

THE RELATIONSHIP BETWEEN MARKET ORIENTATION AND BUSINESS PERFORMANCE OF CZECH AND GERMAN HIGH-TECH FIRMS

Patrik Jangl

Ph.D. Candidate in Economics and Management
Tomas Bata University in Zlín
Mostní 5139, 760 01 Zlín, Czech Republic
Telephone: +420 576 032 120
E-mail: jangl@seznam.cz

Abstract

Ovaj članak ima za cilj utvrditi odnos između uzročne dimenzija tržišne orijentacije poduzeća i uspješnosti poslovanja. Tržišna orijentacija je ispitan kao četiri-dimenzionalnom konstrukta i uspješnost poslovanja jednodimenzionalni. Tržišna orijentacija u ovoj studiji je shvatiti kao proces prikupljanja informacija o kupcima i konkurentima, širenje i integraciju tih podataka unutar tvrtke i odgovor na ove informacije u obliku koordinirane akcije. Istraživanje na uzorku od čeških (N=164) i njemačkih (N=187) high-tech tvrtki. Tvrtke Izbor je izvedena na bazi Albertina i Hoppenstedt. Ispitanici menadžera ispunili upitnik i ocjenu u mjeri u kojoj je navedeno razine slaganja s raznim izjavama. Indeks tržišne orijentacije i uspješnosti su izračunati kao aritmetička sredina izmjerenih vrijednosti. Glavna metoda za postizanje ciljeva korelacije i regresije. Tri linkovi na model višestruke regresije bile značajne. Istraživanje je potvrdilo tezu o postojanju odnosa glavne dimenzije između orijentacije poduzeća i uspješnosti poslovanja.

Ključne riječi: tržišna orijentacija, uspješnost poslovanja, high-tech sektor, regresijska analiza, Češka Republika, Njemačka

Abstract

The main goal of this article is to find out index of the market orientation and to describe the relationship between four components of market orientation of high-tech firms and business performance. Business performance was studied as a one-dimensional construct. Market orientation in this study is defined as a process of intelligence generation about customers and competitors, intelligence dissemination & integration within the company across teams and responsiveness to market intelligence in the form of a coordinated action. The statistical sample was represented by the 164 Czech and 187 German high-tech firms in manufacturing industry. Respondents (sales and marketing managers) completed the questionnaire and marked their rate of approval with individual statements on a Likert scale from 1 to 7. Market orientation and business performance level was determined as arithmetic mean (\bar{x}) of the measured values. Depending on size of total market orientation index (MOI) are Czech ($\bar{x}=5.2$) and German ($\bar{x}=5.14$) high-tech firms medium market-oriented. Business performance index (BPI) reached a slightly higher value in Germany ($\bar{x}=5.22$) compared to the Czech Republic ($\bar{x}=5.13$). The main method to reach the target was correlation and regression analysis. This research study confirmed hypothesis about existence of the relation between components of market orientation and business performance. Three of the four relations in the model of multiple regression were significant. On the contrary, positive significant relation was not confirmed between competitors intelligence generation and business performance.

Key words: Market Orientation, Business Performance, High-Tech Sector, Multiple Regression Analysis, Czech Republic, Germany

1.INTRODUCTION

In the last two decades other prominent world researchers, who were interested in the problem of market orientation across many spheres in the advanced and developing countries, came to similar, but also considerably different results. It depends a lot on the point of view, because there were often used various constructs and definitions of the market orientation and the company performance in analyses, which may be, to a certain extent, considered as obstacles in the process of comparing the results. The used methods of research were mostly the same. The research presented in this work follows the previous author's studies in the area of market orientation of Czech and German high-tech firms in the manufacturing industry. After thorough analysis and research of literature and after successful creation of modified model and measuring scale of market orientation in the Czech Republic, replication of research on German data was performed, where high quality of model of market orientation was also finally confirmed. Both these countries were chosen randomly, but quantitative researches of market orientation of high-tech firms with use of the modified model will gradually follow even in other chosen EU countries.

The author defines market orientation as a process of customer and competitor intelligence generation, intelligence dissemination & integration and responsiveness to market intelligence. The main difference in this definition compared to others is that this definition accents not only dissemination of market information, but also their integration across all departments and working teams, which is usually neglected by traditional scales. Owning market information in order to gain a competitive advantage is not enough today. Market information are often easily available thanks to information technologies. The success consists in its transformation to knowledge and proper use during coordinated action within strategic management of firm marketing. It depends a lot on skilfulness and speed of making decisions of top managers. There were also practical reasons for new instrument creation. Firm practice elicited requirement to create new, shorter, however highly reliable and valid measuring scales. The „Modified Market Orientation Scale“ (MMOS; 12 items) was adopted partially from methodology of Jaworski, Kohli, Kumar (1993), Narver, Slater (1990) and Mohr, Sengupta and Slater (2014) consisting of questions on four respective fields composing market orientation of a company: Intelligence Generation, Dissemination, Integration and Responsiveness to Market Intelligence. Business performance was conceptualised as a one-dimensional construct and was measured by 3 items (growth of sales, profitability – ROA and market share). The research followed the standard procedure of a research work. A secondary data were obtained from many sources such as databases, conferences, literature, and analysis of documentation and use of a deductive process. Primary data were collected through quantitative questionnaire. Data collection was carried out from 9/2014 to 12/2014 in both countries separately and both datasets were analysed individually. Summarized results of both analyses were compared and illustrated in tables in the end of work.

This article will contribute to better understanding of the phenomenon of market orientation and measurement of market orientation and business performance on the Czech and German market. Motivation to pursue this particular field of interest was also the lack of sufficient research in this area, especially in empirical work concerning market orientation of companies in high-tech sector. High-tech sector has a significant position in today's economy, particularly in connection with innovations and business performance. This sector was chosen based upon consultation with professionals as suitable for analysis of market orientation and business performance.

2.MARKET ORIENTATION AND BUSINESS PERFORMANCE

First studies of theoretical construct and measurement of market orientation comes from the United States. They started to appear approximately in 90's. Results of first measurements of market orientation were published in 1990. Authors across all continents were dealing with this measurement in foreign professional literature. Gradually, another replications of researches from Canada, Australia and Western Europe started to appear. In general, less studies were performed in transforming economies, such as Middle and Eastern Europe or Asia and Africa. During the last 25 years there were gradually created several measuring scales that only differ in number

of dimensions and items. The most popular are MKTOR (Narver, Slater, 1990), MARKOR (Kohli, Jaworski, 1990), MOS (Lado, 1998), MORTN (Deshpande, Farley, 1998), MOPRO (Narver et al., 2004) and MOCCM (Carr, Lopez, 2007). There is a range of similar scales and that is why this enumeration is not complete at all. MORTN consists of 10 items and measures so called reactive market orientation. All mentioned authors recommend to use either five or seven point Likert scale for subjective measurement of market orientation in firms. The last mentioned scale interconnects MARKOR and MKTOR. Although it is a perspective area of marketing research, only minimum number of individuals has been dealing with this problem so far in the professional Czech literature and many managers and academicians are not familiar with the principles of market orientation at all. There is only one way of measurement in our country – method of Tomášková (Tomášková, 2005). There are no information available to review construct validity of this scale.

According to Tomášková (2005, 2009), in 90's Kohli and Jaworski (1990) dealt with this topic in big engineering companies, Deng and Dart (1999) similarly researched in smaller organizations, Langerak (1997) in production organizations. For example, a British marketing professor, Graham Hooley et al. (2003), was interested in the service providers in the transition economies of central Europe. The field of non-profit organizations was elaborated by authors Balabanis, Stables & Phillips (1997). The field of developed markets was studied by Liu (1995) and transforming economies by Akimova (2001) in Ukraine. Harris (2001) dealt with implementation and obstacles of market orientation. Bhuian (1997), Flohr et al. (2003), Jangl and Mikuláščík (2013) focused on bank sector. Factors of market orientation in the sector of private insurance industry in Belgium and Spain were compared by Lado and Rivera (1996). Liechtenhal and Wilson (2002) inserted aspects of social structure into implementation of market orientation. In half of the 90's, an American Nobel laureate, Milton Friedman spoke many times about suitability of strategy, innovations, utilization of sources influencing the company performance. German author Fritz (1992) is also worth mentioning. In 90's he emphasised orientation to own employees, production and costs. Chang, Chen and Caruna (2003) had also a similar approach as the above mentioned authors. In the Czech Republic was research realized by e.g. Tomášková (2005, 2008), Chalupský, Šimberová, Tomášková and Kaňovská (2009) in power companies and high-tech firms, Nožička and Grosová (2012) in small and medium innovation companies, Frejková (2014) in aviation companies.

Closeness of the relation between market orientation and performance was mostly judged according to the Spearman or Pearson's correlation coefficient. Results of medium correlation correspond to a positive relation and results of strong correlation correspond to a highly positive relation. Influence of the individual components of market orientation on dependent variable was mostly analysed by the help of multiple regression or structural equation modeling. Narver and Slater (1990) were first to claim that there is a relation between the market orientation and profitability. Subsequent studies mostly confirmed the original results. Oudan (2012) found out a positive influence of the market orientation on the company performance in developing countries of South America and the West Indies. Ramayah, Samat and Lo (2011) also proved influence of the market orientation on the business performance. Kaňovská and Tomášková (2012) also found out a significant positive relation between the market orientation and the company performance in the Czech Republic, Panigyrakis, Theodoridis (2007) in Greece and Dauda, Akingbade (2010) in Nigeria. Mixed results were confirmed in Sri Lanka. Only some components of the market orientation and the performance show mutual relation. Partial relation between the market orientation and the business performance is confirmed by research of authors from Malaysia: Mokhtar, Yusoff and Arshad (2009). Sukato (2014) stated that there is no direct influence of the market orientation on the business performance of small and medium firms in Thailand.

Table 1 Selected results of measurement of market orientation of firms and their performance

Author	Year	Result
Narver and Slater	1990	positive relationship
Pitt; Caruana and Berthon	1996	positive relationship
Chang and Chen	1998	positive relationship
Raju; Lonial; Gupta and Ziegler	2000	positive relationship
Slater and Narver	2000	positive relationship
Wood; Bhuian and Kiecker	2000	strong positive relationship
Harris and Ogbonna	2001	positive relationship
Ramaseshan; Caruana and Pang	2002	strong positive relationship

Pulendran; Speed and Widing	2003	positive relationship
Qu and Ennew	2003	positive relationship
Caruana; Pitt and Ewing	2003	weak positive relationship
Santos-Vijande et al.	2005	positive relationship
Tomášková	2005	positive relationship
Martin-Consuegra and Esteban	2007	positive relationship
Panigyrakis and Theodoridis	2007	positive relationship
Haugland; Myrtveit and Nygaard	2007	strong positive relationship
Farrell; Oczkowski and Kharabsheh	2008	positive relationship
Megicks and Warnaby	2008	strong positive relationship
Nwokah	2008	weak positive relationship
Singh	2009	positive relationship

Source: Own elaboration according Wong & Tong (2012)

It results from the above mentioned survey that former studies from the field of market orientation examined particularly dyadic relations between market orientation of firms and strategy or between market orientation and success with emphasis on performance of the firms. Great number of publications dealing with development of measuring instruments and concepts of market orientation are based upon works of authors such as Narver and Slater (1990) or Kohli and Jaworski (1990). It would be proper to point out that major part of the performed studies proves a direct positive relation of market orientation to the company performance. Studies proving weak or even no dependence appear exceptionally only. The question is, how to measure market orientation in our cultural conditions and what is the causal relationship between market orientation and performance in the Czech Republic and Germany.

3.HIGH-TECH SECTOR

According to information from Eurostat, high-tech sector is normally defined as a combination of economic activities that utilize modern technologies during production and provision of services to a large extent. Development in the branch is pulled forward due to innovations, which may be somehow related to market orientation of firms.

The most often mentioned characteristic features of high-tech firms are the following:

- high rate of innovations
- industrial environment for a quick growth
- considerable share of qualified employees with university degree
- cooperation with science and research
- short lifetime of products

The Czech Statistical Office divides activities of high-tech sector into two main categories – manufacturing industry and services. For purposes of this study only firms from high-tech manufacturing industry will be addressed. It results from classification of CZ-NACE that economic subjects are divided according to prevailing economic activity into the following sections and groups.

High-tech manufacturing industry according to CZ-NACE:

- production of pharmaceutical products and services (section 21)
- production of computers and electronic components (groups 26.1, 26.2)
- production of consumer electronics and optical instruments (groups 26.3, 26.4, 26.7, 26.8)
- production of measuring, testing, navigation and medical instruments (groups 26.5, 26.6)
- production of planes and their engines, spaceships and associated equipment (group 30.3)

Note: NACE = Nomenclature générale des Activités économiques dans les Communautés Européennes

In order to keep a long-term competitive advantage in the market, high-tech firms must be dynamic and innovative. At the same time there exists a close affinity to market research and examination of hidden needs of customers. According to Mohr, Sengupta and Slater (2014, p. 106) high-tech firms must excel at free activities: opportunity identification, product and process innovation, and product commercialization. Because one of marketing's tasks is to listen to the customer and define a broad set of opportunities, a strong marketing capability implies that marketing is able to identify a wide range of markets and customers applications for the innovative technology. The voice that marketing brings to the innovation process must be joined with the knowledge that R&D brings in order to develop an offering that effectively addresses customer needs.

High-tech companies should show a high rate of market orientation, therefore this sector seems to be suitable for market orientation analysis. This statement was confirmed by some previous researches, e.g. Kaňovská and Tomášková (2014). Other studies likewise show that a market orientation leads to a greater creativity and improved new product performance in high-tech firms (Im, Workman Jr., 2004) and the relationship between market orientation and firm performance is stronger in highly dynamic markets, which are characteristic of technology-oriented industries (Homburg, Pflesser, 2000). Firms in high-tech markets need to excel not only at generating new innovations, but also at commercializing these innovations. Superior technology and innovation capabilities must be combined with an effective market orientation to achieve the highest levels of success in high-tech markets. Therefore, the positive relationship between a firm's market orientation and performance outcomes is especially important for high-tech firms (Mohr, Sengupta and Slater, 2014, p. 107).

Production firms in high-tech sector are strongly represented in the Czech Republic and Germany. Together account for around 26% of the high-tech sector in the EU-28. The following table 2 summarizes selected data in both monitored countries.

Table 2 Comparison between Germany and Czech Republic

Characteristics	Germany	Czech Republic
Percent of manufactured exports (2013)	16.1 %	14.8 %
Percent of total employment in high-tech manufacturing	1.7 %	1.8 %
Percent of woman in high-tech manufacturing	34.7 %	50.6 %
Number of enterprises in high-tech manufacturing (2012)	8247	3441
Turnover in high-tech manufacturing (million EUR)	113 476	13 218
Share of innovative enterprises (from 2010 to 2012)	66.9 %	43.9 %
Growth in high-tech manufacturing (from 2008 to 2013)	1.8 %	3.3 %
R&D expenditure – business enterprise sector (2011), (million EUR)	49 342	1735
R&D intensity	2.84	1.84

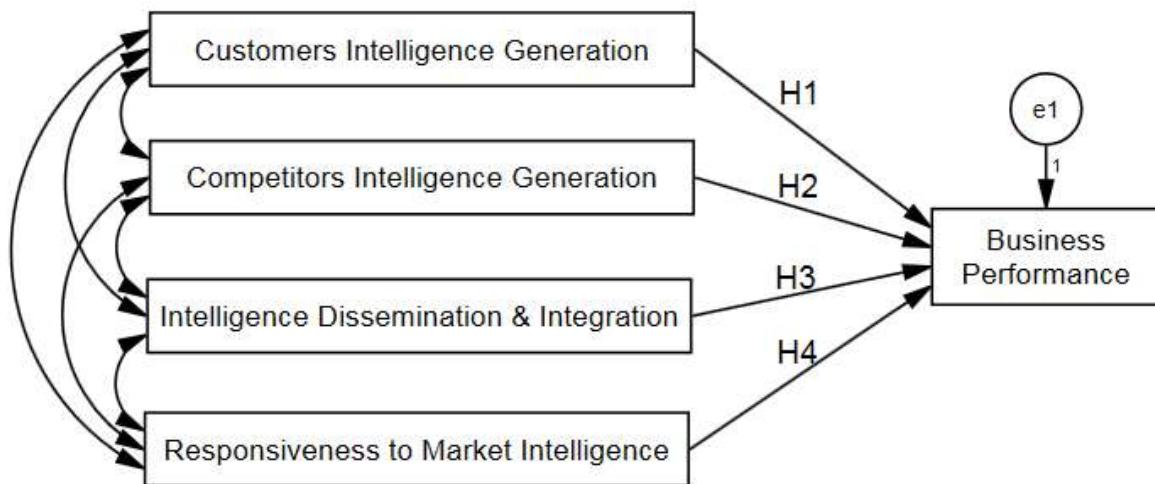
Source: Author's own elaboration based on Eurostat data (2013) and Czech Statistical Office (2011)

4.METHODOLOGY

4.1.Description of data set and the used statistic methods

The analyzed file formed 164 answers from the Czech managers and 187 answers from managers of the German high-tech firms. Necessary data were searched by the help of Albertina and Hoppenstedt databases. It was subjective measurement, when respondents were showing the extent of approval with statements on Likert scale from 1 to 7 (see appendix MMOS and business performance measurement). Index of market orientation and the business performance was calculated as arithmetic mean of the individual answers. Reliability of the measuring instruments was checked by the help of coefficient of Cronbach's alpha. Causal relationship between the market orientation of firms and their performance was studied by the method of least squares (multiple regression analysis). Data were processed by software IBM SPSS Statistics version 21 and IBM SPSS AMOS version 22 (graphic outputs).

Figure 1: Conceptual Framework



Source: Own elaboration

4.2.Hypothesis

Partly positive relation between market orientation and innovations in high-tech sector was confirmed by several independent studies Jangl (2015) or Nožička and Grosová (2012) and others. It is supposable that similar dependance will also exist between market orientation and business performance.

The following hypotheses were tested in this research study:

H₁: Customer Intelligence Generation has a positive significant influence on business performance.

H₀₁: Customer Intelligence Generation has negative or no significant influence on business performance.

H₂: Competitor Intelligence Generation has a positive significant influence on business performance.

H₀₂: Competitor Intelligence Generation has a negative or no significant influence on business performance.

H₃: Intelligence Dissemination & Integration between departments and staff has a positive significant influence on business performance.

H₀₃: Intelligence Dissemination & Integration between departments and staff has a negative or no significant influence on business performance.

H₄: Responsiveness to Market Intelligence has a positive significant influence on business performance.

H₀₄: Responsiveness to Market Intelligence has a negative or no significant influence on business performance.

5.STATISTICAL ANALYSIS

Reliability

Reliability of the measuring scale MMOS was checked by Cronbach's alpha index. According to professional literature the resulting value should range between $\alpha=0.60$ up to $\alpha=0.90$ (Hair, 2006; DeVellis, 2003). Internal consistency of items in the used MMOS scale is $\alpha=0.83$ (Czech Republic) and $\alpha=0.80$ (Germany), which is a very good value. Reliability for the business performance scale was reached satisfactory value $\alpha=0.71$ (Czech Republic) and $\alpha=0.72$ (Germany). The market orientation is formed of four factors (12 items) and the company performance is one of the factors (3 items), see supplement.

Multiple regression analysis

At first basic statistical assumptions were checked before using the regression analysis. Assumptions of linear regression analysis were checked for both data sets. Dependent variable performance is an interval variable. All independent variables are also measured at interval level. Independent variables are not highly correlated, whereof it results that multicollinearity is not present. All correlations are statistically significant. The items are not highly correlated, which means that precondition of multicollinearity absence is satisfied. VIF (variable inflation factor) is below 5, tolerance is not lower than 0.2. Multivariate normality was checked by histogram of the standardised residuals and p-p plot of the standardised residuals. Histogram of the standardised residuals is described by the Gaussian curve very well. The standardised residuals lie on the normal distribution line. Linearity of relations between variables and homoscedasticity was checked by point plot of the standardised residuals and the standardised predicted values. The plot of the standardised residuals, depending on the standardised predicted values, does not show any relationship between the residuals and the standardised predicted values.

Independent variables in the model represent the individual dimensions of the market orientation and dependent variable is the business performance.

The model has the following form: $\widehat{PERF} = \beta_0 + \beta_1 CUIG + \beta_2 COIG + \beta_3 IDI + \beta_4 RMI$

5.1.Czech high-tech firms

Table 3 Arithmetic mean (\bar{x}), Standard deviation (SD), Correlations

Model	\bar{x}	SD	MO (rate)	Correlations					
				CUIG	COIG	IDI	RMI	MO	PERF
Customers Intelligence Generation (CUIG)	5.88	0.88	high	1					
Competitors Intelligence Generation (COIG)	5.13	1.21	medium	0.43**	1				
Intelligence Dissemination & Integration (IDI)	5.12	1.11	medium	0.29**	0.21**	1			
Responsiveness to Market Intelligence (RMI)	4.67	1.13	low	0.35**	0.46**	0.41**	1		
Market Orientation (MO)	5.20	0.78	medium	0.68**	0.75**	0.67**	0.78**	1	
Business Performance (PERF)	5.13	1.09	medium	0.38**	0.31**	0.40**	0.43**	0.52**	1

Note: < 5.0 (low rate); <5; 5.5> (medium rate); > 5.5 (high rate)

** Pearson correlation is significant at 0.01 level; Source: Own elaboration

As Table 3 depicts, the factor “customer intelligence generation“ (\bar{x} =5.88) received the highest evaluation and the factor “responsiveness to market intelligence“ (\bar{x} =4.67) has the lowest average evaluation. The two remaining factors of the market orientation (COIG, IDI) and also the business performance (PERF) were evaluated almost similarly by respondents. Their arithmetic means and standard deviations are very similar. Total index of the market orientation (\bar{x} =5.2) was calculated as arithmetic mean of four dimensions (12 items) and the business performance index (\bar{x} =5.2) of three items.

Multiple regression analysis (model properties) - Czech high tech firms

Table 4 Significance of the model

R	R ²	Adjusted R ²	F
0.538	0.289	0.271	16.16***

Note: ***($p < 0.001$); Source: Own elaboration

It results from Table 4 that the model is statistically significant ($F=16.16^{***}$) at the level of significance 0.001 and it explains 27.1% variance of the variance of the dependent variable.

Table 5 Coefficients

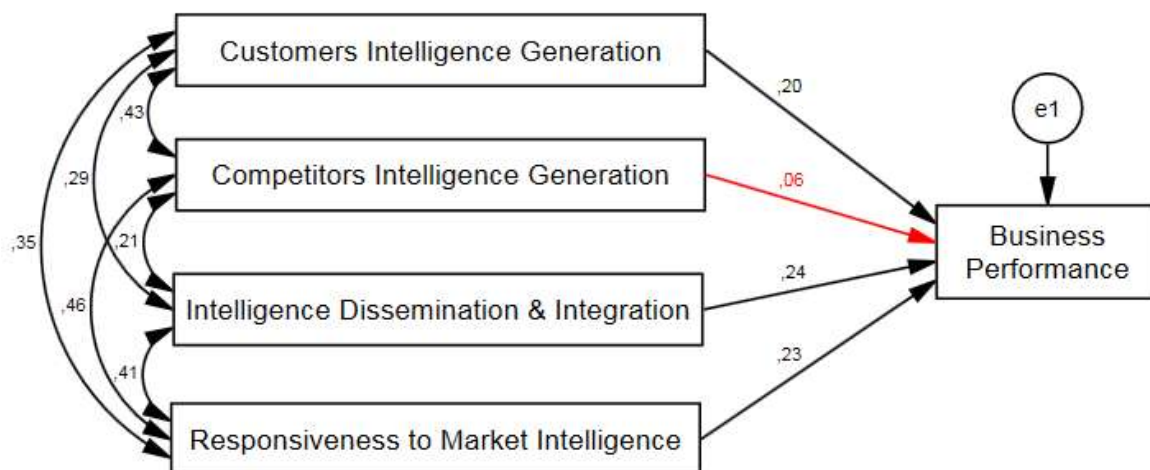
Model	Unstandardised Coefficients		Standardised Coefficients	t-Value	Results
	B	Std. error	Beta		
Constant	1.123*	0.546	-	2.058	-
Customers Intelligence Generation (CUIG)	0.252**	0.095	0.20**	2.643	Reject H₀₁
Competitors Intelligence Generation (COIG)	0.058	0.072	0.06	0.812	Accept H₀₂
Intelligence Dissemination & Integration (IDI)	0.233***	0.073	0.24***	3.185	Reject H₀₃
Responsiveness to Market Intelligence (RMI)	0.222**	0.079	0.23**	2.810	Reject H₀₄

Note: PERF (dependent variable); ***($p<0.001$); **($p<0.01$); *($p<0.05$)
Source: Own elaboration

It is clearly visible that three coefficients in the model are positive and statistically significant (see Table 5). There exists a positive relationship among the factors “customers intelligence generation“, “dissemination & integration of market information“, “response to market information“ and the company performance, that is why null hypotheses H_{01} , H_{03} , H_{04} were rejected. The opposite situation occurred with the factor “competitors intelligence generation“ which is not statistically significant, that is why null hypothesis H_{02} was not rejected. On the basis of the standardised beta coefficient we may state that dissemination & integration of information inside the firm ($\beta_3=0.24^{***}$) and responsiveness to market intelligence ($\beta_4=0.23^{**}$) have the highest influence to the business performance.

The model has the following form: $\widehat{PERF} = 1.123 + 0.252CUIG + 0.058COIG + 0.233IDI + 0.222RMI$.

Figure 2 Graphical representation of the model



Source: Own elaboration

5.2 German high-tech firms

Table 6 Arithmetic mean (\bar{x}), Standard deviation (SD), Correlations

Model	\bar{x}	SD	MO (rate)	Correlations					
				CUIG	COIG	IDI	RMI	MO	PERF
Customers Intelligence Generation (CUIG)	5.74	0.99	high	1					
Competitors Intelligence Generation (COIG)	5.16	1.07	medium	0.43**	1				
Intelligence Dissemination & Integration (IDI)	5.03	1.17	medium	0.38**	0.27**	1			
Responsiveness to Market Intelligence (RMI)	4.64	1.08	low	0.38**	0.50**	0.51**	1		
Market Orientation (MO)	5.14	0.81	medium	0.71**	0.73**	0.74**	0.80**	1	
Business Performance (PERF)	5.22	1.05	medium	0.41**	0.31**	0.41**	0.40**	0.51**	1

Note: < 5.0 (low rate); <5; 5.5> (medium rate); > 5.5 (high rate)

** Pearson correlation is significant at 0.01 level; Source: Own elaboration

On a sample of German firms the factor “customers intelligence generation“ (\bar{x} =5.74) also got the highest value. On the contrary, the worst results had the factor “responsiveness to market intelligence“ (\bar{x} =4.64). The three remaining factors were evaluated almost identically by respondents. Their arithmetic means and standard deviations are very similar. Total index of the market orientation has value (\bar{x} =5.14) and the company performance (\bar{x} =5.22).

Multiple regression analysis (model properties) – German high-tech firms

Table 7 Significance of the model

R	R ²	Adjusted R ²	F
0.524	0.274	0.258	17.191***

Note: *** (p<0.001); Source: Own elaboration

It results from Table 7 that the model is statistically significant (F=17.191***) at the level of significance 0.001 and it explains 25.8% of the variance of the dependent variable.

Table 8 Coefficients

Model	Unstandardised Coefficients		Standardised Coefficients	t-Value	Results
	B	Std. error	Beta		
Constant	1.711***	0.446	-	3.837	-
Customers Intelligence Generation (CUIG)	0.248**	0.078	0.23**	3.187	Reject H ₀₁
Competitors Intelligence Generation (COIG)	0.070	0.074	0.07	0.942	Accept H ₀₂
Intelligence Dissemination & Integration (IDI)	0.191**	0.067	0.21**	2.839	Reject H ₀₃
Responsiveness to Market Intelligence (RMI)	0.164*	0.079	0.17*	2.079	Reject H ₀₄

Note: PERF (dependent variable); ***(p<0.001); **(p<0.01); *(p<0.05)

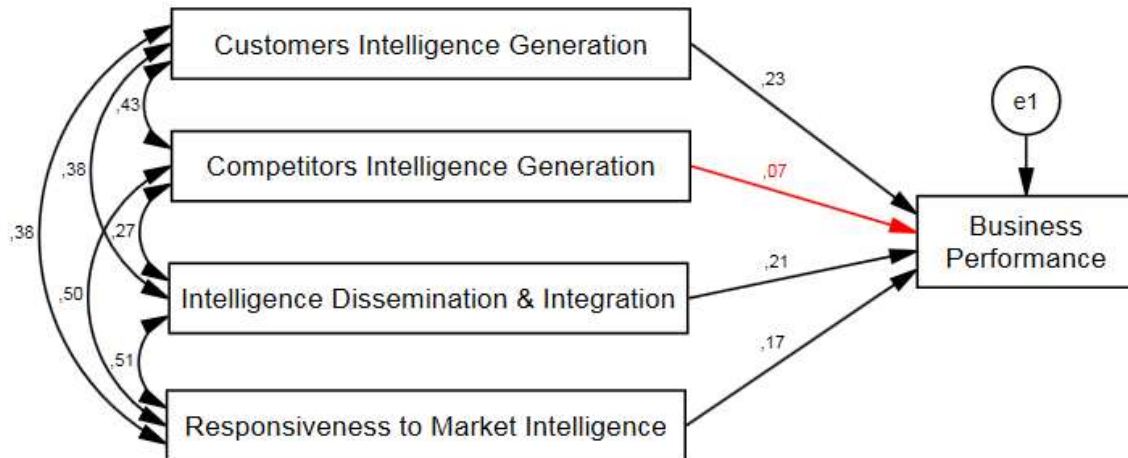
Source: Own elaboration

Null hypotheses H₀₁, H₀₃, H₀₄ were rejected, null hypothesis H₀₂ was not rejected. On the basis of the standardised beta coefficients we may state that “dissemination & integration of information” (β_3 =0.21**) and “customers

intelligence generation” ($\beta_1=0.23^{**}$) have the highest influence to the business performance in Germany. There was not found any significant relation to the company performance for factor “competitors intelligence generation“, not even on sample of the German high-tech firms.

The model has the following form: $\widehat{PERF} = 1.711 + 0.248CUIG + 0.070COIG + 0.191IDI + 0.164RMI$.

Figure 3 Graphical representation of the model



Source: Own elaboration

Table 9 Summary of results (descriptive statistics)

	Germany (MOI)	Czech Republic (MOI)	Germany (SD)	Czech Republic (SD)
CUIG	5.74 (high)	5.88 (high)	0.99	0.88
COIG	5.16 (medium)	5.13 (medium)	1.07	1.21
IDI	5.03 (medium)	5.12 (medium)	1.17	1.11
RMI	4.64 (low)	4.67 (low)	1.08	1.13
MO	5.14 (medium)	5.20 (medium)	0.81	0.78
PERF	5.22 (medium)	5.13 (medium)	1.05	1.09

Note: Market Orientation Index (MOI); Standard Deviation (SD); Source: Own elaboration

Table 10 Summary of results (regression analysis)

Independent variable	Dependent variable	Hypotheses	Beta (Czech sample)	Beta (German sample)
CUIG	PERF	H ₁	0.23**	0.20**
COIG	PERF	H ₂	0.07	0.06
IDI	PERF	H ₃	0.21**	0.24***
RMI	PERF	H ₄	0.17*	0.23**

Note: ***($p<0.001$); **($p<0.01$); *($p<0.05$); Source: Own elaboration

6.DISCUSSION

The model of market orientation was formed of four dimensions and the business performance was measured as a one-dimensional construct. For each dimension was calculated arithmetic mean (\bar{x}). The used modified market orientation scale MMOS, including the business performance measurement, is part of the supplement. Universal classification of the firms according to the reached average value on Likert scale from 1 to 7 was carried out by Frejtková and Chalupský (2013). These authors divided the firms into three categories: a) total index of the

market orientation (\bar{x}) higher than 5.5 (strongly market orientated), b) index lying in the interval from 5 to 5.5 (medium market orientated) and index below the value 5.0 (weakly market orientated). According to this classification both Czech firms ($\bar{x}=5.20$) and German high-tech firms ($\bar{x}=5.14$) seem to be medium market orientated. The results may be considered as almost identical. Generally, the firms may be recommended to pay attention to four dimension “responsiveness to the market information“ that was the worst in both countries. It is a particular coordinated strategic action, which may practically include improvement in areas such as: revealing new market segments, expansion abroad, higher flexibility in solving customer dissatisfaction with final products, faster development of new products, answer to competitive advertising campaign, etc. Improvement would automatically lead towards increase of total index of the market orientation. Authors Nožička, Grosová (2012) found out index of the market orientation in the Czech Republic ($\bar{x}=5.88$), Frejková (2014) came to the value ($\bar{x}=5.19$) and Tomášková (2005) to the value ($\bar{x}=5.74$) for the Czech power industry firms. Although all the above mentioned used a seven point Likert scale, the questionnaire and the resulting sample of the firms was different; that is why the results are only partly comparable. The company performance turned out a bit better for the German high-tech firms ($\bar{x}=5.22$) than for the Czech ones ($\bar{x}=5.13$).

Research of the causal relationship between the market orientation of firms and the company performance was carried out in two phases. In the first part there were analysed data of the Czech high-tech firms in processing industry and in the second part data from managers of the German firms. In the first case was proved statistically significant relation between three dimensions of the market orientation and the performance. The performance in the Czech Republic is the most considerably influenced by dimensions: dissemination of information & integration of knowledge inside the firm ($\beta_3=0.24$; $p<0.001$) and responsiveness to market intelligence in the form of a strategic action ($\beta_4=0.23$; $p<0.01$). Customers intelligence generation ($\beta_1=0.20$; $p<0.01$) has a bit weaker, but also statistically significant influence to the company performance. The three hypotheses H_1 , H_3 and H_4 were thereby proved on the Czech data. Further, the coefficient beta for dimension of getting market information about competition ($\beta_2=0.06$; $p>0.05$) was the only one statistically not significant. Hypothesis H_2 thus was not proved on the basis of results of the regression analysis.

Finally, the regression analysis was carried out on data from the German high-tech firms. It is obvious that no significant relation ($\beta_2=0.07$; $p>0.05$) to the business performance was proved for the factor “competitor intelligence generation“. The hypothesis H_2 was not proved by the same reason as in the Czech Republic. Other relations between components of the market orientation and the business performance may be considered as statistically significant for the German high-tech firms: customer intelligence generation ($\beta_1=0.23$; $p<0.01$), dissemination & integration of information inside the firm ($\beta_3=0.21$; $p<0.01$) and responsiveness to the market intelligence in the form of a strategic action ($\beta_4=0.17$; $p<0.05$). It results thereof that the three remaining hypotheses H_1 , H_3 and H_4 were also proved in Germany.

7.CONCLUSION

Task of this study was to find out index of the market orientation and the business performance and also to test four hypotheses about relation between the main components of the market orientation and the business performance in the Czech Republic and Germany. On the basis of analysis the firms in the both countries are medium market orientated. The company performance can be assessed similarly. Further, in both countries simultaneously was found out a slightly positive and significant relation between the variables: customer intelligence generation, dissemination & integration of information inside the company, responsiveness to market intelligence and the business performance. On the contrary, statistically significant influence was not proved between the variables: competitor intelligence generation and the business performance neither within the Czech Republic, nor on the studied sample in Germany. Unfortunately, there is no comparable quantitative research in the Czech Republic which is solved by a multiple regression analysis, therefore replication of the research is recommended. When using similar methods in Germany they repeatedly succeeded to prove similar results in production sector and services.

Part of the results are also the calculated indices of the market orientation and the company performance that pointed out that the firms pay most attention to getting of market information about customers and they most underestimate response to often hard-acquired market information. On account of this the management may be

recommended to place emphasis on the coordinated action, because its influence on the company results is the same as on other processes. In other respects the differences in high-tech sector of both countries are not big according to the ascertained indices, which is a proof of the similar company management. Results of empirical research may serve as a feedback for managers and help in the self-evaluation of strong and weak points in the firm. Also for research workers in order to confirm the results by the help of innovated model.

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APPENDIX

THE MODIFIED MARKET ORIENTATION SCALE (MMOS)

Construct	Items
Customers Intelligence Generation	<ol style="list-style-type: none">1. We systematically collect and evaluate data about satisfaction or non-satisfaction of customers.2. We have regular meetings with customers in order to learn their future expectations in time.3. We permanently strive for a deeper understanding of the hidden needs and requirements of customers.
Competitors Intelligence Generation	<ol style="list-style-type: none">4. We perform evaluation of strong and weak points of major competitors.5. We try to predict a future behaviour of competitors.6. We monitor mutually competing firms in our branch.
Intelligence Dissemination & Integration	<ol style="list-style-type: none">7. We inform each other about successful and unsuccessful experience with customers across all company departments.8. In our company we hold a lot of formal and informal talks where we solve present business success, market opportunities or risks.9. Market information are integrated in this workplace before decisions are made.
Responsiveness to Market Intelligence	<ol style="list-style-type: none">10. Our reaction to the competitor's price campaign is very short.11. Principles of market segmentation control development of new products in our firm.12. We react immediately if the competition launches intensive advertising campaign aimed at our customers.

BUSINESS PERFORMANCE MEASUREMENT

Construct	Items
Business Performance	<ol style="list-style-type: none">13. Our firm achieved a sales growth over the last year.14. Profitability (ROA) is increased year-on-year.15. Our firm increased its market share over the last year.