CENTRE FOR THE STUDY OF ECONOMIC & SOCIAL CHANGE IN EUROPE

SCHOOL OF SLAVONIC & EAST EUROPEAN STUDIES

"Innovation Activities in Polish Industry in 1998-2000: Main Results from the GUS 2001 Innovation Survey"

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Working Paper No. 25

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INNOVATION ACTIVITIES IN POLISH INDUSTRY IN 1998 - 2000

MAIN RESULTS FROM THE GUS 2001 INNOVATION SURVEY

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Abstract

The paper analyses results of GUS innovation survey in manufacturing for 1998-2000 and innovation survey in services for 1997-1999. Innovation activities in 1998-2000 reflect downturn in Polish economy of this period. A number of innovative enterprises fell from 37.6% (1994-96) to 16.9% (1998-2000). Also, innovation expenditures, which were continuously growing until 1999 have fallen for the first time. There is not significant difference in number of innovative firms between manufacturing and services.

Innovation expenditures as percent of total turnover are still high when compared to the EU but they have also fallen significantly from 1999 to 2000. Objectives of innovation activities of Polish firms are similar as in the EU. Obstacles to innovation are also similar except very high importance of interest rate as an obstacle to innovation in Poland. One third of innovative firms cooperate in undertaking innovation activities but within this the share of small firms is very small. A share of sales due to technologically new and improved products has been continuously growing until 2000 when this share also dropped.

June 2001

ISSN 1476-1734

1. Introduction

In Poland, R&D and innovation surveys have a long and rich tradition going back to the early 1960s. This tradition is now blossoming, against the background of a tremendous rise in interest in innovation problems.

The main source of data on innovation in Poland is the Central Statistical Office of Poland (GUS), which is currently in the process of developing and implementing a new conceptual framework for the conduct of innovation surveys, based on internationally agreed methodological standards.

Regular yearly surveys on technological innovation in industrial enterprises (mining, manufacturing and utilities sectors) employing 50 or more persons were launched by GUS at the beginning of the 1980s (see Annex 1).

In 2000, there was carried out, for the first time in Poland, the comprehensive survey on innovation activities in the marketed service sector (wholesale trade, transport and telecommunications, financial intermediation, computer and related activities, architectural, engineering and other technical activities) in 1997-1999 as a reference period.

Innovation surveys, annual and periodic, carried out by GUS in the 1990s provided a wide range of evidence on a variety of aspects of innovation activities in Polish economy in the transition period.

The patterns emerging from these surveys are in many respects similar to those characteristic of Western countries. However, a number of significant country-specific features were also revealed.

In the last years of the past decade, economic performance in Poland began to get worse and growing unemployment became the most serious problem in Polish economy. Inflation has finally significantly decreased, to less than 3 % *per* year, but very high real interest rates, used to control it, have suppressed economic growth.

In 2000, the science and technology system in Poland was rather significantly affected by slowdown in economic activity. Especially R&D activity in industrial enterprises turned out to be very sensitive to the business cycle.

2. Methodological note

This working paper presents the results from the third comprehensive survey on innovation in Polish industry that was carried out by the Central Statistical Office of Poland in 2001 for 1998-2000 as a reference period.

The two previous GUS comprehensive surveys on innovation in industry were carried out in 1993 and 1997. However, due to some methodological differences consequential to changes and systematic development of methodology underlying the surveys, the results from them are not directly comparable.

The target population in the 2001 GUS innovation survey was the total universe of enterprises employing more than 9 employees in all manufacturing industries (NACE Rev.1: 15-37) and the total universe of enterprises with more than 49 employees in the mining sector (NACE Rev. 1: 10-14) as well as in the utilities sector (NACE Rev. 1: 40 and 41).

The survey method was a combination of sampling and census. The threshold between the census and sampling was 49 employees. The census was applied for the sub-population of enterprises with more than 49 employees in mining, manufacturing and utilities sectors and the sampling for the rest (enterprises with 10 - 49 employees in manufacturing sector)[1].

The sample has been selected through a stratified random selection based on principal economic activity, size, ownership (public - private, domestic - foreign) and geographical location.

The sampling frame was the official statistical business register of the country (REGON).

The data have been collected through a mail questionnaire prepared on the basis of the CIS-2 questionnaire and *Oslo Manual* recommendations. As all other innovation surveys carried out by GUS, the 2001 comprehensive survey on innovation in industry was a mandatory one.

The survey worked very well, a response rate was about 90 %.

The results presented in the publication are grossed-up figures for the whole population covering about 28,8 thous. firms (of which 9123 with more than 49 employees).

Definitions used in the 2001 GUS survey on technological innovation in industrial enterprises are fully in line with those recommended by *Oslo Manual* and used in the *Community Innovation Survey*.

The main methodological differences in comparison with solutions used in the second *Community Innovation Survey* are mentioned below.

- In the questions concerning objectives of innovation and sources of information for innovation in which respondents are asked to evaluate different factors, a **3** point scale was used (non-important**;** moderately important**;** very important).
- Indication of factors hampering innovation activities have been requested from all surveyed enterprises not only from innovators as it was done in the second *Community Innovation Survey*. The same solution was also applied as regards the questions concerning participation in joint innovation projects with other institutions (innovation co-operation).

- To meet national requirements, the list of factors hindering innovation activities used in the second *Community Innovation Survey* was modified, according to Polish experts suggestions, by adding another one obstacle, peculiar to Poland, *viz.* high cost of bank credit (high bank interest rates).

[1] It is worth noting that the sub-population of industrial enterprises with more than 49 employees is covered by the regular, concise, yearly census survey on innovation including questions on selected basic aspects of innovation activities such as *inter alia* expenditure on innovation and domestic and export sales of innovative products.

3. Survey results

3.1. Innovating enterprises

According to the third comprehensive survey on innovation in industry (mining, manufacturing and utilities sectors) carried out by GUS in 2001, only about 17 % of surveyed firms with at least 10 employees have introduced technologically new or improved products or processes in the surveyed period 1998 -2000. It means that the relatively high level of innovatory dynamism recorded by GUS in the two previous comprehensive surveys on innovation has fallen away in recent years[2]

About 51,2 % of industrial innovators in the period 1998 -2000 were engaged in both product and process innovation (see Figure 2).

The 2001 GUS innovation survey exhibits a much lower share of innovators than those revealed by the CIS-2 surveys in EEA countries for the period 1994 - 1996 but, on the other hand, more or less on a par with the share of innovating firms indicated in the recent Slovak innovation survey relating to years 1997 - 1999 [3].

Contrary to the situation in most of the EEA Member countries in the mid-1990s, in which, according to the second *Community Innovation Survey*, technological innovation was, in general, carried out rather significantly more frequently in manufacturing enterprises than in the marketed service sector, in Poland in the late 1990s the two broad economic sectors, industry and marketed services, showed more or less similar shares of innovating enterprises (relatively 16,9 % and 16,0 %).

Introducing technological innovations, Polish industrial enterprises rely mainly on their own resources. According to the results of the survey concerned, 63,3 % of innovators have implemented the innovations developed mainly internally, as against only 7,1 % of firms reporting to have implemented the innovations developed mainly externally (by others). The share of innovators reporting to have implemented the innovations developed mainly by domestic research institutions was about 1,5 %.

In Polish industry the share of enterprises relying on technological innovations developed in co-operation with others (*id est* with other enterprises or research institutions, domestic or foreign) increases with the size of the enterprise.

[2] See: Niedbalska G., *Polish Innovation Surveys: Currrent Status and Analysis of Results*, in Dyker D.A. and Radosevic S. (eds.), Innovation and Structural Change in Post-Socialist Countries: A Quantitative Approach, 261-289, NATO Advanced Science Institute Series, Kluwer Academic Publishers, Dordrecht 1999).

[3] *See*: *Inovacna aktivita priemyslu SR 1997-1999*, Statisticky urad Slovenskej republiky, Bratislava 2001.

Table 1. Innovating enterprises in mining, manufacturing and utilities sectors in 1994-2000

Economic activity according to NACE Rev. 1	Enterprises[a] which		
	introduced technological innovations in		intend to introduce technological innovations in 2001-2003
	1994-1996	1998-2000	
	% of a total number of enterprises		
T o t a l	**37,6**	**16,9**	**21,4**
public sector	52,0	35,3	40,6
private sector	30,3	15,7	20,2
Mining and quarrying	**29,5**	**29,1**	**28,5**
Manufacturing	**38,6**	**16,7**	**21,2**
of which enterprises with more than 49 employees[b]	40,6	30,7	33,8
Manufacture of food products and beverages	38,8	13,7	18,5
Manufacture of tobacco products	57,2	40,0	46,7
Manufacture of textiles	29,7	12,3	17,3
Manufacture of wearing apparel; dressing and dyeing of fur	8,3	4,9	9,6
Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear	18,6	6,6	11,6
Manufacture of wood and wood, straw and wicker products	22,8	11,8	13,1
Manufacture of pulp, paper and paper products	41,5	18,3	27,3
Publishing, printing and reproduction of recorded media	16,7	14,1	17,7
Manufacture of coke, refined petroleum products and nuclear fuel	78,6	51,4	54,3
Manufacture of chemicals and chemical products	73,3	41,3	41,4
Manufacture of rubber and plastic products	48,0	16,5	23,3
Manufacture of other non-metallic mineral products	36,1	19,5	27,3
Manufacture of basic metals	58,1	31,5	39,9
Manufacture of fabricated metal products, except machinery and equipment	40,3	17,2	23,3
Manufacture of machinery and equipment n.e.c	55,2	26,4	33,0
Manufacture of office machinery and computers	14,3	18,8	24,6
Manufacture of electrical machinery and apparatus n.e.c.	63,8	32,8	36,2
Manufacture of radio, television and communication equipment and apparatus.	51,6	27,6	29,7
Manufacture of medical, precision and optical instruments, watches and clocks	59,5	33,8	34,6
Manufacture of motor vehicles, trailers and semi-trailers	54,2	27,3	32,6
Manufacture of other transport equipment	49,6	23,0	26,2
Manufacture of furniture; manufacturing n.e.c.	37,7	18,1	17,9
Recycling	18,7	7,9	17,3
Electricity, gas and water supply	**28,0**	**24,6**	**28,0**

a Data for the period 1994-1996 concern enterprises with: more than 5 employees in manufacturing sector, more than 50 employees in mining sector and more than 20 employees in utilities sector. Data for the period 1998-2000 concern enterprises with more than 9 employees in manufacturing sector and more than 49 employees in mining and utilities sectors.

b With more than 50 employees in the 1997 innovation survey (data for the period 1994-1996).

N o t e. Due to some methodological diffrences the results of the 1997 and 2001 GUS innovation surveys are not directly comparable. The 1997 GUS innovation survey covered not only technological product and process innovations but also another one category of innovations, *viz.* so-called organisational-technological innovations *id est* substantional organisational innovations relating to technological innovations (purely organisational and managerial innovations were not included).

S o u r c e: 1997 and 2001 GUS innovation survey.

According to the definition recommended by *Oslo Manual* and used in the *Community Innovation Survey* technological innovations comprise implemented technologically new products, processes and services and significant technological improvements in products, processes and services. The product, process or service should be new (or significantly improved) to the enterprise, it does not have to be new to the world, country or enterprise's market.

In order to analyse the degree of novelty of technological innovations implemented in recent period by Polish industrial firms, Central Statistical Office carried out in 2000 a special *ad hoc* survey, the results of which revealed that:

- in 1995-1999, every seventh manufacturing enterprise (14 %) employing more than 49 persons introduced at least one product or process new to the country;

- in 1995-1999, about 2 % of manufacturing firms with more than 49 employees introduced a product or process new to the world (worldwide innovation).

Besides, the results of this above mentioned *ad hoc* survey revealed that in the three year period 1997-1999, every eighth (12,2 %) manufacturing firm with more than 49 employees introduced at least one non-technological innovation *id est* organisational or managerial innovation.

Figure 1.
NUMBER OF INNOVATING ENTERPRISES IN MANUFACTURING AND SERVICE SECTORS BY SIZE-CLASS, %.

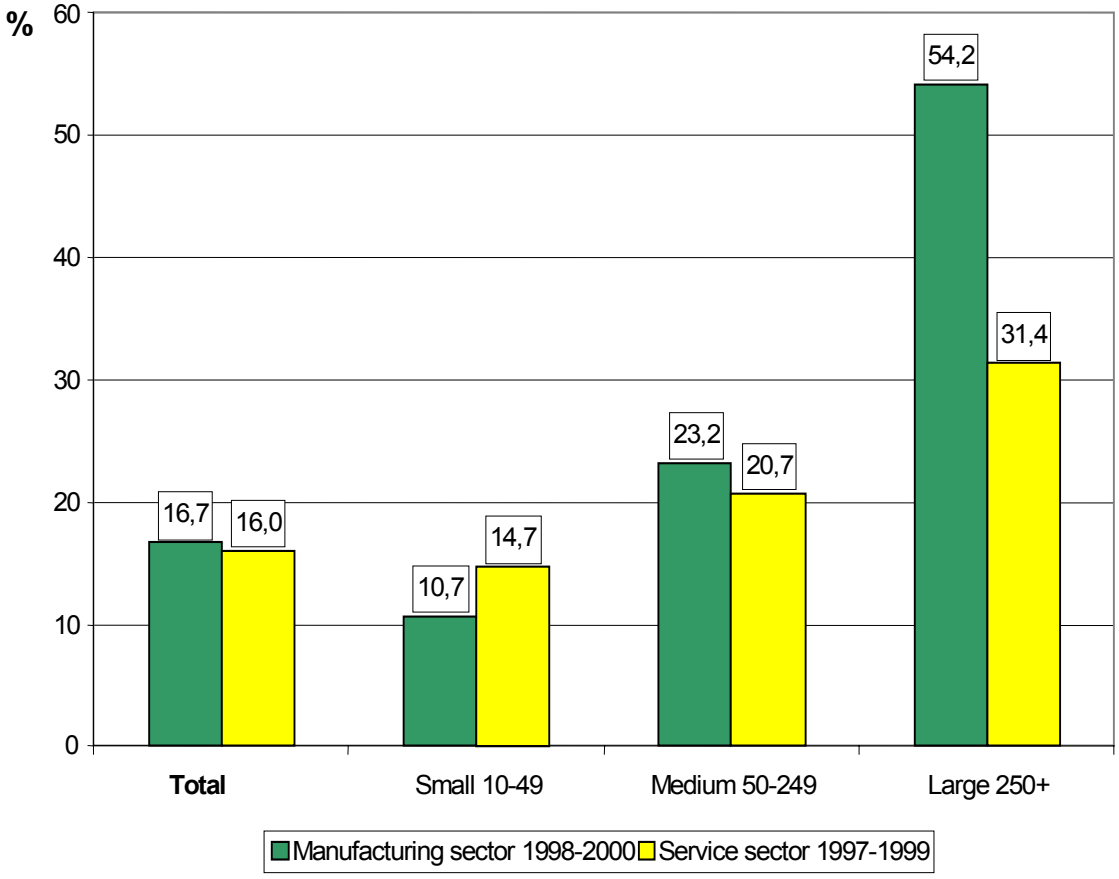
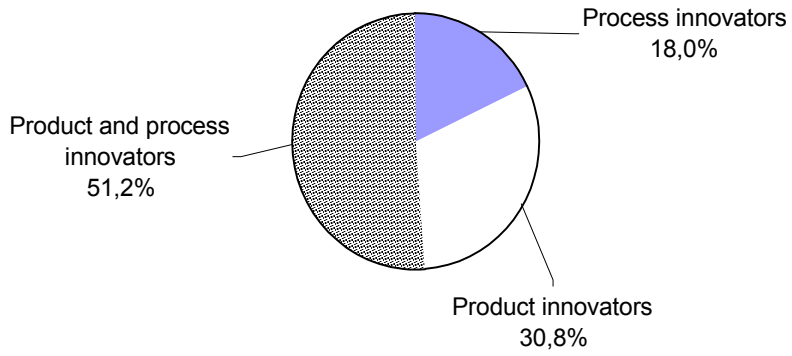


Figure 2.
DISTRIBUTION OF INNOVATING ENTERPRISES BY TYPE OF INNOVATION, MINNING, MANUFACTURING AND UTILITIES SECTORS, %, 1998-2000



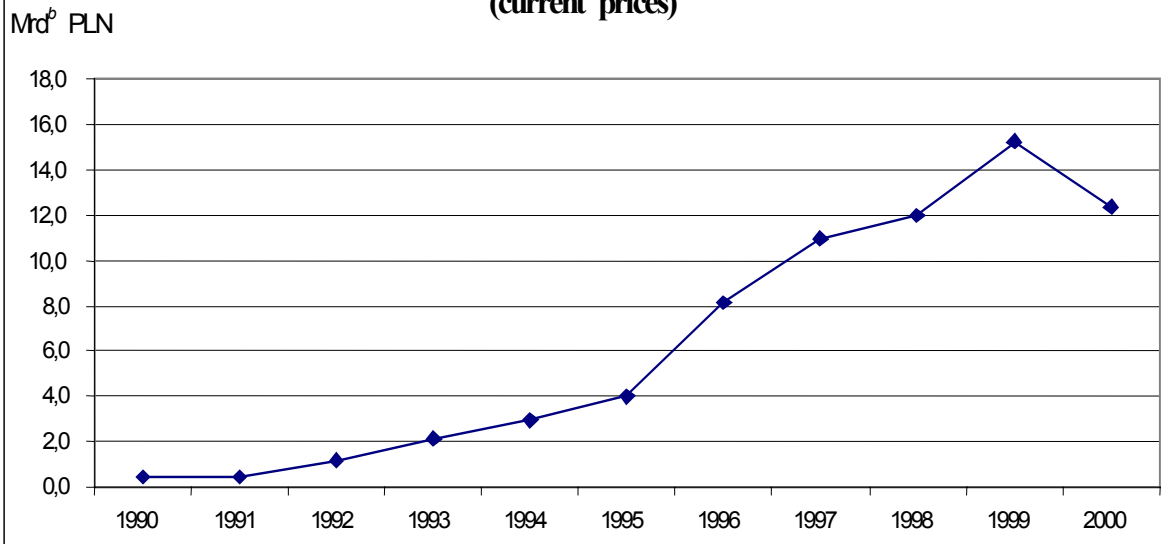
3.2. Expenditure on innovation

Expenditure on innovation in Polish industrial enterprises employing more than 49 persons, covered by the yearly, concise, census survey on innovation, experienced a sharp increase between 1995 and 1999. In this period, it was practically quadruplicated.

In 2000, this positive trend was broken down and innovation expenditure expressed in absolute terms was, for the first time in the whole past decade, lower than in the previous year (see Figure 3). It was a rather significant decrease, by about one-fifth in absolute terms. However, it should be kept in mind that in the previous year, 1999, expenditure on innovation was sharply, by more than one-fourth (27,2 %), higher than in 1998.

Figure 3.

EXPENDITURE ON INNOVATION IN INDUSTRIAL ENTERPRISES[a] IN 1990-2000 (current prices)



a Data concern enterprises employing in the section *Mining and quarrying* and *Manufacturing* until 1998 more than 50 persons, in 1999-2000 more than 49 persons, and in the section *Electricity, gas and water supply* until 1992 more than 50 persons, in 1993-1998 more than 20 persons, and in 1999-2000 more than 49 persons. *b* Milliard (American billion).

Figure 4.

DISTRIBUTION OF INNOVATION EXPENDITURE IN MANUFACTURING ENTERPRISES BY SIZE-CLASS, 2000

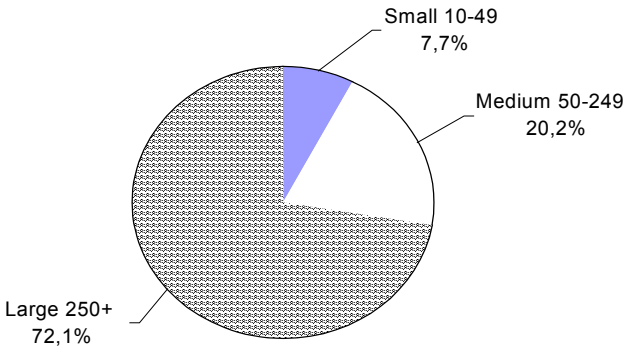
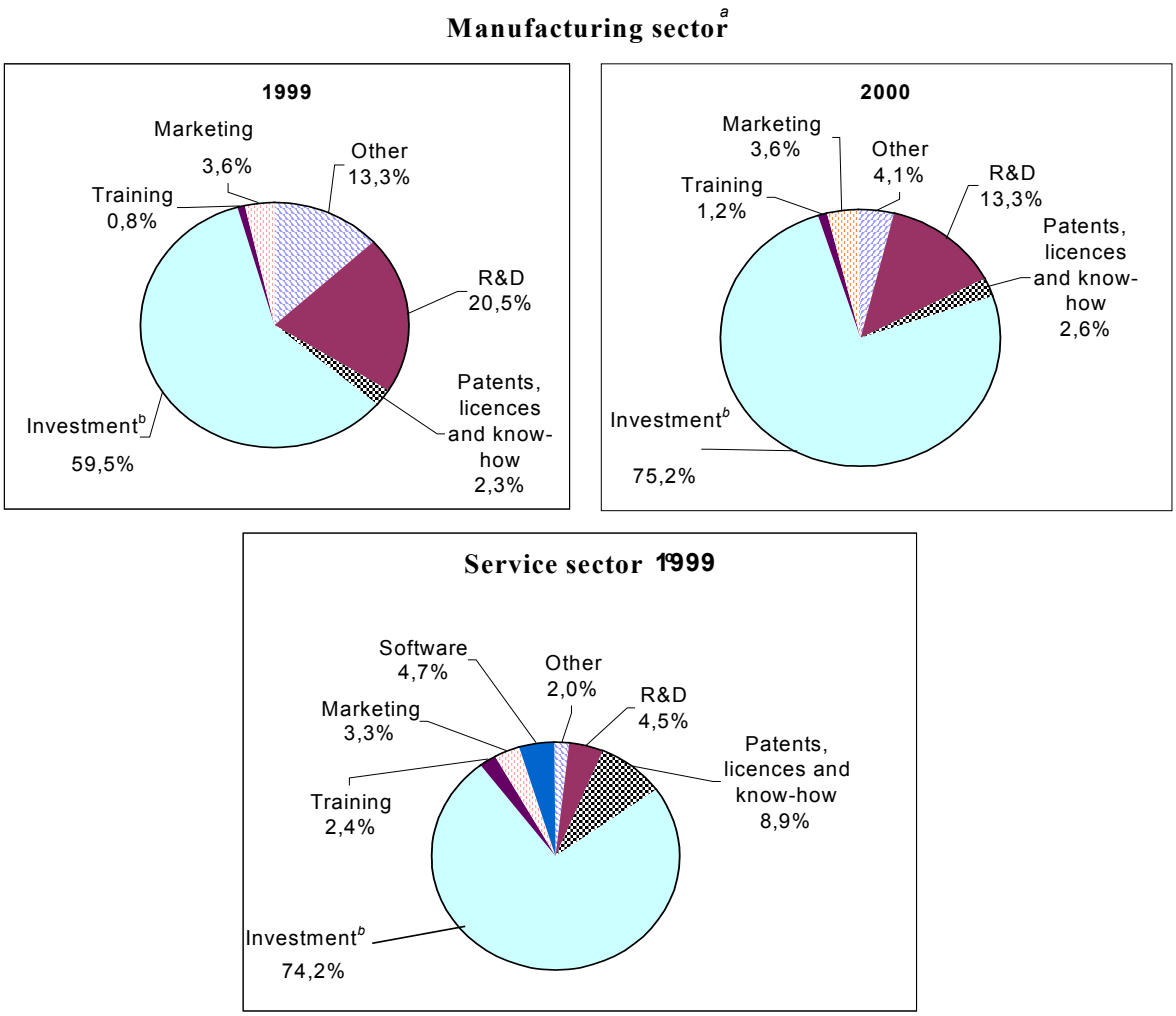


Figure 5.
BREAKDOWN OF INNOVATION EXPENDITURE BY TYPE OF INNOVATION ACTIVITIES, MANUFACTURING AND SERVICE SECTORS



a Data concern enterprises with more than 49 employees.
b Land and buildings, machinery (instruments) and equipment.
c Data concern enterprises with more than 9 employees.

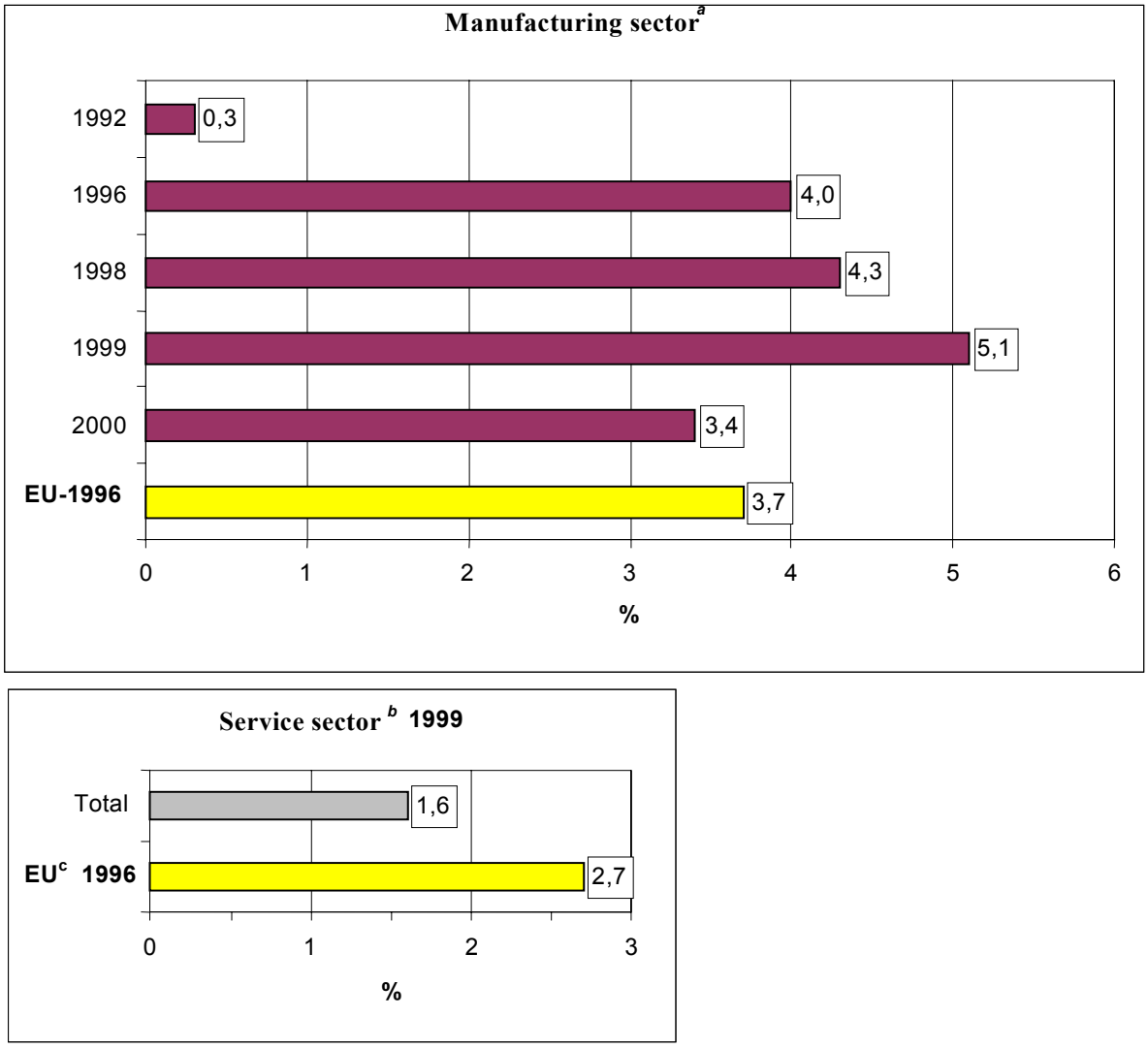
Acquisition of embodied technology (machinery and equipment linked to technological innovations as well as land and buildings for TPP innovation activities including major improvements, modifications and repairs) is the most important component of innovation expenditure in industrial enterprises in Poland (as well as in the service sector, see Figure 5).

The most striking feature of the overall structure of innovation expenditure by type of innovation activities is a very low share of in-house R&D, especially in small firms (in 2000, in manufacturing enterprises employing 10 - 49 persons: only about 5 %).

Despite of the low share of innovating enterprises, the level of innovation expenditure in proportion to turnover, *id est* so-called innovation intensity, is relatively very high compared to the average value in EEA Member States for 1996 as revealed by the second *Community Innovation Survey* (see Figure 7). This seems to suggest that in industrial sector in Poland the innovation activities are concentrated in a relatively small number of highly innovation-intensive firms.

Figure 7.

INNOVATION EXPENDITURE AS A PERCENTAGE OF TOTAL TURNOVER (INNOVATION INTENSITY), TOTAL POPULATION OF ENTERPRISES, %, 1992-2000

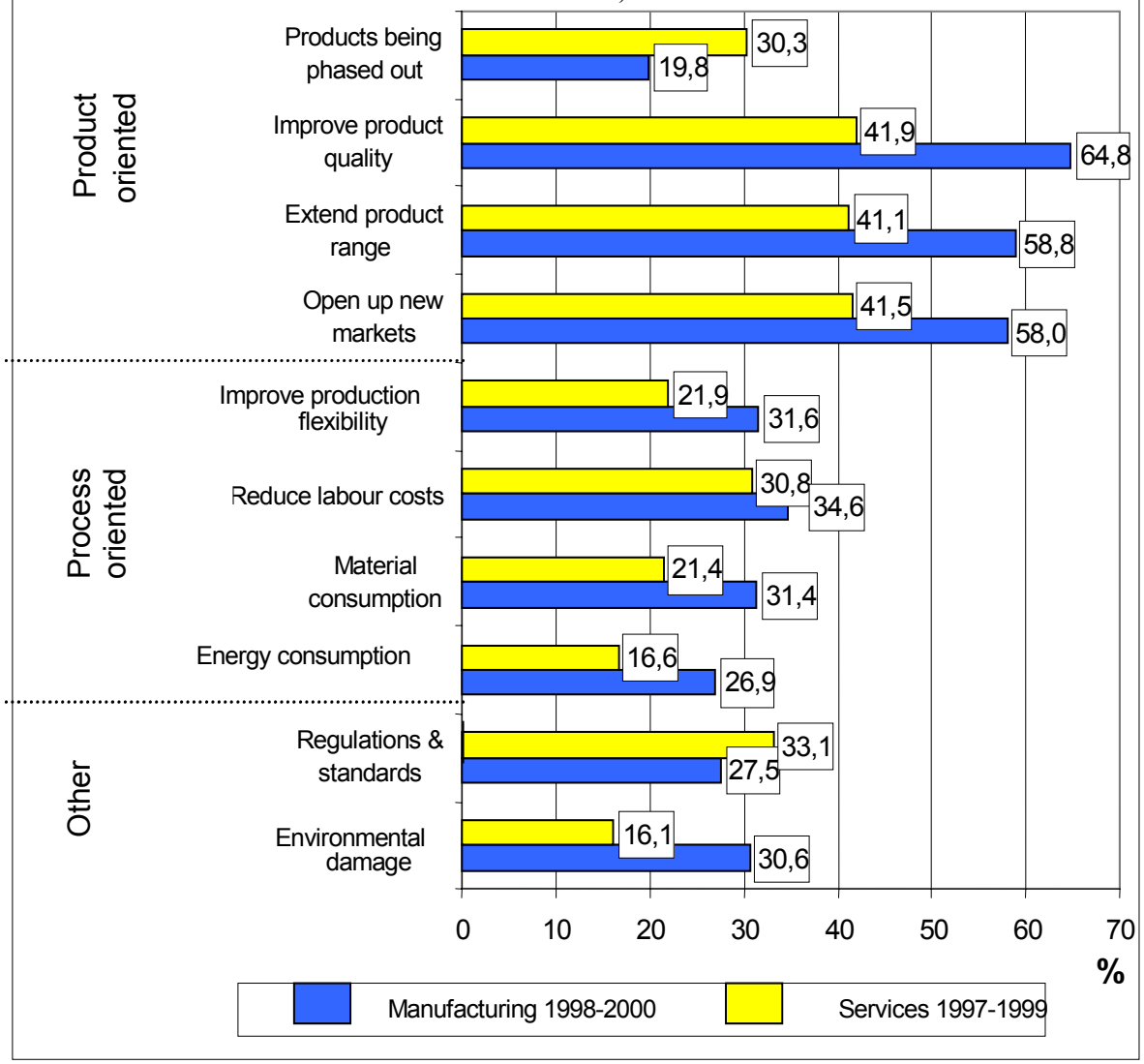


a Data concern enterprises with more than 49 employees, in the European Union - with more than 19 employees. b Data concern enterprises with more than 9 employees.
c Wholesale and commission trade and financial intermediation are not included.

3.3. Objectives of innovation

When introducing technological innovation, industrial enterprises in Poland, in general, appear to pursue much the same objectives as manufacturing firms in the EU and EFTA Member States participating in the second *Community Innovation Survey* (see Figure 8).

Figure 8.
NUMBER OF INNOVATORS WITH VERY IMPORTANT OBJECTIVES OF INNOVATION, %

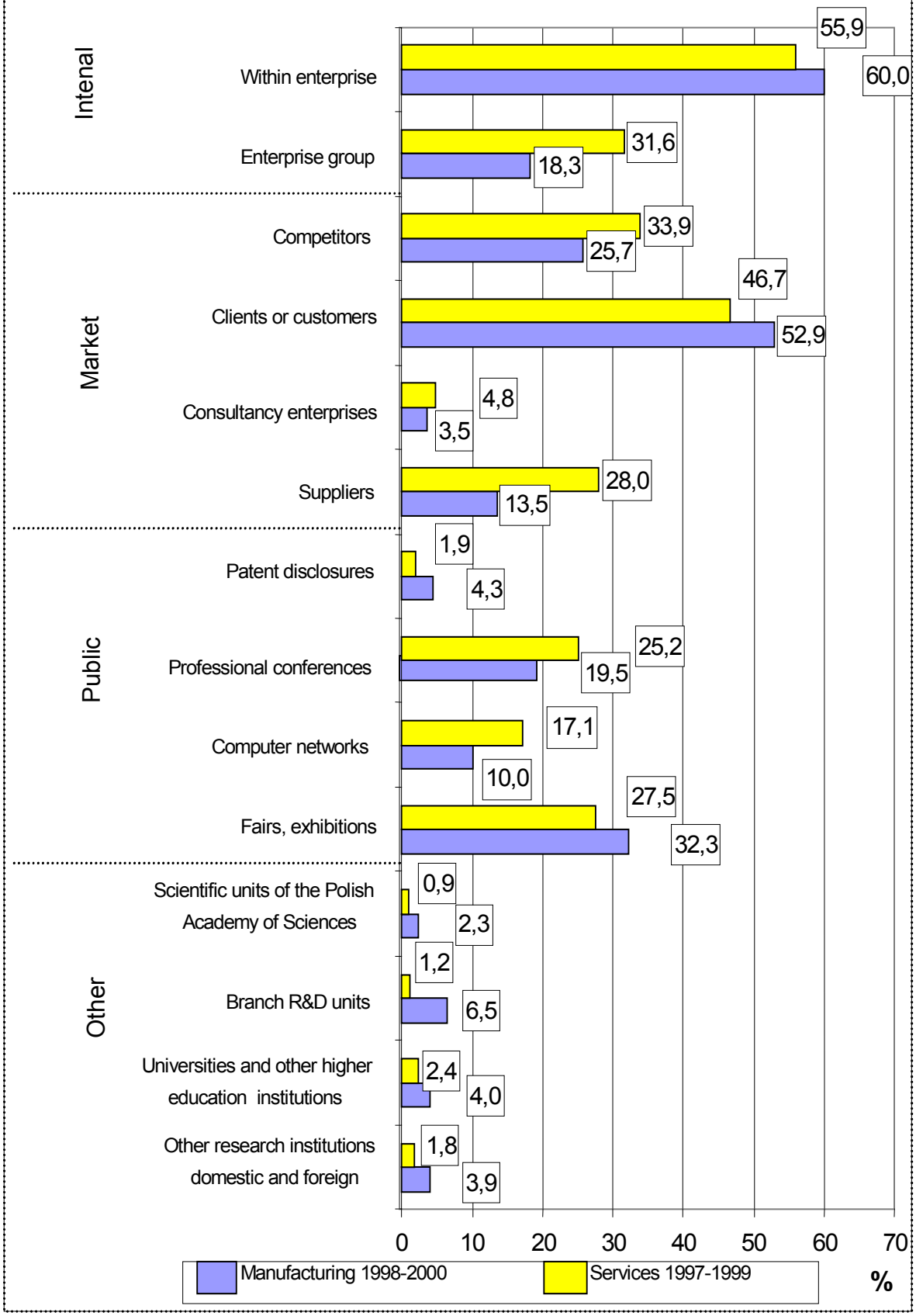


3.4. Sources of information for innovation

In general, the ranking of the sources of information used by industrial enterprises in Poland for the generation of innovative ideas is very similar to that characteristic of West-European countries participating in the second *Community Innovation Survey* (see Figure 9).

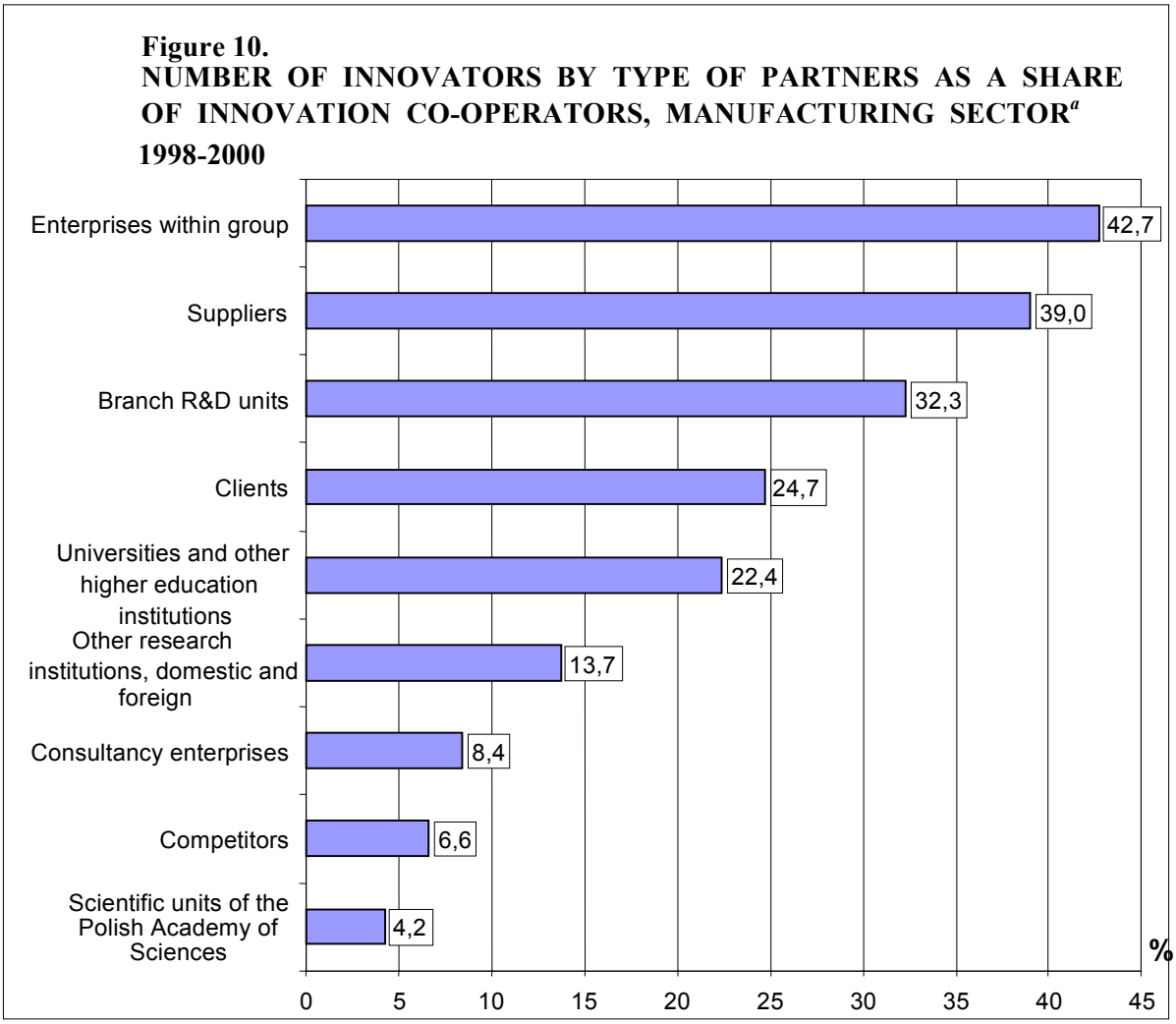
The review of country specifics in terms of using the sources of information for innovation shows that *other enterprises belonging to the same group* and *suppliers* play a more important role in the West-European countries than in Poland. On the other hand, in Polish industry such sources of information as *competitors* and *professional conferences, meetings and journals* as well as *government research institutions* (so-called branch R&D units) are more frequently used and rank higher than in the EEA Member States.

Figure 9.
NUMBER OF INNOVATORS WITH VERY IMPORTANT SOURCES OF INFORMATION FOR INNOVATION USED, %



3.5. Co-operation in innovation activities

Figure 10.
NUMBER OF INNOVATORS BY TYPE OF PARTNERS AS A SHARE OF INNOVATION CO-OPERATORS, MANUFACTURING SECTOR[a]
1998-2000



a Data concern enterprises with 10 or more employees.

Innovation co-operation means active participation in joint R&D and other innovation projects with other organisations (either other enterprises or non-commercial institutions). Pure contracting out of work, where there is no active collaboration, is not regarded as innovation co-operation.

According to the results of the survey concerned, 29 % of innovating enterprises in industrial sector in Poland had co-operation arrangements on innovation activities with other enterprises or institutions during 1998-2000, against 26 % in manufacturing sector in the EEA Member States in 1994-1996 as revealed by the results of the second *Community Innovation Survey*.

Innovating enterprises constituted an overwhelming majority, about 90 %, of the total number of industrial firms that have established co-operation agreement in innovation between 1998 and 2000.

There is a gradual increase in the shares of innovation co-operators from small to medium and large enterprises (in the whole sub-population of small enterprises with 10 to 49 employees, innovators and non-innovators, the share of firms involved in joint innovative projects was only 2,6 % while in the sub-population of very large firms with more than 999 employees - as much as 52,4 %).

Figure 10 shows the number of innovators with more than 9 employees in

manufacturing sector by type of partner organisations as a share of innovators with innovation co-operation between 1998-2000.

3.6. Obstacles to innovation

Obstacles or barriers to innovation may be reasons for not starting planned innovation projects at all, or reasons for innovation projects in progress to be slown up or abandoned.

Factors hampering innovation activities have very diverse nature. The most important are economic factors.

In the survey concerned, the share of enterprises that have declared having at least one innovation project with progress problems (*id est* project seriously delayed, abandoned or not even started) in the whole surveyed population of industrial firms, including non-innovators, was about 15 % (in the service sector in 1997-1999: about 13 %). Among the innovators, the share of firms that have reported having at least one innovation project with progress problems was about 34 %.

The most frequent category of projects with progress problems were projects not even started reported by about 11 % of all surveyed firms. 3,4 % of all surveyed firms had at least one innovation project seriously delayed, and 2,7 % of industrial firms in the whole surveyed population have abolished at least one innovation project in the period concerned. Among the innovators, the dominant category of projects with progress problems were projects seriously delayed reported by about every second innovating firm (54,2 %).

Table 2 presents the ranking of different factors hindering innovation activities in manufacturing enterprises in 1998-2000 and, for comparison, the ranking of factors hindering innovation activities in the service sector in 1997-1999. The data presented in table 2 relate to all surveyed firms, including non-innovators.

It is worth noting that the additional, country-specific, factor included in the list of obstacles used in the GUS innovation surveys, *viz*. high cost of bank credits, ranks very high in this ranking, especially in manufacturing sector.

Ranking based on shares of firms that have indicated given hampering factor (obstacle) as relevant *id est* as factor that had caused serious delay of at least one innovation project during the period covered or abolition of at least one project or failure to even start at least one planned innovation project. One means that given factor was reported as relevant by the highest number of firms having given type of innovation projects with progress problems while ten means that given factor was reported as relevant by the lowest number of firms having given type of projects with progress problems (for instance: among manufacturing enterprises whose at least one innovation project has been deferred, innovation costs too high are claimed to be the hampering factor by 41,6 % of enterprises while lack of qualified personnel only by 9,8 %).

Table 2. Ranking of the barriers to innovation (including non-inovators)

Specification	Projects seriously delayed		Projects abolished		Projects not even started	
	manufacturing	services	manufacturing	services	manufacturing	services
Economic factors						
Economic risks	4	10	2	2	4	2
Sources of finance	3	2	4	3	3	4
Innovation costs	1	1	1	1	1	1
Credit costs too high	2	3	3	6	2	3
Internal factors						
Information on markets	9	6	10	10	8	10
Information on technology	8	9	9	8	10	9
Organisational rigidities	6	8	7	7	9	6
Lack of qualified personnel	10	4	8	5	6	5
Other						
Regulations & standards	5	7	6	4	7	8
Customer responsiveness	7	5	5	9	5	7

3.7. Output of innovation

The principal indicator used to measure the outputs of innovation activities or the impact of innovations on the performance of the firm is the proportion of sales due to technologically innovative products (new or significantly improved products which are technologically novel for the enterprise: firm-only technological product innovations) put on the market within the last three years in total sales.

A quite systematic upward trend in the output of innovation, as measured by share of sales related to technologically innovative products, has been observed in Polish industry in the decade of 1990s - from less than 10 per cent in the early 1990s to about 20 per cent in 1997 - 1999 (in manufacturing sector to more than 20 %).

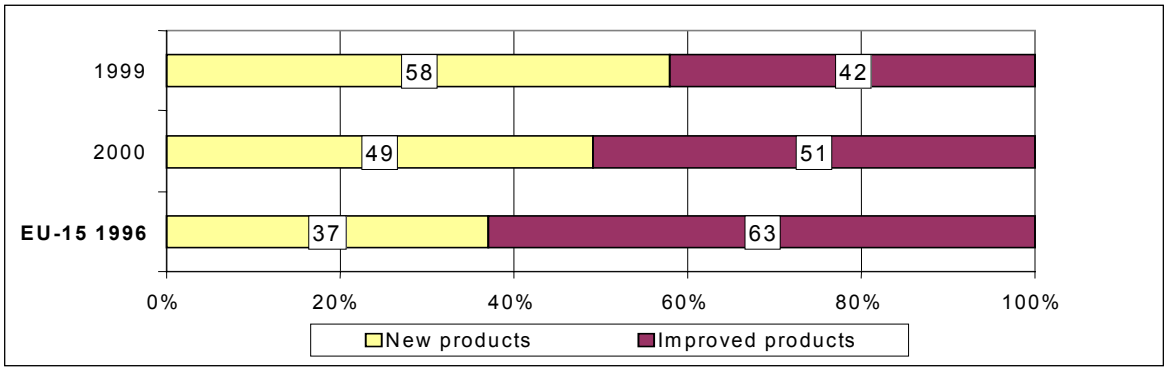
In 2000, this positive trend was broken down and the proportion of innovative products in total turnover in manufacturing enterprises decreased from about one fourth in 1999 to slightly less than one fifth (see Table 3).

Table 3. Share of sales due to technologically new and improved products in sold production of industrial products (current prices)

Specification	1997	1998	1999	2000
	products – in % - introduced into the market during			
	1995-1997	1996-1998	1997-1999	1998-2000
T o t a l	**20,1**	**20,0**	**21,3**	**16,4**
public sector	11,3	14,6	17,0	17,0
private sector	21,5	24,3	25,1	16,1
Of which Manufacturing	**20,9**	**22,4**	**24,7**	**18,5**
Manufacture of food products and beverages	10,1	11,6	12,5	9,6
Manufacture of tobacco products	3,2	8,2	3,5	18,4
Manufacture of textiles	7,9	7,7	8,5	13,3
Manufacture of wearing apparel; dressing and dyeing of fur	1,6	2,6	6,6	2,4
Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear	4,5	9,4	9,9	8,8
Manufacture of wood and wood, straw and wicker products	21,4	25,2	23,5	14,0
Manufacture of pulp, paper and paper products	51,5	7,3	26,4	7,6
Publishing, printing and reproduction of recorded media	2,9	2,9	8,1	13,9
Manufacture of coke, refined petroleum products and nuclear fuel	27,3	32,9	37,7	36,0
Manufacture of chemicals and chemical products	14,5	19,8	21,9	17,7
Manufacture of other non-metallic mineral products	16,2	14,2	12,9	10,6
Manufacture of rubber and plastic products	13,4	9,2	11,0	12,6
Manufacture of basic metals	3,7	5,3	8,4	6,7
Manufacture of fabricated metal products, except machinery and equipment	15,5	28,6	20,2	15,8
Manufacture of machinery and equipment n.e.c	45,3	40,5	63,5	29,5
Manufacture of office machinery and computers	71,7	88,3	96,3	48,3
Manufacture of electrical machinery and apparatus n.e.c.	21,6	22,1	38,7	24,3
Manufacture of radio, television and communication equipment and apparatus.	72,5	16,2	37,3	10,9
Manufacture of medical, precision and optical instruments, watches and clocks	24,0	24,0	71,6	75,0
Manufacture of motor vehicles, trailers and semi-trailers	60,0	79,2	50,1	34,9
Manufacture of other transport equipment	42,5	44,7	58,6	37,0
Manufacture of furniture; manufacturing n.e.c.	16,8	15,3	17,8	10,6

a Data concern enterprises employing more than 49 persons, until 1998 more than 50 persons in the sections: *Mining and quarrying* and *Manufacturing*, as well as more than 20 persons in the section *Electricity, gas and water supply.*

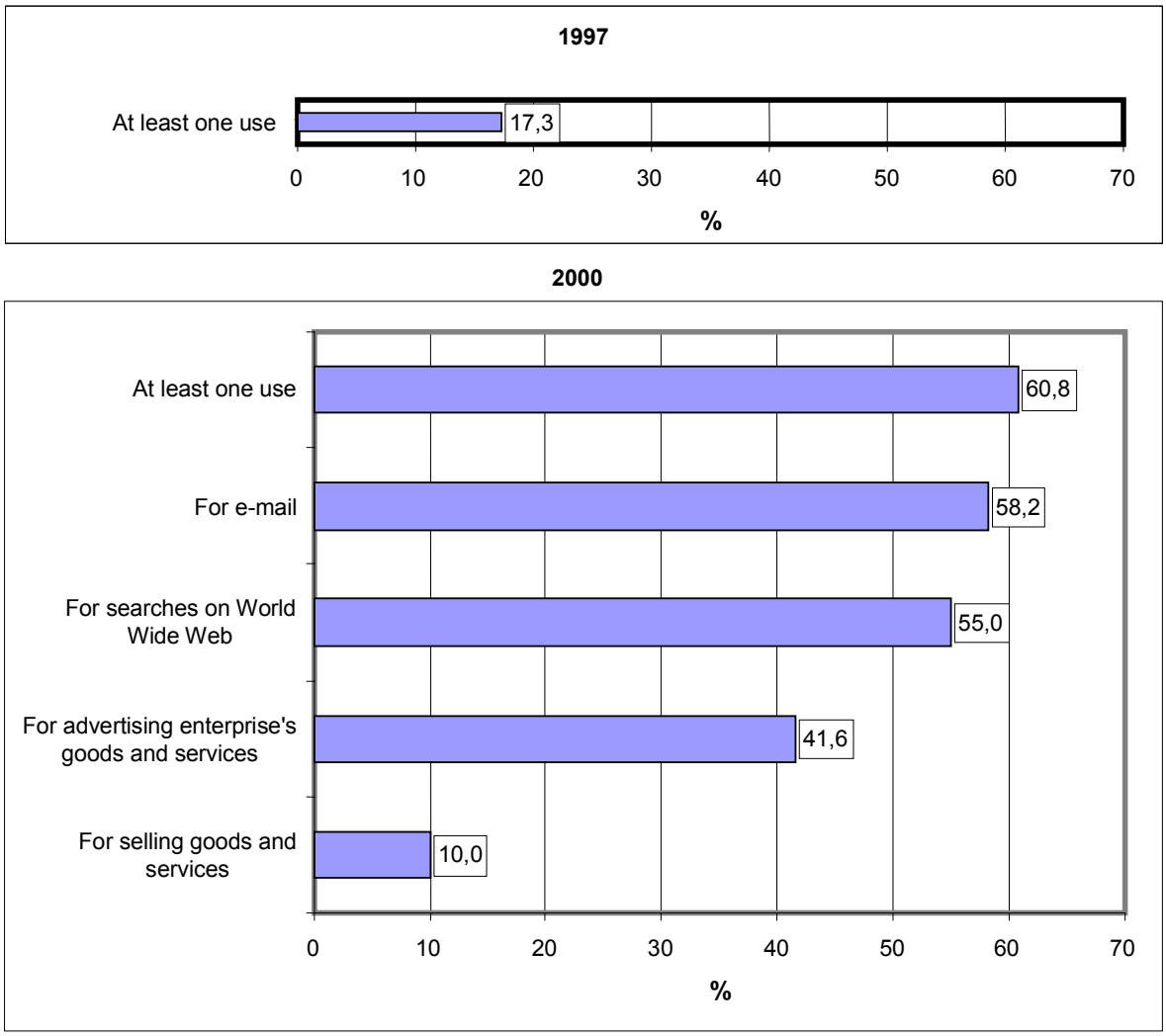
Figure 11.
BREAKDOWN OF TURNOVER[a] DUE TO INNOVATIVE PRODUCTS, NEW PRODUCTS AND IMPROVED PRODUCTS, 1999 AND 2000



a Data concern manufacturing enterprises with more than 49 employees, in the European Union - with more than 19 employees.

3.8. Supplementary information - use of the Internet in manufacturing enterprises

Figure 12.
USE OF THE INTERNET IN MANUFACTURING ENTERPRISES, 1997 AND 2000
As a % of the number of enterprises employing more than 49 persons



In the recent years, there has been recorded rapid growth in number of manufacturing enterprises using Internet.

In 2000, about 61% of all manufacturing enterprises with at least 50 employees, by 43,5 percentage points more than in 1997 and about 13 percentage points more than in 1999, reported that they used Internet in their operation (for e-mail, advertising, searching on WWW or selling goods and services) (see Figure 12).

4. Conclusion:

The paper analysed results of GUS innovation survey in manufacturing for 1998-2000 and innovation survey in services for 1997-1999. Innovation activities in 1998-2000 reflect downturn in Polish economy of this period. A number of innovative enterprises fell from 37.6% (1994-96) to 16,9 % (1998-2000). Also, innovation expenditures, which were continuously growing until 1999 have fallen for the first time. There is not significant difference in number of innovative firms between manufacturing and services.
Innovation expenditures as percent of total turnover are still high when compared to the EU but they have also fallen significantly from 1999 to 2000. Objectives of innovation activities of Polish firms are similar as in the EU. Obstacles to innovation are also similar except very high importance of interest rate as an obstacle to innovation in Poland. One third of innovative firms cooperate in undertaking innovation activities but within the sub-population of small firms the share of innovation co-operators is significantly lower than within large enterprises. A share of sales due to technologically new and improved products has been continuously growing until 2000 when this share also dropped.

ANNEX 1
INNOVATION MONITORING SYSTEM IN POLAND

At present, the innovation monitoring system in Poland consists of two parts:

⇒ A regular, concise, yearly, census on innovation in industry (mining, manufacturing and utilities sectors) in enterprises with more than 49 employees, covering selected basic variables of innovation activities such as expenditure on innovation and domestic and export sales of innovative products as well as transfer of technology; the regular census survey on innovation activity in industry, which was launched by GUS at the beginning of the 1980s, has evolved over time, responding to changing user needs, with the recent introduction of additional questions concerning such problems as the use of information (IT) and advanced manufacturing (AMT) technologies, of which the Internet, or the implementation of quality assurance standards or advanced management techniques.

⇒ Comprehensive, periodic surveys on innovation in industry and in marketed service sector (wholesale trade; transport and telecommunications; financial intermediation; computer and related activities; architectural, engineering and other technical intermediation; computer and related activities; architectural, engineering and other technical activities) in line with the EU/EFTA *Community Innovation Survey*, carried out every four years and covering a broad range of questions concerning different important aspects of innovation activities (sources of information for innovation, objectives of innovation, co-operation in innovation activities and obstacles to innovation).

Abbreviations and Acronyms

CIS	=	Community Innovation Survey
EEA	=	European Economic Area (EU and EFTA)
EFTA	=	European Free Trade Association
EU	=	European Union
GUS	=	Central Statistical Office of Poland
NACE	=	*Nomenclature générale des activités économiques dans les Communautés Européennes*
n.e.c.	=	not elsewhere classified
OECD	=	Organization for Economic Co-operation and Development
PLN	=	Polish national currency (zloty)
REGON	=	Polish register of national economy
R&D	=	research and development activity

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