rf
2007	0.3079	0.0986	0.0000	0.0970	0.0403	0.0720
2014	0.2789	0.0986	0.0000	0.0520	0.0410	0.0873
Change	-0.0290	0.0000	0.0000	-0.0450	0.0007	0.0153
Impact	9.42%	0.00%	0.00%	14.62%	-0.23%	-4.97%

Source: Elaborated by author

Decrease of alternative cost of equity during 2007 and 2014 is mainly caused by decrease of risk premium on financial stability by 4.50% which lead to impact of 14.62% on the change of alternative cost of equity. Risk free rate and entrepreneurial risk premium had negative impacts of -0.23% and -4.97%. As in previous observation, r_{La} and $r_{finstru}$ had no impact on change of r_e.

SimulPlast s.r.o.

Company SimulPlast s.r.o. joined the Czech automotive cluster in 2010 which was three years after its establishment. It specializes in each step of production of plastic components, such as suggestions of appropriate materials, through design of parts in terms of manufacturability of plastic injection moulding technology, it's optimizing, testing the form or assisting in injection process. I have observed this company for period of seven years and the results are provided in the following figures and tables.

Figure 23: Values of INFA Spread for company SimulPlast s.r.o. compared to average values of INFA Spread in industry
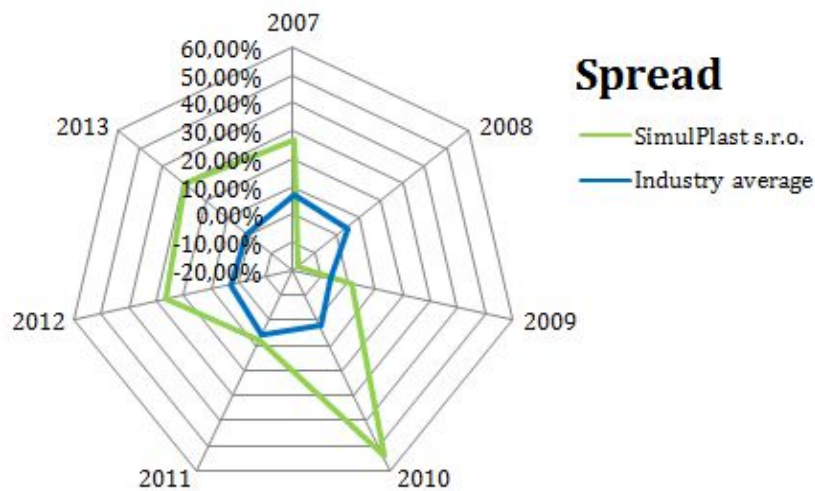
Source: Own processing using data of benchmarking diagnostic system

With exception of year 2008, company SimulPlast reached higher values of Spread than is achieved by the industry average. The greatest Spread of 54.60% can be observed in year 2010. At the end of 2010 company joined the cluster and value of Spread decreased by 46.67 percentage points, however Spread was still above the industry average. With following years Spread increased to level of 26.95 % in 2012 and 30.10% in 2013. In the last year of 2013, the difference between the Spread of company and industry average mounted to 28.94 percentage points.

Figure 24: Development of EVA INFA for period 2007-2013, company SimulPlast s r.o.
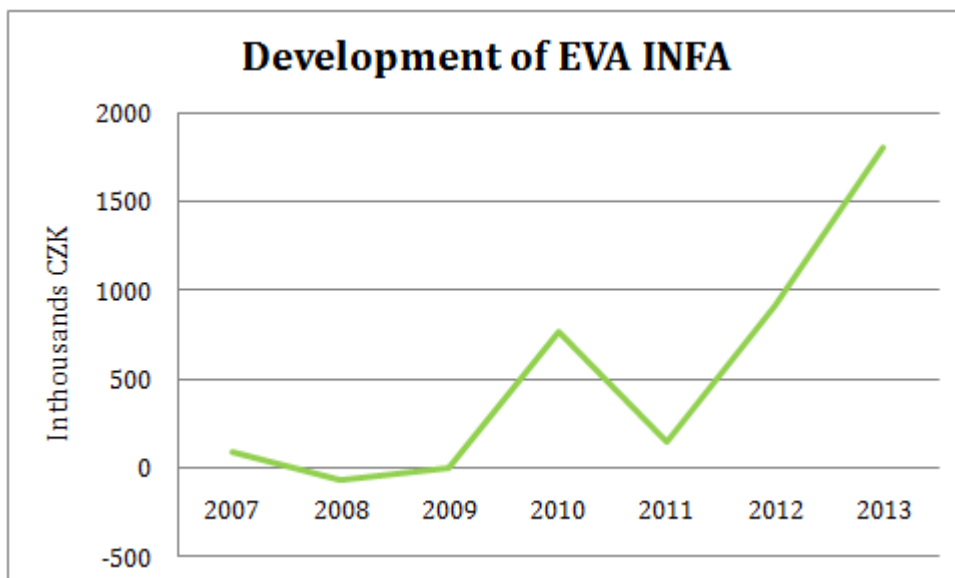
Source: Own processing using data of benchmarking diagnostic system and business registry

With positive values of Spread, EVA INFA was also developing in positive numbers. Only one year, 2008, demonstrated negative EVA INFA values of rather small amount of -63,530 CZK. Although the greatest Spread was reached in year 2010, above Figure 21 displays year 2013 as a year with highest value of EVA INFA. The reason is higher amount of equity in year 2013 than in year 2010. With equity in year 2010 being equal to 1,405,000 CZK, the economic value added rises to amount of 767,130 CZK. In year 2013 equity of company SimulPlast s.r.o. equalled to 6,019,000 CZK, therefore EVA INFA grew to 1,811,719 CZK.

Figure 25: Comparison of values ROE, r_e and r_f for period between 2007 and 2013, company SimulPlast s.r.o.
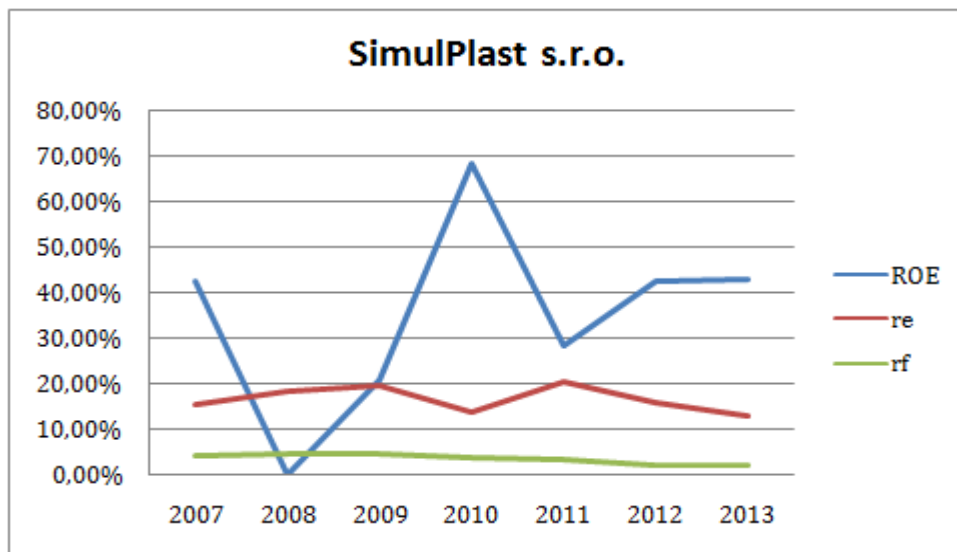
Source: Own processing using data of benchmarking diagnostic system

With one exception of year 2008, company SimulPlast s.r.o. belongs to the first group, according to creation of EVA INFA, which is a group of best enterprises within industry creating values. The reason is that return on equity achieved higher values than alternative cost of equity. In spite of very low ROE in 2008, company managed to remain above zero level, therefore, even in this year it didn't fall among loss making companies.

Table 39: Decomposition of INFA Spread for period 2008 and 2009, company SimulPlast, s.r.o.

	Spread	ROE	re	EAT/EBT	EBT/A	A/E	ROA	Interest Expense	EBIT/R	R/A
2008	-0.1815	0.0029	0.1844	0.2000	0.0049	2.9403	0.0049	0.0000	0.0043	1.1300
2009	0.0146	0.2117	0.1971	0.7642	0.0409	6.7797	0.4090	0.0001	0.0400	1.0200
Change	0.1961	0.2088	0.0127	0.5642	0.0359	3.8393	0.0360	0.0001	0.0357	-0.1100
Impact	19.61%	20.88%	-1.27%	0.82%	8.07%	11.99%	730.01%	-1.43%	4.03%	-0.44%

Source: Own processing using data of benchmarking diagnostic system

In the period between 2008 and 2009 is seen increase of Spread by 19.61%. this increase is primarily caused ba increase of ROE by 20.88%. Alternative cost of equity increased slightly and therefore it had negative impact on the Spread development. Out of three ROE components, the greatest impact on ROE increase had financial leverage and lowest impact had level of taxation.

Table 40: Decomposition of alternative cost of equity for period 2008 and 2009, company SimulPlast s.r.o.

	re	rLa	rfinstru	rfinstab	rer	rf
2008	0.1844	0.0500	0.0000	0.0700	0.0254	0.0390
2009	0.1971	0.0500	0.0000	0.07600	0.0297	0.0414
Change	0.0127	0.0000	0.0000	0.0060	0.0043	0.0024
Impact	-6.89%	0.00%	0.00%	-3.25%	-2.33%	-1.30%

Source: Elaborated by author

On the above decomposition of alternative cost of equity is visible that three indicators have negatively influenced development of r_e, while the greatest impact had risk premium on financial stability, followed by entrepreneurial risk premium and risk free rate. r_{La} and $r_{finstru}$ had no impact on changes occurred in alternative cost of equity.

Table 41: Decomposition of INFA Spread for period 2011 and 2012, company SimulPlast, s.r.o.

	Spread	ROE	re	EAT/EBT	EBT/A	A/E	ROA	Interest Expense	EBIT/R	R/A
2011	0.0793	0.2845	0.2051	0.8020	0.0964	3.6778	0.0964	0.0000	0.0714	1.3500
2012	0.2695	0.4255	0.1560	0.8390	0.1697	2.9886	0.1719	0.0022	0.2131	0.8100
Change	0.1902	0.1410	-0.0491	0.0370	0.0733	-0.6892	0.0755	0.0022	0.1417	-0.5400
Impact	19.02%	14.10%	4.91%	1.31%	22.60%	-9.81%	78.28%	-2.34%	19.13%	-11.51%

Source: Own processing using data of benchmarking diagnostic system

After company joined the cluster value of Spread increased by 19.02%. This change was influenced positively by ROE and also r_e, while higher weight had increase of ROE by 14.10%. ROE was farther influenced by three indictors: EAT/EBT, EBT/A and A/E. Financial leverage had negative impact of -9.81% on the ROE change and the other two components had positive impact, while return on assets with using earnings before taxes had the greatest impact on the change in the value of 22.60%. Reason for increase of EBT/A ratio is increase of ROA and increase of interest expense which had negative impact on EBT/A development.

Table 42: Decomposition of alternative cost of equity for period 2011 and 2012, company SimulPlast s.r.o.

	re	rLa	rfinstru	rfinstab	rer	rf
2011	0.2051	0.0500	0.0000	0.0784	0.0320	0.0447
2012	0.1560	0.0500	0.0000	0.0508	0.0362	0.0190
Change	-0.0491	0.0000	0.0000	-0.0276	0.0042	-0.0257
Impact	23.94%	0.00%	0.00%	13.46%	-2.05%	12.53%

Source: Elaborated by author

Alternative cost of equity, after entering the cluster, decreased by 4.91% which had positive impact on development of Spread value. As in the years preceding the entry into the cluster, r_{La} and $r_{finstru}$ had no impact on the change in alternative cost of equity. Greatest positive influence is seen in indicator $r_{finstab.}$ Similarly high positive impact had also risk free rate indicator. The only r_e indicator which increased and had negative effect on alternative cost of equity from 2011 till 2012 is entrepreneurial risk premium.

Table 43: Decomposition of INFA Spread for period 2011 and 2013, company SimulPlast, s.r.o.

	Spread	ROE	re	EAT/EBT	EBT/A	A/E	ROA	Interest Expense	EBIT/R	R/A
2011	0.0793	0.2845	0.2051	0.8020	0.0964	3.6778	0.0964	0.0000	0.0714	1.3500
2013	0.3010	0.4288	0.1278	0.8142	0.2420	2.1758	0.2427	0.0007	0.2155	1.1300
Change	0.2217	0.1443	-0.0773	0.0122	0.1456	-1.5020	0.1463	0.0007	0.1441	-0.2200
Impact	22.17%	14.43%	7.73%	0.43%	43.60%	-29.60%	151.68%	-0.73%	19.45%	-4.74%

Source: Own processing using data of benchmarking diagnostic system

In the examined period 2011 and 2013 is observed increase of Spread by 22.17%, caused by increase of ROE by 14.43% and decrease of r_e by 7.73%. EBT/A ratio acted positively on the increase of ROE and it had highest impact of 43.60%. Financial leverage, on the other hand, had negative impact of -29.60%. In this period, profit margin has increased and had impact of 19.45% on the change of ROA.

Table 44: Decomposition of alternative cost of equity for period 2011 and 2013, company SimulPlast s.r.o.

	re	rLa	rfinstru	rfinstab	rer	rf
2011	0.2051	0.0500	0.0000	0.0784	0.0320	0.0447
2013	0.1278	0.0500	0.0000	0.0274	0.0294	0.0210
Change	-0.0773	0.0000	0.0000	-0.0510	-0.0026	-0.0237
Impact	37.69%	0.00%	0.00%	24.87%	1.27%	11.56%

Source: Elaborated by author

Decrease of alternative cost of equity in the last examined period had positive influence on the Spread. It was caused by decrease of three r_e components, out of which the risk on financial stability had the greatest impact and risk free rate the lowest impact. Risk on financial structure and risk premium for lower liquidity of shares or size of the enterprise had no impact on alternative cost of equity, same as in previous two observations.

Statistical verification of partial results

In this part of diploma thesis I am going to statistically test, whether there has been a significant change in values of INFA Spread before and after enterprises joined the automotive cluster. Values that are going to be tested are presented in the table below:

Table 45: INFA Spread values of seven observed enterprises

	x-2	x-1	x	x+1	x+2	x+3	x+4
MGL s.r.o.	0.0662	0.1145	0.1243	-0.0682	-0.1496	0.1404	0.3466
MetalPlast Lipník n. B. a.s	-0.3483	-0.4049	-0.0443	-0.0771	-0.0869	-0.0759	-0.2980
GRIOS s.r.o.	-0.1357	-0.1486	-0.0686	-0.0890	-0.1394	0.0131	-0.1571
CROMODORA WHEELS s.r.o	-0.1892	-0.3998	-1.0263	-0.1671	-0.0541	-0.0698	0.0234
Ing. Petr Gross s.r.o.	0.1984	-0.0137	-0.0727	-0.0209	0.0881	0.0561	-0.0588
KOMAS spol, sr.o.	-0.0710	-0.1427	-0.1727	-0.3032	-0.5021	-0.4378	-0.3610
SimulPlast, s.r.o.	-0.1815	0.0146	0.5460	0.0793	0.2695	0.3010	----

Source: Own processing using data of benchmarking diagnostic system

Columns in the Table 45 are named according to year of entry, where *x* stands for year of entry, *x-1* stands for value of INFA Spread one year before entry and *x+1* means INFA Spread one year after company joined the cluster and so on. I will test for significant change of INFA Spread these periods: period *x-1* with one, two, three and four years after entering cluster and also period *x-2* with all four years after entry into the cluster.

One of the assumptions for paired t-test is normality. I will check that differences between pairs are normally distributed. Therefore I will calculate these differences and test them for normality using Shapiro-Wilk test, available in Gretl. Normality test works with following hypothesis:

H_0: Population is normally distributed
H_1: Population is not normally distributed

Chosen significance level for normality testing is 5%. In case p-value will be lower than 0.05, I will reject H_0. In case p-value is higher than 0.05, I will not reject null hypothesis which means that population is normally distributed. As paired t-test will be applied for eight observations mentioned above, I will also test normality for eight sample differences.

Another assumption of paired t-test is that variances of two samples are equal. In order to test variance I will perform F-test in Excel. F-test works with following hypothesis:

H_0: Variances of two populations are equal
H_1: Variances of two populations are not equal

I have selected significance level to be 5% which means that in case p-value is lower than 0.05, I will reject null hypothesis. In case of p-value being higher than 0.05, I will not reject null hypothesis which will suggest that variances of two populations are equal and assumption of paired t-test is fulfilled.

After checking assumptions of paired t-test I can move forward to perform actual paired t-test which tests following hypothesis:

H_0: Mean of two paired samples are equal
H_1: Means of two paired samples are not equal.

Calculated p-value will be checked against significant level of 5% and conclusion about whether to reject null hypotheses will be made. In the following table I present results of normality tests, tests of variance and paired t-tests for all eight observed periods.

Table 46: P-values for normality test, variance testing and paired t-test for eight observations

	p-value of Shapiro-Wilk test	**p- value of F-test**	**p-value of Paired t-test**
x-1 compared to x+1	0.653805	0.115054	0.526887
x-1 compared to x+2	0.315475	0.348765	0.603728
x-1 compared to x+3	0.196525	0.378970	0.176001
x-1 compared to x+4	0.976218	0.329158	0.415247
x-2 compared to x+1	0.269537	0.169578	0.979462
x-2 compared to x+2	0.999429	0.260334	0.916173
x-2 compared to x+3	0.929623	0.286827	0.449950
x-2 compared to x+4	0.510110	0.277014	0.966694

Source: Elaborated by author

On the above Table 46 can be observed that p-value for none of observations and none of tests has been lower than 5% significance level. P-values of Shapiro-Wilk

test and F-test suggest that assumptions for performing paired t-tests were met, because null hypothesis of normality and variance testing were not rejected. Results of paired t-tests imply that null hypothesis will not be rejected for any of observed cases, which mean that means of two paired samples are equal. From statistical testing of INFA Spread values I can therefore make a conclusion that entering the cluster didn't lead to significant change of INFA Spread.

4.2 Processing the survey of Moravian-Silesian Automotive Cluster

Moravian-Silesian Automotive cluster currently consists of 70 members, out of which eight members are universities, secondary schools or higher professional schools. Questionnaire survey was therefore sent out to the 62 enterprises. The response rate was 19.38% as I have received 12 answers from Czech enterprises which are MSA cluster members. Obtained results of the survey were processed in software STATISTICA, using factor analysis. Factor analysis is performed using all twelve valid cases represented by enterprises which answered on the questionnaire and eighteen variables which present the questions from the survey. From the variety of techniques for factor extraction, I have selected Communalities=multiple R^2. In order to identify meaningful factors, rotation of factors through varimax rotation of the normalized factor loadings is performed. Next is determined the number of created factors through the Scree plot or by using Guttman-Kaiser criterion.

Figure 26: Scree plot of eigenvalues
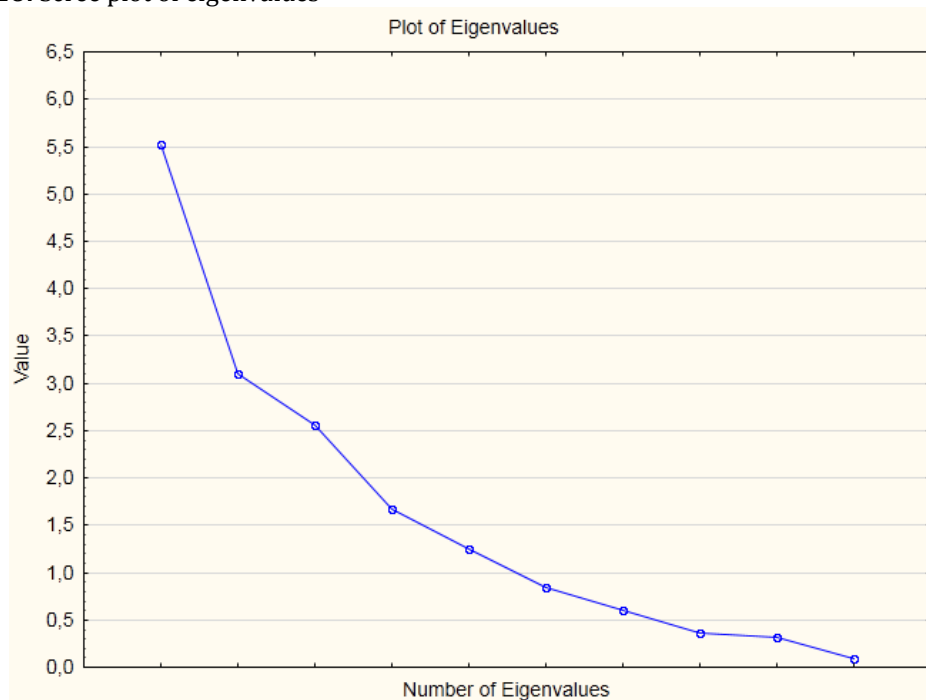
Source: Own processing using STATISTICA software

According to scree plot it is not obvious how many factors should be retained. It is suggested to look at the point where continuous drop of eigenvalues will level off

According to Guttman-Kaiser criterion I will preserve factors which have eigenvalue higher than 1. In this case, there are five factors extracted, with eigenvalue higher than 1, as it is shown in the following table where the exact eigenvalues are reviewed.

Table 47: List of factors with eigenvalues higher than 1

Value	Eigenvalue	%Total variance	Cumulative Eigenvalue	Cumulative %
1	5.52	30.66	5.52	30.66
2	3.10	17.22	8.62	47.88
3	2.55	14.19	11.17	62.07
4	1.66	9.25	12.84	71.32
5	1.25	6.93	14.08	78.25

Source: Own processing using software STATISTICA

On the above table is observed that the first factor contributes to the explanation of total variance of variables with 30.66% and the fifth factor contributes with 6.93% to the explanation of total variance. In total, five created factors with eigenvalues higher than one, contribute to explanation of total variance with 78.25%.

In the next figure I present factor loadings for all variables, with rotation strategy varimax normalized. Factors loadings are explained as correlations between factors and variables and I have concentrated on the factor loading values greater than 0.7.

Table 48: Factor Loadings (Varimax normalized)

Variable	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
1.Economic performance of the company	0.25	0.15	0.17	**0.79**	-0.03

(Table continues on the next page)

2. Management system changes inside the company	**0.76**	0.02	0.07	0.13	0.17
3.Administrative procedure changes inside the company	0.10	0.46	-0.56	0.03	-0.31
4.Productivity of labor increase	0.22	-0.13	0.08	**0.87**	0.08
5.Positive impact on employees' wages on managerial positions	**0.82**	0.09	0.27	0.30	-0.02
6.Positive impact on employees' wages on workers positions	0.34	0.67	0.09	0.14	-0.24
7.Sales growth due to increased cooperation with Czech companies	**0.74**	0.07	0.55	0.23	-0.01
8.Increased sales due to deeper cooperation with foreign companies	**0.72**	-0.18	0.30	0.33	-0.22
9.Sales growth due to increased number of customers	0.32	0.07	**0.79**	0.14	-0.08
10.Better access to information	**-0.87**	-0.06	0.20	-0.14	0.13
11.Increase of financial performance	0.15	-0.59	-0.11	0.49	0.34
12.Research and development activities, innovative projects	**-0.87**	0.33	-0.02	0.07	-0.07
13.More market opportunities	0.25	**-0.84**	0.14	-0.05	-0.31
14.Increased credibility of business entity	0.12	**-0.89**	-0.07	0.12	0.01
15.Cooperation with state organizations	-0.11	-0.30	-0.45	0.50	0.48
16.Access to funding sources: Bank Loans	0.33	-0.09	0.01	-0.11	**0.72**
17.Access to funding sources: Grants from public budgets (structural European Union funds)	-0.30	0.06	0.10	0.26	**0.80**

(Table continues on the next page)

18.Better access to financial subsidies/support from public and other sources	-0.57	0.18	0.55	0.33	0.34

Source: Own processing using software STATISTICA

The results of factor analysis lead to creation of five factors. These factors consists of variables, which are determined according to factor loadings, with values higher than 0,7 (bold values, highlighted in red in the table above). These values can be either positive or negative. The table below shows the newly created factors, together with variables they are consisting of.

Table 49: List of newly created factors

Factor	Name of factor	Variables
Factor 1	Information and R&D motivations + Management and sales growth	➢ Management system changes inside the company ➢ Positive impact on employees' wages on managerial positions ➢ Sales growth due to increased cooperation with Czech companies ➢ Increased sales due to deeper cooperation with foreign companies ➢ Motivation to enter the cluster: Better access to information ➢ Motivation to enter the cluster: Research and development activities, innovative projects
Factor 2	Market and credibility motivation	➢ Motivation to enter the cluster: More market opportunities ➢ Motivation to enter the cluster: Increased credibility of business entity
Factor 3	New customers	➢ Sales growth due to increased number of customers
Factor 4	Performance	➢ Economic performance of the company ➢ Productivity of labor increase
Factor 5	Funding sources	➢ Access to funding sources: Bank Loans ➢ Access to funding sources: Grants from public budgets (structural European Union funds)

Source: Elaborated by author

Five factors created by factor analysis explain almost 80% of total variance of original set. The first factor explains 30.66% of total variance. It groups variables related to management system changes, wages on managerial positions and variables associated with sales increase due to cooperation with both, Czech and the foreign companies. This factor includes also two motivations to enter the cluster: better access to information and research and development projects, innovative projects. Factor loadings for these two variables have a high values of -0.87 in both cases, which suggest high negative correlation between these variables and the Factor 1. Negative signs of factor loadings imply that companies which will score high on the first four variables in this factor, will score low on variables related to information access and research and development projects, and the other way around. As in this case, companies which were motivated to enter the cluster due to better access to information and due to cooperation on innovative and research and development projects, didn't experience increase of sales growth due to cooperation with Czech and foreign companies and also in these companies didn't occur increase of wages on managerial positions or management system changes. The second, Factor 2 includes two variables: more market opportunities and increased credibility of business entity. Both these variables represent motivation for companies to enter the cluster and they explain 17.22 % of total variance. Factor loadings which can be interpreted as a correlation between variables and the factor reach negative values of -0.84 and -0.89. These two negative factor loadings mean that Factor 2 has opposite characteristics of what these two variables measure. Companies which took part in questionnaire survey scored high on these two motivations to enter the cluster. Factor 3 includes one, out of eighteen variables. Variable related to sales growth due to increased number of customers is 0.79, which means positive correlation of this variable with Factor 3. The Factor 4 joins two variables: economic performance of the company and productivity of labor increase (measured as a value added per monetary unit of human labour). Values of factor loadings are 0.79 and 0.87 which suggest high correlation of variables with the Factor 4. The last Factor 5 is created from two variables. It merges two motivations to enter the cluster, both are related to funding sources. Correlations of these variables with factor are 0.72 and 0.80.

Questionnaire survey included also open questions. One of them provided answers on question whether there is any other factor that motivated enterprises to enter the cluster, except the above mentioned motives. 5 out of 12 companies answered as follow:

- Deepening cooperation with enterprises in the same field,
- Personal bonds,
- To get a better/closer contact on suppliers from automotive industry,
- Company presentation,
- Prestige.

Another question was aimed at finding out if entering the cluster brought any disadvantages for the enterprises. The answer from all enterprises was negative one. As the only possible disadvantage, mentioned by one company, was a membership fee. The last open question pointed out the greatest advantages of being a member of Moravian-Silesian automotive cluster and here are the answers:

- Increased awareness of the company,
- Cooperation on scientific research projects and innovations,
- Information,
- Business visibility,
- Contacts on companies from automotive industry,
- Company presentation,
- Prestige,
- Access to funds aimed for clusters,
- Business network.

"Information" was the most common answer when asked about the advantages of being a member of automotive cluster.

4.3 Economic performance of Automotive Cluster Slovakia

Czech Ministry of Industry and Trade provides Benchmarking Diagnostic system of financial indicators INFA which I have used for the analysis of economic performance of Czech enterprises. There is however no such a tool, or similar one, in Slovakia, which is information confirmed by Ministry of Economy of the Slovak Republic and SLCP (Slovak Centre of Productivity). Therefore I will work with Czech Benchmarking system and INFA methodology also for Slovak cases. Components of Balance Sheets and Profit and Loss statements, which need to be entered into Benchmarking Diagnostic system, will be recalculated from Euro currency to Czech Koruna.

As already mentioned in the methodology, for the purpose of finding out factors that have effect on cluster membership, it is important to have information about the date of entry into the cluster. I have contacted the Project Manager of ACS several times, but even after his confirmation to send this information to me, I didn't receive it. Due to difficult cooperation with ACS, I have included question about date of entry into the cluster also in the questionnaire. I have received two responses on the questionnaire survey and two information about date of entry into the cluster.

Table 50: List of companies selected for analysis of economic performance in ACS

Name of the company	Date of establishment	Year of entry into the cluster	Number of employees
INEKON SYSTEMS s.r.o.	29.6.2005	2011	22
RTU EUROPE s.r.o.	8.9.2012	2012	11-50

Source: Elaborated by author using business registry

4.3.1 Economic performance of Automotive Cluster Slovakia's members

INEKON SYSTEMS s.r.o.

INEKON SYSTEMS s.r.o. is a company focused on implementation of management information systems and projects which are focused on support of managerial decision making. It has joined the automotive cluster in 2011. On the following figure is presented value of Spread and its development compared to industry average.

Figure 27: Values of INFA Spread for company INEKON SYSTEMS s.r.o. compared to average values of Spread in industry
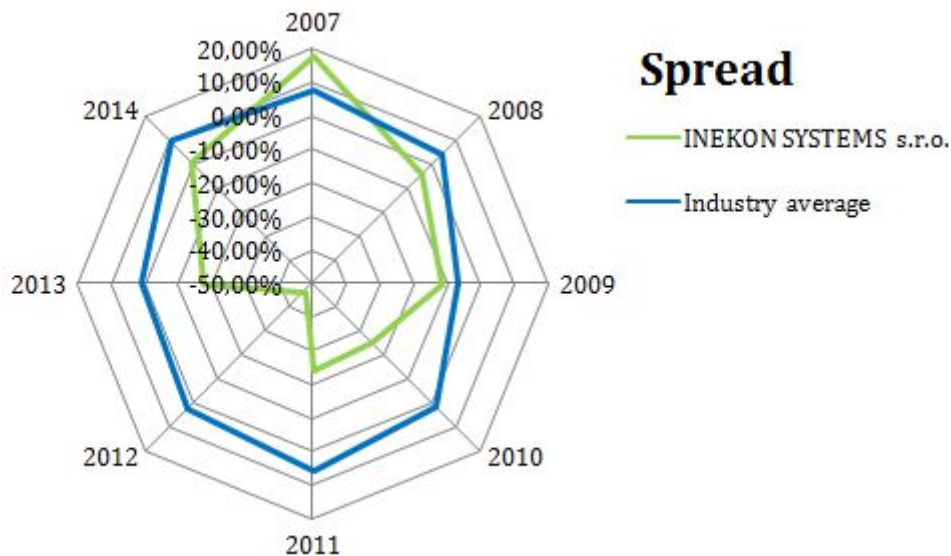
Source: Own processing using data of benchmarking diagnostic system

Except the year 2007, company's Spread value was moving below the Spread average in the automotive industry. One year after company joined the automotive cluster, Spread value decreased to -46.73%. This was the lowest Spread in the observed period of eight years. Since this year, Spread was increasing, until it reached positive value of 1.16% in the year 2014.

Figure 28: Development of EVA INFA for period 2007-2014, company INEKON SYSTEMS s r.o.
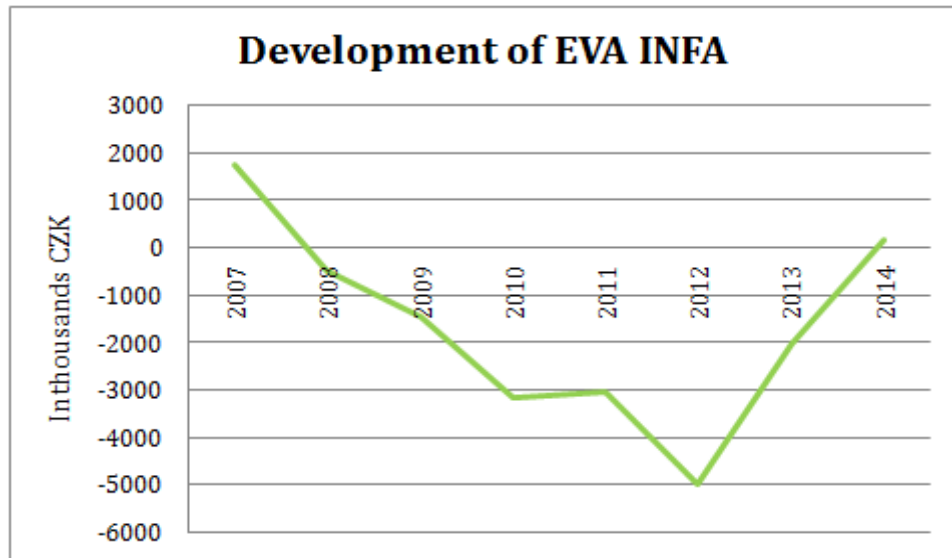
Source: Own processing using data of benchmarking diagnostic system and business registry

Economic value added was decreasing since year 2007 until 2012 when the value of EVA INFA reached its lowest point of -4,968,330 CZK. In the following two observed years, EVA INFA was annually increasing faster, than it was annually decreasing prior to entering cluster. At last, in year 2014 it reached amount of 148.670 CZK.

Figure 29: Comparison of values ROE, r_e and r_f for period between 2007 and 2014, company INEKON SYSTEMS s.r.o.
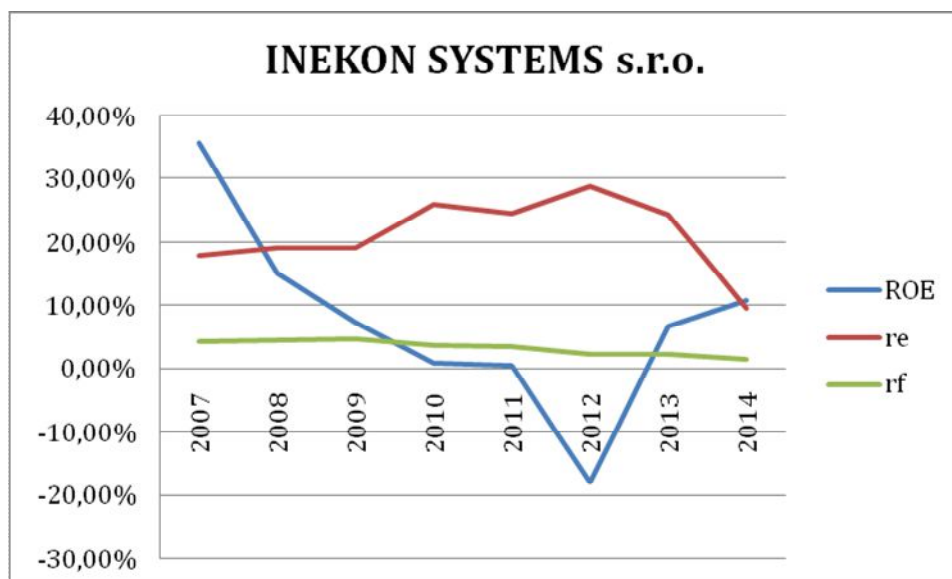
Source: Own processing using data of benchmarking diagnostic system

On the above company is visible how, during the period of eight years, the company moved between all four groups of EVA INFA creation. In year 2007 and 2014, company Inekon Systems belonged to the first group of enterprises creating value. From 2008 until 2009 and in year 2013, the company can be classified into the second group of very good enterprises within industry. In year 2010 and 2011 the value of ROE was below risk free rate but above the zero level, therefore in these two years company belonged to profitable enterprises. ROE in year 2012 reached negative values, lower than r_e and r_f, hence it could be placed into the fourth group of loss making enterprises.

I will next decompose Spread in order to see which indicators had the greatest impact on Spread development.

Figure 30: Pyramidal decomposition of INFA Spread for period 2009 and 2010, company INEKON SYSTEMS s.r.o.
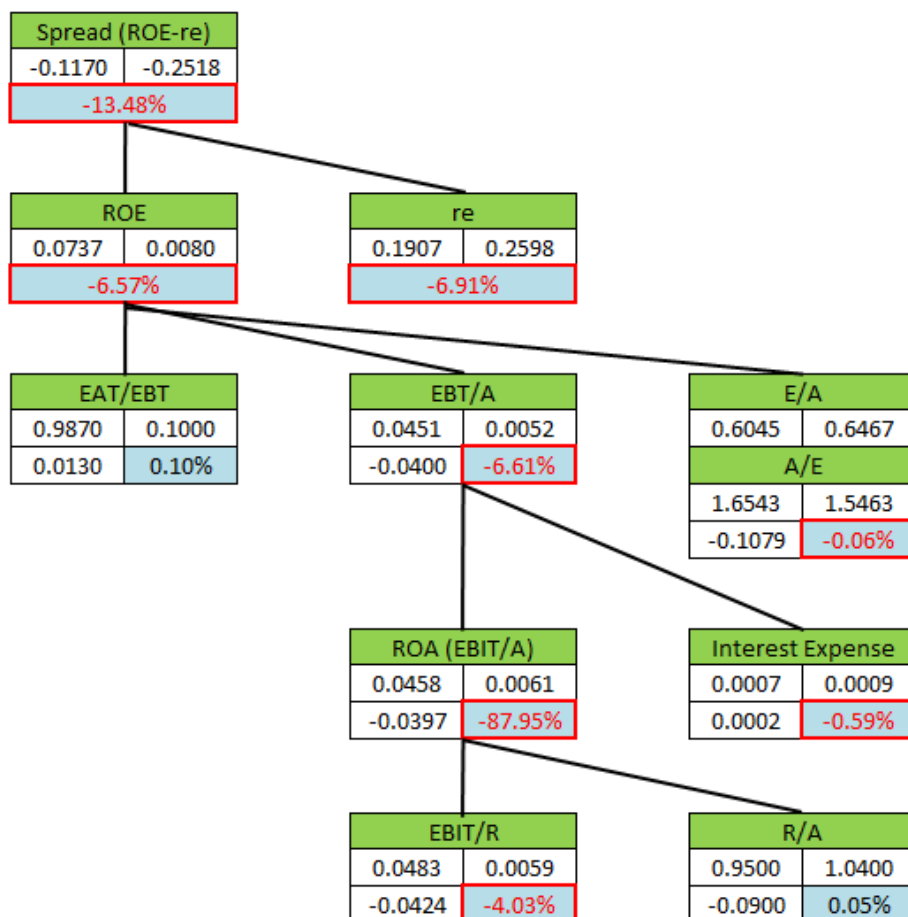

Source: Own processing using data of benchmarking diagnostic system

Pyramidal decomposition on the Figure 27 shows how values of particular indicators changed from year 2009 till 2010, which are two years preceding entry into

the Slovak Automotive cluster. Spread value decreased while ROE and r_e had almost the same impact on this decrease. The main impact on the change of ROE had decrease of return on assets with using earnings before taxes. Further decomposition of EBT/A ratio shows decrease of ROA by 3.97% and increase of interest expense by 0.02%, out of which the greater influence on decrease of EBT/A had EBIT/A ratio. On the last level of decomposition is visible that decrease of profit margin had negative impact of -4.03% on the change of ROA and decrease of asset turnover had positive impact of 0.05%.

Figure 31: Decomposition of alternative cost of equity for period 2009 and 2010, company INEKON SYSTEMS s.r.o.
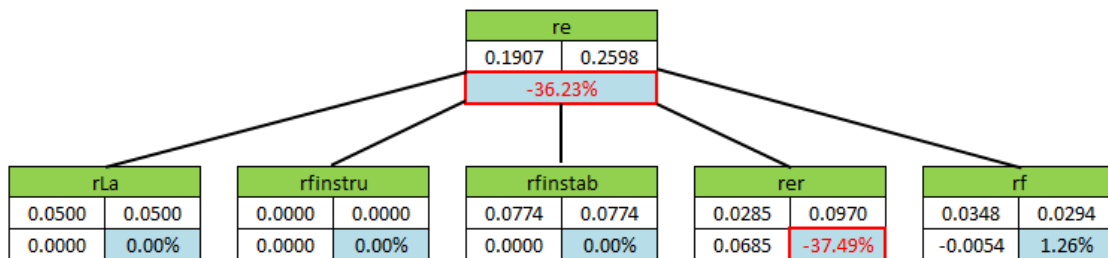
Source: Elaborated by author

Alternative cost of equity increased from 2009 till 2010 which had negative impact on the change of Spread. Three components of r_e decomposition had no impact on the change. Risk free rate decreased, which had positive impact of 1.26% and entrepreneurial risk premium increased which had main, negative, impact of -37.49% on the change of r_e.

Table 51: Decomposition of INFA Spread for period 2012 and 2013, company INEKON SYSTEMS s.r.o.

	Spread	ROE	re	EAT/EBT	EBT/A	A/E	ROA	Interest Expense	EBIT/R	R/A
2012	-0.4673	-0.1796	0.2876	1.0000	-0.1053	1.7053	-0.1049	0.0004	-0.0830	1.2600
2013	-0.1753	0.0680	0.2433	1.0000	0.0364	1.8685	0.0386	0.0022	0.0256	1.5100
Change	0.2920	0.2476	-0.0443	0.0000	0.1417	0.1631	0.1435	0.0018	0.1086	0.2500
Impact	29.20%	24.76%	4.43%	0.00%	24.17%	0.59%	136.25%	-1.70%	13.68%	0.64%

Source: Own processing using data of benchmarking diagnostic system

In the two years following the entry into the Slovak Automotive cluster, value of Spread increased by 29.20%. Main reason for this growth is increase of ROE by 24.76%. Less significant impact, although still positive, on the growth of Spread, had decrease of alternative cost of equity. Decomposition of ROE shows EBT/A indicator as one with the greatest impact on ROE, while level of taxation had no impact and financial leverage had positive impact of 0.59%. The only negative impact from all indicators had interest expense, which increased by 0.18%, leading to negative impact of -1.70% on the change of EBT/A ratio.

Table 52: Decomposition of alternative cost of equity for period 2012 and 2013, company INEKON SYSTEMS s.r.o.

	re	rLa	rfinstru	rfinstab	rer	rf
2012	0.2876	0.0500	0.0000	0.1000	0.1000	0.0376
2013	0.2433	0.0500	0.0000	0.1000	0.0562	0.0371
Change	-0.0443	0.0000	0.0000	0.0000	-0.0438	-0.0005
Impact	15.40%	0.00%	0.00%	0.00%	15.23%	0.17%

Source: Elaborated by author

As in the previous observation of years 2009 and 2010, in the two years following the entry into the cluster, r_{La}, $r_{finastru}$ and $r_{finstab}$ had no impact on alternative cost of equity. Decrease of r_e was caused by decrease of risk free rate and mainly by decrease of entrepreneurial risk premium which had positive impact of 15.23 percentage points on the change of r_e.

Table 53: Decomposition of INFA Spread for period 2012 and 2014, company INEKON SYSTEMS s.r.o.

	Spread	ROE	re	EAT/EBT	EBT/A	A/E	ROA	Interest Expense	EBIT/R	R/A
2012	-0.4673	-0.1796	0.2876	1.0000	-0.1053	1.7053	-0.1049	0.0004	-0.0830	1.2600
2014	0.0116	0.1085	0.0969	1.0000	0.0751	1.4457	0.0776	0.0026	0.0462	1.6800
Change	0.4789	0.2881	-0.1907	0.0000	0.1804	-0.2596	0.1825	0.0021	0.1292	0.4200
Impact	47.89%	28.81%	19.07%	0.00%	30.76%	-1.95%	173.29%	-2.03%	16.28%	1.94%

Source: Own processing using data of benchmarking diagnostic system

By examining the last period of 2012 and 2014, the further growth of Spread is visible. During two years time, Spread increased by 47.89%. Both components, ROE and r_e, had positively acted on this growth by 28.81% and 19.07%. The greatest influence on the growth of ROE had increase of EBT/A by 18.04% which had impact of 30.76%. Although the financial leverage decreased by 25.96%, it lead to impact of only -1.95% on change of ROE. On the ROA decomposition to profit margin and asset turnover is visible the stronger impact of profit margin on the ROA increase.

Table 54: Decomposition of alternative cost of equity for period 2012 and 2014, company INEKON SYSTEMS s.r.o.

	re	rLa	rfinstru	rfinstab	rer	rf
2012	0.2876	0.0500	0.0000	0.1000	0.1000	0.0376
2014	0.0969	0.0500	0.0000	0.0093	0.0245	0.0131
Change	-0.1907	0.0000	0.0000	-0.0907	-0.0755	-0.0245
Impact	66.31%	0.00%	0.00%	31.54%	26.25%	8.52%

Source: Elaborated by author

During the two years time, alternative cost of equity decreased by almost 20% which was caused, unlike in the first two observations, by three indicators. All three indicators had positive impact on the change of r_e, with risk premium on financial stability having the greatest impact, followed by entrepreneurial risk premium and risk free rate.

RTU EUROPE s.r.o.

RTU EUROPE s.r.o. is a research and development company established with the aim of introducing and applying latest technologies. It focuses on developing applications for the automotive, industrial and commercial sectors in the area of manufacturing of engines for public transport, industry and motorsport. RTU EUROPE was established in year 2012 and in the same year it joined the automotive cluster. Hence, for this company I will work with only three years period.

Figure 32: Values of INFA Spread for company RTU EUROPE s.r.o. compared to average values of Spread in industry
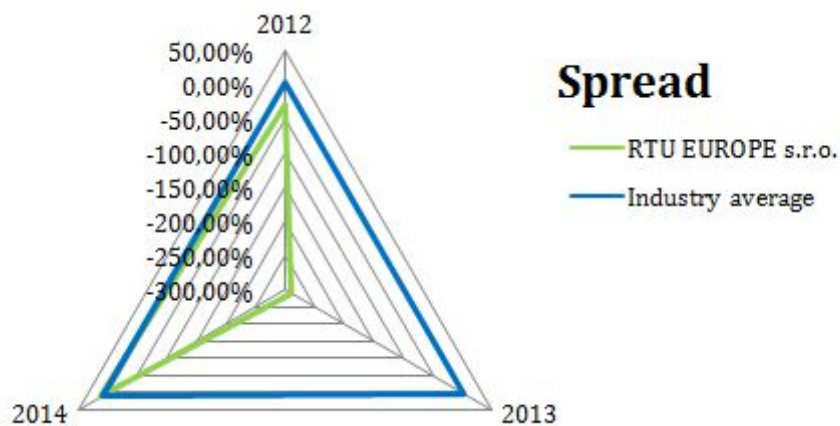
Source: Own processing using data of benchmarking diagnostic system

On the above spider graph is visible how largely the value of Spread declined in year 2012. From year 2012 to 2013, it decreased by 261.58%, however in the next year 2014 the value of Spread improved to 11.46% which was by 1.77% higher than industry average.

Figure 33: Development of EVA INFA for period 2012-2014, company RTU EUROPE s r.o.
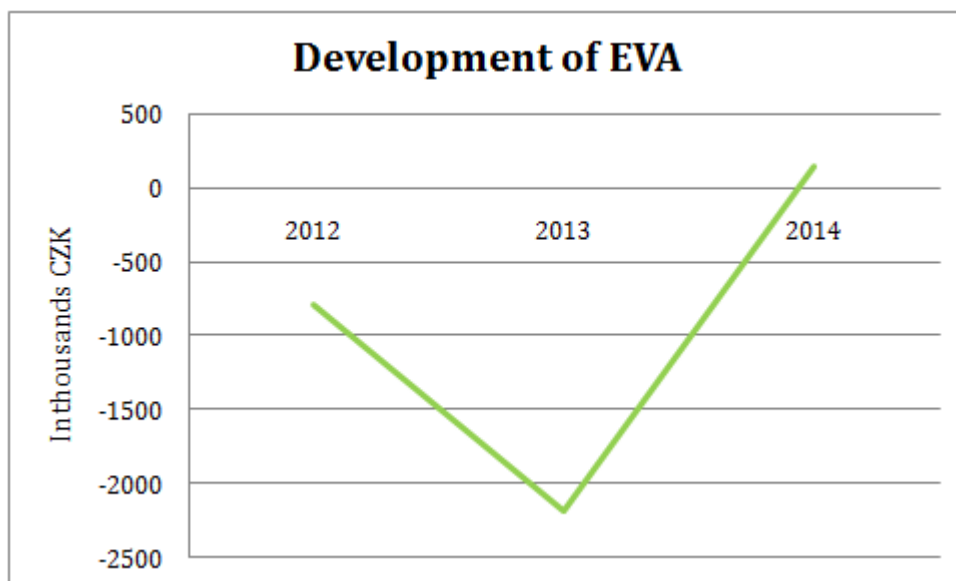
Source: Own processing using data of benchmarking diagnostic system and business registry

Development of EVA INFA is similar to development of Spread. In year 2012 it reached negative value of -787,909 CZK. This value further decreased to -2,186,860 CZK in year 2013 and large improvement is visible in year 2014 when the EVA INFA grew to positive value of 144,625 CZK.

Figure 34: Comparison of values ROE, r_e and r_f for perod between 2012 and 2014, company RTU EUROPE s.r.o.
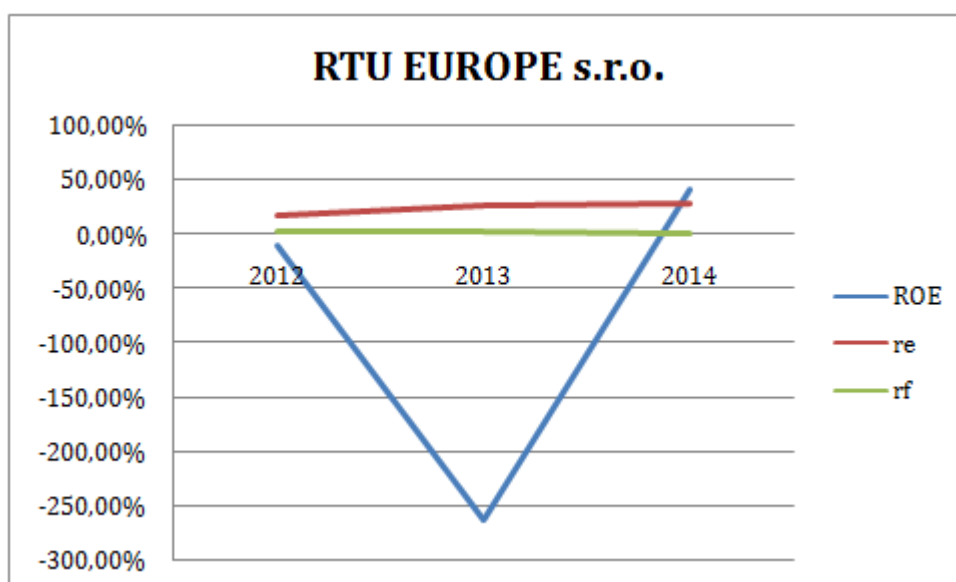
Source: Own processing using data of benchmarking diagnostic system

On the above figure is presented comparison of three indicators which show value ROE being below the zero level for the first two years 2012 and 2013. This suggests that company belonged to the last, fourth group of loss making enterprises. In the last year of 2014, value of ROE rapidly grew and company get into the first group of EVA INFA creation, which is the group of best enterprises within industry, enterprises creating value.

As the company RTU EUROPE joined the automotive cluster in the same year as it was established, development of particular Spread indicators before entering the cluster cannot be checked. In the case of this company I will therefore check one period of years 2013 and 2014, which are two years following the entry into the cluster.

Table 55: Decomposition of INFA Spread for period 2013 and 2014, company RTU EUROPE s.r.o.

	Spread	ROE	re	EAT/EBT	EBT/A	A/E	ROA	Interest Expense	EBIT/R	R/A
2013	-2.9042	-2.6316	0.2726	0.9995	-0.1366	19.2678	-0.1334	0.0032	-0.2491	0.5400
2014	0.1146	0.4041	0.2895	0.9497	0.0488	8.7260	0.0540	0.0052	0.1761	0.3100
Change	3.0188	3.0357	0.0169	-0.0498	0.1854	-10.5418	0.1874	0.0020	0.4252	-0.2300
Impact	301.88%	303.57%	-1.69%	13.11%	339.28%	-48.82%	137.14%	-1.46%	22.96%	-4.05%

Source: Own processing using data of benchmarking diagnostic system

There was a very large increase of Spread from year 2013 to 2014 by 301.88%, which was mainly influenced by increase of ROE by 303.57%. Alternative cost of equity increased only slightly which had negative impact on the change of Spread. Out of three ROE components, the greatest impact on the ROE growth had return on assets with using earnings before taxes. Although this indicator grew by 18.54%, the impact on the change of ROE was 339.28%. Negative effect on ROE was created by financial leverage which decreased from year 2013 to 2014 by 10.54% and had impact of -48.82% on the ROE change. Decomposition of ROA suggests positive impact of profit margin and negative effect of asset turnover on the ROA change.

Table 56: Decomposition of alternative cost of equity for period 2013 and 2014, company RTU EUROPE s.r.o.

	re	rLa	rfinstru	rfinstab	rer	rf
2013	0.2726	0.0500	0.0000	0.1000	0.1000	0.0226
2014	0.2895	0.0500	0.0000	0.1000	0.0884	0.0511
Change	0.0169	0.0000	0.0000	0.0000	-0.0116	0.0285
Impact	-6.20%	0.00%	0.00%	0.00%	4.27%	-10.47%

Source: Elaborated by author

Alternative cost of equity increased which had negative impact on the Spread development. Three out of five indicators had no impact on the change of r_e. Only two indicators, r_{er} and r_f have influenced increase of r_e. Entrepreneurial risk premium decreased which had positive impact of 4.27% and risk free rate increased which lead to negative impact of -10.47% on the change of r_e.

Statistical verification of partial results

Statistical testing of INFA Spread, for Slovak automotive cluster, cannot be performed due to lack of data.

4.4 Processing the survey of Automotive Cluster Slovakia

Automotive Cluster Slovakia has currently 37 members. Questionnaire survey was distributed among 27 business entities. The rest of the members are 7 educational institutions, City of Trnava, Trnava Autonomous Region and Slovak-German Chamber of Commerce and Industry. From 27 asked, I have received only two answers on the questionnaire survey, which corresponds to response rate of 7.41 %. I have made several attempts to contact enterprises through e-mails and phone for the purpose of receiving more responses, however persons entitled to answer my questions claimed to be either busy or not willing to answer this questionnaire.

Due to receiving answer only from two enterprises, I will summarize their answers in the table below. Answers are marked by numbers ranging from 1 to 10 where 1 stands for strongly disagree and 10 means completely agree.

Table 57: Summary of answers on the questionnaire survey from Inekon Systems s.r.o. and RTU EUROPE s.r.o.

	Inekon Systems s.r.o.	RTU EUROPE s.r.o.
1.Date of entry into ACS	2011	-
2.Has economic performance of your company improved since joining the cluster?	2	5
3.Did you have to make structural changes inside the company after entering the cluster?		
a) Management system changes?	1	1
b) Administrative procedure changes?	1	1
4.Has productivity of labour (value added per monetary unit of human labour) increased since your company joined the cluster?	1	1
5.Does joining the cluster have a positive impact on employees' wages?		
a) Managerial positions?	1	5
b) Workers positions?	1	5
6.Is there a sales growth due to increased cooperation with Slovak companies since joining cluster?	2	1
7.Have sales increased due to deeper cooperation with foreign companies since joining cluster?	1	1
8.Does joining the cluster lead to sales growth due to increased number of customers?	1	1
9.Which factors motivated your company to become a member of cluster?		
a) Better access to information?	10	8
b) Increase of financial performance?	9	8
c) Research and development activities, innovative projects?	5	8
d) More market opportunities?	5	10
e) Increased credibility of business entity?	-	10
f) Cooperation with state organizations?	5	8
g) Access to funding sources: Bank Loans?	1	1
h) Access to funding sources: Grants from public budgets (structural European Union funds)?	9	8
10.Is there any other factor which motivated you to join?	-	-
11.If yes, please name it and mark the extent of influence on your decision?	-	-

(Table continues on the next page)

12.As a member of automotive cluster, do you have a better access to financial subsidies/support from public and other sources?	2	5
13.Have joining the cluster brought any disadvantages to your company?	1	5
14.If yes, please state these disadvantages:	-	-
15.Please name the greatest forte/advantage of being a cluster member.	Seminars	-
16.Please name the greatest disadvantage of being a cluster member.	-	-
17.Any additional comments?	-	"Our perception of cluster is very neutral. We don't see disadvantages and neither advantages. "

Source: Elaborated by author, based on conducted questionnaire survey

From the answers of two members of ACS can be observed that entering the cluster had rather no impact on most of the areas included in the questionnaire. This is also confirmed by additional comment of RTU Europe s.r.o. enterprise. Factors which motivated these both enterprises to enter the automotive cluster was the better access to information, increase of financial performance or access to funding sources such as structural European Union funds. In fact, RTU Europe s.r.o., was motivated to enter the cluster by all above mentioned factors, except having access to bank loans. Company RTU Europe s.r.o. hasn't stated date of entry into cluster through the questionnaire, but I have managed to get an answer over the phone. The answer was not certain but it was year 2011. I would like to point out that, as stated in Slovak Business Registry, this company was established in year 2012.

Besides two answers gained from online survey, I have received one feedback on cluster membership through the e-mail and one feedback over the phone. The new Director General, of the state enterprise TSU Piešťany (Technical testing Institute) took over this enterprise in September 4th, 2012 when company was in a state of bankruptcy. In year 2011 and the following year, the business was in loss which was leading, according to law, to a bankruptcy. The new management accomplished to save the company. The average wage before September 2012 was 801 Euro and currently the average wage reaches 1,400 Euro. The Director General pointed out that till now, being a member of Automotive Cluster Slovakia, had no influence on company's activities. He claimed that there have been other priorities more important, but he plans to engage more in cluster activities in the future. Director General participated in two meetings of cluster and the only benefit was

establishing new relationships with potential customers. I haven't received answer regarding date of entry into the cluster.

For all members of the cluster, the official ACS website provides website of member enterprises and contact details. As stated on the official website of ACS, one of the members of Automotive Cluster Slovakia is company SimPlan Optimizations s.r.o.. However, website of this cluster member is no longer valid. After contacting the Executive Manager, I found out that company has changed its name to Innov8 s.r.o.. According to business registry, the change of business name happened on January 21st, 2014, which is more than two years ago, and since then, this information has not been updated on the official website of Slovak Automotive Cluster. After a call with Executive Manager I would conclude that there aren't many advantages brought by being a member of ACS, especially for recent years. Innov8 s.r.o. also cooperates with Automotive Industry Association of the Slovak Republic, which Executive Manager described as being more beneficial than being member of ACS.

I was interested in whether the cluster membership is still growing or not. The most recent presentation about ACS, provided on the official website is from year 2014. This presentation contains list of the members. By comparing the list of members from presentation with current members provided on the website, it is observed that the overall number of members decreased from 40 to current 37 members, from year 2014 till now. Four members decided to exit and one member entered the cluster. I have tried to contact companies which exited the ACS with the aim of finding out the reason of their exit. I got in touch with company Comax TT, a.s. and they explained that during financial crisis they stopped production for automotive industry and they sold the technology. That was the reason for exiting the Automotive Cluster Slovakia.

5 Discussion

Among the main priorities of enterprises belong increasing company's value, increasing performance and maintaining and increasing competitiveness. Nowadays, the competitiveness is maintained mainly through continuous innovations. Innovation activities are one of the main activities of clusters. There is one automotive cluster in Slovakia called Automotive Cluster Slovakia and one automotive cluster in the Czech Republic called Moravian Silesian Automotive Cluster.

In the Slovak Republic exists no comprehensive system for supporting the creation and development of clusters. The current state therefore presents a barrier for development of clusters and hence barrier for development of enterprises, sectors or regions. Automotive Cluster Slovakia lacks sufficient amount of financial resources which are necessary for implementation of all activities allowing development of cluster members. It is trying to solve this problem by obtaining sources from solutions of international projects. In order to improve this situation, cluster is actively approaching new members and expands the portfolio of provided services. Automotive Cluster Slovakia defines main issue of development to be an absence of partner with supervision role on the level of ministries and also uncoordinated structure of associations, industrial unions and chambers of commerce. Currently, Automotive Cluster Slovakia expects support mainly from the Ministry of Economy of the Slovak Republic as the coordinator of industry and innovation in Slovakia (Balog, 2015). Automotive Cluster Slovakia currently consists of 37 members, which is, according to available information, three members less than in year 2014. Although questionnaire survey was distributed among all business entities, only two answers from the member enterprises were received. Two answers received from the questionnaire survey suggest that Slovak automotive cluster is perceived very neutral. All questions in the survey, aimed at identifying any changes or improvements inside the company, after joining the cluster, were answered mostly with choosing option 1, on the scale from 1 to 10, which suggest that there weren't recognized any changes or improvements due to being member of automotive cluster. Some questions, regarding development of company, scored more than one, however none of them scored 6 or more on the scale, which means no sign of changes or performance improvement due to entering the cluster. Although these two companies didn't experience advancement due to cluster membership, one of their motivations to enter the cluster was increased financial performance. Besides this motivation factor, company Inekon Systems s.r.o. was motivated also by better access to information and by access to funding sources, such as European Union funds. RTU Europe s.r.o. was driven by same factors as company Inekon Systems, and also by research and development activities, innovative projects, more market opportunities, increased credibility of business entity and by cooperation with state organization. The only factor, from the factors asked about, which didn't motivate any of these two companies, was better access to bank loans.

The successful start and operation of Automotive Cluster Slovakia was possible only thanks to high-quality management which has a many years of practice (Balog, 2015). My effort to cooperate with management of the automotive cluster was however not successful and after several attempts I didn't acquire information regarding date of entries into the cluster. It was one of crucial points for identifying factors of integration process into automotive cluster. Another concern for me, regarding Slovak automotive cluster, presents no up-to-date information provided on the official website. Due to lack of information provided from the management of cluster and particular members, it was attempted to acquire more information from the website. It was then realized that not only contact information on member companies are not up-to-date, neither the changed name of the company is updated, as in the case of company SimPlan Optimizations s.r.o which changed its name in January 2014 to Innov8 s.r.o.. On the cluster website, in the "members" section is provided short list of five "new members", while two of these members, Nebotra s.r.o. and Carisch s.r.o., are even no longer members of the cluster and together with other three members, listed as new, were all already on the list of members in 2014. By comparing list of cluster members from year 2014, which is placed in the presentation of a cluster on the official cluster website, with the current list of members, it is observed that four enterprises exited the cluster and only one enterprise joined the cluster.

By examining economic performance of two members of Automotive Cluster Slovakia it can be concluded that values of INFA Spread and EVA INFA increased not one year, but two years after cluster. Period before entering the cluster could have been observed only in case of Inekon Systems sr.o., because RTU Europe entered the cluster in the same year as it was established. On the case of Inekon Systems s.r.o. can be observed that in the observation of two years before entering the cluster, INFA Spread value was negative. In the other two observed periods, after company joined the cluster, INFA Spread value reached positive values, with return on equity and alternative cost of equity having positive impact on the change. In all observations, including observation of RTU Europe s.r.o., the greatest impact on the change of return on equity had production power ratio indicator using earnings before taxation. Next, the greatest impact on the change of production power ratio indicator using earnings before taxation had production power ratio indicator using earnings before interests and taxation, and the greatest impact on production power ratio indicator using earnings before interests and taxation had profit margin. Regarding indicator alternative cost of equity, the size of an impact of three components, entrepreneurial risk premium, risk premium on financial stability, and risk free rate, was changing in different cases. However, the other two components, risk premium for lower liquidity of shares or size of the enterprise and risk premium on financial structure had no impact on development of alternative cost of equity in all observed periods, in both companies.

Moravian Silesian Automotive Cluster has currently 70 members, which is a number continuously growing since establishment of cluster. After contacting management of MSA cluster, regarding date of entries of particular members, I

have received complete detailed list in short period of time. I have distributed questionnaire survey to the business entities and received 12 answers which were processed by using factor analysis. Factor analysis, a method for reduction of original variables, provided five factors that explain 78.25% of total variance. The original 18 variables were reduced to 13 variables. The first factor joins variables related to management system changes, wages on managerial positions and variables associated with sales increase due to cooperation with both, Czech and the foreign companies. This factor includes also two motivations to enter the cluster with negative correlation to the factor: better access to information and research and development projects/innovative projects. The second factor includes two variables negatively correlated to the factor: more market opportunities and increased credibility of business entity. Factor 3 includes variable related to sales growth due to increased number of customers. The Factor 4 joins two variables: economic performance of the company and productivity of labor increase (measured as a value added per monetary unit of human labour). The last, Factor 5 merges two motivations to enter the cluster, both are related to funding sources and correlations of these variables with factor are positive. Variables with negative correlations to the factors suggest that when the factor will score high, the variables will score low and the other way around.

In the automotive industry is a great pressure on low prices and high quality of deliveries. For some cluster members this could mean decreasing of financial resources for innovations and concentrated rather on improving of performance of current production processes (Dušička, Miller, Hlaváč, Husák, Nedělová, 2014). Innovations, together with cooperation on scientific research projects, access to information, increased awareness of the company or prestige are some of the greatest advantages identified by conducting questionnaire survey. It is crucial for enterprises to work on innovations in order to maintain their and cluster's competitiveness.

Values of INFA Spread were statistically tested in order to find out if there is statistical difference between values of INFA Spread before companies joined the cluster and after their entry into the cluster. The results of paired t-test showed that there is no statistical difference in INFA Spread values, which means that entering the cluster had no impact on the development of INFA Spread.

Moravian Silesian Automotive Cluster is generally a well performing cluster. The highly possible threat for this cluster in the future may represents decrease of technically educated personnel and at the same time ageing of professional staff and their retirement. Therefore it is recommended to expand cooperation with secondary schools and high schools (Dušička, Miller, Hlaváč, Husák, Nedělová, 2014). Conducting analysis of economic performance of seven selected SMEs by decomposition of INFA Spread into return on equity and alternative cost of equity and its further decomposition, was employed to determine indicators with greatest influence on INFA Spread and therefore on the competitiveness of companies in financial area. However, indicators for every selected company were developing differently. By examining two years prior to entry into the cluster, it can be con-

cluded that value of INFA Spread was negative in five out of seven cases. In the three cases, the main impact on the change of return on equity was caused by financial leverage and four other companies' return on equity was influenced mainly by production power ratio indicator using earnings before taxation. In these cases, the production power ratio indicator using earnings before taxation was influenced in all four cases mostly by production power ratio indicator with using earnings before interest and taxation, not by the interest expense. Further decomposition of production power ratio indicator with using earnings before interest and taxation showed main impact of profit margin in two cases and asset turnover in other two cases. Level of taxation had, in none of seven cases, no major impact on changes in return on equity. Regarding alternative cost of equity, in the first observed period, it can be concluded that in six out of seven cases the major impact on development of alternative cost of equity had risk premium on financial stability and in one case the major impact had entrepreneurial risk premium. Second observed period was focused on two years following the year of entry into the cluster. In four companies the INFA Spread value decreased and in the other three companies the value of INFA Spread increased. As in the first observed period, level of taxation didn't have major impact on return on equity change in none of seven cases. The main impact on return on equity was caused by financial leverage only in two cases, which is one case less, compared to first period, and in other five cases the main impact had production power ratio indicator using earnings before taxation. Return on assets with using earnings before taxes were influenced in four cases mainly by production power ratio indicator with using earnings before interest and taxation and in case of one company it was mostly affected by interest expense. Main impact on change of alternative cost of equity had in four companies risk premium on financial stability, in two companies risk free rate and in one case it was risk premium on financial structure. The last observed period, which compared one year after entering the cluster with year of last available data, showed more homogenous results. In five out of seven companies, INFA Spread increased. In all seven cases the change of INFA Spread was driven mainly by return on equity and not by alternative cost of equity and in all seven cases the main impact on change of return on equity had production power ratio indicator using earnings before taxation ratio which was mainly influenced by production power ratio indicator with using earnings before interest and taxation. Production power ratio indicator with using earnings before interest and taxation was effected by profit margin in four cases and by asset turnover in other three cases. In the last observed period, level of taxation and the financial leverage had no major impact on development of return on equity. Impact on alternative cost of equity had risk premium on financial stability only in three cases. Twice the main impact on alternative cost of equity had risk free rate and twice the entrepreneurial risk premium.

6 Conclusion

The main objective of this thesis was to determine key factors of integration proc-
esses into automotive clusters in the Czech Republic and Slovakia. Due to lack of
answered questionnaires from members of Automotive Cluster Slovakia and no
answer from management of cluster, the intended scope of analysis couldn't be
conducted. I have observed no up-to-date information on the official cluster web-
site, no cooperation from Automotive cluster Slovakia's management or no posi-
tive feedback from the members of cluster, although only few feedbacks were re-
ceived. This observation and the fact that number of members in Automotive clus-
ter Slovakia decreased from 40 members in 2014, to 37 members nowadays, lead
me to a conclusion that this cluster could be either wrongly organized, is in need of
more employees who could engage more in cluster activities or needs more finan-
cial sources for conducting its activities. I have therefore focused more on automo-
tive cluster in the Czech Republic. In order to determine main factors influencing
integration into automotive cluster, from the qualitative point of view, and to an-
swer first research question: "Which factors affect the competitiveness of clustered
enterprises?", factor analysis was conducted. Result of factor analyses are five fac-
tors which consists of 13 variables, out of original 18 variables. These factors were
named as:

> ➢ Information and R&D motivations + Management and sales growth,
> ➢ Market and credibility motivation,
> ➢ New customers,
> ➢ Performance,
> ➢ Funding sources.

It is necessary to mention that all variables regarding motivation for enter-
ing the cluster have negative correlation with particular factors, while the rest of
variables are positively correlated with the factors. As the main advantages of be-
ing a cluster member were determined the better access to information and deep-
ening cooperation with other companies in the industry. Factors which are affect-
ing competitiveness of clustered enterprises can be also analysed from quantita-
tive point of view, by identifying indicators with greatest impact on INFA Spread
indicator and therefore on development of Economic Value Added INFA indicators´
value. INFA Spread value is calculated as a difference between return on equity
and alternative cost of equity. It was attempted to determine which indicators of
return on equity and alternative cost of equity had the greatest impacts on their
changes in three different periods. First period examined two years preceding the
entry into the cluster and two periods were observed in the years after companies
joined the cluster. Conclusion that can be made from quantitative point of view is
that there is no single indicator which would have the major impact on return on
equity or on alternative cost of equity in all seven companies. However, indicators
which had major impacts on return on equity and on alternative cost of equity

most often were identified. In the period before companies entered the automotive cluster, the greatest impact on the return on equity had in 57% of observed enterprises production power ratio indicator using earnings before taxation and in 43% of observed enterprises the greatest impact on return on equity had indicator financial leverage. In the second observed period, the production power ratio indicator using earnings before taxation had the greatest impact on return on equity in 71% of observed enterprises and financial leverage had the greatest impact on return on equity in 29% of observed enterprises. In the last observed period, the indicator with greatest impact on return on equity, in 100% of observed enterprises, was production power ratio indicator using earnings before taxation. Alternative cost of equity consists of five components, out of which the greatest impact on alternative cost of equity, in the pre-cluster period, had in 86% of observed enterprises risk premium on financial stability. This component was also most influential in second observed period, however in only 57% of observed enterprises. Risk free rate had the greatest impact on alternative cost of equity in 29% of observed enterprises and risk premium on financial structure in 14% of observed enterprises. In the last observed period the main impact on alternative cost of equity had risk premium on financial stability in 43% of observed enterprises, entrepreneurial risk premium in 28.5% of observed enterprises and risk free rate, also, in 28.5% of observed enterprises.

Economic performance of selected companies included also part of statistical verification of INFA Spread values. Statistical verification was conducted in order to answer research question: "Is there a dependency between economic performance of enterprise and entering the cluster?" Results of statistical verification lead to a conclusion that entering the cluster had no impact on development of INFA Spread indicator and therefore on development of Economic Value Added INFA.

Conducted questionnaire survey provided answer on the third research question: "Which changes made SMEs inside the company in order to improve their economic performance?". Member enterprises didn't make any management system changes, neither an administrative procedure changes within company. There hasn't been registered any changes in employees 'wages, neither on managerial positions, nor on workers positions. In general, there has been no significant change made within the enterprises, after they entered the automotive cluster.

Regarding the conducted analysis and respective results, it can be concluded that according to performed analysis on selected companies, being member of automotive cluster doesn't have significant impact on economic performance of companies, but it cannot be denied that membership, in a well functioning cluster, brings number of benefits to the companies in the form of access to information, new contacts on businesses from the same or related industries, or participation on research and development projects and innovations. Based on the relevant analysis conducted and on the respective results which were obtained, I consider the main objective of this diploma thesis to be fulfilled.

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Attachments

A Questionnaire survey

Table 58: Questionnaire survey

1. Has economic performance of your company improved since joining the cluster?

2. Did you have to make structural changes inside the company after entering the cluster?
  a) Management system changes?
  b) Administrative procedure changes?

3. Has productivity of labour (value added per monetary unit of human labour) increased since your company joined the cluster?

4. Does joining the cluster have a positive impact on employees' wages?
  a) Managerial positions?
  b) Workers positions?

5. Is there a sales growth due to increased cooperation with Slovak (asked Slovak companies)/ Czech (asked Czech companies) companies since joining cluster?
6. Have sales increased due to deeper cooperation with foreign companies since joining cluster?
7. Does joining the cluster lead to sales growth due to increased number of customers?

8. Which factors motivated your company to become a member of cluster?
  a) Better access to information?
  b) Increase of financial performance?
  c) Research and development activities, innovative projects?
  d) More market opportunities?
  e) Increased credibility of business entity?
  f) Cooperation with state organizations?
  g) Access to funding sources: Bank Loans?
  h) Access to funding sources: Grants from public budgets (structural European Union funds)?

9. Is there any other factor which motivated you to join?
10. If yes, please name it and mark the extent of influence on your decision?
11. As a member of automotive cluster, do you have a better access to financial subsidies/support from public and other sources?
12. Have joining the cluster brought any disadvantages to your company?
13. If yes, please state these disadvantages:
14. Please name the greatest forte/advantage of being a cluster member.
15. Please name the greatest weakness/disadvantage of being a cluster member.
16. Any additional comments?

Source: Elaborated by author

B List of MSAC members

Table 59: List of Moravian Silesian Automotive Cluster's members with dates of entry into the cluster

Moravian Silesian Automotive Cluster			
Name of the enterprise	**Date of entry into the cluster**	**Name of the enterprise**	**Date of entry into the cluster**
100% Rework	10.10.2012	MS technik spol. sr.o.	28.8.2006
Anamet, s.r.o.	8.7.2008	One3D s.r.o.	10.3.2015
Argutec, s.r.o.	14.5.2013	PFEIFFER Vacuum Austria GmbH	8.4.2008
Batz Czech s.r.o.	15.5.2012	PHA CZECH s.r.o.	14.5.2013
Brano Group, a.s	23.8.2006	PKS servis spol. sr.o.	11.2.2014
Brembo Czech s.r.o.	10.8.2011	PRO NORTH CZECH, a.s.	11.3.2014
Brose spol. sr.o.	13.4.2010	Proact Czech Republic, s.r.o.	10.6.2008
Centre of Excellence Prague, s.r.o.	21.3.2012	Protocom, s.r.o.	13.4.2010
COMTES FTH, a.s.	11.8.2015	RB SOU autoopravárenské s.r.o.	11.12.2007
ContinentalAutomotive	25.8.2006	Remarkplast, s.r.o.	11.12.2007
CROMODORA WHEELS, s.r.o	29.2.2008	RMT, s.r.o.	13.10.2015
CTS Corporation	15.12.2009	ROSSIGNOL TechnologyCZ, s.r.o.	10.8.2011
ČVUT Praha	12.1.2011	SCOVECO, s.r.o.	11.8.2015
DYTRON s.r.o.	15.5.2015	Sdružení pro rozvoj MSK	15.12.2006
Eduard Mikeš	8.9.2009	Schoeller Allibert, s.r.o.	1.12.2006
Erich Jaeger, s.r.o.	9.2.2011	SimulPlast, s.r.o.	14.12.2010
Exact Systems Czech Republic s.r.o	10.1.2012	SLAVÍK - Technické plasty, s.r.o	20.8.2006
FLTC Europe a.s.	9.9.2014	SMARTPLAST, s.r.o.	8.9.2009
Fortex- AGS, a.s.	12.2.2008	SMC Industrial Automation CZ s.r.o.	8.10.2013
Galvan CZ, s.r.o.	14.7.2006	SOLEA CZ, výrobní družstvo	18.8.2006
GP Quality Management, s.r.o.	11.12.2007	Soš a Sou Jablunkov	8.4.2008

(Table continues on the next page)

GRIOS, s.r.o.	7.11.2006	Spš-Vítkovice	24.4.2012
HallaVisteon Climate Control Corp	25.8.2006	SŠTO Havířov - Šumbark	22.11.2011
Hayes Lemmerz Czech, s.r.o.	14.5.2013	SWELL, spol. sr.o.	29.2.2008
HM PARTNERS s.r.o.	2.8.2006	TOP Function	8.2.2012
Ing. Petr Gross, s.r.o.	14.10.2008	TŘINECKÉ ŽELEZÁRNY, a.s	10.7.2006
KARLA spol. s r.o.	13.1.2015	TÜV SÜD Czech, s.r.o.	12.7.2006
KLEIN automotive s.r.o	12.6.2007	United Polymers, s.r.o.	14.7.2006
Koma Commercial, s.r.o.	10.10.2012	Univerzita Tomáše Bati ve Zlíně	15.12.2009
KOMAS, spol. sr.o.	12.7.2006	Varroc Automotive Systems, s.r.o.	31.10.2012
LAKOVNA HAJDÍK s.r.o.	8.9.2015	VorKon Engineering, s.r.o.	14.5.2013
LAMMB technology, s.r.o.	10.2.2015	VOŠ, SOŠ a SOU Kopřivnice	14.8.2007
MAZETA, spol. sr.o.	10.4.2008	VŠB-TU Ostrava	13.9.2006
MetalPlast Lipník n. B. a.s	15.12.2009	VÚHŽ a.s.	14.8.2006
MGL s.r.o.	12.8.2008	Západočeská univerzita v Plzni	10.6.2014

Source 1: Project Management of MSAC, edited by author