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THE CHANGES IN THE INNOVATION ACTIVITY OF SMALL AND MEDIUM-SIZED ENTERPRISES IN WIELKOPOLSKA REGION IN THE YEARS 1992–2004

1. Introduction

Collecting statistical data relevant to monitoring of innovation processes in Poland is coordinated by the Central Statistical Office (CSO). At the moment the CSO is carrying out two kinds of research into innovativeness of enterprises: the first has the form of a shortened annual examination concerning units employing over 49 persons; the other is an extended cyclical examination concerning various aspects of innovation activity. The examination includes also smaller subjects, employing from 10 to 50 workers. The latest extended examination concerned the years 1998–2000. Unfortunately, there is a lack of research that would deal with innovativeness of all types of companies of the small and medium-sized enterprises (SME) sector, including the most numerous, here, firms employing up to 9 persons. As regards the scale of the whole country, such companies make up 94% of all firms. Therefore, it is worth showing how the innovation activity of the whole SME sector looks like, using the Region of Wielkopolska (Great Poland) as an example. In order to do so, it will be advisable to make use of a method that is convergent with those discussed in a series of OECD and Eurostat manuals.

The aim of the present work is to find an answer to the question whether the innovation activity of small and medium-sized companies of Wielkopolska Region changed in the years 1992–2004, and also what factors were limiting the transformation in the examined period. Diagnosing the changes has permitted to present conclusions and recommendations for the future. For the needs of the present work, results of a questionnaire-based survey conducted in 164 small and medium-sized enterprises based in Wielkopolska Region in 2005 were used. The questionnaire form included questions related to the innova-

tion activity, among others, innovations introduced in the firm in the years 2001–2004. The obtained results of the research were compared to the ones of the own research project concerning innovation activity of SME in Wielkopolska Region in the years 1992–2004 [Mizgajska 1997; 1999; 2002; 2004].

2. The research method and characteristics of the examined enterprises

It was assumed, taking into account the specific nature of small and medium-sized business, that innovation activity of SME includes the activity inside and outside the company, and its goal and effect is introduction of new and improved products, processes and organizations, as well as winning new markets. The source of innovation in a small and medium-sized enterprise is its own invention-oriented activity and absorption of new technologies from outer sources. The innovation activity is thus a dynamic notion, which refers to activities of an economic subject [Mizgajska, 2002]. In the research under consideration, the innovation activity was measured by means of the number of implemented new technologies, new products, new services, and new technical solutions in the forms of patents, licenses, trade marks and own technology-improving ideas in the years 2001–2004. In compliance with the principle accepted by Community Innovation Survey in research into innovation activity in industrial enterprises, the collected data concern goods and products that are new to the company.

The research of 2005 covered 163 companies, including 34 firms employing up to 9 workers, 84 firms – 10–49 persons, and 45 ones – between 50 and 249 workforce. Among the examined enterprises, 52% were production firms, 16% – firms providing services, 26.4% – production-services companies and 5.5% – trading firms. The majority of them had been established before the time of the socioeconomic transformation, the average length of time of functioning of

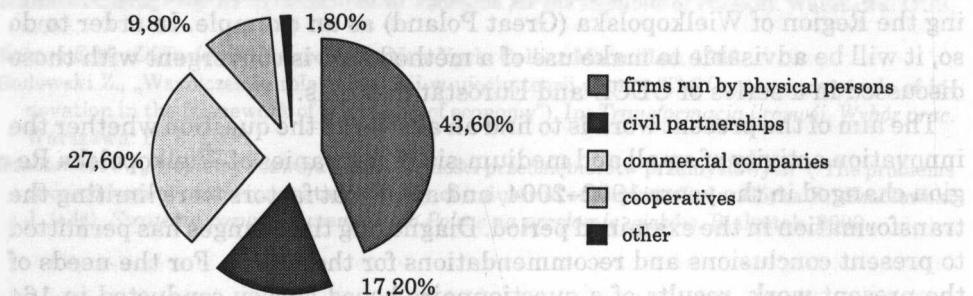


Fig. 1. Legal status of the examined enterprises

Source: author's own elaboration

a company being 15 years, which means that a considerable part of the examined enterprises started their activity in the reality of socialist economy.

The examined companies represent the private sector, most of them functioning in the form of firms run by physical persons; on the second place are companies which were established as a result of privatization, and also a small number of cooperative companies. The ownership structure of the selected firms does not differ from that of production companies in the country.

Out of the examined enterprises, the largest number are those dealing in the branches of food articles (39.56%), woodwork for construction industry (11.7%), furniture manufacture (9.3%), machine manufacture and automation industry (8.6%), as well as clothes manufacture (6.2%). They represent these directions of activity, in which SME play a leading role in the country [Rogut, 2002]. These are traditional sectors of the economy, in which competitive advantage is based on low costs of labor. The average owner or manager of an examined enterprise is a man (84.6%) at the age of about 46 years, with secondary education (84%), spending around 5 days a year attending training courses.

3. The innovation activity of the examined enterprises

The examined companies were divided according to the number of implemented new technologies, new products and new services into those which did not introduce any innovations, introduced 1–3 innovations, 4–10 innovations and over 10 innovations. Such a division was applied in order to compare the results of the research of 2001–2004 with those of the research into innovation activity of firms, which the author conducted in 347 enterprises based in Wielkopolska Region in the years 1994–1997, as well as in the years 1997–2000, in 119 companies, accordingly [Mizgajska, 2002; 2004].

Table 1. Changes in the innovation activity of firms in the years 1994–2004

Years	Enterprises							
	With no innovation		1–3 innovations		4–10 innovations		Over 10	
	Number of firms	%	Number of firms	%	Number of firms	%	Number of firms	%
1994–1997	48	14	132	38	152	44	14	4
1996–2000	4	3	48	40	62	52	5	4
1998–2001	3	3	36	34	61	58	6	6
2001–2004	19	12	49	30	85	52	10	6

Source: author's own research [Mizgajska 2002; 2004]

It follows from the numerical data contained in Table 1 that the innovation activity of SME in Wielkopolska Region in the years 1994–2004 nearly did not change. The percentage of highly-innovating enterprises which implemented from 4 to 10 innovations grew only to a minimal extent. In each of the examined periods the companies of the Region implemented more of new products than new technologies and new services. The dominance of product-related innovations in the 1990s was the consequence of having at disposal obsolete machinery and suffering from a lack of capital, whereas nowadays – it is connected, first of all, with shortages of financial means. The rise in the number of new products results from firms' strategies, as they are looking for market novelties in the form of products and services that are new to firms. They also want to improve the quality of pattern-designing, coloring and packages, which secures their advantage in the market or defends their position in it. It follows from the conducted research that the firms undertook innovation activity, primarily, with the aim to enrich market offer, strengthen or maintain the position in the market, as well as to search for new sales markets.

Among the examined companies, the most innovating ones included the construction branch and machinery and automation. Here, the measure of innovativeness was the number of new technologies, the number of new products, new services per a company. They were firms employing 70–100 workforce and characterized by a well-educated managerial personnel (about 70% executives in both branches possessed higher education). As regards the construction branch there dominated new firms, established after 1989, the majority of which had the form of companies. The average age of machines in those firms amounted to three years. In turn, the firms belonging to the branch of machinery included ones of the longest activity in the market, that is established before 1989. They could "shrink" due to the process of privatization, yet managed to maintain their own R&D departments. The average age of the machinery connected with the main production lines, as found in those companies, amounted to three years. Enterprises qualified as the machinery branch, but representing automation plants, had been active on the market for a shorter period of time. Despite the highly-qualified executive personnel in those firms, each manager devoted, on the average, 18 days a year to participate in trainings related to the problem of management.

The branches of clothes manufacture and furniture manufacture proved the least innovative. Enterprises belonging to the branches employed 40–60 personnel and the majority of the managerial staff consisted of persons with secondary education (70%). Those were mainly crafts services-production plants established before 1989. The life of the machinery connected with the main production lines amounted to six years on the average.

Table 2. Type of branch and the innovation activity of the examined firms

Type of branch	No. of firms	Kind of innovations introduced in the years 2001–2004					
		new technologies		new products		new services	
		No. of new technologies	No. of new technologies per 1 firm	No. of new products	No. of new products per 1 firm	No. of new services	No. of new services per 1 firm
Food products industry	64	54	0.84	199	3.11	61	0.95
Construction industry	11	16	1.45	26	2.36	31	2.82
Woodwork for construction industry	19	25	1.32	37	1.95	13	0.68
Furniture manufacture	15	13	0.89	23	1.53	15	1.00
Machinery and automation	14	23	1.64	31	2.21	17	1.21
Clothes manufacture	10	12	1.2	12	1.20	2	0.20
Motor industry	11	10	0.91	22	2.00	20	1.82
Other*	18	24	1.33	30	1.67	31	1.72

* The branch: "other", includes: photographic services, communal services, printing services, packages manufacture, production of advertisements, manufacture of purses and bags, services in the field of environmental protection

Source: author's own research

Table 3. Non-material resources in the examined enterprises in the years 1992–2004, own and foreign

Specification	Average number of solutions per 1 firm		
	1992–1995	1996–2000	2001–2004
Patents	0.01	0.02	0.24
Licenses	0.13	0.07	0.08
Registered trade marks	0.23	2.53	0.73
Rationalization-related ideas	0.15	0.45	0.63

Source: author's own research [Mizgajska, 1997; 2002]

The innovation ability can also be assessed through evaluation of its effects, which include own patent-related activity, licenses purchased, applied registered trade marks and own rationalization-related ideas.

In the years 2001–2004, the examined firms applied 276 technical solutions, which was a result of their own research activity and improvements in technologies, as well as that coming from other companies. The number of implemented technical solutions was compared with the results of the research which the author carried out in Wielkopolska Region in the years 1992–1995 and 1996–2000 [Mizgajska, 1997; 2004]. Thus, in 2004, in comparison with 1995, the number of companies which applied registered trade marks and rationalization-related ideas increased (Table 3). Within the 12-year period under examination, there followed a slight rise in the number of patented technical solutions, while the purchase of licenses remained on a low level. These results are convergent with those obtained by Stawasz in the research conducted among 100 small and medium-sized enterprises in the Provinces of Łódź, Ostrołęka and Toruń [Matusiak, Jewtuchowicz, Stawasz, 2001]. A slight increase in the number of inventions submitted for patent rights protection is compliant with the growth in the inventiveness coefficient in industry in 2002 [Janasz, 2005].

Innovation activity is usually tied to the size of the company. Accordingly, all the firms were divided into those employing up to 9 persons, between 10 and 49, and 50–249 workforce. Larger firms introduced more innovations, particularly, new technologies, than their smaller correspondents. Rationalization-oriented activity, and also introduction of trade marks are also related to the size of the given company. Like in the previous years, the least innovative were micro-enterprises employing between 1 and 9 persons, whereas the most – medium-sized companies with 50–249 workforce [Mizgajska, 1997; 2004] (Table 4).

Also, sources of innovation are dependent on the innovation activity of firms, the dominant one for low-innovating companies being own experience

Table 4. Size of the firm and innovation activity

No. of the employed	Type of innovations introduced in the company in the years 2001–2004			Introduced patents, licenses, registered trade marks (number per 1 firm)
	No. of new technologies per 1 firm	No. of new products per 1 firm	No. of new services per 1 firm	
0–9	0.8	1.9	1.2	1.4
10–49	1.0	2.5	1.1	2.1
50–249	1.4	2.3	1.3	3.0

Source: author's own research

in the years 2001–2004 (76% of the companies). Apart from own experience (79%), firms of medium innovating level pointed to participation in fairs and conferences (67%), making use of domestic publications (54%) and contacts with foreign enterprises (30). Highly-innovating companies listed, beside own experience (80%) and domestic publications (90%), cooperation with research units as a significant source of information on novelties. Each of the companies of the last group declared collaboration with two research institutes on the average, while – in comparison – only every third of the low-innovating companies did so with reference to one such center. This means that cooperation between SME and scientific-research institutes varies to a great extent as regards looking for mutual contacts. The reasons for this can be seen in the growing competitiveness in the market, which forces scientific-research institutes to take interest in the needs of small industry; on the other hand, the interest of SME in the offer from research centers is also growing stronger.

4. Barriers of introducing innovations in firms

The factors which, in the opinions of the respondents, limited, in 1995, introduction of innovations in the firms were the following: high risk of implementation, obsolete machinery, lack of financial means, as well as lack of active pro-innovation policy on the part of the Government. In 2001, the hierarchy of factors changed, the most important of the limiting factor being the lack of financial means, lack of pro-innovation policy on the part of the Government, high risk of implementation, and the “choking” banking system [Mizgajska, 2004]. In turn, in 2004, every fifth enterprise indicated the lack of financial means, high risk of implementation, lack of active pro-innovative policy of the Government, highlighting – in particular – too high taxes and obsolete machinery, as the factors limiting introduction of innovations to the

highest degree. On the other hand, the one of the ineffective banking system fell down considerably on the list of the most hampering factors. Still, it is perceived as significant by medium-sized and highly-innovating enterprises. In a sense, this is an untypical situation since it is innovating enterprises that should not encounter difficulty obtaining credits first of all.

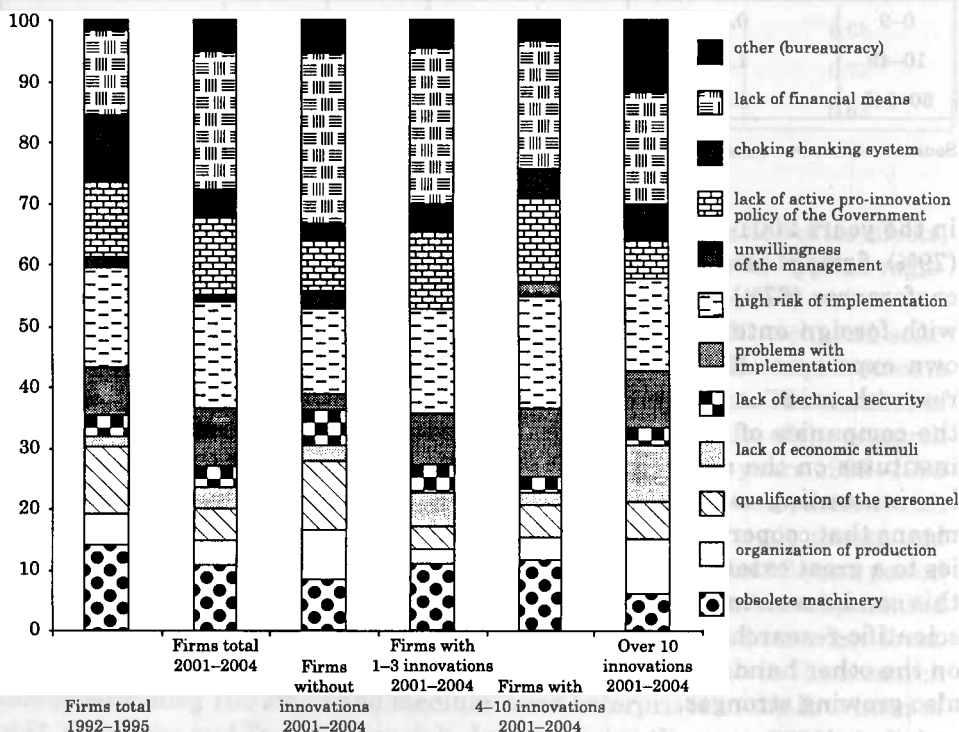


Fig. 2. Barriers to introducing innovations in firms

Source: author's own research [Mizgajska, 2004]

Introduction of a new or modernized technology, or new product, in the production is connected with substantial expenditure: costs of purchasing a license, cost of research projects, cost of obtaining necessary certificates, etc. Consequently, the outlays are too high for SME. The lack of financial means in the enterprises results from financial standing of SME caused by a small income, interrupted cash flow resulting in belated payments; it can also be connected with a hampered access to external sources of financing. The main source of financing innovations in 2004 was own means of the enterprises (82%), credits (64%) and foreign capital (18.2%) (Fig. 2). However, the chief barriers to access external capital, especially as regards small enterprises, is the lack of surety, complexity of credit application forms, as well as applica-

tion of simplified forms of taxation, which entails running simplified form of accounting. The limited access of SME to foreign capital is also connected with high commissions by financial institutions for their services.

In the opinions voiced by the majority of respondents, a factor limiting implementations of innovations in firms is a lack of pro-innovation policy on the part of the Government. The policy of the Government towards SME was determined, among others, in the document accepted by the Board of Ministers "Kierunki działań rządu wobec małych i średnich przedsiębiorstw od 2003 do 2006 roku" ("The directions of the Government's activity in relation to SME from 2003 until 2006"). An important goal behind this program was undertaking actions for a rise in the innovation activity and technological development. The directions of actions on the part of the Government included a series of declarations concerning financial support for such initiatives as establishment of new enterprises making use of new technologies, including informatics-related, subsidizing research-developmental works ordered by SME, subsidizing modernization of enterprises and their modernization of their own activity, among others, through implementation of innovations and new technologies in enterprises. Moreover, in the institutional surrounding of SME, attention is drawn to promotion of existing ways of supporting, e.g. networks of innovations transfer centers, and also consultative aid concerning establishment of innovation centers, technical and industrial machinery supporting implementations of new technologies.

The data relating to the public aid offered to entrepreneurs in the years 2001–2003 point to the fact that the aid was chiefly appropriated to grants and tax exemptions, as well as to deferments or arranging installments for repayments to the state budget. On the other hand, pro-developmental programs such as enterprises' adjustment to meet the requirements of the EU in the area of environmental protection or technical standards, and also expenditure on R&D and innovation activity, made up an insignificant share in the total quota of public support granted. A greater part of the public aid was appropriated to actions aiming at particular industrial branches or given enterprises overcoming difficulties, including – primarily – restructuring of coal mining. In comparison with the EU-15, where the amount of the public aid granted is being lowered and is oriented towards horizontal targets, in Poland both the scope and the structure of the aid differ to a great extent. In 2003, the biggest differences concerned, among others, support for development of SME in Poland (4.7%), while in the EU-15 this amounted to 14% [Program operacyjny "Innowacje. Inwestycje. Otwarta gospodarka"].

In 2003, the realization of all the tasks was subsidized PLN 223.4 million from the budget, PLN 57 million from the PHARE. In the years 2004–2006, it was accepted that from PLN 2 to 2.5 billion from the structural funds of

the state budget should be appropriated to realization of task included in the Operation Program "Innovations. Investments. Open Economy"

It seemed that the support programs financed from the structural means appropriated to investments for enterprises should enjoy particular interest. One of such programs is Sector Operation Program "Rise in Competitiveness of Enterprises through Investments". So far the decisive majority of pre-accession means was directed to trainings and counseling; only a few, such as the "National Fund for Investment Grants", were used to purchase new fixed assets. According to the information released by the accredited consultant in charge of European Funds, out of 6,400 applications, as few as 713 projects obtained recommendations to be granted funds. Part of the projects did not satisfy formal criteria, the most common reason being a lack of innovativeness or ideas how to realize the business ["Jak napisać dobry projekt inwestycyjny", 2005, 44].

A lack of investment activity of Polish banks is another specific problem. There still are no preferential credits available to entrepreneurs wishing to establish their own companies or to firms implementing new technologies. Banks do not show readiness to create an extensive offer for SME.

Similarly, there still is a lack of extensive system of guarantees and loans, which was announced in "The directions of the Government's conduct towards SME until 2002". The required credit guarantees are the necessary condition to gain access to capital market and play the selective function since banks refuse to credit investments of enterprises that do not guarantee repayment of the dues. Since 1994, in Poland, there have been two credit guarantee funds in operation, which serve 30 local guarantee funds; however, their activity is still on a limited scale. The latter is proved by the fact that in 1997 there were granted only 487 guarantees for the total of PLN 89 million [Dzierżanowski, Sztetyło, 2000, 212]. As regards that, the "Government's program for development of loan and guarantee funds for SME in the years 2002–2006" should be evaluated as a very positive undertaking. The aim of the governmental program is constructing an integrated, effective system of regional and local financial institutions which serve the purpose of strengthening external financing for SME. It is assumed that finally there are to function strong regional institutions in each province and a total of about 100 local institutions.

5. Conclusions and recommendations for the future

On the basis of the conducted research into the innovation activity of SME in Wielkopolska Region the following conclusions were formulated:

– in the years 1992–2004 there did not follow any significant rise in the innovation activity of SME;

- there still maintains an advantage of the type of product-related innovation over that of process-related innovation;
- out of the branches examined in the years 2001–2004 the ones of construction and machinery with automation were the most innovation-active;
- in the period under examination larger firms implemented more innovations than smaller ones;
- in the years 1992–2004, the hierarchy of importance of factors limiting introduction of innovations in firms changed;
- lack of financial means, high risk of implementation, lack of active pro-innovation policy of the Government belonged to the most severe factors limiting introduction of innovations in the years 2001–2004.

Taking into account the research results, the policy of the state should be directed towards stimulating innovation activity, and – especially – towards increasing process-oriented innovations connected with implementation of new technologies. The pro-innovation politics towards SME ought to prefer innovating firms, particularly in the branches that are competitive in the process of integration with the European Union. Financial means for enterprises can include direct aid, facilitating access to bank credits, as well as capital instruments. The following can count as direct aid: subsidies, subventions of public subjects, and it is important that forms of support which stimulate activating enterprises' own means should be developed. The latter, in turn, include: introduction of tax relieves, gentler conditions of amortization and lowering of assessment rate. On the other hand, the postulated changes in the sphere of aid that facilitates it to enterprises to access bank credits, comprise preferences for innovating companies while applying for credits necessary to finance innovations, e.g. through expanding restitutions which lower costs of interest bearing. It is postulated that the sphere of warranty and credit guarantee should be developed, which would strengthen entrepreneurs' reliability in their contacts with banks. Another significant form of support is development of capital instruments, which include development of higher risk funds (*venture capital*) and facilitations while establishing companies with foreign capital. A considerable part of the above-mentioned postulates found their way into the Act on certain forms of supporting innovation activity of 29 July, 2005. Moreover, concerned about competitiveness of our enterprises, the Ministry of Economy issued the document "Kierunki zwiększania innowacyjności gospodarki na lata 2007–2013" ("The directions of increasing innovativeness of the economy for the years 2007–2013"), in which – apart from the evaluation of the state of innovativeness of the Polish economy – directions of activities significant for innovativeness of the whole economy are recommended. Realization of the innovation policy, as included in the "Directions", requires acceptance on the part of political, socioeconomic and scientific elites.

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