

EMPIRICAL DEVELOPMENT TAXONOMY OF MICRO, SMALL AND MEDIUM-SIZED ENTERPRISES IN SOUTH MORAVIAN REGION

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Abstract

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This paper represents a pilot study examining entrepreneurial behavior patterns within the area of development of micro, small and medium-sized market active enterprises in South Moravian Region from the perspective of strategic management. The main aim of this article is to classify the enterprises by the character of development activities into relatively homogeneous groups and identify those activities that contribute to considerable differences between the individual groups. Empirical evidence is based on a quantitative survey in terms of a random choice of respondents obtained by means of an e-mail questionnaire. The major analytic procedure applied within this research comprises methods of Cluster Analysis and validation technique based on chi-square and G-square nonparametric tests for testing differences (independence) of variables between the clusters. By means of Cluster Analysis three relatively homogenous SME groups were identified. The first cluster, called "global", (approximately 6% of the respondents) prevails in most of the strategic development aspects of the researched enterprises. Global SMEs rely on development activities in the area of product innovations and risk diversification into other activities. In terms of changes in functional strategies this involves primarily the area of new technology and human resources development, and the ability to benefit from participation in networks of cooperating organizations. The second cluster, called "transition", (approximately 59% of the respondents) is developed mainly by means of investments in business specific knowledge, and/or in technical skills of their employees. They are more conservative in the area of product innovations and risk diversification into other activities, which is then reflected in a lower level of investments in technologies and marketing. In comparison with global enterprises the major difference lies in a much lower number of activities in the area of seeking cooperation with other enterprises. The third cluster, called "local", (approximately 35% of the respondents) chooses the way of product innovations whose supply is mostly composed of standardized products and services, especially in local or regional markets. Local enterprises, when compared to the former clusters, are typical for a lower level of business cooperation, and in fact for absence of utilizing the support programs.

micro, small and medium-sized enterprises, development strategies, cluster analysis, empirical taxonomy, South Moravian Region, quantitative research

SME development is, as a result of a social-economic role (Storey, 1994; Chládková, 2010) they have been playing approximately in the last three decades, a respected research issue (Chan *et al.*, 2006), being significant for many economies which, through their policies, strive for the support for establishing new enterprises together with the support for growth and development of those SMEs

already existing (Smallbone *et al.*, 1995; Foreman-Peck *et al.*, 2006).

One of the key determinants of SME development is a strategy and management of activities related to SMEs' accomplishment (Storey, 1994; Smallbone *et al.*, 1995; Stokes *et al.*, 2010). Apparently, for many SMEs the decisions regarding strategic management occur in cases of survival and operational necessity

rather than in case of enterprise growth and development (Beaver and Prince, 2004). However, there are an immense number of strategy concept definitions (Boohene *et al.*, 2008). An overview of different perspectives and typologies of strategies can be found, for instance, in the empirical study by Gibcus and Kemp (2003) or from the perspective of historical development of strategic management by Hoskisson, (1999). In the studies examining strategies and their impacts on SME performance there can be found a number of “classical” approaches such as Miles and Snow typology (Aragón-Sánchez and Sánchez-Marín, 2005), Porter’s generic strategy (Man and Wafa, 2009), Ansoff’s product expansion matrix (Andersen and Kheam, 1998) or combinative position of criteria (Smallbone *et al.*, 1995; Gibcus and Kemp, 2003), where also the mentioned research study belongs to.

SME development is a heterogeneous phenomenon (Zhou and De Wit, 2009) because of this heterogeneity of resources and capabilities of SMEs which are mobilized by enterprises to secure their growth and survival, to which consequently the application of various strategies relates (Mangematin *et al.*, 2003). However, there are also opposite views which document acquiring a homogeneous group of SME characteristics such as similar strategies and policies for goal achievement (Smallbone *et al.*, 1995; Gibcus and Kemp, 2003; Chan *et al.*, 2006; Foreman-Peck *et al.*, 2006). Raymond and Croteau (2006) claim that the strategic development of SMEs depends on technology development, product innovation development, markets development and network extending. Singh *et al.* (2008) suggests that SMEs shall continuously review their strategies in order to identify market priority aspects, structure of products and services, production configuration and investments.

Development is, in this article, understood as a business strategy that is either adopted or planned by company’s management with regards to its resources, skills and environmental risks (Man and Wafa, 2009). The following strategies show that SMEs must not only develop new product/market strategies, but also network strategies.

1. Product development

Product innovations reflect changes in final products or services, being typically related with creating new markets (Forsman, 2011).

Expand production/services within a current activity. These solutions can include all types of innovations, which will be used to create either minor modifications to existing products and services or completely new products and services within current activity (Forsman, 2011). A horizontal integration of the manufacturing and services are extended of further products/services of various character which either supplement the original activity or stems from the company’s knowledge (Drdla and Rais, 2011).

Expand production/services into a different activity. Risk diversification by means of extending a manufacturing program, and this is done either in a vertical form i.e. attempts to manage material resources or manage distribution channel (Man and Wafa, 2009) or diversification into unrelated sectors which is accompanied also by changes of manufacturing and business strategy (Drdla and Rais, 2001).

2. Market development

The expansion into new markets creates opportunities for a firm to extend the range of its customers, and also for an increase of sales volume and extension of manufacturing capacities for meeting the market demands (Lu and Beamish, 2001; Dobbs and Hamilton, 2007).

Firms geographical expansion outside a town/region. According to Schmitt-Degenhardt *et al.*, (2002), typical examples are SMEs offering standardized products and services to a local or regional market. In all these cases the business strategy is chosen by firm’s owners-managers, whose aim is, from the very beginning, to occupy a local or regional niche market.

Firms geographical expansion abroad. SME participation in international markets (Andersen and Kheam 1998; Procházková and Kubíčková, 2011) involves relatively small enterprises formed by active business people whose supply includes a considerable added value, often as a result of a significant breakthrough in processes or technologies (Bell *et al.*, 2004).

3. Development of business collaboration

In general, there could be three forms of cooperation that can help SMEs in their development activities.

Development of alliances. Inter-firm cooperation as a base of small firms’ networks, can be both formal and informal, in extent from free affiliates to narrow associations marked with merger (Estelyiová and Koráb, 2010). Such alliances can involve customers, suppliers and other firms in the industry (Mazzarol, 2004). These cooperative relationships are considered necessary for successful internationalization (Bell *et al.*, 2004; Davidsson *et al.*, 2005), sharing of products, manufacturing technologies, marketing, R&D and know-how (Singh *et al.*, 2008; Forsman, 2011).

Development interactions with associations, town/municipality. Business associations for example Regional Chamber of Commerce (RCC), provide a quick access to industry-related information, opportunity to communicate with fellow industrialists and collective lobbying (Dobbs and Hamilton, 2007). In the context of the Local Action Groups (LAGs), cities, regions, municipalities, it is the involvement of the business sector in the strategic planning of public administration but also joint promotion at trade fairs and exhibitions abroad.

Government support programs and infrastructure.

Utilization of support programs and infrastructure is one of the forms of SME network activity (Mazzarol, 2004; Macpherson and Holt, 2007). When creating favorable environment, a crucial role belongs to governmental policies due to some initiatives such as increasing investment and credit limits, government subsidies for technology update, improvement of infrastructure, (Singh *et al.*, 2007), support the development of innovative activities (Forsman, 2011) or, in general, the activities for passing knowledge on by means of institutional support (Macpherson and Holt, 2007) such as public research centers, education and specialized training of financial institutions (Mazzarol, 2004).

4. Investment priorities

Business strategies are accompanied also by changes in activities in the main functional areas (Boohene *et al.*, 2008). According to Singh *et al.*, (2007) effective strategies for making investments for developing competencies over time are very important.

Employee training and development. The care for business specific knowledge and skills, and investments in education is beneficial for the growth (Foreman-Peck *et al.*, 2006). Freel (1999) identifies major gaps, which hinder successful innovations in SMEs such as technical skills of employees, managerial competences and poor marketing skills. Strategic management of human resources offers to firms with internal capacity an opportunity to adapt to their competitive environment in terms of synchronizing the policy of human resources and procedures such as education and development with the business strategy (Barrett and Mayson, 2007).

Technological development. Technical innovativeness involves new products, enhancement of current products – whether it is their performance or aesthetic function, implementation of new automation, new equipment, new processes or machinery for a quite short term cycle, design for manufacturability and finally improvement in materials or supplies (Man and Wafa, 2009). New technologies have also marketing impacts because they enable SMEs to access markets abroad and thus facilitating the process of introducing these products/services in these markets (Singh *et al.*, 2008). According to Maranto-Vargas and Rangel (2007), technologies are considered to be soft techniques such as methods and processes, and hard techniques such as equipment, materials and facility.

Change or improve the marketing strategy. Marketing strategy is one of the most important of the strategy whose main interest is to assign and efficiently coordinate marketing activities and resources for firm's goal achievement into a specific market, together with introduction of the target markets for a particular product or lines of products (Vega and Rojas, 2011). Therefore a change

in business strategy (e.g. firm's focus on e-business) brings about a large number of changes in firm's functional strategies such as marketing (Drdla and Rais, 2001).

Every firm of SMEs may or do not have to follow the mentioned business and investment strategies, or their combination may occur or they can serve as supplementary strategies. These activities then serve as a guideline for a complex development strategy implemented by a firm. The aim of this paper is to examine behavior patterns of market active SMEs in South Moravian Region regarding above mentioned selected (identical) features of development activities in particular. The principal research questions of this paper are: *Is it possible to divide or differentiate SMEs by the features of development activities into homogeneous or similar areas? Which of these activities contribute to considerable differences between the individual groups? Are these groups influenced by a size category and a sector of enterprise?*

MATERIALS AND METHODS

In August and September 2011 a quantitative research was performed based on a random sample focusing on SMEs in South Moravian Region. Empirical evidence is based on quantitative data gathered by means of electronic distribution (e-mail) of a questionnaire. The questionnaire is divided into the following three sections: (1) *respondent profile* (2) *development activities and their significance for firms* (3) *investment intentions*. For the purpose of quantitative examining there was provided a total of 2073 contacts on entrepreneurial subjects from the database of Regional Chamber of Commerce for South Moravia. Due to non-fulfillment of definition criteria for SME, issued by Commission Regulation (EC) No. 800/2008 Annex 1, Article 1, a final total number of selected respondents was reduced to 1123. Out of the selected number of respondents the questionnaire was replied to by 76 firms, and so the total ratio of returned replies was 7.12%.

A profile of the respondents ($n = 76$), according to size category and a sector of enterprise, is shown in the following Tab. I., which illustrates absolute, relative frequencies and cumulative absolute and relative frequencies. The largest number of the respondents is formed by micro enterprises (46.1%). According to principal objects of business (according to sections CZ-NACE), this involves mainly building industry (30.3%), manufacturing industry (23.7%) and professional, scientific and technical activities (18.4%).

Most of the examined enterprises were established within 1989–1998 (61.8%). From the perspective of the other characteristics, according to geographical determination of market within the Czech Republic (CR), 93.4% of the respondents perform their sales in their regions, while 82.9% of the respondents perform their sales outside their regions (within CR). Sales outside CR are performed most often in member states (38.2%), in Eastern Europe including

I: *Properties of Selective Sample of Respondents (n =76)*

Principal objects of business according to CZ-NACE	Micro 0-9 employees		Small 10-49 employees		Medium 50-249 employees		SME total	
	No.	%	No.	%	No.	%	No.	%
A Agriculture	1	2.9	0	0.0	0	0.0	1	1.3
C Manufacturing industry	5	14.3	7	23.3	6	54.5	18	23.7
D Production and distribution of electricity, gas, heat and air conditioning	0	0.0	1	3.3	0	0.0	1	1.3
F Building industry	9	25.7	10	33.3	4	36.4	23	30.3
G Wholesale and retail	7	20.0	3	10.0	0	0.0	10	13.2
H Freight and warehousing	1	2.9	0	0.0	0	0.0	1	1.3
I Accommodation, catering and hospitality industry	1	2.9	3	10.0	0	0.0	4	5.3
J Information and communication activities	1	2.9	1	3.3	0	0.0	2	2.6
L Real estate activities	1	2.9	0	0.0	0	0.0	1	1.3
M Professional, scientific and technical activities	8	22.9	5	16.7	1	9.1	14	18.4
S Other	1	2.9	0	0.0	0	0.0	1	1.3
Total	35	46.1	30	39.5	11	14.5	76	100.0

Source: Own design

Russia (outside EU) (17.1%) and in other regions of the world (6.6%). In terms of geographical distribution of the respondents operating in South Moravian Region, 53.9% of the enterprises come from Brno City. From the perspective of business premises location, 22 enterprises are currently located in enterprise zones, which represent 16.7% of the total number of the examined respondents.

Strategies and management of activities related to SME development are, in tune with the literary framework above, assessed with respect to the areas. As a part of questioning, the respondents were asked to indicate those activities from the list of options that are the most important in agreement with their plans for the next 5 years. Further, the respondents were offered an open question "other", which, however, brought only few replies, therefore this option was then excluded from the reassessment due to an insignificant number of data.

The most advantageous method for testing the research questions of this study is cluster analysis. According to McMahon (2001), its aim is to classify objectively the cases into several groups excluding each other on the basis of similarity among its values for a certain clustering of variables selected by an investigator. These groups should imply high internal homogeneity and high external heterogeneity. Out of a total number of 76 respondents 5 firms were excluded for the purpose of cluster analysis (they did not indicate any of the offered options), which represent remote objects. In total, 71 respondents enter the analysis. Clustering algorithms, comparing objects in terms of degrees of similarity, work efficiently up to 16 variables (Řezanková *et al.*, 2007), therefore it is not necessary to reduce the task scope. According to the range, these are asymmetric dichotomous variables (Řezanková *et al.*, 2007) which, when turned into

binary code, acquire values of 0 and 1 (0 – absence, 1 – occurrence).

Since the difference between variables shall be investigated at same time, in connection with a term "data mining", there was chosen a module "Generalized EM Cluster Analysis" in a program system STATISTICA Cz. 10. The technique is based on *non-hierarchical clustering* by means of *EM algorithm* ("Expectation Maximization") which initially randomly assigns different probabilities to each class or category, for each cluster in gradual iterations. From the perspective of categorical variables, the distances can acquire only 0 (in case that the class, which particular comparison belongs to, is the one that occurs with the highest frequency in a given cluster) or 1 (if it is different from this class). These probabilities are modified in order to maximize data probability with respect to an entered number of clusters.

Subsequent testing of differences (independence) between clusters according to variables shall be verified by a chi-square non-parametric test, which is used in statistics to express a degree of dependence among binary variables. For alternative variables there is used χ^2 criterion (*Chi-square measure*) that tests agreement of expected frequencies (theoretical) m_{ij} and really measured empirical frequencies n_{ij} in parts of the field of possible values. The test is used for verifying the hypotheses in the contingency table. The test criterion χ^2 is compared with a critical p value of relevant division chi-square at a required significance level $\alpha = 0.05$. This criterion is determined according to the following relation:

$$\chi^2 = \sum_{i=1}^k \frac{(n_{ij} - m_{ij})^2}{m_{ij}}. \quad (1)$$

With testing the independence of categorical variables there shall follow the application of statistics based on credibility ratio (likelihood-ratio or G-test), deviance:

$$G = 2 \sum_{i=1}^r \sum_{j=1}^s n_{ij} \ln(n_{ij} / m_{ij}). \quad (2)$$

This testing criterion has asymptotic chi-square division with $v = (r - 1)(s - 1)$ degrees of freedom. Test criterion G is again compared with the critical p value of relevant division chi-square at a required significance level $\alpha = 0.05$. With samples of adequate size, the G-test and chi-square test will lead to the same conclusions. However, an approximation of theoretical chi-square divisions for G-test is better than with the test of Pearson chi-square.

RESULTS AND DISCUSSION

The result of analysis by means of EM algorithm, the optimal division of objects was into 3 clusters. Tab. II illustrates the results of respondents' group membership in a form of absolute and relative frequencies, and the tests for detecting cluster differences according to variables on the basis of values of test criteria and of p -values of independence tests. The application of descriptive statistics to the description of respondent characteristics facilitates the representation of the results of cluster analysis.

The non-parametric test chi-square and asymptotic G-square test, at 5% significance level, have proved that the variables differ greatly in the most aspects among the clusters. Both tests have proved the most significant differences between the clusters in changes of functional strategies in the area of new technology development ($p = 0.000 < 0.05$), staff development ($p = 0.000 < 0.05$) and in investments in real property development ($p = 0.000 < 0.05$). Among the most significant differences there are also activities in the area of internal geographical expansion ($p = 0.000 < 0.05$) and in business cooperation development in terms of business network expanding ($p = 0.000 < 0.05$). Chi-square test has not proved any significant differences across the clusters with activities in the area of development of expansion abroad ($p = 0.096 > 0.05$) and with activities relating to a change or improvement of marketing strategy ($p = 0.056 > 0.05$). G-square test has not detected any significant differences in activities relating to the property purchase ($p = 0.068 > 0.05$), expansion abroad ($p = 0.096 > 0.05$) and making use of enterprise zones ($p = 0.068 > 0.05$).

In terms of a close evaluation of individual clusters, a cluster called "global" ($n = 4$) definitely dominates in all aspects of strategic development of the examined SMEs. In the area of product development in the market they reach the highest number of activities (100%) within the current entrepreneurial activity and risk diversification into other activities (75%). The research study of SMEs

by Smith *et al.*, (2003) confirmed that successful SMEs are linked with the entrepreneurial behavior/style as being willing to take risks, being innovative/change orientation, articulated with an ambition to grow. A high percentage of the respondents (75%) plan activities in the area of investments in business specific knowledge and/or technical skills, in implementation of new soft (75%) and hard technologies (50%) which are necessary for innovation development. Research study of Mexican SMEs from Vargas and Rangel (2007) also found that internal capabilities such as soft technology (i.e. technical knowledge, administrative processes and, organization procedures), more than hard technology (i.e. state-of-the-art machinery) contribute to the development of competitive advantages.

Global SMEs have 100% representation in the development of firms alliances often linked with reduce uncertainty and vulnerability associated with design and implementation of new products/services and decreasing the development cycle, facilitating also the monitoring of new customers expectations (Singh *et al.*, 2008). These SMEs are also planning cooperate with the public administration (75%) and ½ of the respondents plan to use support programs. This cluster has the ability to benefit from participation in networks of cooperating organizations.

A cluster called "transition" ($n = 42$) has, in comparison with global SMEs, a lower number of activities in the area of production innovations (64%) reflecting the changes in the final products or services and risk diversification into other activities (19%). Transition SMEs are also typical for a lower level of investment in soft technology implementation (45%). Similarly, less than half (45%) of these enterprises are willing to invest in change or enhancement of marketing strategy. On the other hand, in the area of human resources development, they reach approximately the same level (74%) as global enterprises. A significant difference, in comparison with global enterprises, is a lower proportion of activities in the area of establishing cooperation with other enterprises (only 12% of the respondents) and public administration (5% of the respondents).

A cluster named "local" ($n = 25$) does not significantly differ in the number of activities in the area of development of products in the market (96%) or their mixture with respect to global enterprises. The activity extent surpasses even transition enterprises. However, the character of product innovations is not reflected in changes in the area of technologies (0%) or staff development (12%). Local enterprises reach the highest number of activities in the area of internal geographical expansion (36%). This is reflected in the level of activities in the area of enhancement and/or change of marketing strategy which is, comparing to the other clusters, at a lower level (36%). Nevertheless, the number of activities abroad is not insignificant either (20%), being

II: Patterns of SME Strategic Development

Variables	Local Cluster 1 (n=25)		Transition Cluster 2 (n=42)		Global Cluster 3 (n=4)		Independence test for categorical variables			
	No.	%	No.	%	No.	%	Chi-square	p	G-square	p
Development of products and services										
Expand production/services within a current activity	24	96	27	64	4	100	10.263	0.006**	12.626	0.002***
Expand production/services into a different activity	3	12	8	19	3	75	8.674	0.013**	6.753	0.034***
Investment priorities										
Staff development and education	3	12	31	74	3	75	24.881	0.000**	27.151	0.000***
New technology implementation	0	0	19	45	3	75	18.837	0.000**	25.555	0.000***
Change or enhancement of marketing strategy	9	36	18	43	4	100	5.769	0.056	7.248	0.027***
Purchase of new facilities, machinery, materials	1	4	5	12	2	50	7.340	0.025**	5.390	0.068
Reconstruction, launching construction of premises or facilities	0	0	14	33	4	100	21.682	0.000**	26.929	0.000***
Renting other property (real property, machinery, facilities)	2	8	0	0	1	25	6.999	0.030**	6.419	0.040***
Market development										
Firm's geographical expansion outside a town/community/region	9	36	0	0	1	25	17.201	0.000**	20.552	0.000***
Firm's geographical expansion abroad	5	20	8	19	1	25	0.084	0.096	0.080	0.096
Development of business cooperation										
Establishing a new (in)formal cooperative strategy with firms	4	16	5	12	4	100	19.087	0.000**	14.955	0.000***
Cooperation in terms of new industrial/business networks	0	0	0	0	0	0	-	-	-	-
Cooperation with RCC, LAGs, region/town/community	0	0	2	5	3	75	30.445	0.000**	15.591	0.000***
Utilization of support programs and infrastructure										
Utilizing the programs supporting enterprise	1	4	14	33	2	50	8,985	0,012**	10.751	0.005***
Entering enterprise zone	1	4	0	0	1	25	8,535	0,014**	5.325	0.068
Entering business incubator	0	0	0	0	1	25	16,990	0,000**	6.013	0.049***

** in rows, statistically significant differences for chi-square $p < 0.05$; *** in rows, statistically significant differences for G-square $p < 0.05$

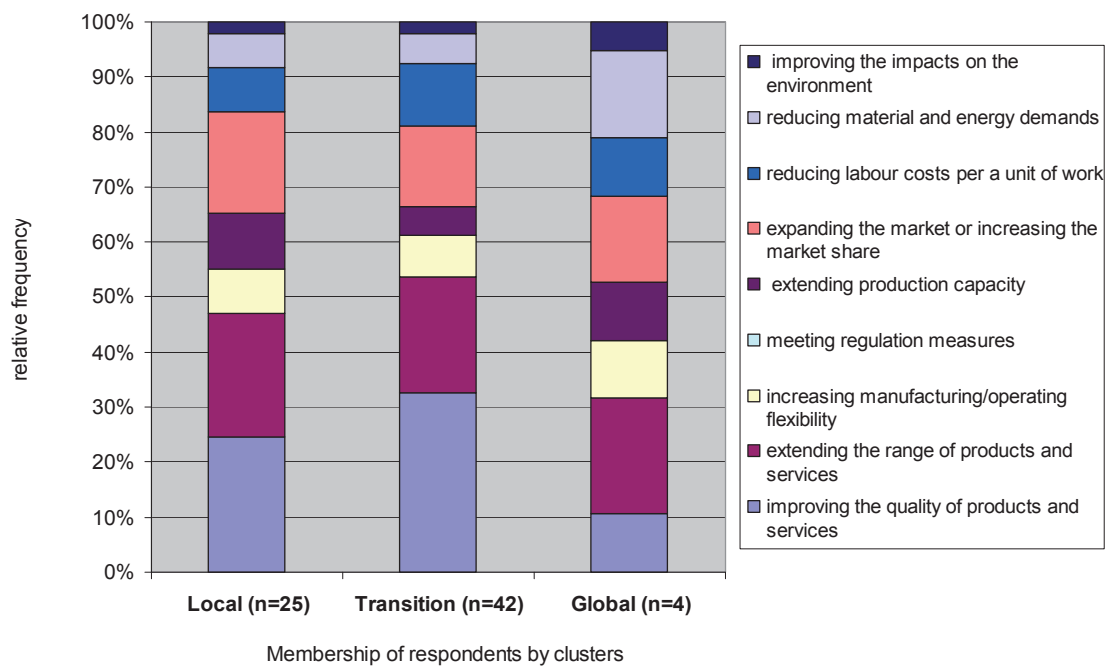
Source: Own design

approximately the same as with transition SMEs. A cluster composing of local enterprises is typical for a low level of activities in the area of development of business cooperation (16%) and only one firm plans to utilize the governmental support programs.

The results of the research study of strategic development of Canadian SMEs by Raymond and Croteau (2006) showed that a cluster called "local SMEs" and a cluster "transition SMEs" did not differ in terms of network development, but they did differ considerably in terms of product and technology development. A cluster called "World-Class SMEs" easily surpassed transition SMEs in network and market development, but not in terms of development of products and technologies. This study found different results in the technological

primacy of global enterprises in comparison to all the other groups. Similarly, a research study of Spanish SMEs by Aragón-Sánchez & Sánchez-Marín (2005) who, applying Miles and Snow typology, found out that prospectors are typical for increasing their technical positions, a higher level of innovations, utilizing information technologies and human resource management than analysts and defenders.

According to Singh *et al.* (2007) strategies for reducing costs, improving quality and flexibility are thus needs to be considered. From this perspective, a significance of innovative activities according to the respondents included in individual clusters, the most frequent were product quality improvement and product range extending (see Graph 1). Global



1: Significance of SME Innovative Activities by Clusters

Source: Own design

III: Internal Variability of Clusters by Size

Clusters	frequencies	Size			Total	Independence test for categorical variables			
		Micro	Small	Medium		Chi-square		G-square	
						χ^2	p	G	p
Global	n _{ij}	19.0	-	18.0	37.0	0.027	0.869	0.027	0.869
	m _{ij}	18.5	-	18.5	37.0				
Transition	n _{ij}	31.0	84.0	37.0	152.0	33.250	0.000**	31.211	0.000***
	m _{ij}	50.7	50.7	50.7	152.0				
Local	n _{ij}	36.0	22.0	4.0	62.0	24.903	0.000**	29.573	0.000***
	m _{ij}	20.7	20.7	20.7	62.0				

** in rows, statistically significant differences for chi-square $p < 0.05$; *** in rows, statistically significant differences for G-square $p < 0.05$

Source: Own design

enterprises differ from the other clusters in their competitive priorities with higher proportion of activities in the area of increasing manufacturing/operating flexibility, reducing material and energy demands and improving the impacts on the environment.

The follow-up analysis of internal variability of clusters by size, which is illustrated in Tab. III has not proved, at a 5% significant level, that the size category of enterprises under the global cluster impacts the character of development activities. This fact has been proved identically by both tests ($p = 0.869 > 0.05$). However, a considerable influence of organization characteristics in terms of enterprise size has been proved with the clusters composing of transition and local enterprises ($p = 0.000 < p = 0.05$).

The analysis of internal variability of clusters by sector, which is illustrated in Tab. IV has again

not prove, at a 5% significant level, that the sector membership of enterprises under the global cluster impacts the character of development activities (for chi-square $p = 0.062 > 0.05$ and G-test $p = 0.071 > 0.05$). A significant impact of sector on the character of development activities was again proved with clusters composed of transition and local enterprises ($p = 0.000 < 0.05$). These findings can be supported by the research study of homogeneity "50 Best Managed" Canadian small firms by Chan *et al.*, (2006), which confirmed that successful SMEs are quite homogenous in strategy and style due to relatively small "repertoire" of skills at their disposal. Their findings illustrate that ways to reach sustainable high growth of small enterprises are heterogeneous. However, the enterprises that achieve this goal are similar to each other regardless of their organization characteristics.

IV: Internal Variability of Clusters by Sector

Sector			Global		Transition		Local	
			n _{ij}	m _{ij}	n _{ij}	m _{ij}	n _{ij}	m _{ij}
A	Agriculture		-	-	-	-	3	8.857
C	Manufacturing industry		10	12.333	41	19	16	8.857
D	Production and distribution of electricity, gas, heat and air conditioning		-	-	4	19	-	-
F	Building industry		19	12.333	62	19	7	8.857
G	Wholesale and retail		8	12.333	7	19	16	8.857
H	Freight and warehousing		-	-	-	-	1	8.857
I	Accommodation, catering and hospitality industry		-	-	6	19	-	-
J	Information and communication activities		-	-	8	19	3	8.857
L	Real estate activities		-	-	2	19	-	-
M	Professional, scientific and technical activities		-	-	22	19	16	8.857
Total			37	37	152	152	62	62
Independence test for categorical variables	Chi-square	χ^2	5.570		36.123		32.387	
		p	0.062		0.000**		0.000***	
	G-square	G	5.301		173.158		153.052	
		p	0.071		0.000**		0.000***	

** in rows, statistically significant differences for chi-square $p < 0.05$; *** in rows, statistically significant differences for G-square $p < 0.05$

Source: Own design

It is therefore necessary to consider the size and sector of enterprise (Storey, 1994 Smallbone *et al.*, 1995; Gibcus and Kemp, 2003; Forsman, 2011; Pett and Wolf, 2012) that may influence the SME development trajectories. This involves especially the consequence of factors that influence them and technology choices, opportunities for growth and types of strategies. This is reflected in differences between sectors in significance of product innovations and also in types of investment strategies. The sector context has a significance impacts on external advisory and support of SMEs.

CONCLUSIONS AND FUTURE RESEARCH

The findings of this study reflect potential developments of SMEs, which make an effort to adapt the three cases of obvious and expanding strategy logic. Regardless of size or sector, global enterprises build on development activities in the areas of technologies and human resources development and they are able to profit from their participation in networks of cooperating organizations. Transition enterprises develop mainly by means of investments in business specific knowledge and/or technical skills of their employees. They are quite conservative in the area of product innovations and risk diversification into other activities, which is reflected in a lower level

of investments in technologies and marketing. Local enterprises follow the direction of product innovations, usually connected with development of new markets whose supply is mainly composed of standardized products and services or their mixture, especially in the local or regional market. The character of development activities of local and transition SMEs is significantly reflected in their size and sector membership.

The study has its scope limits owing to the character of the cross-sectional research performed at a fairly small sample from a single region, being also quite atypical in its nature. Regarding further research, there shall be carried out a deeper analysis of dimensions of the individual areas and extent of activities mentioned, which may intensify differences between groups and help to understand the logic of strategic development of SMEs. These dimensions can be also extended of further aspects such as organization culture, flexibility at various levels, ICT applications, investments in R&D, financing of development or the knowledge dimension. The findings further show that when researching entrepreneurial behavior of SMEs' development, it is necessary to focus on a single size category within a single sector. Another option is to compare the in-advance-defined clusters, which are divided by sector, according to the character of variables selected by the researchers.

SUMMARY

The main goal of this paper is to classify the enterprises by the character of development activities into relatively similar areas, and to identify those activities that contribute to considerable differences between the individual groups. The empirical evidence based on the quantitative survey gathered by an e-mail questionnaire of the market active SMEs in South Moravian Region and major analytic procedure based on non-hierarchical cluster analysis used for testing of a total 71 respondents, identified three relative similar areas: “**local SMEs**” (approximately 35% of the respondents), “**transition SMEs**” (approximately 59% of the respondents) and “**global SMEs**” (approximately 6% of the respondents).

Statistical validation analysis for testing the differences (independence) of variables between the clusters based on chi-square and G-square nonparametric tests has proved significant differences in most of the areas of strategic development. Both tests have proved, at a 5% significant level, the most significant differences between the clusters in changes of functional strategies in the area of new soft technology ($p = 0.000 < 0.05$), staff development and education ($p = 0.000 < 0.05$) and in investments in real property development ($p = 0.000 < 0.05$). Among the most significant differences there are also activities in the area of internal geographical expansion ($p = 0.000 < 0.05$), network development ($p = 0.000 < 0.05$) and product expansion (*within a current activity: chi-square $p = 0.006 < 0.05$; G-test $p = 0.002 < 0.05$; into a different activity: chi-square $p = 0.013 < 0.05$; G-test $p = 0.034 < 0.05$). “Global SMEs” prevails in most of the strategic development aspects of the researched SMEs. These enterprises clearly surpass the other clusters in all areas.*

The follow-up statistical analysis of variability inside of the individual clusters by size and sector has proved a significant influence of these variables on the character of development activities of the enterprises belonging to the cluster labeled transition and local (*chi-square; G-square: $p = 0.000 < p = 0.05$*). No significant influence of theirs has been proved with the cluster labeled global (*size: chi-square; G-square: $p = 0.869 > 0.05$; sector: chi-square $p = 0.062 > 0.05$; G-test $p = 0.071 > 0.05$*).

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REFERENCES

- ANDERSEN, O. and KHEAM, L. S., 1998: Resource-based theory and international growth strategies: an exploratory study. *International Business Review*. 7, 2: 163–184. doi: 10.1016/S0969-5931(98)00004-3.
- ARAGÓN-SÁNCHEZ, A. and SÁNCHEZ-MARÍN, G., 2005: Strategic Orientation, Management Characteristics, and Performance: A Study of Spanish SMEs. *Journal of Small Business Management*. 43, 3: 287–308. doi: 10.1111/j.1540-627X.2005.00138.x.
- BARRETT, R. and MAYSON, S., 2007: Human resource management in growing small firms. *Journal of Small Business and Enterprise Development*. 14, 2: 307–320. doi: 10.1108/14626000710746727.
- BEAVER, G. and PRINCE, CH., 2004: Management, strategy and policy in the UK small business sector: a critical review. *Journal of Small Business and Enterprise Development*. 11, 1: 34–49. doi: 10.1108/14626000410519083.
- BELL, J., CRICK, D. and YOUNG, S., 2004: Small Firm Internationalization and Business Strategy. An Exploratory Study of ‘Knowledge-intensive’ and ‘Traditional’ Manufacturing Firms in the UK. *International Small Business Journal*. 22, 1: 23–56. doi: 10.1177/0266242604039479.
- BOOHENE, R., SHERIDAN, A. and KOTEY, B., 2008: Gender, personal values, strategies and small business performance. A Ghanaian case study. *Equal Opportunities International*. 27, 3: 237–257. doi: 10.1108/02610150810860075.
- CHAN, Y. E., BHARGAVA, N. and STREET, CH. T., 2006: Having Arrived: The Homogeneity of High-Growth Small Firms. *Journal of Small Business Management*. 44, 3: 426–440. doi: 10.1111/j.1540-627X.2006.00180.x.
- CHLÁDKOVÁ, H., 2010: Specifika malých a středních podniků v ČR a EU. *Acta Univ. Agric. et Silv. Mendel. Brun.*, 58, 6: 161–170. ISSN 1211-8516.
- DAVIDSSON, P., ACHTENHAGEN, L. and NALDI, L., 2005: Research on Small Firm Growth: A Review. In: *European Institute of Small Business* [online]. [cit. 2013-18-1]. Available from http://eprints.qut.edu.au/2072/1/EISB_version_Research_on_small_firm_growth.pdf.
- DOBBS, M. and HAMILTON, R. T., 2007: Small business growth: recent evidence and new directions. *International Journal of Entrepreneurial Behaviour & Research*. 13, 5: 296–322. doi: 10.1108/13552550710780885.

- DRDLA, M. and RAIS, K., 2001: *Řízení změn ve firmě. Reengineering. Jak vybudovat úspěšnou firmu*. 1. vyd. Praha: Computer Press, 145 s. ISBN 80-7226-411-7.
- ESTÉLYIOVÁ, K. and KORÁB, V., 2010: Síťová spolupráce malých a středních firem v Jihomoravském kraji. *Acta Univ. Agric. et Silv. Mendel. Brun.*, 58, 4, 3: 41–54. ISSN 1211-8516.
- FOREMAN-PECK, J., MAKEPEACE, G. and MORGAN, B., 2006: Growth and profitability of small and medium-sized enterprises: some Welsh evidence. *Regional Studies*. 40, 4: 307–319. doi:10.1080/00343400600725160.
- FORSMAN, H., 2011: Innovation capacity and innovation development in small enterprises. A comparison between the manufacturing and service sectors. *Research Policy*. 40, 5: 739–750. doi:10.1016/j.respol.2011.02.003.
- FREEL, M. S., 1999: Where are the skills gaps in innovative small firms? *International Journal of Entrepreneurial Behaviour & Research*. 5, 3: 144–154. doi:10.1108/13552559910371095.
- GIBCUS, P. and KEMP, R. G. M., 2003: Strategy and small firm performance. Research Report H200208. Zoetermeer, SCALES. SCientific AnaLysis of Entrepreneurship and SMEs [online]. [cit. 2013-18-1]. Available from <http://www.ondernemerschap.nl/pdf-ez/H200208.pdf>.
- HOSKISSON, R. E., HITT, M. A., WAN, W. P. and YIU, D., 1999: Theory and research in strategic management: Swings of a pendulum. *Journal of Management*, 25, 3: 417–456. doi: 10.1177/014920639902500307.
- LU, J. W. and BEAMISH, P. W., 2001: The Internationalization and Performance of SMEs. *Strategic Management Journal*, Special Issue: Strategic Entrepreneurship: Entrepreneurial Strategies for Wealth Creation, 22, 6–7: 565–586. doi: 10.1002/smj.184.
- MACPHERSON, A. and HOLT, R., 2007: Knowledge, learning and small firm growth: A systematic review of the evidence. *Research Policy*. 36, 2: 172–192. doi:10.1016/j.respol.2006.10.001.
- MAN, M. M. K. and WAFA, S. A., 2009: The Relationship Between Innovativeness, Strategy Types, Environment and the Export Performance of Small and Medium size Enterprises (SMEs) of Malaysian Manufacturing Sector. *The Business Review*, Cambridge. 13, 2: 145–154. ISSN 15535827.
- MANGEMATIN, V., LEMARIÉ, S., BOISSIN, J. P., CATHERINE, D., COROLLEUR, F., CORONINI, R. and TROMMETTER, M., 2003: Development of SMEs and heterogeneity of trajectories: the case of biotechnology in France. *Research Policy*. 32, 4: 621–638. doi:10.1016/S0048-7333(02)00045-8.
- MARANTO-VARGAS, D. and RANGEL, R. G-T., 2007: Development of internal resources and capabilities as sources of differentiation of SME under increased global competition: A field study in Mexico. *Technological Forecasting & Social Change*. 74, 1: 90–99. doi: 10.1016/j.techfore.2005.09.007.
- MAZZAROL, T., 2004: Small Firms, their Customers and the Value of Strategic Alliances and Networks to Innovation. Annual ANZAM Conference paper, Dunedin New Zealand [online]. [cit. 2013-2-4]. Available from <http://www.cemi.com.au/sites/all/publications/ANZMAZZ04.pdf>.
- MCMAHON, R. G. P., 2001: Deriving an empirical development taxonomy for manufacturing SMEs using data from Australians business longitudinal surveys. *Small Business Economics*. 17, 3: 197–212. ISSN 0921898X.
- MINTZBERG, H., 1994: *The Rise and Fall of Strategic Planning*. New York: Free Press, 107–114. ISBN 13 978-0029216057.
- PETT, T. L. and WOLFF, J. A., 2012: SME Identity and Homogeneity – Are There Meaningful Differences Between Micro, Small, and Medium-Sized Enterprises? *Journal of Marketing Development and Competitiveness*. 6, 2: 48–59. ISSN 21552843.
- PROCHÁZKOVÁ, L. and KUBÍČKOVÁ, L., 2011: The internationalization of SMEs operating in the engineering industry. *Acta Univ. Agric. et Silv. Mendel. Brun.*, 60, 2: 279–284. ISSN 1211-8516.
- RAYMOND, L. and CROTEAU, A-M., 2006: Enabling the strategic development of SMEs through advanced manufacturing systems: A configurational perspective. *Industrial Management & Data Systems*. 106, 7: 1012–1032. doi:10.1108/02635570610688904.
- ŘEZÁNKOVÁ, H., HÚSEK, D., SNÁŠEL, V., 2007: *Shluková analýza dat*. 1. vyd. Praha: Professional Publishing, 196 s. ISBN 978-80-86946-26-9.
- SADLER-SMITH, E., HAMPSON, Y., CHASTON, I. and BADGER, B., 2003: Managerial Behaviour, Entrepreneurial Style and Small Firm Performance. *Journal of Small Business Management*. 41, 1: 47–67. doi:10.1111/1540-627X.00066.
- SCHMITT-DEGENHARDT, S., STAMM, A. and ZEHDNICKER, M., 2002: *The Growth Gap: A small enterprise phenomenon*. San Salvador: El Salvador. 1–19.
- SINGH, R. K., GARG, S. K. and DESHMUKH, S. G., 2007: Strategy development for competitiveness: a study on Indian auto component sector. *International Journal of Productivity and Performance Management*. 56, 4: 285–304. doi:10.1108/17410400710745315.
- SINGH, R. K., GARG, S. K. and DESHMUKH, S. G., 2008: Strategy development by SMEs for competitiveness: a review. Benchmarking. *An International Journal*. 15, 5: 525–547. doi: 10.1108/14635770810903132.
- SMALLBONE, D., LEIG, R. and NORTH, D., 1995: The characteristics and strategies of high growth SMEs. *International Journal of Entrepreneurial Behaviour & Research*, 1, 3: 44–62. doi: 10.1108/13552559510100657.
- STATISTICA Cz., 2011: Statsoft. Inc. STATISTICA (data analysis software system). version 10. www.statsoft.com.

- STOKES, D., WILSON, N. and MADOR, M., 2010: *Entrepreneurship*. United Kingdom: Cengage Learning EMEA. 391 p. ISBN 978-1-4080-0745-7.
- STOREY, D. J., 1994: *Understanding the small business sector*. London: Thomson Learning, 355 p. ISBN 13 978-1861523815.
- VEGA, R. and ROJAS, S., 2011: Knowledge, Perception, and Application of Strategic Marketing in MSMEs (Micro, Small, and Medium Enterprises) in Bogota. *Journal of Marketing Development and Competitiveness*. 5, 4: 119–130. ISSN 21552843.
- ZHOU, Z. and DE WIT, G., 2009: Determinants and dimensions of firm growth. *SCALES EIM Research Reports (H200903)* [online]. [cit. 2013-18-2]. Available from <http://www.entrepreneurship-sme.eu/pdf-ez/H200903.pdf>.

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