CLUSTERS – A USEFUL CONCEPT OF INCREASING THE INTERNATIONALIZATION OF SMALL AND MEDIUM SIZE ENTERPRISES? THE CASE OF FURNITURE, AUTOMOTIVE AND BOILER-MAKING CLUSTERS IN POLAND[1].

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Abstract:
Global companies draw their competitive advantage from the benefits of the access to suppliers of components and semi-products in different areas of the world. SMEs do not have such opportunities of improving their competitive potential as they are often the enterprises of local importance. However, firms which are active on a local level can use external effects, occuring locally, to upgrade the sources of their competitive advantage. Besides, one has to emphasize the advantages from the combination of competition and cooperation between local companies, and between companies and public and private institutions located in business environment. It seems that coopetition phenomenon, which is so typical for clusters, can also have enormous importance for internationalization of the companies.

The following paper presents the importance of cooperation within a cluster for internationalization of the companies in the cluster. The discussion is based on the literature of the subject and the analysis of the results of the empirical research. The research was conducted by the authors among Polish enterprises which participate in three cluster initiatives.

Key words: cluster, small and medium size enterprises, internationalization, Poland

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Introduction – the concept of a cluster, the aim and structure of the paper

The origins of the cluster concept go back to neoclassical economy and Alfred Marshall. In his book entitled „Principles of economics" [Marshall 1920] he used the term of an industrial district. He associated it with regional concentration of businesses of the same or similar sector. He based his theses, e.g. on the observation of small handicraft companies from textile (Manchester), and metallurgic sector (Birmingham), and companies producing knives located in the areas of Sheffield.

Currently the problem of clusters is discussed by many researchers who define the concept in different ways [Sölvell et.al.2003]. The most popular is the definition of a cluster proposed by Michael Porter [2000], according to which cluster is „group of companies existing in geographical neighbourhood and the institutions which are related to them and deal with particular activity, connected by similarities and completing one another".

At the beginning of the concept of economic clusters researchers analysed the relation between clusters and competitiveness on a local, regional and domestic scale. The discussion aim was to answer the question how e.g. the cluster of furniture producers, which was concentrated around city X, gains advantage over the group of furniture producers located close to city Y. Today, in times of developing internationalization and globalisation the above mentioned question has a different content and meaning. The problem is how clusters can enable the increase in competitiveness on international scale. Do clusters influence internationalization of enterprises – their participants which basically belong to SME sector or even micro companies?

First of all, the authors highlight some theses of other researchers on the clusters and internationalization of a company-the cluster participant. Then they present some results of their own research conducted in 2006 and 2007 among SME and micro companies regarding the importance of being a cluster participant and the internationalization.

The effect of a cluster on the internationalization of a company – its participant

The basic components of clusters are small and medium enterprises, hence the subjects which usually show particular internationalization ambitions, but at the same time, they face the constraints connected with their competitive potential[2] and strong competitive pressure from international companies. But it seems that small and medium enterprises working on a local scale can use so called external effects which occur locally, and which had been brought up out by Marshall [1920] and further, Krugman [1991]. However, economies of agglomeration raised by Marshall, are not the only source of potential advantages for local agents. Besides, one should mention the advantages coming from the combination of competition and cooperation between local entrepreneurs, and between those entrepreneurs and public and private institutions in a given business environment.

[2] The authors perceive the competitiveness of a firm as: firstly, the competitive potential – it is the enterprise's relative (i.e. referred to its rivals' abilities) capability to compete in the future; in other words this is competitiveness possible to be achieved; secondly as the competitive position – it is the firm's position in the market relative to the competitors, it can be assessed by the profitability and market share; and thirdly – the competitive strategy – the enterprise's behaviour towards its market rivals.

The research conducted by Oviatt and McDougall [1995, 1997] proved that numerous, small, knowledge-based companies managed to gain advantage in narrow segments in international markets, thanks to the cooperation with many local partners. The cooperation enabled them to provide higher value to a customer, e.g. products of higher quality for a lower price. The issue of dependence between "participation in a cluster" and internationalization was also raised by such researchers as Brown and Bell [2000], Sopas [2000] or Porter [2000], who found crucial, positive feedback between functioning in a cluster and internationalization of its participant. Mariotti and Piscitello [2001] drew attention to the link between tendency for internationalization in small and medium production enterprises through Foreign Direct Investment (FDI) and the specifics of their local environment. They presented the example of Italian manufacturing firms (textile, clothing, leather products, shoe, wooden products and machine industry sectors) in 20 smaller geographical areas and their internationalization activities during 1986-1995. Territorial system of connections which involve production system, economic agents, social institutions, specific culture and collective learning [Camagni 1991], forms a stimulus for creation of unique, difficult to imitate competitive advantage on the side of the companies which are involved in this system [Porter, Rivkin 1997]. Mariotti and Piscitello [2001] demonstrated that the nearest, local company environment may complete its competitive potential and support its foreign expansion.

The studies of some researchers prove that smaller companies attempt to base their strategies on cooperation with other agents on the market [Gomes-Cassers 1996; Yoshino, Rangan 1995]. The trend which can be observed in the behaviour of the companies which succeeded on international market, is gaining the market in cooperation with other companies, and thus basing their internationalization strategy on forming coalitions with other players on the market. In this type of solutions one can include, reminded by Coviello and Munro [1995], Oviatt and MacDougall [1994], global networks of small and medium enterprises and partnerships between companies which are directed at seeking synergistic – based partnerships [Dana et.al., 2000, Etemad 2001 et.al., Hakanson, Snehota 1995]. In the case of small and medium enterprises, there exists a crucial importance of ability to manage the relations with their business partners [Etemad 1999, 2003].

Bearing in mind the fact that cluster is created by agents connected with one another in a network creating values, one can also state that internationalization of buyers stimulates certain suppliers in international direction.

In further part of the paper there are presented the results of empirical research in relation to the problem of participation in a cluster and its connections with the internationalization of a company.

The results of empirical research

Research method and tools

Empirical research related to the role of clusters in supporting international competitiveness and internationalization of Polish companies in relation to the two of the clusters in Wielkopolska region – automotive and furniture cluster was conducted in July and August of 2006. The research among the representatives of boiler-making industry took place in April and May 2007. The main criterion of selection of units to sample was first of all the location of a company in the area of Wielkopolska region and secondly, the area of its activity. The key importance was also given to the consent of the company representative for the participation in the research.[3]

31 furniture, 13 boiler-making and 12 automotive companies took part in the research. The method of sample selection proves its small representativeness. The results of the research cannot, therefore, be generalised for the whole population but they characterise only the situation in the researched group of companies.

In the research was used the method of depth individual interview. The tool used in the research was a survey. It consisted of 21 scaled questions. The questions were grouped according to topics into six parts which were entitled:

- general characteristics of a company,
- cluster and competitive potential,
- cluster and competitive position and competitive strategy,
- cluster and the internationalization of a company,
- cluster and economic local government,
- cluster and economic policy.

Research sample – characteristics

All of the surveyed companies are located in the Wielkopolska region and participate in the regional clusters – respectively furniture, boiler-making and automotive. The biggest group (31 firms) were companies involved in furniture sector – 36 section of Polish/European Classification of Businesses. Among them were particularly agents dealing with production of different kinds of furniture, materials for their production, providing services and selling furniture.

Automotive cluster was represented by 12 companies which produce parts for cars and buses, elements of vehicle equipment, materials used in putting the finishing touches to cars, offer car electronics and deal with sales of the parts and elements of vehicles. In boiler-making cluster it was possible to encourage to participate in the survey 13 agents and the companies which focus their business on production of boilers, their elements and companies doing business involving the boilers and their elements.

As to the employment size, the sample size is dominated by small enterprises. Majority of the surveyed companies are businesses employing up to 99 people. The participants of the forming clusters are small companies which is particularly visible in case of boiler-making cluster where all the respondents employ below 50 people. Only one company employing over 1000 people took part in the survey and it was a company from furniture cluster.

[3] The existence of the above mentioned three clusters was earlier confirmed by the research conducted by the Wielkopolska Agency for Enterprise Development Ltd. (WAFED) WAFED is a company founded by the regional authorities of Wielkopolska. Its main areas of activity are: providing loans for SMEs, matching partners, networking, investor service, organizing trade missions and fair exhibitions, promoting the region in the Internet and during official foreign visits of the Marshal Office. Key counterparts of WAFED in performing its statutory tasks are local (regional, sub-regional and communal) authorities, companies, business support institutions (chambers, associations), academic institutions, state-level investment and entrepreneurship promotion agencies, foreign companies, public institutions and business environment organizations. WAFED fosters the cluster development in the region.

As far as legal forms of companies in furniture and boiler-making clusters are concerned, there is a domination of sole traders (respectively 58.06% and 76.92%). In automotive cluster there is a majority of commercial companies, among them private limited companies. The main feature of respondents from all three clusters is a domination of private capital in ownership structure. Most of the surveyed companies do not have foreign capital in their ownership structure.

Within the characteristics of the researched group the respondents were asked to present the data concerning sales revenues and financial results for the years 2000-2005. However, the questions were not answered readily by many respondents and most of the companies were not able to give appropriate information for the respective years 2000, 2002, 2004 and 2005. Frequently, respondents presented data only for the years 2004-2005.

Export activity and the importance of cooperation for the internationalization of the researched companies

From the research one can conclude that on average about 65% of the companies from furniture cluster and 66% from automotive cluster is active on foreign markets. The lowest level of the internationalization through export occurs in boiler-making cluster where only around 16% of the surveyed companies signalled exported activity. Only a few of the surveyed companies regardless of cluster origin got in touch with foreign client through the company involved in a cluster. (see Table 1).

Table 1. Doing business on foreign markets and the source of information about foreign client – furniture, automotive, boiler-making clusters

Details	Furnitu-re	Boiler-making	Automot-ive	Details	Furnitu-re	Boiler-making	Automoti-ve
	PI	PI	PI		PI	PI	PI
Company does not do business on foreign markets	35.48	84.62	33.33	Contact with a foreign client obtained from other member of cluster	12.90	0.00	16.67
Company does business on foreign markets	64.52	15.38	66.67	Contact with a foreign client obtained outside a cluster	54.84	15.38	50.00
No data	0.00	0.00	0.00	Not related – no activity	32.26	76.92	33.33

PI – percentage of indications (%)
Source: Authors' own research based on the survey

The group of export markets of the three surveyed clusters is quite developed and varied. The following countries are included in the export markets for the companies-participants of furniture cluster: Germany, Ireland, France, Switzerland, Norway, the Netherlands, Belgium, Austria, Czech Republic, Slovenia, Belarus, Lithuania, Slovakia, Denmark, and Great Britain. The representatives of boiler-making cluster send their goods to German, French, Ukrainian and Czech markets. Automotive cluster is active in Baltic countries markets – Lithuania, Latvia and Estonia, in German, Ukrainian, Russian, Belarussian, Kazakh, Hungarian, Czech, Slovak, Bulgarian and Irish markets.

The representatives of companies from a particular cluster were asked a question what importance for the internationalization of their company may have/has formal/informal cooperation with certain local organisations in Wielkopolska region (Table 2). To obtain this information respondents were asked to use five-degree scale where 0 is „not important", 1 - „minimal importance", 2 – "moderate importance", 3 – "significant importance", 4 – "very important".

In relation to furniture cluster the most important, from the point of view of the internationalization, is a cooperation with a client (2.38) and further with suppliers (2.04). The least important is cooperation with local authorities (0.81). In case of boiler-making cluster the highest score went to clients (2.50). On the next position were sector organisations (2.33). The representatives of automotive cluster gave the highest score to the clients, however, it signalizes minimal importance of this type of cooperation for the internationalization of automotive companies.

Table 2. The importance of cooperation with particular agents for the internationalization of surveyed companies – furniture, boiler-making and automotive clusters

Reason	Furniture			Boiler-making			Automotive		
	PI	AM	SDV	PI	AM	SDV	PI	AM	SDV
1. Competitors	87.10	1.78	1.40	92.31	2.25	1.42	100.00	0.33	0.89
2. Sector organisations	83.87	1.77	1.37	92.31	2.33	1.23	100.00	0.42	0.67
3. Suppliers	83.87	2.04	1.54	92.31	1.83	1.53	100.00	0.92	1.24
4. Clients	83.87	2.38	1.20	92.31	2.50	1.24	100.00	1.00	1.35
5. Research and development institutions	83.87	1.96	1.48	92.31	2.17	1.27	100.00	0.42	0.67
6. Agencies, research and market analysis	83.87	1.65	1.47	92.31	2.25	1.22	100.00	0.42	0.90
7. Marketing and distribution units	83.87	1.69	1.38	92.31	2.25	1.22	100.00	0.33	0.65
8. Local government, other institutions	83.87	0.81	1.20	92.31	1.08	1.16	100.00	0.17	0.39
9. Universities, other schools	83.87	0.88	1.31	92.31	1.58	1.31	100.00	0.50	0,80

PI –percentage of indications (%), AM – arithmetic mean, SDV – standard deviation
Source: Authors' own study based on the results of surveys

The significance of local cooperation for the internationalization of researched companies - comparison of clusters

As the results of empirical research seemed to be quite similar for every of the three clusters (see Table 2), the authors decided to compare the three clusters according to the significance of local cooperation for the internationalization of the analysed firms. The authors' attempt was to find out if there are any statistically significant differences among companies which are the participants of furniture, boiler-making and automotive clusters. In comparing the clusters nonparametric analysis of Kruskal-Wallis variance was used as a basic statistical technique. The test is more powerful than the tests based on median. It is used in case of many distributions, i.e. in the situation when we study differences between more than two independent measurement groups expressed by order relation [Francuz, Mackiewicz 2006, p. 449]. Kruskal–Wallis test is a development of U Mann–Whitney test for more than two independent samples. Its additional advantage is independence of normal empirical distribution which is required in parametric tests. Therefore, if the analysed populations do not have normal distribution (which in fact is the basic criterion of using Anov procedure), then Kruskal-Wallis test is used.

The procedure of Kruskal-Wallis test is based on the connection of evaluations with k of samples in one big distribution [Mynarski 2000, p. 105]. In this test, first of all there is ordering of all *n = n1 + …+* nk of *Xij* of observations in one increasing sequence. There is order in all the data in the whole set from the lowest to the highest, regardless of the sample. Then, the ranks (their numbers) in this sequence are given to the next observations. Then, the statistics of Kruskal-Wallis test is expressed in the following formula:

$$V_{emp} = \frac{12}{n(n+1)} \sum_{j=1}^{k} \frac{R_j^2}{n_j} - k(n+1) \tag{1}$$

where: k - number of independent samples

R_j - the sum of ranks of *i* – of the sample

n_j - number of *i* – of the sample

n - general number of all samples

If now $V_{emp} > V_{a,k,n1,...,nk,}$ then null hypothesis $H_0 : F_1 = ... = F_k$ (proving identical distribution) can be rejected. In this case we assume alternative hypothesis (with different distribution). Critical values $V_{a,k,n1,...,nk,}$ are presented in the table (Table 3). Shortly speaking we could say that null hypothesis assumes that k of analysed populations has the same distributions and alternative hypothesis says that at least two of these distributions differ from each other.
Within the conducted test there were checked differences in distributions in relation to independent variable “cluster”. The studied feature (dependent variable) were the answers to the question related to the significance of cooperation with particular local businesses from Wielkopolska region for the internationalization of the companies under the research.
The answers on the five-degree scale where 0 -„not important”, 1 - „minimal importance”, 2 – “moderate importance”, 3 – “significant importance”, 4 – “very important” were recoded in such a way that their value was in the middle of the value of the answers category. The lowest value, which was in this case 0, was recoded to 1, (value 1 to 2; value 2 to 3, value 3 to 4 and value 4 to 5). As a result, the 5 –degree was built. Due to the extreme differentiation of the number in particular categories (especially low numbers of companies in clusters: boiler-making and automotive to furniture one) during the analysis of the data there arose a problem connected with heterogeneity of the population, i.e. different influence of the companies from different strata (clusters) on the results. Therefore for different sizes of the strata there were used appropriate weights to obtain unbiased estimators. The answers were considered separately and treated as measurement results.

The formula for weights is expressed by the following formula for weighted average as the average estimator in population [Miszczak 2004]:

$$\overline{X}_w = \sum_i p_i \overline{X}_i = \sum_i p_i \frac{1}{n_i} \sum_j X_{ij} \tag{2}$$

The results presented in table 3 include critical values and significance levels in relation to the areas where there were observed clear differences in answers distribution in the sample

related to the question about the importance of cooperation for the foreign expansion of local company participating in a cluster. If significance level (*p*) equalled 0.05 then the level indicated the differences in particular answers which were given by the respondents from companies constituting three clusters. The largest differences in the values of average empirical distribution can be noted in such areas as:
2 - „sectoral organisations",
5 - „scientific-research institutions",
7 - „marketing-distribution units".

High level of distribution consistency occurs in case of University and other schools (significance level is 0.0858). It exceeds the level of 0.05, and so there is no basis for conclusion that answers distribution in this category differ statistically in a significant way from one another.

Table 3. The importance of cooperation with particular local subjects for the internationalization of companies from the researched clusters. The level of results significance and critical value [differences and similarities in answers of distribution in the group of clusters]

Entity	Kruskal-Wallis test and the level of results significance in differences and similarities (N=56)
1. Competitors	H =12.58332, p =.0019
2. Sector organisations	H =13.63395, p =.0011
3. Suppliers	H =7.600973, p =.0224
4. Clients	H =11.55015, p =.0031
5. Research and development institutions	H =14.09078, p =.0009
6. Agencies dealing with research and analysis of the market	H =12.00729, p =.0025
7. Marketing and distribution units	H =14.63191, p =.0007
8. Local government, other institutions	H =6.404667, p =.0407
9. University, other schools	H =4.910372, p =.0858

Source: Authors' own study based on the surveys

Conclusions

All of the researched companies declared readiness to be a participant in a cluster and they are also aware of their function within a cluster. But as one can conclude on the basis of the results of empirical research, the furniture, automotive and boiler-making clusters in the region of Wielkopolska in Poland are not fully-formed. The firms compete and co-operate but the intensity of co-operation is still on a low level. The enterprises notice the importance of co-operation for their internationalization but do not see a strong link between their participation in a cluster and their foreign expansion. The coopetition phenomenon is not appreciated enough as a factor that could foster internationalization of the firms. The only strategy of internationalization is export. A good prospect may be the diversity in the array of foreign markets.

The reader might be interested in the reasons of such situation. The companies are still not convinced that participating in a cluster can bring real benefits. One must admit that clusters are not the only and the best solution to increase the level of internationalization of firms. However, there are some very encouraging results achieved by some developed economies thanks to the exploitation of the concept of clusters. The key success factor in fostering the cluster development in Poland and in exploiting the concept for the purpose of winning foreign markets is the positive attitude of companies to cooperation with other market players, R&D institutions and local government. In this context, there is a scope for activity at the universities in Poland. Those institutions should promote the culture of business co-operation. It is crucial when Polish companies want to improve their internationalization taking advantage of being a cluster participant.

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