

**INNOVATIVE POTENTIAL AND ACTIVITY
OF THE SME-SECTOR IN THE PROVINCE
OF WARMIA AND MAZURY**

Kamil Decyk, Katarzyna Chrobocińska

Department of Enterprise Economics
University of Warmia and Mazury in Olsztyn

Key words: innovations, innovativeness, SME-sector.

Abstract

SME-sector enterprises seeking to be more competitive in the domestic and foreign markets should build their competitive advantage on the basis of innovativeness. Analysis and assessment of innovative potential translates into activity (or its absence) in the field of innovation. This is important for determination of business innovativeness and represents a component of business competitiveness. This paper studied the innovativeness of SME-sector enterprises in the region of Warmia and Mazury. The results showed that as many as 62.3% of the surveyed SME-sector enterprises were innovative and that they implemented product innovations the most frequently (31.7% of all innovations). Nevertheless, the majority of innovations were local in nature and the opinions expressed by customers proved to be the most important external source of innovations, while the enterprise owner was the main source of internal innovations.

**POTENCJAŁ I AKTYWNOŚĆ INNOWACYJNA SEKTORA MSP
W WOJEWÓDZTWIE WARMIŃSKO-MAZURSKIM**

Kamil Decyk, Katarzyna Chrobocińska

Katedra Ekonomiki Przedsiębiorstw
Uniwersytet Warmińsko-Mazurski w Olsztynie

Słowa kluczowe: innowacje, innowacyjność, sektor MSP.

Abstract

Przedsiębiorstwa sektora MSP, chcąc być bardziej konkurencyjnymi na krajowym i zagranicznym rynku, powinny budować swoją przewagę na innowacyjności. Analiza i ocena potencjału innowacyjnego, który przekłada się na aktywność (lub jej brak) w zakresie innowacji, jest znacząca do określenia innowacyjności podmiotów gospodarczych oraz jest składową konkurencyjności przedsiębiorstwa. W opracowaniu przedstawiono wyniki badań nad innowacyjnością sektora MSP

w regionie Warmii i Mazur. Wyniki badań wykazały, że aż 62,3% badanych przedsiębiorstw sektora MSP było innowacyjnych i najczęściej wdrażały innowacje produktowe (31,7% wszystkich nowości). Większość innowacji miało jednak charakter lokalny, najważniejszym zewnętrznym źródłem informacji o innowacjach okazały się opinie wyrażane przez klientów, wewnętrznym zaś – właściciel przedsiębiorstwa.

Introduction

The issues of innovation have been, and still are, the key component in considerations related to European Union development. This is evidenced by the communique of March 2010 – *A Strategy for Smart, Sustainable and Inclusive Growth*. It highlights that a knowledge- and innovation-based economy is one of its key priorities. In analysing the strategy of economic development of Poland until 2012, it can be concluded that the current sources of competitiveness advantages including, among others, the relatively low labour costs and availability of cheap raw materials, will be nearing exhaustion. Consequently, the search for new sources of competitive advantage (e.g. innovations) is recommended because, as indicated by the experience of highly developed countries, only those factors can guarantee sustainable economic growth.

Innovation, as one of the pillars for building a competitive advantage, represents a fundamental factor of business success in a free-market economy environment. This is highlighted by BACHNIK (2006, p. 33), who claims that, together with globalisation, internationalisation and the opportunities of expansion into foreign markets as well as increasing pressure from competitors, the innovativeness of a company becomes a source of its competitive advantage. Within the framework of fierce competition, innovation becomes necessary to achieve market success. BACHNIK (2006, p. 33) agrees with that and points out that only innovative activity conducted systematically may secure a lasting competitive advantage. SIEROTOWICZ (2007, pp. 78–89) also supports this thesis and notes that technological progress and development in science and knowledge result in the increasing complexity of products and current innovations. This is possible only when a company conducts innovative activities with a scientific (research), technical, administrative, financial, trade and commercial nature (*The OECD Bologna Ministerial Conference... 2001*). The innovativeness of a business is defined as the skill of implementing new ideas and research results in practice, intended to lead to the improved competitive position of the company (*Innowacje w firmie... 2012*). The above considerations have inspired empirical studies concerning the innovativeness of small and medium enterprises (SME) functioning within the province of Warmia and Mazury aimed at assessment of the innovative potential and activity of the SME-sector.

Methodology of studies

This paper presents a comparative analysis of own studies with those obtained by JUCHNIEWICZ et al. (2009) and PLAWGO and KORNECKI (2010) concerning the SME-sector innovativeness in Warmia and Mazury compared to the rest of the country. This allowed an analysis to be made of the cause-and-effect relations involved and to determine the influence of the different factors studied.

Own studies were conducted in 2009 encompassing 124 SME-sector enterprises in Warmia and Mazury within the framework of the project "*The role of women in innovative enterprises based on the example of entities from Warmia and Mazury*"¹. The entities for the survey were identified during a stratified draw (where the individual strata represented sub-regions of Warmia and Mazury, i.e. Olsztyn, Elbląg and Elk sub-regions), and the next 400 entities were drawn at random from each sub-region. Responses were obtained from 163 entities, of which 76% could be classified as innovative entities functioning in the SME-sector.

For this study, the individual categories of entities were identified using the definitions supplied by PKPP Lewiatan (STARCZEWSKA-KRZYSZTOSZEK 2006, p. 5). The criterion of employment was assumed for classification of participants into one of two groups, which indicated that small enterprises represented the majority of the population surveyed (68%), while the remaining participants were entities with employment of 50–249 persons. An innovative enterprise was defined as an enterprise that implemented at least one product, process, marketing or organisational innovation during the years 2006–2008 (*Zasady gromadzenia i interpretacji...* 2008, p. 19). It should also be noted that, as a consequence of the small survey population, the data collected is insufficient and may not form the basis for formulation of general conclusions, although it can be a certain point of reference for more studies of this issue.

Innovative potential of the SME-sector

Meeting the challenges of contemporary economic processes requires businesses to increase activities to enhance their ability to compete. This can only be achieved through the innovative potential available to those entities. Spending on innovative activities represents one group of innovative potential indicators. They define the capacity for creating and commercialisation of new

¹ The project was implemented by the Warmia and Mazury Agency for Regional Development S.A. in Olsztyn within the frameworks of the Integrated Regional Development Operational Programme 2004–2006, (Priority II – Strengthening the development of human capital in the region, Measure 6: Regional Innovation Strategies and knowledge transfer).

ideas and, as a consequence, reflect the ability of the businesses to innovate. Both positive and negative symptoms can be noted (Tab. 1) in analysing the dynamics of spending on innovative activities of SME-sector enterprises in Warmia and Mazury.

Table 1
Level and dynamics of spending on innovative activities during the years 2004–2008

Item	Poland		Warmia and Mazury		Dynamics (2004 = 100%)	
	2004	2008	2004	2008	Poland	Warmia and Mazury
Spending on innovative activities						
Total (PLN million)	15,628.10	25 367.00	210.20	325.40	162.80	154.80
As % of the GDP	1.69	1.99	0.78	0.92	117.50	117.31
Per 1 enterprise conducting innovative activities (in PLN thousand)	4,928.70	4,614.7	1,625.70	1,848.80	93.63	113.72

Source: own work based on the data of the BDL and *Powierzchnia i ludność...* 2005, table 02; *Powierzchnia i ludność w...* 2008, p. 19; *Produkt krajowy brutto...* 2006, p. 48; *Produkt krajowy brutto...* 2010, p. 58; *Nauka i...* 2005, p. 81; *Nauka i...* 2010, p. 171.

The total value of spending on innovative activities by SME-sector enterprises increased in 2008 by over half (55 p.p.) as compared to 2004, while in Poland the increase was slightly higher at 63 p.p. On the other hand, for spending on innovative activities in relation to GDP, the rate of change in Poland was similar (the national level was 117.5% while for the province of Warmia and Mazury it was 117.3%). It should be added that JUCHNIEWICZ et al. (2009, p. 74), found a directly proportional correlation between the GDP level and spending on innovative activities. Increased GDP was correlated with higher spending on innovation for enterprises from a given province. The increasing trend in spending on innovation by innovative enterprises should be considered to be a positive phenomenon. In Warmia and Mazury, firms allocated almost 14 p.p. more spending for innovation in 2008 than in 2004. In Poland, an opposite trend was observed – the level of spending decreased by almost 6 p.p. The domination of low-tech industries in the region (70% of total spending on innovation) could be the reason for the low expenditures on innovation activities in Warmia and Mazury. This directly influences the clearly lower level of innovativeness in the businesses from Warmia and Mazury (JUCHNIEWICZ et al. 2009, p. 77).

The sources of financing of innovative activities (similar to expenditures) indicates that innovative capacity is an important determinant of innovative activities. Nationally, and in Warmia and Mazury, the clear domination of own

funds can be noticed. In 2009, entrepreneurs in Poland and in the SME-sector indicated the use of own funds in 68.4% and 81.2% of responses while in 2007 in the region they represented 81.9% of such funds (Tab. 2, the data for 2009 for the province of Warmia and Mazury are not available due to confidentiality requirements).

Table 2
Structure of spending on innovative activities according to the source of funding

Item	2009		2007*
	Poland (total)	SME	Warmia and Mazury
	[%]		
Own funds	68.4	81.2	81.9
Bank loans	25.7	16.1	15.6
Funds obtained from abroad	3.2	2.1	1.2
Budget funds	1.1	0.2	1.2

Source: own work based on *Nauka i technika...* 2009, *Nauka i technika...* 2011.

* for 2009 the data for the province is not available as a consequence of maintaining statistical confidentiality according to the Act on Public Statistics.

Additionally, in 2009, Polish entrepreneurs were quite willing to contract bank loans for innovative activities (25.7%). The situation was slightly different for the SME-sector where only 16.1% of the respondents employed own funding for innovation. Bank loans enjoyed similar popularity in Warmia and Mazury (15.6%). The share of funds obtained from abroad and the national government contributed to the development of innovation in the SME-sector in the country and in the province only slightly.

The sources of inspiration both within an enterprise and from its environment represent another factor initiating innovative activities. Opinions expressed by the clients proved to be the most important external source of inspiration for innovative activities in the surveyed units from the SME-sector (4.13 points), while the business owner was the main internal source of such inspiration (3.95 points – Tab. 3). The results of own studies were highly consistent with those obtained by PLAWGO and KORNECKI (2010, p. 123), where client opinions scored 6.73 points on a ten-point scale. This is also confirmed by the results of studies conducted by JUCHNIEWICZ and GRZYBOWSKA (2010, p. 118) of the innovativeness of micro-enterprises, which found that owners and clients were the most important sources of information used in innovative activities.

Table 3

Sources of information on innovation in SME-sector enterprises

Item	Source type	SME-sector	
		Own survey 2009	Survey by PLAWGO and KORNECKI 2010
Internal	owner	3.95	bd
	ideas from the research and development unit employees	3.78	bd
	company management	3.71	bd
	ideas of other enterprise employees	3.22	5.74
External	opinions from clients	4.13	6.73
	cooperation with other enterprises	3.23	5.58
	cooperation with research and development units	2.84	bd
	copying of competitor solutions	2.45	bd

Source: own work based on own surveys and those by; PLAWGO, KORNECKI (2010, p. 123).

* The evaluation was conducted using a 1–5 scale where 1 was a source without importance and 5 was the most important source. bd means no data available. The data represent the arithmetic averages of the ratings.

Ideas of the R&D-unit employees were the second-most important source of inspiration for innovative activities (3.78) while the company management scored lower (3.71). It is worth adding that our own studies found cooperation with other market entities was the second-most important external source of innovation ideas (3.23). Similar results were obtained by PLAWGO and KORNECKI (2010). In their studies, the above factor scored 5.58. The respondents did not highly assess cooperation with R&D units (2.84) or the solutions employed by competitors (2.45).

Innovative activity of the SME-sector

Innovative activity is correlated with the ability of an enterprise to implement innovative products and solutions. MIZGAJSKA and WŚCIUBIAK (2005, p. 4) consider the set of activities inside and outside the enterprise aimed at producing or obtaining innovation, i.e. new products, processes, markets and organisational methods, as representing innovative activities.

In Poland, the SME-sector innovation level is relatively low; innovative activity has been, and still is, at a low level. According to the subject literature (ŚWIADEK 2005, p. 34), the major inhibitions include, among others, economic risk, loan interest rates, investment costs, lack of qualified personnel, legal

regulations and lack of reaction to new products by clients. Identification of these factors allows a systemic, logical and well-considered understanding the mechanisms inhibiting innovation and steps to be taken to minimise their influence. This was visible in the higher innovative activity among the medium enterprises. In 2009, the data on innovation in the SME-sector in Warmia and Mazury and in Poland showed that only 10.9% of the small businesses in the region and 12.5% of small Polish enterprises implemented innovations (Tab. 4). Our own studies showed that more than half of small businesses (55.3%) took an active part in innovative activities.

Table 4
Structure of the SME-sector enterprises implementing innovations in 2009 by type

Item		Innovative enterprises		New or significantly improved products		New or significantly improved processes	
		small	medium	small	medium	small	medium
		[%]					
BDL 2010	Warmia and Mazury	10.9	26.5	7.2	21.9	7.9	22.7
	Poland	12.5	30.1	8.7	18.8	9.5	20.1
Own studies	Warmia and Mazury	55.3	77.3	28.3	36.1	19.6	33.3
	Poland	62.3		31.7		25.6	

Source: own work based on: own studies, CSO, Local Data Bank (no data on organisational and marketing innovations), Warsaw 2010.

Despite the relatively low share of innovative businesses in the total number of entities, this situation compares favourably against the average data for Poland (10.9%, 6th place among all provinces). For the implementation of new or significantly improved products, small enterprises also compared favourably at 8.7% (the province was ranked 5th in the country) compared to the national average of 7.2%. A similar ranking of the province compared to the rest of the country was observed for process innovations.

Unfortunately, in 2009 the share of medium enterprises from Warmia and Mazury looked much worse compared to the country as a whole. The share of innovative enterprises employing from 50 to 249 people in the total number of businesses was 26.5% (last place in Poland) while the national average was 30.1% for such entities.

For process and product innovation implementation by medium enterprises, the region of Warmia and Mazury compared to Poland looked even worse (14th place among all provinces). Medium enterprises implementing new or significantly improved products represented only 18.8% of the innovative enterprises of this type (3.1 p.p. less than the national average). Process innovations were only implemented by every fifth medium-sized business in the province (20.14% – 2.6 p.p. less than the national average).

Comparing the data from the Local Data Bank (BDL) with own studies, it can be seen that both product and process innovations were the domain of the medium-sized enterprises. As many as 77.3% of medium enterprises were innovative. Those partial shares of innovative enterprises influence the results of the SME-sector as a whole. As indicated by the conducted studies, the majority (62.3%) of small- and medium-sized businesses from Warmia and Mazury were involved in innovation implementation, but only every third enterprise (31.7%) implemented a new or improved product. This can be explained by the specificity of the region. According to the CSO data, 75% of enterprises registered in Warmia and Mazury in 2010 were services. It can be assumed that the entities surveyed focused on the implementation of new or improved services. The domination of product innovations in the total number of novelties might occur as a consequence of the fact that, compared to other innovations, they are characterised by a relatively low complexity of implementation. They do not require (as is the case with some administrative innovations) changes at all levels of management. The resistance to change – a frequently mentioned factor inhibiting innovativeness – is of low importance in the case of product innovations.

Process innovations were less-frequently implemented in the SME-sector (25.6%). It should be added that product and process innovations are complementary because not every product or service can be produced using existing machinery or employing an obsolete production line.

According to the subject literature (*Zasady gromadzenia i interpretacji...* 2008, pp. 60–61), a new or improved product or marketing solution, although known only in the domestic or local market, can also be considered an innovation. For this reason, innovations were also grouped at the so-called novelty level for this empirical study. The results of studies by ZIĘBA and OSTER (2011) on predictions concerning the scope of innovation, indicated that among the entrepreneurs from the SME-sector there is high belief in the implementation of innovations that will be novelties only within the enterprise (50%). At the same time, every fourth entrepreneur believed that, in the future, the implemented innovations would be novelties on a local scale, while roughly every fifth entrepreneur would implement the novelty on a national scale. The above-presented studies, however, did not fully correspond with our own studies.

Our own studies found that the largest proportion of enterprises had implemented a local-scale (county) innovation (39.1%) and those were small businesses (Tab. 5). Fewer small enterprises implemented innovations that were novelties for themselves only (29.8%), while every fifth enterprise was involved in an activity that was innovative on the regional scale (22.6%). The results presented are similar to those for the entire SME-sector.

Table 5
Novelty scale of different innovation types implemented by the SME-sector in the province of Warmia and Mazury

Item	Novelty in					
	company scale only	local scale (county)	regional scale (province)	national scale	European scale	global scale
	[%]					
Enterprises small	29.8	39.3	22.6	6.0	1.2	1.2
Enterprises medium	15.2	20.3	29.1	24.1	7.6	3.8
SME-sector	22.7	30.1	25.8	14.7	4.3	2.5

Source: own work based on studies.

Medium-sized enterprises were involved mainly in activities innovative on the regional (29.1%) and national (24.1%) scales while to a lesser extent on the county scale (20.3%). Significantly fewer entities implemented innovative projects that were novelties just on a company-scale (15.2%). A small percentage of the SME-sector companies were implementing European- or global-scale innovations. This can be explained by the fact that creating a national scale innovation requires major expenditures on research and development that the SME-sector enterprises are unwilling to cover (only 10% of the total amount of the declared funds for innovations) (ZIEBA, OSTER 2011).

The results showed that the innovative activities of small entities were focused mainly on local and, less frequently, on regional markets. This is confirmed by the number of novelties introduced to the market in all types of innovations (from 45% of product innovations and 44.4% of administrative innovations, through 36.8% of marketing innovations to 33.3% of process innovations – Tab. 6). It was noted that only in the case of marketing innovations did small enterprises implement a similar number of innovations on a local (33.3%) and regional (29.6%) scale.

For medium enterprises, the level of novelty of innovations implemented was local, regional and sometimes national in character. Medium-sized entities implemented the largest proportion of administrative innovations (47.1%) at the province scale and product innovations at the county and national scale (31%) and on the regional scale (24%) as well as national-scale process innovations (31%) and on a regional scale (24.1%). The marketing innovations were the fewest and they were mainly county or regional scale novelties (26.7%).

Innovative activity is nowadays a must for the business competitiveness and those that implement such activities achieve quantifiable returns in the form of higher net revenues from products sold than competitors. According to

Table 6

Novelty scale of different innovation types implemented by the SME-sector

Item	Novelty in					
	company scale only	local scale (county)	regional scale (province)	national scale	European scale	global scale
[%]						
Product innovations, including:						
Enterprises small	25.0	45.0	30.0	0.0	0.0	0.0
Enterprises medium	6.9	31.0	24.1	31.0	3.4	3.4
Process innovations, including:						
Enterprises small	31.6	36.8	15.8	10.5	5.3	0.0
Enterprises medium	6.9	17.2	24.1	31.0	13.8	6.9
Organisational innovations, including:						
Enterprises small	38.9	44.4	11.1	5.6	0.0	0.0
Enterprises medium	29.4	23.5	47.1	0.0	0.0	0.0
Marketing innovations, including:						
Enterprises small	25.9	33.3	29.6	7.4	0.0	3.7
Enterprises medium	13.3	26.7	26.7	20.0	6.7	6.7

Source: own work based on the studies.

the Oslo methodology (*Zasady gromadzenia i interpretacji...* 2008, p. 49) product innovation occurs when a new or improved product is introduced to the market. The share of new and modernised products in the total production sold or sales of innovative products that were introduced to the market reflects the implementation capacity of the enterprises.

A comparative analysis of net revenues from sales of new products and processes by medium-sized enterprises from Warmia and Mazury and the remaining provinces of Poland showed that the situation was the best in the province of Małopolskie (14.7%) (Fig. 1).

The share of revenues from innovations in total net revenues from the sales of enterprises employing 50–249 people located in Warmia and Mazury was 2.8% in 2009, which ranked them sixth. On the other hand, this value was lower than the national average (3.9%). The position of Warmia and Mazury was much better for small enterprises. The share of revenues from the sales of innovations in total revenues was 7.4% in Warmia and Mazury, which ranked it third in the country after Opolskie (10.3%) and Podkarpackie (8%), although this share was 1.4 p.p. higher than the national average.

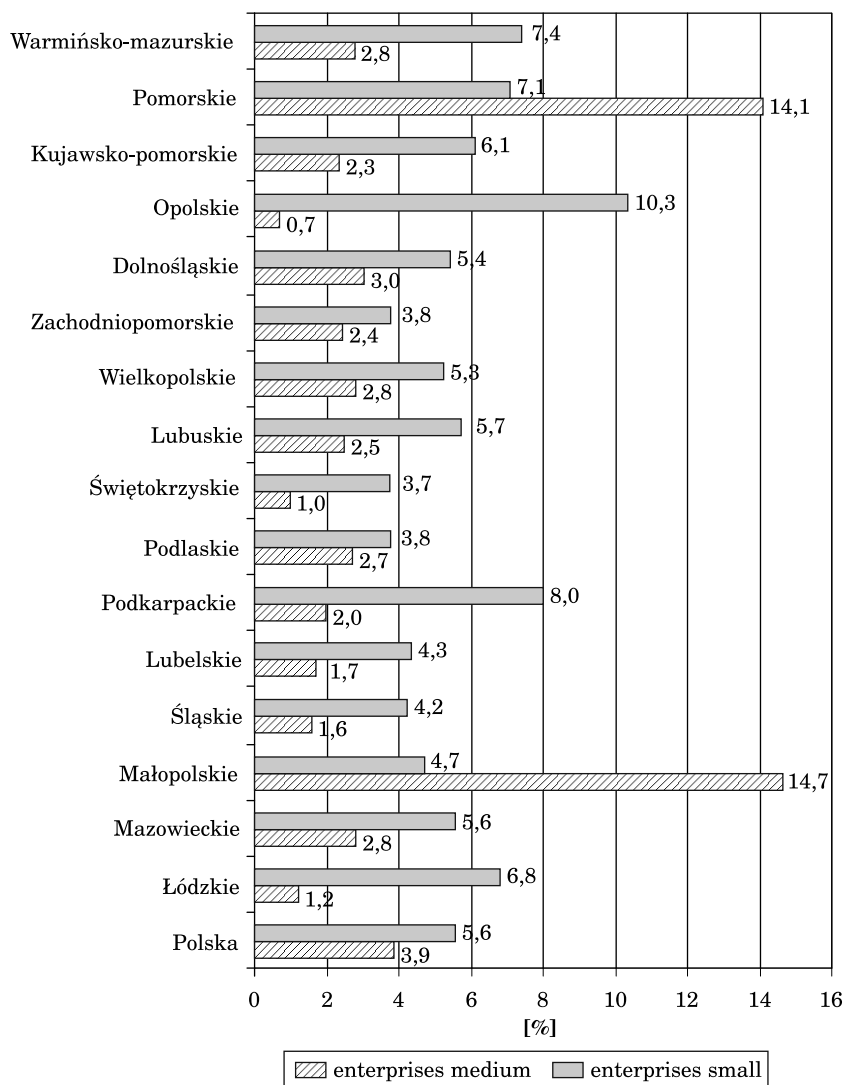


Fig. 1. Share of net revenues from sales of innovative products in the net revenues from total sales in the SME-sector in 2009

Source: own work based on the CSO, Local Data Bank, Warsaw 2010.

Conclusion

The development trends of highly-developed countries show that sustainable development can be guaranteed only by building a competitive advantage based on knowledge and innovation. The dynamic changes in an economy

resulting from technological progress cause the implementation of both local and global scale innovations to become a necessity. Such changes are possible when the enterprise possesses the capacity, which is expressed in the level spending on innovative activities. In the case of both Poland and the province of Warmia and Mazury, positive trends of systematic increases in spending on innovative activities has been observed in the SME-sector. Unfortunately, the domination of low technology sectors in the region has a direct influence on a clearly lower level of innovativeness in the entities from Warmia and Mazury.

Innovative capacity is expressed in the capacity for funding. In the surveyed population, following the national trends, own funds represented the most important funding source for implementation of innovative activities. This was probably why the respondents from the SME-sector in Warmia and Mazury considered themselves innovative in the majority of cases (62.3%). The remaining respondents declared that innovative solutions had already been implemented and that there was no need to re-implement innovative activities. It is worth adding that, considering the enterprise size, there were more innovative entities among the medium enterprises (77.3%).

The situation of enterprises in Warmia and Mazury was relatively favourable for innovative activities. Through implementation of product innovations (31.7%), entrepreneurs could react to changes taking place in the market and adjust to the requirements of consumers as well as create new needs among the consumers. The data showed that the enterprise size had a significant influence on the level of novelty, which is evidenced by the fact that small entities were interested in local- and regional-scale innovation implementation. Medium-sized entrepreneurs had higher aspirations because the innovations they implemented were mainly of a national character.

It should be emphasised that the low innovative capacity of the surveyed enterprises from Warmia and Mazury resulting from the structure of the economy was not reflected in low innovative activity. Opinions expressed by clients and the enterprise owner were the most important sources of inspiration for innovative activities. It should be added that the results of own studies are highly consistent with the results obtained by other authors.

Translated by JERZY GOZDEK

Accepted for print 27.04.2012

References

- BACHNIK K. 2006. *Innowacyjność a mikro i małe przedsiębiorstwa*. In: *Uwarunkowania rynkowe rozwoju mikro i małych przedsiębiorstw*. Ed. A. Bielawska, Zeszyty Naukowe Uniwersytetu Szczecińskiego, 427. Ekonomiczne problemy usług, 2: 33.
- Bank Danych Lokalnych*. 2010. GUS, Warszawa.

- Innowacje w firmie*. Winnova. Wielkopolska dla innowacji. <http://www.winnova.pl/pl/Page.aspx?SP=131> (access of 21.03.2012).
- JUCHNIEWICZ M., CHROBOCIŃSKA K., DECYK K. 2000. *Rola kobiet w innowacyjnych przedsiębiorstwach na przykładzie podmiotów z regionu Warmii i Mazur*. Fundacja Wspierania i Promocji Przedsiębiorczości na Warmii i Mazurach, Olsztyn, pp. 74–77: 118.
- KOWALEWSKI K. 2006. *Działalność innowacyjna polskich przedsiębiorstw przemysłowych w latach 1998–2004*. In: *Zarządzanie innowacjami. Teoria i praktyka*. Ed. J. Szablowski. WSFiZ, Białystok, pp. 295–309.
- MIZGAJSKA H., WŚCIBIUK Ł. 2005. *Czynniki wpływające na aktywność innowacyjną zaawansowanych technologicznie firm produkcyjnych sektora MSP w Polsce*. Wyd. Uniwersytetu Ekonomicznego, Poznań, p. 4.
- Nauka i technika w 2004 r.* 2005. GUS, Warszawa, p. 81.
- Nauka i technika w 2008 roku. Informacje i opracowania statystyczne*. 2009. GUS, Warszawa.
- Nauka i technika w Polsce 2008 r.* GUS, 2010. Warszawa, p. 171.
- Nauka i technika w Polsce w 2009 r.* GUS, 2011. Warszawa, p. 171.
- OECD Bologna Ministerial Conference*. 2001. Enhancing SME Competitiveness, Organization for Economic Co-Operation and Development, France, p. 14.
- PLAWGO B., KORNECKI J. 2011. *Wykształcenie pracowników a pozycja konkurencyjna przedsiębiorstw*. PARP, Warszawa, p. 123.
- Powierzchnia i ludność w przekroju terytorialnym w 2004 r.* GUS, (on line) <http://www.stat.gov.pl/gus/5840-1869-PLK-HTML.htm>.
- Powierzchnia i ludność w przekroju terytorialnym w 2008 r.* 2008. GUS, Warszawa, p. 19.
- Produkt krajowy brutto. Rachunki regionalne w 2004 r.* 2006. GUS, Katowice, p. 48.
- Produkt krajowy brutto. Rachunki regionalne w 2008 r.* 2010. GUS, Katowice, p. 58.
- SIEROTOWICZ T. 2007. *Kultura dzielenia się wiedzą w innowacyjnej organizacji*. In: *Działania ekonomiczne podmiotów rynkowych – materiały konferencyjne*. Ed. D. Kopycińska. Wyd. Katedra Mikroekonomii Uniwersytetu Szczecińskiego, Szczecin, pp. 78–89.
- STARCZEWSKA-KRZYSZTOSEK M. 2006. *Konkurencyjność małych i średnich przedsiębiorstw 2006. Raport z badań*. PKPP Lewiatan, p. 5.
- ŚWIADEK A. 2005. *Determinanty ograniczające działalność innowacyjną Pomorza Zachodniego – analiza korelacyjna*. In: *Innowacje, ryzyko, zarządzanie wiedzą, strategie przedsiębiorstw*. Ed. W. Janasz. Zeszyty Naukowe Uniwersytetu Szczecińskiego, 397. Prace Instytutu Ekonomiki i Organizacji Przedsiębiorstw, 42: 34.
- Zasady gromadzenia i interpretacji danych dotyczących innowacji. Pomiar działalności naukowej i technicznej*. OECD, 2008, Eurostat, Paryż, pp. 49, 60–61.
- ZIĘBA M., OSTER P. 2011. *Innowacyjność w małych i średnich przedsiębiorstwach*. E-mentor, 3(40). SGH, Warszawa, (on-line) <http://www.e-mentor.edu.pl/artukul/index/numer/40/id/839>.

