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INNOVATIONS AND USAGE OF NEW TECHNOLOGIES IN POLISH SMALL AND MEDIUM-SIZED ENTERPRISES. RESULTS OF A SAMPLE SURVEY

Abstract. New technologies provide opportunities for competitive advantages. Enterprises which introduce innovations in their activities have more chances for fast development and are less affected by economic slow down. Poland's membership in the European Union gives all enterprises opportunities for financial assistance if they want to implement various kinds of innovations. European funds aimed at promoting innovations are widely used by small and medium-sized enterprises. This financial support helps the whole Polish economy get more competitive.

Two sample surveys based on the random samples of 1300 Polish SMEs, carried out in 2007 and 2009, enabled us to evaluate the degree of innovation and the usage of new technologies in the whole sector. In this paper we present basic results of these two surveys with respect to kinds of activities, and size of the surveyed enterprises. This allows us to indicate groups of enterprises with the highest degree of innovation and identify factors which determine their attitude to innovations.

Key words: innovations, small and medium size enterprises, sample survey

I. INTRODUCTION

Innovations and usage of new technologies in small and medium-sized enterprises is a complex phenomenon. Despite of importance of SMEs in the European Union economies, they often have restricted financial resources for investments in new technologies and employ people with technical skills [Acs, 1996]. On the other hand, because of their flexibility and adaptability, SMEs are important drivers of innovation in each economy. For this reason, many European programs aimed at economic development, special attention paid to the development of innovative policy in small and medium-sized enterprises [Eurostat 2009]. In recent years, many Polish companies have benefited from European Union funds, particularly in the area of new technologies, implementing innovations in business, and developing human resources.

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The aim of this study was to determine the level of innovation's development and to identify factors influencing the propensity of enterprises to invest. The study is based on data obtained from representative surveys – Finance SME 2007 and Finance SME 2009, conducted by Qualifact- Market Research and Consulting Ltd.

Finance SME Research covers a wide range of issues related to finance, investment, human capital and innovation of SMEs. The study is based on a representative sample of SMEs (drawn from the REGON register run by the Central Statistical Office in 2007, and from the Polish Companies Database run by HBI Poland in 2009) and used stratification drawing scheme with systematic sampling. Particular strata were defined by the size of a company, the sector and the region represented. The allocation of the sample was disproportionate with regard to the size of the company (the sample consisted of 44% of micro, 36% small sized and 20% medium sized enterprises). Face to face interviews were conducted using paper printed questionnaire (PAPI). Interview were carried out in February and March 2007 and 2009.

The sample size of 1308 firms in 2007 and 1346 in 2009 means, that the average value of the sampling error of the proportion estimates (depends on the real proportion in the population) is at most 1.4 percentage points. In the analysis of individual domains average size of sampling error is higher, for micro sized enterprises is up to 2.1, for small ones is up to 2.3, and for medium sized enterprises is up to 3.1 . By business sector the largest error is for real estate (9.6) and for hotels and restaurants (8.2), smallest for manufacture (3.3) and trade (2.7). When the criterion is the origin of capital mean error is up to 1.4 for the entirely Polish capital and 5.5 for the firms with foreign capital, according to the criterion of company headquarters from 2.1 for companies from towns with more than 200 thousand population up to 5.9 for firms located in rural areas. When interpreting the results one should consider also a non-sampling error, even if the percentage of non-response rate in 2009 was relatively low for this type of surveys (less than 15%).

II. INFORMATION AND COMMUNICATION TECHNOLOGY IN POLISH SMEs

One of the most important factors affecting economic development in the last two decades was the development of information technology. With widespread use of computers and advent of the Internet, the way of functioning in most companies has changed [Levy, Powell, 2005]. Polish companies, especially SMEs, were lagging behind in terms of computerization as compared to companies from Western Europe. But thanks to the Poland's accession to the European Union and growing access to computer technologies and the Internet, Polish SMEs are bridging the gap between themselves and their counterparts

from the old EU members. For an increasing number of companies is already evident that without the use of new technologies they will not be able to function effectively and gain competitive advantage. Currently, in medium-sized enterprises access to the Internet is already common and in the micro and small enterprises it has grown up in the past two years (see Chart 1). It can be concluded that in terms of access to the Internet, Polish companies has strongly decreased the distance to companies from other European Union countries.

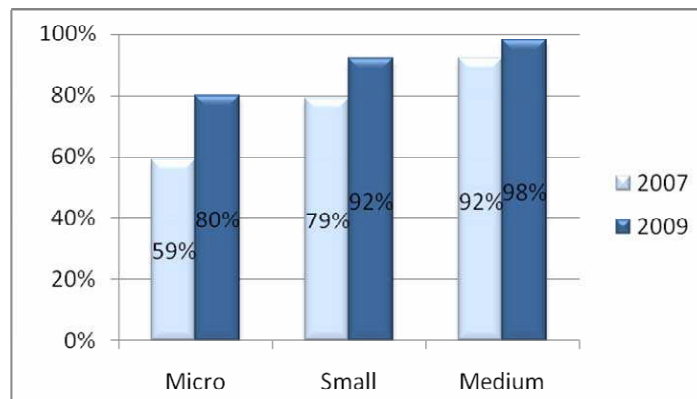


Chart 1. Internet access among Polish SMEs

Despite the prevalence of the Internet, some companies still do not have it, particularly the smallest ones. Differences in access to the network can also be observed with regard to the branch of activity. Most companies use the Internet in the field of financial intermediation, real estate services and education, and the least, on the other hand, in trade and manufacturing industry.

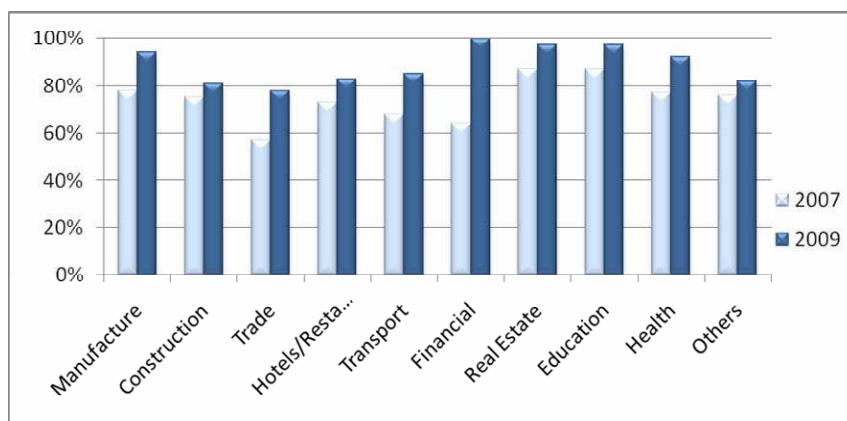


Chart 2. Internet access according to branch of business.

Significant impact on the level of Internet access has the source of capital in the company, and also the size of the administration unit, where its head office is located. Nearly 100% companies with foreign capital use the Internet, and the corresponding proportion for companies with Polish capital reaches 90%. In addition, the company whose head office is located in a rural area, uses Internet even less extensively: only 70% of such enterprises have access to the network, compared with 92% in towns and cities. The biggest increase of this ratio (from 65% to 90%) over the last two years has been recorded in companies located in towns of 50 thousand or more inhabitants.

Access to the Internet is usually only the beginning of the use of a global network in business development [Teo, 2003]. In order to establish itself in the Internet business needs a website, through which current and potential customers, and contractors can find out about the company. Opportunities offered by creation of a website often has a significant influence on the development of the company. Websites are not only business cards with full contact data, but they offer opportunities to gain knowledge about customers' evaluation of the company' offer, placing an order without contacting the employee, paying for the product and after-sales services [Mehrtens, 2001]. A few years ago the main problem of Polish SMEs (especially micro) was the lack of websites. In the last two years, the share of firms without a website has definitely fallen (see Chart 3). Currently, a major problem of SMEs is relatively little possibilities of the websites created, too often they are limited to business cards and too rarely offer more complex processes such as sales and payment via Internet.

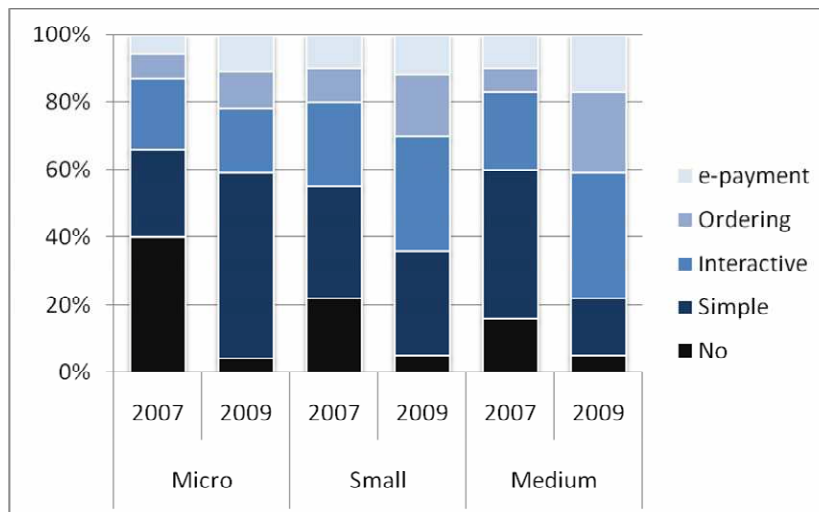


Chart 3. Services performed by the websites of SMEs

Advanced websites in 2009 had only 10% micro, 15% small and 20% of mediums-sized companies. More optimistic is however the decreasing number of companies without a website and a growing share of the more advanced pages. Even among companies that sell via the Internet, the turnover generated by this distribution channel is not crucial for the functioning of the company. In only 5% of the surveyed companies the Internet sales generates a majority of the revenue.

III. FOREIGN ACTIVITIES

Currently, great importance for the development of enterprises have foreign activities by gain an advantage by offering customers products from abroad which are not manufactured in the country, or by offering them cheaper than the competition. Moreover, through exports firms may expand their markets, to acquire additional customers of their products, thus increasing revenues and profits, so the company gets additional capital for growth and investment [Mendo 2005].

Based on previous research in the field of foreign trade it appears that smaller companies have problems with the development of foreign business, especially in exports. Micro-enterprises operate mainly in local markets and rarely direct its offer abroad. But in recent years, it was noted that the innovative firms, even if small, can successfully operate in the global marketplace. With its innovative range are able to gain an advantage over competitors, even outside the country, and by using ICT, especially Internet capabilities, have no problems with obtaining foreign customers.

Size of the company is definitely one of the most important factors affecting the international cooperation (see Chart 4). It is noteworthy that despite the financial crisis, there was more than double the increase of foreign activities in micro-enterprises.

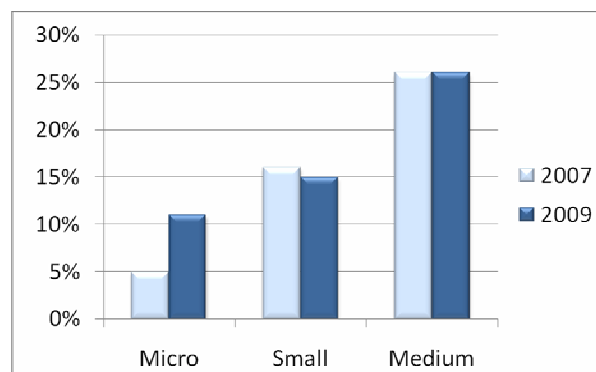
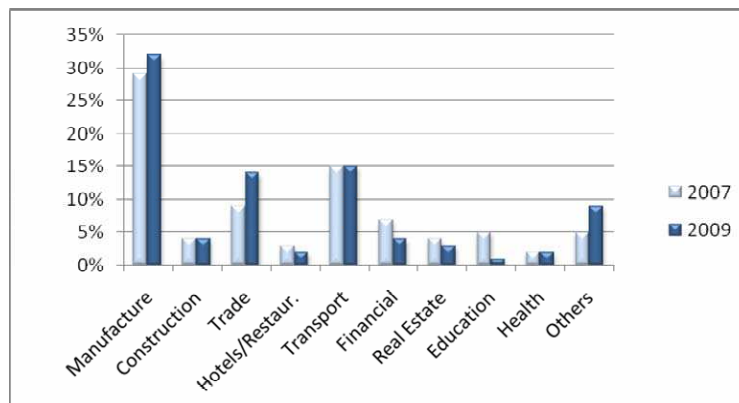


Chart 4. Foreign activities among Polish SMEs

Another important factor in foreign operations is the branch of activity. Most often lead it company with manufacturing, trade and transport, and the least from health, education and hotels and restaurants. In terms of the size of the locality in which the company headquarters is located, we did not find significant differences between enterprises from villages and small towns and large cities, with the exception of companies in Warsaw, which has by far the highest rate of firms operating abroad.

The main branches of the economy driving the export of Polish SMEs are manufacturing industry and transport, the import is notice mostly in the companies of manufacturing and trade (see Chart 5). It should be noted that while in the past two years, more and more enterprises leading export activities that import was a general decline. Due to the crisis, and adverse changes in the course of the main currencies against PLN for importers, many companies no longer import products from abroad. This is confirmed by the macroeconomic data.

Export



Import

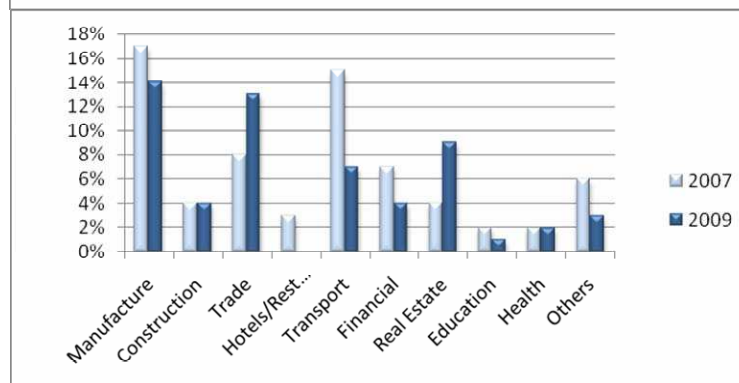


Chart 5. Export and import in SMEs

IV. INNOVATIONS

Significant impact on growth and competitiveness of SMEs is the level of innovation. It is believed that smaller companies can be more competitive with a bigger from each other by the fact that they are more flexible and rapidly adapt to changing economic conditions [Karlsson, 1998].

Based on the findings, it can be concluded that the level of innovation Polish SMEs in 2009 remained generally unchanged compared with 2007 (see Chart 6). In addition, there is a correlation between the introduction of innovation and the size of the company. With an increase in the company size, the level of innovation also increases. Only one in four of micro-firms introduced innovations during the year and among medium-sized companies the figure was over 40%.

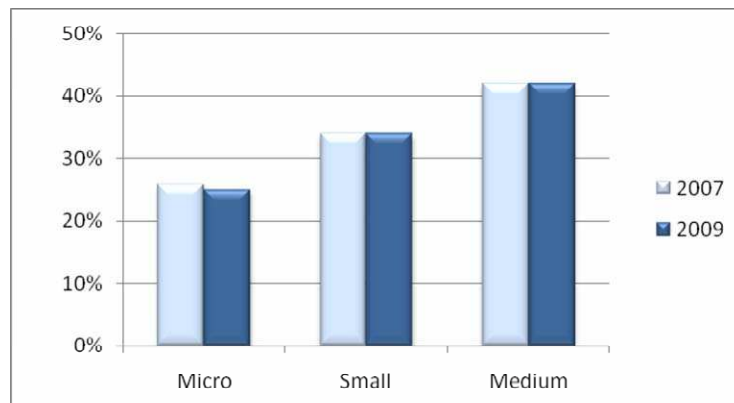


Chart 6. Percentage of SMEs that have introduced innovations in the last year.

Implemented innovations focused on the introduction of new products/services and new ways of customer service. Most new products and services was introduced to the SMEs in manufacturing sector and trade, the least innovative in this respect was the transport sector and real estate (see Chart 7). The percentage of companies implementing this type of innovation, decreased slightly compared to 2007.

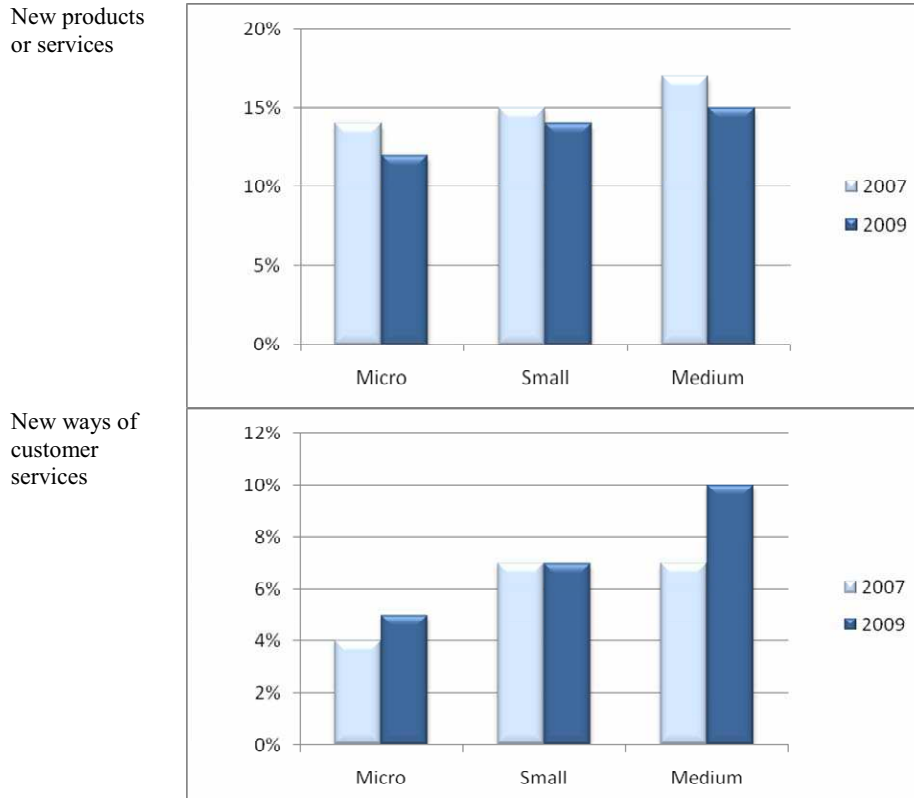


Chart 7. Selected types of innovation made by SMEs

V. RESULTS OF THE CLASSIFICATION OF COMPANIES

In order to determine the variables affecting the innovation, we performed a classification of Polish SMEs into some homogeneous subgroups. For this purpose, group self-organizing neural networks (SOM) [Kohonen 1997] and the method of k-means clustering was used, and the number of groups was based on the Davis-Boulding index [Davis, Boulding 1979].

Among the distinguished six groups, the largest group consisted of the least innovative firms. Mainly the smallest companies, young and mostly with Polish capital belongs to this group. Smaller group was the most innovative companies. In both studies from years 2007 and 2009 it was confirmed that young but solidified on the market companies belonged to that group. These companies were usually small in terms of the level of employment and have their location mostly in small towns.

The third largest concentration consisted of enterprises cooperating with foreign countries. These were mainly medium-sized companies (and larger for small), acting at least several years and established in the larger cities. In addition, this group covers many companies with foreign capital. The remaining isolated clusters were very small and characterized by a rather average values of variables studied.

VI. CONCLUSIONS

SME sector is heterogeneous in terms of innovation level. The least innovative companies are the smallest and youngest, which may cause problems with their survival in the market. Companies which operate longer on the market are significantly more likely to introduce new ideas. The size of the local market and thus competition, significantly affects the innovation of companies. It is noteworthy that there has been significant progress in the computerization of business, which in today's economy is an important element of business competitiveness.

The financial crisis did not affect significantly the innovation policy of companies, but decreased the tendency for introducing new products and technologies and more companies focus on new methods of customer service. It can also be noted that an increase in international activity of firms, especially in exporting goods and services has been confirmed in the study.

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INNOWACYJNOŚĆ I WYKORZYSTANIE NOWYCH TECHNOLOGII W POLSKICH MSP – WYNIKI BADAŃ ANKIETOWYCH

Nowe technologie pozwalają zdobyć przewagę konkurencyjną. Przedsiębiorstwa, które wprowadzają innowacje do swoich produktów lub sposobu funkcjonowania mogą się szybciej rozwijać i są w mniejszym stopniu dotknięte zagrożeniem upadłości w czasie okresie spowolnienia gospodarczego. Od czasu wejścia Polski do Unii Europejskiej firmy mające nowe pomysły na rozwój mogły dofinansować ich realizację dzięki funduszom unijnym. Znaczna część tych środków trafiła do polskich małych i średnich przedsiębiorstw, aby zwiększyć konkurencyjność polskiej gospodarki.

Przeprowadzone w roku 2007 oraz w 2009 badanie ankietowe na grupie losowo wybranych ponad 1300 małych i średnich przedsiębiorstwach w Polsce pozwoliło na ilościową ocenę innowacyjności i wykorzystania nowych technologii. Autorzy przedstawiają wyniki badań z uwzględnieniem podziału na branże działalności oraz wielkość przedsiębiorstwa, dzięki czemu możliwe jest wskazanie grup najbardziej innowacyjnych polskich MSP oraz czynników innowacyjność determinujących.