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# BUDGETING AS A METHOD OF FINANCIAL MANAGEMENT OF POLISH HOSPITALS COMPARED TO EUROPEAN COUNTRIES

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Key words: planning, budgeting, hospital.

Abstract

This article presents the range of budget planning usage in European hospitals. The budgeting system in one of the Polish hospitals in the province of Warmia and Mazury is described.

**BUDŻETOWANIE W PROCESIE ZARZĄDZANIA SZPITALAMI W POLSCE NA TLE KRAJÓW EUROPEJSKICH**

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Słowa kluczowe: planowanie, budżetowanie, szpital.

Abstrakt

W artykule przedstawiono zakres wykorzystania planowania budżetów w szpitalach europejskich, w tym polskich. Scharakteryzowano również system budżetowania funkcjonujący w jednym ze szpitali województwa warmińsko-mazurskiego.

## Introduction

Linking the level of revenues generated by Polish hospitals with the number and quality of health services which they provide within the new financing system has resulted in the need for implementation of new manage-

ment methods. There is an on-going search for such a management system to ensure both effective planning and control of the financial resources in health care units. This need has proved the more urgent because, with the change in the financing system, patients have gained the possibility of deciding at which hospital they want to be treated, which has introduced competition between individual units. Budgeting seems to be an appropriate method for managing hospitals, a method which considers the principles of planning and the use of financial resources for the purpose of effective performance of tasks.

This paper presents planning as one of the components of the budgeting process in a hospital. A literature review and the results of research on the subject showed the level of utilisation of budgeting in the activities of Polish and European hospitals.

## Budgeting as a category of financial planning

Budgeting as an interdisciplinary category makes use of both management theory and the science of finance. This is a method which provides discipline and control of the flows of funds within an enterprise, while encompassing all the functions of management: planning, organising, motivating and control. Planning in an enterprise can be defined after M. Nowak (KOMOROWSKI 1997) as the "systematic setting of the directions of actions and the use of resources for achievement of the intended goals".

The goals of budgeting can be divided into:

a) short-term (operational) ones,

b) medium-term (tactical) ones,

c) long-term (strategic) ones.

Financial liquidity improvement, operational profit level control, decreasing the level of risk and uncertainty in economic activity, enterprise organisational efficiency improvement as well as improvement of operative production management can be classified as operational goals. Improvement of technological work intensity and material consumption standards, effective allocation of resources and maintaining the stable financial standing of the organisation are considered the main tactical goals. The strategic goals of budgeting include the increasing confidence of clients and institutions cooperating with the enterprise. The mission and plans of the organisation are tightly correlated with the entire budgeting process.

The position of budgeting in the planning system of the organisation is presented in Figure 1.

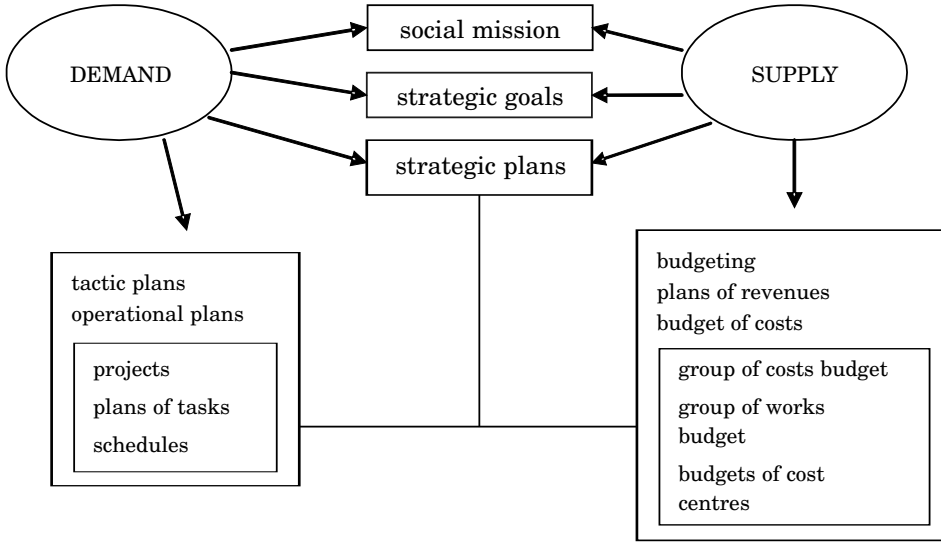


Fig. 1. Position of budgeting in the system of plans of the enterprise
*Source*: own work.

## Budgeting of costs and revenues of hospitals in the light of empirical studies

The budgeting process in health care entities became the subject of research and studies during the early 1990s. The pioneering studies in this area by D. Reis Miranda were conducted during the years 1994–1996 in 12 European countries (JEGERS 1996). They aimed at investigating the methods of budgeting as well as recording and accounting for the costs that were practiced at health care institutions.

The surveys were conducted in Belgium, Denmark, England, France, Germany, Italy, Luxemburg, The Netherlands, Poland, Portugal and Spain (in the case of Spain, Catalonia was separated because of specific organisational solutions in the operation of health care institutions). The data was collected from a questionnaire from selected respondents in several hospitals in individual countries. In the questionnaire, budgeting was defined as a sovereign decision taken by the hospital authorities, allowing incurring expenditures to be distributed to individual units during the assumed period. The interviewers investigated the level of detail of the budgets prepared at the individual hospitals. In the majority of cases, the budgets prepared by the hospitals were prepared at the level of current expenditures for payroll, budget of other current expenditures and budget of investment expenditures. The responses to

Table 1

Existence of budgets for investment expenditures in the hospitals surveyed

| Country | Response | | | | | | Total |
|---|---|---|---|---|---|---|---|
| | yes | | no | | no response | | |
| | *n* | % | *n* | % | *n* | % | *n* |
| Belgium | 3 | 50 | 1 | 17 | 2 | 33 | 6 |
| Denmark | 1 | 17 | 5 | 83 | 0 | 0 | 6 |
| England | 1 | 13 | 7 | 88 | 0 | 0 | 8 |
| Finland | 5 | 100 | 0 | 0 | 0 | 0 | 5 |
| France | 2 | 50 | 2 | 50 | 0 | 0 | 4 |
| Germany | 1 | 33 | 2 | 67 | 0 | 0 | 3 |
| Italy | 1 | 14 | 5 | 71 | 1 | 14 | 7 |
| Luxemburg | 1 | 100 | 0 | 0 | 0 | 0 | 1 |
| The Netherland | 4 | 67 | 2 | 33 | 0 | 0 | 6 |
| Poland | 1 | 13 | 4 | 50 | 3 | 38 | 8 |
| Portugal | 1 | 20 | 2 | 40 | 2 | 40 | 5 |
| Spain | 8 | 28 | 18 | 62 | 3 | 10 | 29 |
| Total | 29 | 33 | 48 | 55 | 11 | 13 | 88 |

*n* – number of hospitals
*Source*: own work based on JERGES (2006).

the question of whether hospitals prepare budgets for investment expenditures are presented in Table 1.

For the entire surveyed population of hospitals from the European countries, this indicator was at the level of 33%. The highest percentages of hospitals preparing the investment budgets were recorded in Finland and Luxemburg (100%) and in The Netherlands (67%). In Belgium and France, only every second hospital surveyed prepared plans of investment expenditures in the form of budgets. In Poland, among the 8 hospitals surveyed, only one prepared a budget of that type, which represents only 13% of the hospitals surveyed in Poland. This situation indicates the low interest in employing budgeting in the process of managing hospitals in Poland.

The so-called "increase-based" method, according to which the budget for the following year is drafted on the basis of the previous year's budget periodically adjusted for inflation, is the most frequent method of budget preparation. This budgeting method was encountered in Denmark, England and France. Appropriate flexibility is an immensely important characteristic of the budget. In case of changing external and internal conditions, performance

of the set budget may be irrational and sometimes impossible. Budgeting can play the role of the effective management tool when it considers in its assumptions the dynamic operational conditions of the individual centres responsible. Within the framework of the survey discussed, the respondents were asked about the possibility of making changes to the budget after its approval (Tab. 2).

Table 2

Possibility of modification of the implemented budgets at the surveyed hospitals

| Country | Response | | | | | | Total |
|---|---|---|---|---|---|---|---|
| | yes | | no | | no response | | |
| | *n* | % | *n* | % | *n* | % | *n* |
| Belgium | 1 | 17 | 2 | 33 | 3 | 50 | 6 |
| Denmark | 3 | 50 | 0 | 0 | 3 | 50 | 6 |
| England | 7 | 88 | 0 | 0 | 1 | 13 | 8 |
| Finland | 5 | 100 | 0 | 0 | 0 | 0 | 5 |
| France | 3 | 75 | 0 | 0 | 1 | 25 | 4 |
| Germany | 2 | 67 | 1 | 33 | 0 | 0 | 3 |
| Italy | 2 | 29 | 4 | 57 | 1 | 14 | 7 |
| Luxemburg | 1 | 100 | 0 | 0 | 0 | 0 | 1 |
| The Netherlands | 3 | 50 | 0 | 0 | 3 | 50 | 6 |
| Poland | 0 | 0 | 4 | 50 | 4 | 50 | 8 |
| Portugal | 2 | 40 | 2 | 40 | 1 | 20 | 5 |
| Spain | 9 | 31 | 4 | 14 | 16 | 55 | 29 |
| Total | 38 | 43 | 17 | 19 | 33 | 38 | 88 |

*Source*: own work based on JERGES (2006).

The responses indicate that, in Poland, rigid budgets were prepared that could not be modified at the performance stage. That characteristic of the budgets differentiated Poland from all the other countries. In Finland and Luxemburg, the possibility of modifying the budgets existed in all the hospitals, while in France and Germany the percentage of hospitals that had such a possibility was 75% and 67%, respectively.

It is worth highlighting that studies on the use of management accounting, including budgeting, in Polish enterprises are quite extensive (GIERUSZ et al. 1996, KANAST 1993, RADEK, SCHWARZ 2000, SOBAŃSKA, WNUK 2000), but similar analyses concerning the functioning of health care institutions are very few (WAWE 2001, KUJAWSKA 2004, KLUDACZ 2005).

In 2006, a survey concerning budgeting in hospitals in the province of Warmia and Mazury was conducted. The survey aimed at determination of the scope of the budgeting system use by hospitals in the management process. The survey involved conducting interviews with the managements of 5 hospitals concerning the implementation of a comprehensive budgeting system. The choice of entities for the sample was deliberate. They were all entities from the area of the province of Warmia and Mazury whose managements had agreed to take part in the survey. Among the 5 hospitals surveyed, only one had completely implemented a comprehensive budgeting system. The planning process as an element of the budgeting system at that hospital is described further in this paper[1].

At the surveyed hospital, the budget was prepared for a period of one year with division into annual quarters in correlation with strategic planning. Both strategic and tactical goals had a clear influence on drafting the budget.

The hospital surveyed defined its strategic goals for the years 2003–2006 as follows:

a) retaining the supply of health services adjusted to the health needs of the population and hospital infrastructure capacity,

b) retaining the accredited hospital status as evidence of the high quality of services provided,

c) increasing the scope of health services within the market demand limits,

d) improving hospital management efficiency.

The above assumptions were targeted at attainment of long-term goals consistent with hospital development directions and its mission, which is: "Providing specialist health services [...] competitive for the body managing the funds as concerns the quality and costs of medical procedures". In the detailed description of the strategic goals, the tactical and operational objectives of the hospital were defined. The following, among others, were included among those objectives:

a) quarterly monitoring of the statistical and epidemiological indicators of the hospital activity,

b) analysis of hospital personnel work time and the volume of tasks entrusted to it and performed by it,

c) staff training according to the human resources policy,

d) modernisation and refurbishment of hospital facilities.

Correlation of the hospital plan with the entire budgeting process was considered necessary as it is an element of the principle of planning homogeneity.

The system of financing, as well as the system of recording and accounting for costs, are a major influence on the method of planning medical services in

[1] The hospital Management did not give its consent for revealing its name.

Polish hospitals. Surveys conducted in 2000 on a sample of 24 public health care units in Poland showed that the contracts with the regional health funds functioning at that time represented the main source of funding for those institutions (KAUTSCH et al. 2000). This is confirmed, among others, by the structure of inflow of funds to the hospital surveyed in the province of Warmia and Mazury, which in 2005 was as follows:

a) Revenues from sales of services (96%),

b) Subsidies received (2.3%),

c) Other operational revenues (1.2%),

d) Other revenues (donations, compensations, financial revenues) (0.5%).

At the hospital surveyed, the contracts[2] with the National Health Fund (NFZ) represented 92% of all revenues. The level of revenues from sale of health services generally depends on the volume and price of the health services contracted. At the hospital they are represented in the form of both subjective and objective budgets. In drafting plans of medical services sales, historical data is used the most frequently coupled with consideration for factors such as the capacity for contracting services with the NFZ, changes in the demand for individual medical services and timely payments by NFZ for the medical services provided. Another, more complicated method for projecting sales of medical services also exists. It involves comparison of the given hospital with other health care entities in the given region by applying, e.g. a linear function of regression.

In practice, the planned sale of medical services is formed in the budgets of:

a) service plans contracted with the NFZ considering the individual organisational units of the hospital (rehabilitation, urodynamic examinations, clinical services, dental department),

b) performance plans of the individual services at hospital laboratories,

c) performance plans of the hospitalisation services at individual hospital departments,

d) performance plans of the individual procedures at specialist clinics.

In addition to planning the revenues from sales, planning of costs is also necessary. The hospital analysed draft budgets of costs by type, budget of the fixed costs and budget of the investment expenditures.

Budget reporting represents an important element of the budgeting procedure. The report from performance of the budget in the hospital surveyed contains the following elements:

– costs divided into fixed and variable,

– revenues in the contracted part (1/12 of the yearly contract),

– transfer of a part of the contracted revenue for costs of general management,

[2] According to the plan for 2006.

– revenues in the part exceeding the contracts with the NFZ,

– financial result (cash financial result adjusted by revenues exceeding contracts with the NFZ).

Additionally, the report presents the information concerning the number of beds at the department, number of person/days performed, accrued points for procedures and employment (Tab. 3).

Table 3

Report from performance of the budget of the hospital surveyed

| Report performance of the budget | | | | | | |
|---|---|---|---|---|---|---|
| Unit name | | | for the period of | | | |
| Person responsible for performance | | | | | | |
| Costs | Variable | Year budget | Performance accrual | Budget for the period | Performance for the period | Deviation [%] |
| A. Direct costs | | | | | | |
| Medical equipment | ✓ | | | | | |
| Material consumption | ✓ | | | | | |
| Medical drugs | ✓ | | | | | |
| Auxiliary materials | ✓ | | | | | |
| Depreciation | | | | | | |
| Payroll | | | | | | |
| ... | | | | | | |
| B. Indirect costs | | | | | | |
| Sterilisation | | | | | | |
| Laboratory | | | | | | |
| Clinics (USG – RTG) | | | | | | |
| Pharmacy | | | | | | |
| Technical Department | | | | | | |
| Admissions I | | | | | | |
| Administration | | | | | | |
| ... | | | | | | |
| C. Revenues | | | | | | |
| Contracted sales | | | | | | |
| Other sales | | | | | | |
| Internal revenues | | | | | | |
| Financial result | | | | | | |
| Points contracted for the year | | Limits of points for the period | | Performance of points during the period | | |

*Source*: material of the hospital surveyed.

The prepared budgets represent an important element in the reports from their performance in that next to the planned values, information concerning performance is also contained. The same solid foundations are established for, e.g. budget performance level assessment, taking corrective actions, analyses of the costs of patient treatment and procedures performed during individual reporting periods, determining methods for decreasing costs and renegotiation of the contracts made with the NFZ.

## Conclusion

Planning as a function of management is particularly important in large enterprises possessing complicated and complex production processes and operating under conditions of high competition. Hospitals are undoubtedly such organisations. Considering the various forms of activities within one organisation (the basic activity of the hospital, hospital clinics, pharmacies, analytical laboratories, rehabilitation centres, clinics,) coordination of their functions by defining the goals of the entire enterprise as well as the preparation of plans of operations for the future periods is necessary.

In Polish hospitals, the extent of use of this tool is very low and looks very poor as compared with the European hospitals. Additionally, the quality of the budgeting systems already in operation also seems unsatisfactory. It seems that the poor standing of Polish hospitals is also influenced by the unfavourable condition of medical service contracting as well as poor financial management of those institutions.

Translated by Małgorzata Cygańska

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# INFLUENCE OF MILK PRODUCTION LIMITS ON THE DAIRY SECTOR IN THE PROVINCE OF WARMIA AND MAZURY

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Key words: milk quota system, common agricultural policy, milk production.

Abstract

This paper analyses the influence of the implementation of milk quotas on the dairy sector and the situation of milk producers in the province of Warmia and Mazury and describes the changes taking place in the milk market from 2004–2009 in milk production, processing and management. The research material originated from a questionnaire-based survey conducted by the Chair of Economic and Regional Policy of the University of Warmia and Mazury in Olsztyn in close collaboration with the Agricultural Market Agency (AMA). The survey encompassed 313 milk producers from the province of Warmia and Mazury during the quota year of 2009/2010. The remaining data referenced in the publication originated from materials developed by the AMA, the Agency for Restructuring and Modernisation of Agriculture (ARMA), the Ministry of Agriculture and Rural Development (MoA) and the Central Statistical Office (GUS).

The milk production quota system was intended to prevent excessive supply of raw material on the market and trigger concentration processes in the dairy sector. On the basis of the AMA studies results, it was determined that in the six years following milk production quotas, almost 3,500 producers withdrew from the market. Additionally, an analysis of data made available by the AMA indicates that the volume of milk produced has been constantly increasing (during the years 2004–2010 the volume of wholesale milk sold from a single supplier per year increased by 58.11% in the area of the province of Warmia and Mazury).

## WPŁYW LIMITOWANIA PRODUKCJI MLEKA NA SEKTOR MLECZARSKI W WOJEWÓDZTWIE WARMIŃSKO-MAZURSKIM

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Słowa kluczowe: system kwot mlecznych, wspólna polityka rolna, produkcja mleka.

Abstrakt

W pracy przeanalizowano wpływ wdrożenia systemu kwotowania produkcji mleka na sektor mleczarski oraz sytuację producentów mleka w woj. warmińsko-mazurskim. Podjęto też próbę charakterystyki zmian zachodzących na rynku mleka w latach 2004–2009 w dziedzinie produkcji, przetwórstwa i zarządzania. Materiał badawczy wykorzystany w pracy pochodził z ankiet przeprowadzonych przez Katedrę Polityki Gospodarczej i Regionalnej Uniwersytetu Warmińsko-Mazurskiego w Olsztynie w ścisłej współpracy z olsztyńskim oddziałem Agencji Rynku Rolnego (ARR). Badaniami objęto 313 producentów mleka z woj. warmińsko-mazurskiego w roku kwotowym 2009/2010. Pozostałe dane przytoczone w publikacji pochodziły z materiałów opracowanych przez ARR, Agencję Restrukturyzacji i Modernizacji Rolnictwa (ARiMR), Ministerstwo Rolnictwa i Rozwoju Wsi (MRiRW) oraz GUS.

System kwotowania produkcji mleka miał przeciwdziałać nadmiernej podaży surowca na rynku oraz wzmóc procesy koncentracji w sektorze mleczarskim. Na podstawie wyników badań ARR stwierdzono, że w ciągu sześciu lat od wprowadzenia limitów produkcji mleka z działalności na tym rynku wycofało się blisko 3,5 tys. producentów. Ponadto z analizy materiałów udostępnionych przez ARR wynika, że stale wzrastała ilość produkowanego mleka (w latach 2004–2010 na obszarze woj. warmińsko-mazurskiego wielkość hurtowo sprzedanego mleka rocznie od 1 dostawcy wzrosła średnio o 58,11%).

## Introduction

Milk quotas, next to direct subsidies, are among the fundamental instruments functioning within the framework of the Common Agricultural Policy (CAP). Milk production limits were introduced in 1984 to inhibit excessive milk production development in the European Economic Community (EEC) member states. The integration of Poland into the European Union (EU) and integrating the agricultural sector with the CAP mechanisms initiated a process of extensive transformation of Polish agricultural producers. The milk market has seen extensive transformations since the system of milk quotas began in 2004 (KASZTELAN 2009).

Operating a farm requires not only extensive labour input but also market sensitivity. This principle is not just a consequence of Poland's accession to the EU, but is also a determining factor for continual economic development, including an evolution in the perception of the function of agriculture and changes in consumer expectations (REKLEWSKI, RUNOWSKI 2005). Intensified adjustment processes concerning the structure and scale of animal production have been accelerated by subjecting Polish agriculture to the CAP principles (ZIĘTARA 2006).

## Characteristics of the studied area

A questionnaire-based survey of 313 dairy farmers from all counties of the province of Warmia and Mazury was conducted. Analysis of the responses to the questions took into account the division of the surveyed population into

groups according to milk production volumes to obtain in-depth opinions from individual communities. The division into groups of very small (25 respondents with production not exceeding 70,000 kg of milk per year), small (94 respondents with production ranging from 71,000 to 150,000 kg of milk per year), medium (143 respondents with production ranging from 151,000 to 350,000 kg of milk per year), large (37 respondents with production ranging from 351,000 to 700,000 kg of milk per year) and very large (13 respondents with production exceeding 700,000 kg of milk per year) producers was made based on the product of the maximum milk productivity of cows in the province of Warmia and Mazury in 2009 (7,000 kg of milk per year) and the upper value of the ranges of heads per herd presented in the questionnaire (10, 20, 50, 100 and over 100 heads of dairy cows, respectively).

The low level of infrastructure development, shortage of human resources and poor development of enterprise are the specific characteristics of agriculture in the province. Additionally, farmers are challenged by unfavourable terrain structure, diversification of soils and a relatively short vegetation period. Unfavourable natural conditions require the possession of specialised technical facilities, which also generates higher agricultural production unit costs and results in lower profitability as compared to the other regions of the country (Development strategy of the province of Warmia and Mazury by 2020. 2005). A relatively good farm size structure is the fundamental strength of agriculture in the province of Warmia and Mazury. The average farm size in the province in 2010 was 22.95 ha, which was over twice the national average (Agencja Restrukturyzacji i Moderniyacji Rolnictwa).

The surveys indicate that more than half of the dairy farmers from the province of Warmia and Mazury possessed farms ranging from 21 ha to 50 ha. Farms with areas ranging from 51 ha to 100 ha were owned by almost 28% of the respondents. Large area farms exceeding 100 ha were owned by slightly over 12% of the respondents. An analysis of the survey results confirmed that along with an increase in the level of production, the owned area of the farmed also increased. Larger production scales involved increasing the number of heads per herd, which required increasing the area of agricultural land owned.

According to the literature, farms keeping a minimum of 10 dairy cows have opportunities for development; however, this group of suppliers has the largest problems with establishing favourable cooperation with dairy plants (Ziętara 2009). The largest herds, consisting of 51–100 heads of cattle were owned by 10.58% of the respondents. The largest group of milk producers surveyed (67.31%) possessed herds of 20 to 50 heads of dairy cows. The smallest herds (consisting of a maximum of 10 heads of cattle) were owned by fewer than 2% of the farms surveyed.

Milk is one of the more important products in human nutrition. According to the majority of specialists, milking is the most important job in maintaining dairy cows. All mistakes or negligence during milking influence, among others, the productivity and quality of milk and, consequently, may have a large influence on decreasing the profitability of milk production (OPRZĄDEK 2005). In recent years, the methods of obtaining milk have changed from manual milking to using advanced automated milking units.

Analysis of the results obtained from the survey conducted indicates that the most traditional technology, i.e. hand milking, was applied by only 19 milk producers. Pipeline milking devices and a milking parlour system were indicated as the main technique for obtaining milk applied by suppliers in the province. Evident progress in milking techniques and an increase in the scale of milk production should be highlighted.

The farmer plays the most important role on a farm. He makes decisions and actions which depend, among others, on his ability to see and evaluate environmental conditions (MIERZWA 2008). The age and health status of the person running the farm are important factors as they also have a major influence on the decisions related to the production process and its future.

The age structure of the surveyed population was considered favourable because of the high share of young people (compared to the other regions of the country). People aged 40–60 years (ca. 58%) dominated among the owners of the farms surveyed. Both the youngest and the oldest groups of milk producers have similar shares in the surveyed population, oscillating around 3–4%. Based on the surveys, it was confirmed that young people aged up to 25 years were searching for employment in non-agricultural sectors of the economy (HELLER 2000). This behaviour can be explained by the fact that agricultural production was, in the opinion of the respondents, a highly-demanding occupation whose economic benefits frequently did not cover the costs incurred or the labour input.

## Influence of the milk quota system on dairy sector concentration in the province of Warmia and Mazury

During recent years, milk production has played an important role in the animal production market in the surveyed area. In 2008, milk production in the province of Warmia and Mazury represented close to 32.6% of the total animal production market (Główny Urząd Statystyczny). As of 2005, the milk production volume in the province of Warmia and Mazury had a similar share in the total national production. However, over the last 5 years it has not exceeded 8%.

In analysing the milk production data obtained from the surveys conducted by the Central Statistical Office, a slight increasing trend can be noticed (from 2005–2010 the volume of raw material produced in the province of Warmia and Mazury increased by 13.71%).

Nevertheless, the concern is that the milk production increase was more a result of increasing the number of dairy cattle heads and not increasing their milk productivity per head. Over the five years, milk productivity per head only increased by 4% (Tab. 1) This small productivity increase is not a good sign for future production scale increases, as increasing the herd size is less favourable than increasing the unit effectiveness level.

Table 1

Population of cows and milk production in the province of Warmia and Mazury from 2005–2009

| Year | Milk production [kg] | Share in the national production [%] | Average number of cows [heads] | Productivity [kg] |
|---|---|---|---|---|
| 2005 | 811,076 | 7.01 | 188,384 | 4,305 |
| 2006 | 854,004 | 7.34 | 197,221 | 4,330 |
| 2007 | 832,782 | 7.09 | 196,729 | 4,233 |
| 2008 | 862,606 | 7.15 | 197,783 | 4,361 |
| 2009 | 907,249 | 7.51 | 203,068 | 4,468 |
| 2010 | 922,278 | 7.74 | 207,882 | 4,549 |

*Source:* own work based on the Central Statistical Office data.

The introduction of the milk production quota system significantly accelerated the process of transformations in the dairy sector in the province of Warmia and Mazury. On the basis of the results of surveys made available by the GUS, from 2004–2010 a continual decrease in the number of active wholesale suppliers was observed in the province. Analyses conducted by the AMA (PAŁACH 2011) indicate that during the quota year of 2009/2010, there was a decrease in the number of active wholesale producers in the province of Warmia and Mazury by almost 3,500 compared to 2004/2005 (Tab. 2). A similar trend was recorded in the other regions of the country. It should be assumed that changes in both the production structure and the number of suppliers were caused by milk producers adjusting to the new quality requirements.

Much more extensive changes occurred among the direct milk suppliers. Over the six years following implementation of milk quotas, their numbers decreased by more than 77%, while the total volume of milk they supplied to the market decreased by over 75%. The data indicates an increasing concentration of milk production and decreasing popularity of direct supplies. The

Table 2

Characteristics of the dairy sector in the province of Warmia and Mazury after implementation of the milk production quota system

| Item | Quotas year | | | | | |
|---|---|---|---|---|---|---|
| | 2004/2005 | 2005/2006 | 2006/2007 | 2007/2008 | 2008/2009 | 2009/2010 |
| Wholesale suppliers | | | | | | |
| Number of collaborating dairy plants | 46 | 41 | 37 | 38 | 39 | 39 |
| Number of active producers | 12,137 | 11,322 | 10,329 | 9,494 | 9,041 | 8,672 |
| Volume of milk purchased [M kg] | 628.8 | 689.9 | 707.5 | 701.2 | 733.4 | 710.7 |
| Production share in the national quota [%] | 7.80 | 8.00 | 7.80 | 7.30 | 7.80 | 7.90 |
| Direct suppliers | | | | | | |
| Number of producers | 929 | 432 | 395 | 345 | 235 | 211 |
| Volume of milk traded [M kg] | 6.59 | 3.51 | 3.55 | 3.01 | 1.81 | 1.59 |

*Source:* Rolniczy biuletyn informacyjny – Bieżące Informacje WMODR Olsztyn, nr 3/2011.

decrease of interest in direct sales can be explained by the higher transaction costs as compared to wholesale supplies. Additionally, suppliers involved in direct sales were forced to meet much higher quality requirements than wholesale suppliers[1].

Table 2 presents the outline of the general dairy sector situation in the province of Warmia and Mazury, although the surveys indicate that individual regions have different conditions for milk production. To obtain a more precise synthesis, the AMA material analysed the situation of the individual counties within the area surveyed. From 2004–2010, the largest decrease in the number f producers occurred in the counties of Nowe Miasto, Ostróda and Braniewo (by 53.78, 47.82 and 42.15%, respectively) while the smallest proportion of suppliers resigned from milk production in the counties of Pisz, Mrągowo and Olecko (10.63, 12.88 and 16.44%, respectively). On this basis, however, we cannot indicate particular regions where milk production decreases or increases occurred. As indicated by surveys, producers resigning from milk production usually increased the resources of the available labour force in the regional labour market or changed their profile of activities.

According to the AMA data, during recent years the volume of wholesale milk sold by single suppliers increased continually. Over the six years of the quota system, the largest milk production concentration occurred in the

[1] Regulation of the Minister of Agriculture and Rural Development of 18.08.2004 on the veterinary requirements for milk and dairy products.

county of Nowe Miasto (an increase in milk sales from 1 supplier by as much as 137.80%) as well as Ostróda and Iława (by 89.62% and 80.15%, respectively). The lowest level of milk production concentration was observed in the counties of Kętrzyn and Gołdap (by 10.26 and 20.96% respectively) (Fig. 1).

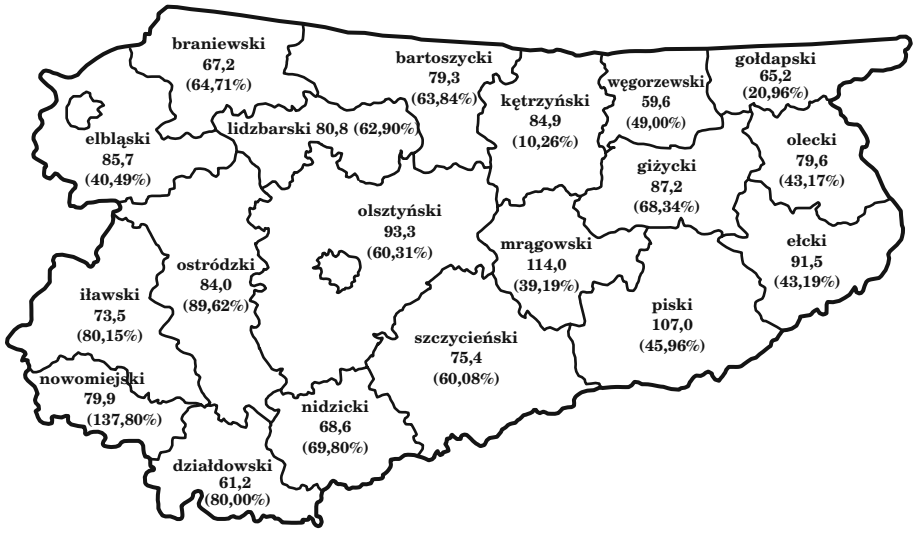


Fig. 1. Average milk sales from 1 supplier in the province of Warmia and Mazury in the quota year of 2009/2010 and the actual change as compared to the quota year 2004/2005 [K kg]
*Source:* own work based on the AMA 2010 data.

It should be assumed that the willingness to increase the profit margin generated by the farm and the necessity of recovering the costs incurred on investments by adjusting the quality of raw material produced to the market conditions were the causes for the increased sales.

Poland's integration to the EU facilitated the establishment of cooperation and competition with the economies of the other member states. Although entering the new market offered new opportunities to Polish agriculture, it should also be remembered that membership in such a large organisation also resulted in threats resulting from the western partners' advantages in the fields of technology and experience (FABIRKIEWICZ et al. 2008). The decision to include the Polish dairy sector into the European Union milk production quota system was a concern for producers. The fears of farmers concerned mainly the possibility of being allocated limits below their scale of production. After over six years of the milk quota system operation in Poland, it now seems clear that those concerns were unjustified and milk producers have adjusted the level of their production perfectly to meet the new market conditions.

## Evaluation of the milk market

Following Poland's accession to the European Union, the dairy sector was covered by community law. As of 2004, the situation in the Polish milk market also started becoming dependent on the EU market situation. It should be pointed out that Poland's accession to the EU, in addition to stabilisation of agricultural policy, resulted in the requirement to accept and observe the community legal regulations concerning production methods, environment protection and animal welfare. Additionally, milk producers had to meet the increasing demands of consumers concerning the quality and price of dairy products (SŁONIEWSKI 2005).

The conducted surveys did not show any clear opinion concerning the situation in the milk market after the implementation of milk quotas. Only slightly more than 1/3 of the respondent milk producers in their evaluation of the situation in the raw material market after 2004 declared that it was subject to perceptible improvement. That result shows (according to the producers) that the main goal of the quotas (i.e. stabilisation of supply in the milk market and of the prices for raw material) was not fully achieved. The worst opinions on the quota system's influence on the Polish dairy sector were held by the group of the smallest producers – 28%, while the most positive opinions were presented by the largest ones – 46.15% (Tab. 3).

Table 3

Evaluation of the milk market after the implementation of the milk quota system with division of producers according to milk production [in %]

| Production groups [K kg] | Evaluation of the milk market after implementation of the milk quota system | | | |
|---|---|---|---|---|
| | improved | deteriorated | did not change | no opinion |
| | [%] | | | |
| Up to 70 | 12.00 | 28.00 | 28.00 | 32.00 |
| 71–150 | 28.72 | 23.41 | 28.73 | 19.14 |
| 151–350 | 38.46 | 25.17 | 23.08 | 13.29 |
| 351–700 | 38.14 | 26.73 | 18.92 | 16.21 |
| Over 700 | 46.15 | 15.39 | 30.77 | 7.69 |
| Average for the population surveyed | 32.69 | 25.64 | 25.00 | 16.67 |

*Source:* own work based on surveys.

It is possible that the negative opinion on the quota system reflected the collapse of the equilibrium mechanisms in the milk market between 2007 and 2008. Producers, convinced that the quotas would protect that production sector against negative consequences of the economic crisis were surprised by

the low effectiveness of the CAP instrument. Although the system of milk quotas was not evaluated too positively by the respondents, more than a half of them stated that elimination of production limits would lead to deterioration of the situation in the milk market. That result shows that the producers were more supportive of retaining the milk quotas system even though, in their opinion, it was not perfect. Their support for the quotas was probably based on their fear of adjusting to the new conditions in the milk market.

Milk as a commodity possesses a defined price which, in a market economy, is determined by the volumes of demand and supply. Despite periodic declines in the milk market, an increasing trend can be observed in milk prices (KOGUT 2006). Stabilisation of supplies was one of the major goals for implementation of the milk production quota system, which was to result in maintaining milk prices at the level satisfying both the milk producers and the consumers (MALAK-RAWLIKOWSKA 2005). In 2000, the average price was PLN 0.78 per 1 $dm^3$, while in 2009 the dairy plants paid PLN 0.90 per 1 $dm^3$ of milk (Główny Urząd Statystyczny). The producers surveyed declared that the system of milk quotas had a significant influence on milk prices in the market. Unfortunately, although they assumed that milk quotas were intended to regulate the supply of milk to the market and, consequently, stabilise prices, producers frequently declared that its influence was the opposite. Almost 40% of the respondents did not notice any influence of quotas on the economic situation in the milk market.

The unfavourable relation between the milk purchasing prices and the production costs during the surveyed quota years forced the dairy farmers to conduct a milk production cost analysis. It should be highlighted that the profit of dairy farms is determined not only by milk prices but, above all, the costs of its production. The cost of feeding the dairy cows, i.e. the costs of producing or purchasing feed, is the most important item of expenditures (ca. 40–60% of the total milk production costs) (KOWALSKI 2009). The remaining costs include electricity and water consumption charges, maintenance of the technical facilities and labour costs.

## Interventionism in the milk market

In analysing the experiences of the developed economies, it can be concluded that the free market mechanisms, as well as providing benefits, also result in negative consequences to the economy of the country by increasing the disproportions in the level of regional, economic and social development. Supporters of full liberalism say that price fluctuations in the market represent the normal situation, which has a positive influence on increasing

economic effectiveness. Unfortunately, the process of adjustment of milk producers to the market demands usually progresses much slower and less efficiently than in other sectors of the economy. That characteristic is correlated with the length and natural conditions of the individual production cycles (KISIEL 2001, 2002).

In surveying the opinions of selected milk producers from the province of Warmia and Mazury, it was established that up to 64.74% of them expected more extensive state intervention in the milk market; although the larger the producer was, the lower the expectations related to state aid were. Almost 3/4 of the smallest milk producers wanted more extensive state involvement in the milk market. Those expectations could result from the unfavourable economic situation of small scale milk producers and the inability to compete in the free market. Every fourth respondent stated that the regulations in the milk market at that time were at a sufficient level (Fig. 2).

The European Union milk market is governed by numerous legal and administrative regulations whose main aim is to adjust the raw material supply to the market demand. According to the free market economic principles, the so-called "invisible hand" of the market is the best in stimulating the size of demand and supply. Unfortunately, that mechanism usually offers benefits to the stronger party, which increases the disproportions in agricultural population incomes (MICHNA, MIEROSŁAWSKA 2009).

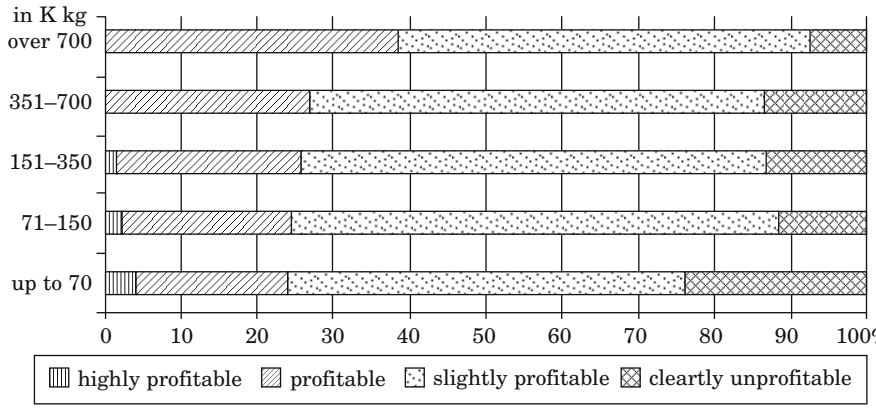


Fig. 2. Level of milk production profitability according to milk production volume [K kg]
*Source:* own work based on surveys.

The questionnaire-based surveys were conducted immediately after a deep collapse of prices in the milk market, which was reflected in the responses concerning production profitability. In view of the conducted surveys, it was concluded that milk production was the least profitable for farmers with milk

production under 70 K kg. In every group of producers, low opinions concerning milk production profitability dominated (Fig. 2). Additionally, an analysis of opinions expressed by milk producers showed a peculiar regularity: with a decrease in production scale, the percentage of producers declaring that milk production is highly profitable increases. Considering the fact that a larger scale of production should translate into reducing costs and decreasing expenditures, large and very large milk producers should theoretically be more satisfied with the economic results of their farms.

## Conclusions

Many restructuring and concentration processes in the domain of agricultural raw material production have taken place in Poland since its accession to the European Union. Gradually, the number of active milk suppliers has decreased while milk production has moved to regions where the concentration of herds, production of cheap volume feed and favourable natural conditions, make dairy farming more profitable (http://rolnicy.com/mleczarstwo). It should be highlighted that limiting milk production may influence the production structure in diversified ways. Milk quotas, first of all, limit production and result in a decrease in the numbers of small herds and an increase in unit productivity. On the other hand, milk quotas limit unrestricted production development and frequently force the purchase or lease of quotas, which results in the necessity of bearing additional costs. The analyses conducted indicate that during the quota year of 2009/2010, in the province of Warmia and Mazury there was a decrease in the number of active wholesale producers by almost 3,500 as compared to 2004/2005 and, in the case of direct suppliers, by over 77% (718 producers). Additionally, during the six years of the milk quota system, a concentration of milk production has taken place. From 2004–2010 a decrease by 15.22% in the number of entities purchasing milk was also observed. In every county of the province, an increase in the volume of milk sold per wholesale supplier was recorded (on average by 58.11%).

The introduction of CAP principles to the Polish milk market has forced producers to adjust to new, uncertain conditions. Small, unprofitable farms (with an area not exceeding 10 ha) have been gradually withdrawing from milk production (during the quota years surveyed they represented just under 8% of the total population). The questionnaire-based surveys were conducted following the collapse of the milk market, so the system of quotas was evaluated very poorly by the producers – almost 1/4 of them declared that it had a negative influence on the raw material market. Additionally, almost 3/4 of the respondents stated that production in their case was slightly profitable or unprofitable (58.00% and 14.04%, respectively).

Preventing excessive milk production, acceleration of production concentration and relative stabilisation of milk and dairy product prices should be viewed as the main positives of the milk quota system. The market economy mechanisms have forced changes in the conditions of farming. Achievement of success in the agricultural market, including the milk market, depends, above all, on modernising production resources to improve technical, productive, breeding and, most importantly, economic-financial efficiency.

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# MACROECONOMIC CONDITIONS OF ECONOMIC AND ORGANISATIONAL CHANGES IN POLISH DAIRY FARMS IN THE PERIOD 1989–2009[1]

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Key words: milk production, dairy farms, dairies, economic factors.

Abstract

In the period 1989–2009, the Polish economy and milk sector experienced profound changes. After the collapse of milk production and milk collection in the period 1990–1995, milk production and milk processing began to recover. The price competitiveness of milk in comparison to other agricultural products began to improve (2005 was the most favourable period in this respect). The greatest influence on the process of changes in dairy farms was exerted by dairies, mainly through milk price calculation methods.

## MAKROEKONOMICZNE UWARUNKOWANIA ZMIAN EKONOMICZNO-ORGANIZACYJNYCH W POLSKICH GOSPODARSTWACH MLECZNYCH W LATACH 1989–2009

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Słowa kluczowe: produkcja mleka, gospodarstwa mleczne, mleczarnie, czynniki ekonomiczne.

Abstrakt

Lata 1989–2009 to czas głębokich zmian w polskiej gospodarce i sektorze mlecznym. Po okresie załamania się produkcji i skupu mleka w latach 1990–1995 produkcja i przetwórstwo mleka stopniowo zaczęło się odbudowywać. Zaczęła się poprawiać konkurencyjność cenowa mleka w stosunku do innych produktów rolniczych. Najbardziej korzystnym okresem w tym aspekcie był rok 2005. Na proces zmian w gospodarstwach mlecznych najbardziej wpłynęły mleczarnie, głównie przez sposób ustalania cen za mleko.

[1] The study was prepared within the project of the Ministry of Science and Higher Education entitled: *"Economic and social conditions of regional changes of milk production and milk processing"*, No 0890/B/H03/2010/39.

## Introductory issues

There are many factors causing changes in the lives of people or economic entities. They include, mainly, a continuous need for "more convenient" solutions. People make improvements in the production technologies of certain goods, make a visible impact on other living organisms (genetic modifications) and are continuously looking for new information from the remotest parts of the world (Internet), etc. Changes also take place in agricultural farms. They are characterised by different paces and intensities. They take place, mainly, in an evolutionary manner under the influence of internal mechanisms and the external environment. As stated by A. Woś, *An agricultural farm changes not only as a result of inherent forces, but also as a result of changes of its closer and further environment. The latter mechanism is becoming increasingly more significant now; it is dynamic* [...]. *It might be stated that a changing environment interferes in a farm in a deeper and more efficient way than the internal mechanism thereof* (WOŚ 2004, p. 12).

The purpose of the study is to present changes taking place in the milk market and on Polish dairy farms in the period 1989–2009 and to present the main factors outside a farm that affect such changes. The figures used in the analysis have been derived from data provided by the Polish Central Statistical Office (GUS), Institute of Agricultural and Food Economics (IERiGŻ), and the author's own research.

## Changes in the milk production in Poland in the period 1989–2009

Over the last 20 years, the Polish economy has experienced profound changes. They have concerned all sectors of the economy, including the agriculture and food sectors. They have taken place, mainly, under the influence of external factors. Augustyn Woś has identified several periods of changes in the post-war Poland, using the criterion of the introduction of instruments exerting influence on rural areas and agriculture. After 1989, he identified a period of shock therapy (1990–1992), a period of achieving a new balance with a general rapid economic growth (1993–1997), a period of a new crisis (1998–1999), a period of adjustments to the EU structures (1999–2004), and a period of Polish agriculture competing against global agriculture (the period of Poland's membership in the EU) (WOŚ 2004, p. 18). The aforementioned periods are visibly connected to the situation in the Polish market for milk and the situation of dairy farms. During the first of the said periods (1990–1992) certain new phenomena took place: a growing inflation rate, an

increase in the loan interest rate, abandonment of subsidies to the prices of means of production, abandonment of subsidies to the products manufactured by dairies, cessation of collection guarantees and the collapse of the traditional structure of institutions dealing with the agriculture. In addition, these phenomena were accompanied by a recession which reduced the demand for food products (TOMCZAK 1994, p. 18). The situation of agricultural farms (including those dealing with milk production) became very difficult. State-owned farms usually did not survive such changes, went bankrupt and were privatised. In consequence of the difficult situation, agricultural production in the period analysed decreased. Milk production abruptly decreased. In 1989, milk production in Poland accounted for 15,926 million litres, with 12,770 million litres in 1992 (a reduction by 20%). Even more visible changes took place in milk collection by dairies. In 1989, the amount of milk collected was 11,385 million litres, with only 6,696 million litres in 1992 (a reduction of 40%) (*Statistical yearbook of agriculture* 1998). Some family-run farms resigned from producing milk, but the major change in the production direction took place in state-owned and privatised state-owned farms. Labour-intensive and capital-intensive milk production was mainly replaced by plant production. Milk production in the public sector in the period 1989–1990 decreased by over half (from 2,139 to 982 million litres).

The period 1993–1997, referred to as the period of achieving a new balance with a general rapid economic growth, was characterised by small changes in milk production and milk collection. At the beginning of the period (1993–1995), milk production continued to decrease (by 1,467 million litres). In 1996, milk production and milk collection ceased to decrease (a slight increase took place in comparison to 1995 – table 1).

The period 1998–1999, referred to as the period of a new crisis, left its mark on the dairy sector. Particularly in 1999, global milk production and milk collection decreased in comparison to the period 1996–1998. The worsening economic situation (a decrease in GDP from 6.4% in Q1 to 2.9% in Q4 of 1998) negatively affected the situation of enterprises that were not prepared for an abrupt reduction in demand. The upward trend of the domestic demand for dairy products weakened and the export potential diminished as a result of reduction by the EU member states of imports from Poland and a later collapse of demand from Russia. In consequence of these factors, farm gate prices went down.

The end of 1999 and the following years until May 1st, 2004 was a process of continuous adjustment of Polish dairy farms and dairies to meet the EU requirements. After January 2000, class III milk and unclassified milk was withdrawn from the market. Dairies introduced different prices for extra class milk and other quality classes. In consequence of the foregoing, farms charac-

Table 1

The main data on milk production in Poland in the period 1989–2009

| Periods of changes* | Years | Milk production | | Milk collection | | Cow headage | | Milk productivity | |
|---|---|---|---|---|---|---|---|---|---|
| | | millions of litres | dynamics 1989= 100% | millions of litres | dynamics 1989= 100% | thousands of heads | dynamics 1989= 100% | litres | dynamics 1989= 100% |
| The first period | 1989 | 15,926 | 100.0 | 11,385 | 100.0 | 4,987.0 | 100.0 | 3,260 | 100 |
| | 1990 | 15,371 | 96.5 | 9,829 | 86.3 | 4,919.0 | 98.6 | 3,151 | 96.7 |
| | 1991 | 14,022 | 88.0 | 7,722 | 67.8 | 4,577.0 | 91.8 | 3,082 | 94.5 |
| | 1992 | 12,770 | 80.2 | 6,696 | 58.8 | 4,257.0 | 85.4 | 3,015 | 92.5 |
| The second period | 1993 | 12,271 | 77.1 | 6,562 | 57.6 | 3,983.0 | 79.9 | 3,075 | 94.3 |
| | 1994 | 11,866 | 74.5 | 6,149 | 54,.0 | 3,863.0 | 77.5 | 3,121 | 95.7 |
| | 1995 | 11,303 | 71.0 | 6,059 | 53.2 | 3,579.0 | 71.8 | 3,136 | 96.2 |
| | 1996 | 11,355 | 71.3 | 6,315 | 55.5 | 3,461.0 | 69.4 | 3,249 | 99.7 |
| | 1997 | 11,770 | 73.9 | 6,770 | 59.5 | 3,490.0 | 70.0 | 3,370 | 103.4 |
| The third period | 1998 | 12,178 | 76.5 | 7,011 | 61.6 | 3,542.0 | 71.0 | 3,491 | 107.1 |
| | 1999 | 11,915 | 74.8 | 6,324 | 55.5 | 3,418.0 | 68.5 | 3,510 | 107.7 |
| The fourth period | 2000 | 11,878 | 74.6 | 6,487 | 57.0 | 3,098.0 | 62.1 | 3,668 | 112.5 |
| | 2001 | 11,873 | 74.6 | 6,832 | 60.0 | 3,005.0 | 60.3 | 3,828 | 117.4 |
| | 2002 | 11,661 | 73.2 | 7,007 | 61.5 | 2,873.0 | 57.6 | 3,902 | 119.7 |
| | 2003 | 11,881 | 74.6 | 7,150 | 62.8 | 2,897.0 | 58.1 | 3,969 | 121.7 |
| | 2004 | 11,477 | 72.1 | 7,600 | 66.8 | 2,796.0 | 56.1 | 4,083 | 125.2 |
| The fifth period | 2005 | 11,566 | 72.6 | 8,361 | 73.4 | 2,795.0 | 56.0 | 4,147 | 127.2 |
| | 2006 | 11,633 | 73.0 | 8,275 | 72.7 | 2,824.0 | 56.6 | 4,200 | 128.8 |
| | 2007 | 11,744 | 73.7 | 8,222 | 72.2 | 2,787.0 | 55.9 | 4,292 | 131.7 |
| | 2008 | 12,000 | 75.3 | 8,470 | 74.4 | 2,807.0 | 56.3 | 4,360 | 133.7 |
| | 2009 | 11,950 | 75.0 | 9,130 | 80.2 | 2730.0 | 54.7 | 4455 | 136.7 |

* the periods identified by A. Woś in the study entitled: *W poszukiwaniu modelu rozwoju polskiego rolnictwa*. Wydawnictwo IERiGŻ, Warszawa 2004.

** forecast.

*Source*: the author's own study based on: *Statistical yearbook of agriculture* 1998, 2001, *Statistical yearbook of agriculture and food economy* 2005, 2008, 2010, *Market analyses – Market for milk* 1999–2010.

terised by a small production scale (having up to 3 cows) ceased to sell milk to dairies (they carried on mainly direct sales). At the same time, large farms, often making great efforts, increased the production scale and adjusted themselves to the sanitary and veterinary requirements. In consequence, the global milk production in 2000 slightly decreased in comparison to 1999, and the milk amount purchased by dairies increased (table 1). The following years observed similar trends as in 2000 – global milk production did not face any significant changes and the milk amount collected by dairies increased.

The period 2005–2009 is referred to as the "period of Polish agriculture competing against global agriculture" (the period of Poland's membership in the EU). The Polish dairy sector dealt quite well with the competition. At the beginning of the analysed period, farmers benefited from visibly higher milk prices. Later, also milk processing plants, particularly dairies manufacturing

high-quality products intended for export, gained some benefits. The value of milk products exported significantly increased. In the period 2003-2008, the value of milk products exported nearly tripled. The main recipients of the Polish milk products were EU member states.

The changes in the global production and milk collection were accompanied by certain changes in the number of cows and their milk productivity. According to the data presented in table 1, the headage of cows was visibly decreasing until 1996. Later, slight fluctuations with a downward trend took place. The cow milk productivity until 1997 was lower than in 1989. Thereafter, it was increasing until 2009.

## The selected macroeconomic factors affecting the changes in dairy farms in the period 1989–2009

The factors affecting the process of changes in dairy farms should be sought in the market conditions prevailing in the analysed period. Mainly the supply and demand of products, services, labour and land and capital (which are differently controlled by state mechanisms) affected the behaviours of farmers, including milk producers. The farmers, under the influence of the market, were forced to make different decisions.

In the opinion of many authors, the economic development of a country affects the development of the agricultural sector. It is economic development which pre-determines the development of agricultural farms (TOMCZAK 2004, p. 13, ZIĘTARA 2009, p. 10). By accepting this thesis, the relations may be analysed between GDP changes in Poland and the milk market and the situation of agricultural farms. According to the data presented in table 2, the gross domestic product per capita (expressed in nominal values) increased between 1990 and 2007 by almost twenty times, and the average salary in the economy (between 1992 and 2007) increased by nearly ten times. The foregoing resulted, on one hand, from a relatively high inflation rate (particularly at the beginning of the period analysed) and, on the other, from the growing labour efficiency. In the period analysed, the milk market also observed an increase in the nominal prices of raw materials. According to GUS, between 1990 and 2007 the nominal prices of milk rose by nearly eighteen times. In the period analysed, the milk collection (described above) slightly increased and the number of farms breeding dairy cows significantly decreased. The relation between the milk collection and the number of farms producing milk is particularly interesting. It is relatively difficult to establish this relation as there is no information about the number of farms breeding dairy cows (particularly at the beginning of the period analysed). The information may be

found in the statistical studies prepared by the Central Statistical Office solely for the years covered by the Census of Agriculture (1996, 2002) and for the years 2005, 2007. Between 1996 and 2007, the number of farms breeding dairy cows decreased by more than half. It is notable that a considerable percentage of farms breeding dairy cows is constituted by farms producing for their own purposes or conducting so-called "direct" sales. The foregoing is evidenced by the data of the Agricultural Market Agency (ARR) presenting the number of the so-called wholesale suppliers (farmers having a wholesale milk quota). The information about the number of suppliers having wholesale milk quotas is available from the implementation of this mechanism on the Polish market (after Poland's accession to the EU).

Table 2

Macroeconomic conditions versus the situation in the milk market

| Periods of changes* | Years | GDP/capita [PLN] | Average monthly salary in the economy [PLN] | Average farm gate price [PLN/100 litres] | Milk collection [millions of litres] | Number of farms breeding cows |
|---|---|---|---|---|---|---|
| The first period | 1990 | 1,549 | n.a.** | 6.0 | 9,829 | n.a. |
| | 1991 | 2,152 | n.a. | 10.0 | 7,722 | n.a. |
| | 1992 | 2,992 | 290 | 18.0 | 6,696 | n.a. |
| The second period | 1993 | 4,046 | 390 | 23.0 | 6,562 | n.a. |
| | 1994 | 5,454 | 525 | 28.0 | 6,149 | n.a. |
| | 1995 | 7,980 | 691 | 44.0 | 6,059 | 1,364,000 |
| | 1996 | 10,037 | 880 | 51.0 | 6,315 | 1,258,000 |
| | 1997 | 12,218 | 1,066 | 59.0 | 6,770 | n.a. |
| The third period | 1998 | 14,316 | 1,233 | 61.0 | 7,011 | n.a. |
| | 1999 | 15,925 | 1,697 | 61.0 | 6,324 | n.a. |
| The fourth period | 2000 | 19,465 | 1,893 | 78.0 | 6,487 | n.a. |
| | 2001 | 20,170 | 2,045 | 78.0 | 6,832 | n.a. |
| | 2002 | 21,010 | 2,098 | 72.0 | 7,007 | 839,937 |
| | 2003 | 22,050 | 2,185 | 72.0 | 7,150 | n.a. |
| | 2004 | 24,157 | 2,273 | 87.0 | 7,600 | n.a. |
| The fifth period | 2005 | 25,770 | 2,361 | 93.0 | 8,361 | 730,342 |
| | 2006 | 27,804 | 2,476 | 93.0 | 8,275 | n.a. |
| | 2007 | 30,834 | 2,673 | 107.0 | 8,222 | 694,876 |
| | 2008 | 33,540 | 2,944 | 102.0 | 8,470 | n.a. |
| | 2009 | 35,210 | 3,102 | 102.3 | 8,870 | n.a. |

* the periods identified by A. Woś in the study entitled: *W poszukiwaniu modelu rozwoju polskiego rolnictwa*. Wydawnictwo IERiGŻ, Warszawa 2004.

** n.a. – data not available.

*Source*: the author's own study based on: *Statistical yearbook of agriculture* 1998, 2001, *Statistical yearbook of agriculture and food economy* 2005, 2008, 2010, *Market analyses – Market for milk* 1999–2010, http://www.lex.com.pl/serwis/mp/2009/0112.htm

At the end of March 2005 (end of the quota year 2004/2005), the number of farms with a wholesale milk quota accounted for 310,460 (43% of all farms breeding dairy cows). In the quota year 2006/2007 (as of March 31st, 2007), there were 285,000 wholesale suppliers (a reduction in comparison to the first quota year 2004/2005 by 26%). In consequence of the continuing production concentration, there were 24% fewer wholesale suppliers with limits of up to 50 tons of the individual reference amount, and the number of suppliers with a milk quota above 50 tons increased. The greatest increase (by 53%) was observed in the group with the quota of 200–500 tons (SYCH-WINIAREK 2007, p. 27). In the quota year 2008/2009 (as at February 23rd, 2009), the number of wholesale suppliers decreased to approximately 194,000 against approximately 201,000 in April 2008 (SYCH-WINIAREK 2009, p. 21).

The changes in the milk market may, to some extent, be explained by the prices of certain products, production means and production factors in a given period. The relations between prices of certain products are particularly interesting. The relations between the achievable milk prices, prices of cereals, sugar beets and potatoes affect the behaviours of farmers, including farmers running relatively small farms with poor buildings and machines. According to the figures presented in table 3, at the beginning of the period analysed, the price competitiveness of milk in comparison to other products (mainly cereals) was low. This discouraged the farmers from conducting capital-intensive and labour-intensive milk production. They were more likely to be involved in plant production. The second half of the 1990s saw prices fluctuations and a gradual improvement in the relations between milk prices and the prices of other products. In the period 2000–2004, referred to by Woś as the period of "adjustment to the EU structures", the price competitiveness of milk in comparison to other products remained at a quite stable level, with a slight upward trend. The first full year of Poland's membership in the EU (2005) was the best time for milk producers in terms of price relations. In 2005, milk prices, in comparison to cereal prices, increased by 37% in comparison to 2004. This was the most favourable price relation in the whole period analysed. 2007, which was a very good year for the dairy sector in Poland and the world, observed interesting phenomena. However, if the relations between milk prices and the prices of other agricultural products (mainly cereals) are taken into account, it turns out that the relations were not as favourable as in 2005. The subsequent years (2008, 2009) saw a reduction in prices for agricultural raw materials, including both milk and cereals. The relationship between milk prices and cereal prices was equal to that in 2004.

Table 3

Relations between milk prices and prices of other products in the period 1990–2009 (average milk price/average price of another product)

| Periods of changes* | Years | The selected products | | | | | |
|---|---|---|---|---|---|---|---|
| | | wheat | barley | potatoes | sugar beets | cattle for slaughter | porkers |
| The first period | 1990 | 0.74 | 0.84 | 2.71 | 3.53 | 0.14 | 0.08 |
| | 1991 | 1.27 | 1.47 | 2.20 | 4.39 | 0.17 | 0.10 |
| | 1992 | 1.10 | 1.48 | 1.47 | 4.51 | 0.20 | 0.14 |
| The second period | 1993 | 0.96 | 1.13 | 3.11 | 5.25 | 0.18 | 0.14 |
| | 1994 | 1.13 | 1.32 | 1.63 | 5.14 | 0.16 | 0.11 |
| | 1995 | 1.24 | 1.46 | 1.45 | 5.45 | 0.19 | 0.17 |
| | 1996 | 0.89 | 1.08 | 2.27 | 5.60 | 0.19 | 0.17 |
| | 1997 | 1.16 | 1.41 | 2.18 | 6.22 | 0.23 | 0.16 |
| The third period | 1998 | 1.30 | 1.62 | 2.39 | 6.31 | 0.24 | 0.18 |
| | 1999 | 1.42 | 1.59 | 1.95 | 6.11 | 0.23 | 0.20 |
| The fourth period | 2000 | 1.53 | 1.56 | 2.24 | 7.65 | 0.27 | 0.21 |
| | 2001 | 1.55 | 1.62 | 2.42 | 7.01 | 0.27 | 0.18 |
| | 2002 | 1.65 | 1.65 | 2.10 | 6.42 | 0.26 | 0.20 |
| | 2003 | 1.58 | 1.49 | 2.12 | 5.80 | 0.29 | 0.23 |
| | 2004 | 1.84 | 1.78 | 2.63 | 4.65 | 0.26 | 0.21 |
| The fifth period | 2005 | 2.53 | 2.49 | 2.51 | 5.31 | 0.23 | 0.24 |
| | 2006 | 2.08 | 2.31 | 2.14 | 7.22 | 0.23 | 0.26 |
| | 2007 | 1.51 | 1.67 | 2.63 | 9.88 | 0.27 | 0.31 |
| | 2008 | 1.89 | 2.27 | 2.49 | 9.93 | 0.25 | 0.24 |
| | 2009 | 1.73 | 2.07 | 2.26 | 9.31 | 0.23 | 0.21 |

* the periods identified by A. Woś in the study entitled: *W poszukiwaniu modelu rozwoju polskiego rolnictwa*. Wydawnictwo IERiGŻ, Warszawa 2004.

** forecast.

*Source*: the author's own study based on: *Statistical yearbook of agriculture* 1998, 2001, *Statistical yearbook of agriculture and food economy* 2005, 2008, 2010, *Market analyses – Market for milk* 1999–2009.

## The impact of dairies on changes in dairy farms in the period 1989–2009

Economic studies carried out by the author and confirmed by other scientific research have shown that dairies have made the greatest impact on the process of changes in dairy farms (MALAK-RAWLIKOWSKA and others 2007, p. 45). Due to dairies which, on one hand, conduct training and consultancy activities for farmers and, on the other, conduct activities enforcing the observance of quality parameters of milk collected, significant progress in milk production has taken place. In the period analysed, dairies experienced profound changes. In the period 1989–1995, the number of enterprises involved in the milk collection and milk processing increased by 1/3, although at the same time the amount of milk processed in dairies decreased by almost

half. As a result of the abandonment of the command-and-quota system and market liberalisation, approximately 100 new companies were established in the dairy sector during the first period. In 1994, 436 enterprises dealing with milk collection and milk processing were operating in the dairy sector, 336 of which were cooperatives (including 309 regional dairy cooperatives and 27 other cooperatives and experimental farms). During subsequent years the number of enterprises operating in the dairy sector gradually decreased, until at the turn of the century it was more or less equal to that observed 10 years before, with the employment rate being more than 10% lower. In the period 2001–2004, the number of enterprises in the dairy sector decreased by almost 1/5, i.e. to 292, including 265 dairies. At the same time, the number of employees decreased by approximately 15% with the milk amount collected and the actual sales value increasing by approximately 18% and 22.8%, respectively. In consequence, the amount of milk processed by a statistical dairy increased by more than 44%, i.e. up to 29.3 million litres, with the number of employees almost unchanged (159 people in 2004 against 156 people in 2000). Over 4 years, the labour efficiency in terms of the amount of milk processed per employee increased by nearly 41%, and the sales value increased by nearly 50%. However, the share of dairies in the sales value of the entire dairy sector remained between 95% and 96% (SEREMAK-BULGE 2005, p. 116).

During the period of operation in the common EU market (2005–2009), the concentration and specialisation of processing continued. In addition to the dairies dealing with milk collection and milk processing, companies specialising in only milk collection or milk processing were also established. In 2008, 293 entities collecting milk were operating, along with 325 entities dealing with milk raw material processing, including secondary processing (*Market Analyses – Market for milk*, 2008).

Due to the nature of the products manufactured, dairies are forced to closely cooperate with farmers. The quality of the raw material supplied pre-determines the quality of the finished products. Many dairies, after the transformation of the economy, took different activities aimed at improving the quality of milk collected. For instance, OSM Piątnica disbursed some funds for low-interest loans for farmers to purchase milk tanks, milking machines and dairy cows. The company implemented the possibility for farmers to buy disinfection preparations for udders, ointments and balsams preventing udder diseases and spare parts for milking machines. In addition, multifaceted training activities were launched (NIEWĘGŁOWSKA 1996, p. 45). In addition to these activities, many dairies began to influence farmers using calculation methods of prices for milk supplied to the dairy. Some components of the aggregate milk price were established. The components of the milk price were changing in the period analysed. At the beginning of the 1990s, an important component was

fat content and the parameters of a given quality class of milk (determined by the specific content of bacteria and somatic cells). At a later time, other price incentives appeared. For instance, in 1994 the Bielmlek cooperative in Bielsk Podlaski introduced subsidies for farmers with their own milk tanks. The subsidy accounted for PLN 0.08 per litre of milk supplied, with the average milk price in December 1994 being PLN 0.39. In that dairy there were only 31 farmers who received such subsidies (PARZONKO 1996, p. 35). The price components evolved at a later time. In the period 2003–2005, the main price components taken into account by most of dairies included: price for a protein unit, price for a fat unit, subsidy for the quality class, subsidy for cooling milk to 4°C, subsidy for having a veterinary certificate, subsidy to the amount of milk produced, subsidy for having cows under control of milk performance, PLN exchange rate. It is notable that in the period analysed, most of the dairies operating in the market had different methods of establishing prices for milk supplied by farmers. The data from three dairies present the situation (table 4).

Table 4

Milk price components taken into account by the dairies analysed, in the years 2003, 2005

| Specification | Dairy A | | Dairy B | | Dairy C | |
|---|---|---|---|---|---|---|
| | 2003 | 2005 | 2003 | 2005 | 2003 | 2005 |
| For a protein unit [PLN/unit] | 0.09 | 0.12 | 0.14 | 0.19 | 0.12 | 0.14 |
| For a fat unit [PLN/unit] | 0.04 | 0.06 | 0.04 | 0.09 | 0.03 | 0.04 |
| For cooling milk to +4°C [PLN/litre] | – | – | 0.01 | – | 0.03 | – |
| For veterinary certificate | 0.10 | 0.12 | 0.08 | – | 0.15 | 0.25 |
| Deductions for lack of a veterinary certificate [PLN/litre] | | | – | 0.10 | | |
| For suppliers with cows under control of milk performance [PLN/litre] | 0.03 | 0.02 | – | – | 0.01 | 0.01 |
| For long–term contracts [PLN/litre] | – | 0.03–0.18 | – | – | – | – |

*Source*: the author's own study based on a questionnaire survey.

A very important component of the aggregate price paid to suppliers for milk purchased by dairies included the amount of monthly supplies of milk from a farm. In dairies A and C (dairy cooperatives), the minimum amount of monthly supplies on which price bonuses were given accounted for 1,500 and 2,000 litres, respectively. In dairy B (a limited liability company with a dominating share of foreign capital), the minimum amount of monthly supplies from a farm on which a price bonus was given was 5,000 litres. The maximum bonus

for the amount of milk supplied by a farm was calculated, in dairies A and C (dairy cooperatives), with monthly supplies of at least 10,000 litres of milk from a farm. In dairy B, this threshold accounted for 40,000 litres. In the period analysed, certain changes took place in the method of calculation of price bonuses on the amount of milk supplied by a farm. The most significant changes took place in dairy B (a limited liability company with a dominating share of foreign capital). In 2003, the price bonus on one litre of milk purchased, for producers supplying 5,000 to 10,000 litres of milk, accounted for PLN 0.06 a month, and in the following year, it decreased to PLN 0.01. The producers supplying to dairy B more than 40,000 litres milk a month in 2003 received a price bonus on one litre of milk supplied accounting for PLN 0.19, and in the following years, PLN 0.11. It is notable that in the dairy cooperatives analysed (A and C dairies), the price bonus was reduced for the lowest supplies.

In the following years, the method of calculation of milk prices slightly changed. Most of the dairies, in addition to bonuses for certain parameters, introduced deductions. In dairy A, according to the price list dated April 20$^{th}$, 2009, for one protein unit farmers received PLN 0.18, and for one fat unit only PLN 0.03. The price list also provided for deductions: for unclassified milk – PL 0.20 per litre, for lack of veterinary certificate (compliance with the sanitary and veterinary conditions) – PLN 0.20 per litre of milk supplied, and for supplies below one thousand litres milk a month – PLN 0.03 per litre. The cooperative maintained bonuses for the amount of milk supplied – the minimum amount on which a bonus was given was 1,500 litres (a bonus of PLN 0.04 per litre) and the maximum bonus was given for supplies exceeding 40,000 litres milk per month (the bonus accounted for PLN 0.13 per litre). In addition, the dairy gave bonuses for having cows in a milk performance program and for maintaining long-term contracts with the dairy.

## Summary and conclusions

1. The lives of people and different economic entities (including agricultural farms) are facing on-going changes. In the period analysed (1989–2009), the Polish economy experienced profound changes. They affected all sectors of the economy, including the agricultural and food economy sector.

2. At the beginning of the period analysed (the period 1989–1992), the economic situation of agricultural farms was very difficult. As a result, agricultural produce decreased. Milk production decreased significantly. In 1989, milk production in Poland accounted for 15,926 million litres and in 1992 it accounted for 12,770 million litres (a reduction of 20%). Even more signifi-

cant changes took place in the milk collection by dairies. In 1989, the amount of milk collected was 11,385 million litres and in 1992 it was only 6,696 million litres (a reduction by 40%).

3. The period 1993–1997, referred to as "the period of achieving a new balance with a general rapid economic growth", was characterised by tiny changes in milk production and milk collection. At the beginning of the period (1993–1995), milk production continued to decrease (by 1,467 million litres). In 1996, milk production and milk collection ceased to decrease.

4. The period 2005–2009 is referred to as the "period of the Polish agriculture competing against global agriculture" (the period of Poland's membership in the EU). The Polish dairy sector dealt quite well with the competition. At the beginning of the analysed period, farmers benefited from visibly higher milk prices. Later, milk processing plants, particularly including dairies manufacturing high-quality products intended for export, also gained some benefits.

5. The factors affecting the process of changes in dairy farms should be sought in market conditions prevailing in the analysed period. The development of the agricultural sector was affected by the pace of Poland's economic growth. As GDP per capita and salaries in the national economy increased, the number of dairy farms decreased and the global milk collection by dairies increased.

6. The changes in the market for milk may, to some extent, be explained by the prices of certain products, production means and production factors in a given period. At the beginning of the analysed period (the period 1989–1991), the price competitiveness of milk in comparison to other products (mainly cereals) was low. The second half of the 1990s saw price fluctuations and a gradual improvement in the relations between the prices of milk and other products. In the period 2000–2004, the price competitiveness of milk in comparison to other products remained at a quite stable level with a slight upward trend. The first full year of Poland's membership in the EU (2005) was the best time for milk producers in terms of price relations.

7. Dairies have had the greatest impact on the process of changes in dairy farms. Due to dairies, which conduct, on one hand, training and consultancy activities for farmers and, on the other, activities enforcing the observance of quality parameters of the milk collected, significant progress in milk production has taken place. Dairies have exerted an influence mainly through milk price calculation methods (which have changed over time) and helped to reinforce desirable behaviour among farmers.

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# POSSIBILITIES OF MINIMISING RISKS ASSOCIATED WITH THREATS TO SAFETY OF MEAT PRODUCTS

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Key words: risk perception, meat safety, young consumers.

Abstract

This paper analysed the opinions of young consumers on chemical contaminations of meat and on methods used by them to minimize hazards. The research was carried out from 2007 to 2009, involving 1568 full-time students at the University of Warmia and Mazury in Olsztyn. Students from the second to sixth (in the case of the Veterinary Medicine Faculty) years of study were polled using the methods of random sampling and indirect survey measurement.

It was found that the safety of meat products as perceived by consumers depended on their confidence in the legal regulations in force and in food producers, as well as on the provision of detailed information on potential risks. It was found that the knowledge of young consumers in the domain of chemical threats involved in meat was not systemized. It was also found that the year of study and the education profile constituted characteristics which differentiated the perception of risk and the methods of minimizing this risk.

## MOŻLIWOŚCI MINIMALIZOWANIA RYZYKA ZWIĄZANEGO Z ZAGROŻENIAMI BEZPIECZEŃSTWA PRZETWORÓW MIĘSNYCH

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Słowa kluczowe: postrzeganie ryzyka, bezpieczeństwo mięsa, młodzi konsumenci.

Abstrakt

Celem pracy było zbadanie opinii młodych konsumentów produktów mięsnych dotyczącej zanieczyszczeń chemicznych mięsa oraz sposobów minimalizowania zagrożeń. Badania realizowano w latach 2007–2009 wśród 1568 studentów studiów dziennych Uniwersytetu Warmińsko-Mazurskiego w Olsztynie. Badaniami objęto drugi, trzeci, czwarty, piąty i szósty (w przypadku Medycyny Weterynaryjnej) rok studiów. Zastosowano metodę losowego doboru próby. Badania przeprowadzono metodą pośredniego pomiaru sondażowego.

Wykazano, że postrzegane bezpieczeństwo produktów mięsnych jest uwarunkowane zaufaniem konsumentów do regulacji prawnych i producentów żywności, jak również dostarczaniem wyczerpujących informacji o potencjalnym ryzyku. Stwierdzono, że wiedza młodych konsumentów z zakresu zagrożeń chemicznych mięsa nie jest usystematyzowana. Wykazano, że rok studiów i profil kształcenia były cechami różnicującymi percepcję ryzyka i sposoby jego minimalizowania.

## Introduction

Risk in the context of consumer purchasing decisions is a form of uncertainty which consumers encounter when they cannot foresee important consequences of making a decision about the purchase of a product. Currently, consumers expect not only a wide choice of price-competitive, convenient and highly processed food products, but also fresh, tasty food with high nutritional values, but above all, safe food (JAKUBOWSKA, RADZYMIŃSKA 2010, pp. 381–385).

The identification of chemical contaminations of meat and its products has gained increasing significance in the face of increasing knowledge of consumers and their often disapproving approach to applied agricultural production methods and natural environmental pollution. Consumers believe the issue of chemical residues in food is closely linked with food quality and safety, particularly with the quality and safety of meat and its products (OBIEDZIŃSKI, KORZYCKA-IWANOW 2005, pp. 10–12). According to KOWALCZYK (2009, pp. 15), food safety includes such elements as the quality of food, its compliance with trade and market standards, its organoleptic, physicochemical and microbiological food properties and irregularities associated primarily with food adulteration. OZIMEK (2007, pp. 321–325) emphasizes that food quality and safety depend on multiple factors, among others, on the contamination level of the environment, proper measures used at each production stage and food preparation methods in households. URBAN (2005, pp. 14–17) showed that the presence or absence of foreign chemical compounds in meat products depends, among other things, on the impact of stock-farming stimuli, post-slaughter changes, processing methods and the storage of products until they are consumed. This shows that food safety is a multi-disciplinary field referring not only to food products, but also the methods and basic conditions of production and safety of agricultural production, the environment and wild animals (KOWALCZYK 2009, pp. 15).

Governmental organizations, as well as food producers, maintain liability for ensuring that toxic chemicals are not present in food at the stages that can negatively affect the health of consumers. In contrast to the microbiological contamination of food which causes instant alimentary intoxication, the consequences of chemical contamination very rarely cause acute poisoning.

However, they may produce pathological symptoms after a long time (WAWRZYNIAK, PAWLICKA 2000, pp. 55–60). Owing to this specific behaviour, the levels of such chemical compounds consumed in food products must be checked to ensure there is no danger to consumer health. For this purpose, admissible levels are set regarding the contents of individual substances in food products and the observance of these levels is monitored (WHO 2004). This type of control is indispensable for protecting the health of consumers, as well as for facilitating the trade of food products. At the same time, careful attention must be paid to estimating the consumer health risks caused by the presence of toxic compounds in food products.

Consumers are becoming increasingly interested in issues relating to the presence of harmful chemical substances in food products. While assessing food products, they consider, among other things, information shown on the packaging, other consumers' opinions and data disseminated by the mass media. They purchase a specific food product not only based on its sensory features (appearance, smell), utility or aesthetic qualities, but also on any foreign substances it contains which could endanger their health (KRYSTALLIS, ARVANITOYANNIS 2006, pp. 164–176). POŚPIECH et al. (2006, p. 24) also identified other factors motivating a consumer to purchase a given food product. One of such factors is the availability of a given raw material on the market and its price. Although an increase in the price of meat and its products causes consumers to buy smaller quantities of expensive meat assortments, the consumers' expectations of quality are also increased.

A study by RADZYMIŃSKA et al. (2010, pp. 132–139) into the perception of foreign substances in food found that the level of consumer knowledge in this domain is diversified. Two groups of young consumers were distinguished based on their knowledge of food-related risks. The first group, the majority of consumers, were more aware of the occurrence of the chemical risks than of the microbiological risks in food. VERBEKE and VIAENE (1999, pp. 437–445) found that during the crisis in Belgium caused by BSE (Bovine Spongiform Encephalopathy), consumers' perception of health safety and the reliability of beef meat constituted a major problem in this regard. This event showed that in a situation with no information provided on a health hazard, consumers behaved completely differently than during a food-connected crisis, which produced a short-term perception of threat amongst consumers. Those issues gave rise to many debates, and several authors represented the topics linked with the perception of health hazards by food consumers (DE BOER et al. 2005, pp. 241–265, KNOWLES et al. 2007, pp. 43–67, LEIKAS et al. 2007, pp. 232–240, BREWER, ROJAS 2008, pp. 1–22). However, there is scarce data referring to how harmful chemical substances are perceived by young food consumers.

The objective of the research performed by JAKUBOWSKA et al. (2010, pp. 123–129) was to determine the perception of risks resulting from the presence of chemical compounds in meat products in relation to the demographic characteristics of the surveyed consumers. Additionally, the respondents were classified according to how they perceived the individual risk components. It was found that in the group of demographic characteristics, age was a factor influencing almost all the determinants of the perceived risk. Two key segments were identified based on how the surveyed consumers perceived the risk components. One segment of respondents (the majority of whom were aged between 45 and 54 years) were characterized by a higher level of knowledge, by the awareness of the presence of chemical compounds in meat products and by fears of the consequences of their effects. According to the opinions of consumers in this segment, both the legal regulations and the level of controlling the presence of chemical compounds were insufficient. In other research (JAKUBOWSKA et al. 2010, pp. 57–63), the same authors found that the risk involved in the purchase of meat products as perceived by consumers impacted the consumers' purchasing decisions. In the event of consumers perceiving a high risk, they are more likely to buy established, proven brands and products of guaranteed quality or to seek more information on products. Moreover, a consumer's country-of-origin-related biases (JAKUBOWSKA et al. 2010, pp. 29–37) were revealed between the risk perceived by the consumers and the methods used by them to reduce this risk.

The objective of this paper was to survey the opinions of young consumers on chemical contamination of meat and on possible methods they employ to minimize threats.

## Subject and Methodology of Research

The research was carried out from 2007 to 2009 using a survey of 1568 students. All of them were full-time students between the second and sixth (in the case of the Veterinary Medicine Faculty) years of study at the University of Warmia and Mazury in Olsztyn using the simple random sampling method (without replacement). The structure of the surveyed individuals is presented in Table 1.

The research was performed using the method of indirect survey measurement. The questionnaire form included issues connected with the perception of chemical threats in meat and meat products as well as risk-reducing methods. The items were modified from the work of YEUNG and YEE (2003, pp. 219–229) and YEUNG and MORRIS (2006, pp. 294–305) by excluding those items not related to chemical hazards. The respondents were requested to express their opinions using a 7-level Likert scale.

Table 1

Sample profile

| Variable | Number | [%] |
|---|---|---|
| Fields of science | | |
| Economics | 422 | 26.91 |
| Agriculture | 425 | 27.10 |
| Veterinary medicine | 123 | 7.84 |
| Technical science | 208 | 13.26 |
| Law | 192 | 12.25 |
| Humanities | 126 | 8.04 |
| Biology | 72 | 4.60 |
| Year of study | | |
| I | 383 | 24.42 |
| II | 324 | 20.66 |
| III | 388 | 24.74 |
| IV | 263 | 16.77 |
| V | 173 | 11.03 |
| VI | 37 | 2.38 |

The results received were statistically tabulated with the use of basic statistics, i.e. mean and standard deviation. By applying a chi-squared test (known as $\chi^2$ test), the impact of quality variables (the year and profile of studies) was determined on the perception and threat-minimizing methods.

## Results and Discussion

### Determinants of the Perceived Risk

Table 2 contains the opinions of young respondents polled referring to the major factors affecting the perceived risks connected with the presence of harmful chemical substances in meat and meat products. The analysis of the respondents' knowledge of the issues discussed showed that the information they had was insufficient. The respective views varied depending on the year of studies of the respondent and on his/her education profile (Table 2). The respondents found the use of growth hormones (GH) and antibiotics to breed and cure animals to be the main cause of the presence of harmful chemical substances in meat and meat products. Those opinions are supported by PURCELL and LUSK (2003, pp. 463–492) and OZIMEK et al. (2004, pp. 100–111), who also found a high percentage of food consumers believed that plant protection chemicals, antibiotics and additional substances were elements of food production which involved a high risk to consumers.

Table 2

Determinants of risk perception in relation to year and fields of study of respondents

| Opinion of Respondents | | $x \pm$ SD | Median | Year of study | Fields of science |
|---|---|---|---|---|---|
| | | | | $\chi^2$ value | |
| Knowledge | Sources of chemical contamination in meat: | | | | |
| | – environmental contaminants (dioxins, PCBs pesticides) | 3.65 ± 1.84 | 3 | 83.36** | 91.02** |
| | – animal husbandry (veterinary drugs, growth promoters) | 5.88 ± 1.21 | 6 | 51.53 | 48.197 |
| | – improper storage | 5.06 ± 1.58 | 5 | 66.92** | 68.25** |
| | – food preparation (nitrosamines, acrylamide) | 4.13 ± 1.79 | 4 | 75.23** | 62.73* |
| Information | Incomplete information about chemical hazards | 4.39 ± 1.89 | 5 | 127.62** | 165.04** |
| Awareness of consequences | Adverse effect on the environment | 5.88 ± 1.22 | 6 | 40.83** | 59.61** |
| | Adverse effect on future generations | 5.97 ± 1.17 | 6 | 27.67 | 35.13 |
| | Real risks are hidden from consumers | 5.60 ± 1.27 | 6 | 62.65 | 55.45* |
| Concern | Concern about the consequences | 5.29 ± 1.52 | 6 | 25.50 | 50.54 |
| | Becoming more serious | 5.56 ± 1.21 | 6 | 43.77* | 52.59* |
| Control | Controlled by adequate regulations | 3.36 ± 1.60 | 3 | 53.54** | 62.87** |
| | Prevented by meat producers | 5.32 ± 1.40 | 6 | 45.55* | 62.91** |

$x$ – mean value, SD – standard deviation
* and ** – indicate statistical significance at the 0.05 and 0.01 levels, respectively.

It was found in this study that the young consumers were aware of the consequences resulting from the presence of harmful chemical substances in the analysed products. These results support the research results of McCarthy and Benson (2005, pp. 435–445), who showed that consumers fear the impact of harmful compounds in food on their health, although they do not possess sufficient knowledge of this issue.

The education profile differentiated the respondents regarding their opinions on informing about the risk and impact of the compounds under analysis on the environment. The respondents expressed their fears concerning the effects of harmful compounds (5.29 ± 1.52) and their levels in meat and meat products (5.56 ± 1.21). This view seems reflected in the fact that the respondents also assessed the legal controls as very poor (3.36 ± 1.60). Obiedziński and Korzycka-Iwanow (2005, pp. 10–12) remark that control efficiency was so poorly assessed because the public generally believes that the efficiency of examinations and controls of food products on the market is also very poor from the point of view of the consumer health safety.

## Risk-Reducing Methods Applied by the Respondents

Table 3 represents an analysis of selected issues linked with the risk-minimizing methods applied by the consumers. The results found that the young consumers highly positively assessed the guaranteed quality of a product (5.82 ± 1.30), loyalty to the brand (5.67 ± 1.32), inspections in the state-run laboratories (5.32 ± 1.56) and the information shown on the packaging (5.31 ± 1.48) as factors to reduce the food-related risks. Neither the year of studies nor the education profile of the respondents differentiated the opinions on this issue, except for the variables: "purchase of a product inspected in a state-run laboratory" and "seeking information on the product's packaging".

Table 3

Risk-reducing strategies in relation to year and fields of study of respondents

| Risk-reducing strategies | | $x$ ± SD | Median | Year of study | Fields of science |
|---|---|---|---|---|---|
| | | | | $\chi^2$ value | |
| Brand loyalty | Purchasing the same brand that I purchased before | 5.67+1.32 | 6 | 27.33 | 50.48 |
| Quality assurance | Choosing meat with quality assurance | 5.82+1.30 | 6 | 29.64 | 39.27 |
| | Purchasing meat that has been tested by government laboratory | 5.32+156 | 6 | 49.74* | 83.35** |
| | Purchasing meat that has been tested by private laboratory | 4.73+1.60 | 5 | 57.14** | 64.52** |
| Product information | Reading the label for product information | 5.31+1.48 | 6 | 44.56* | 44.02 |
| | Taking the advice of family and friends | 5.13+1.46 | 5 | 44.23* | 55.67* |
| Place of purchase | Purchasing a meat product that is available in all supermarkets | 3.28+1.71 | 5 | 37.86 | 39.11 |

* and ** indicate statistical significance at the 0.05 and 0.01 levels, respectively.

In the context of the present research, it should be stressed that the seeking of information, and, in particular, the analysis of the information on the packaging were highly positively assessed by the respondents. SZYMAŃSKI (2008, pp. 12–19) adds that despite very many detailed legal regulations and instructions on how the meat and meat products should be labelled, there are still many improperly labelled meat products on the market largely owing to different interpretations of the legal regulations in force. The respondents believe that choosing a proven, established brand can decrease the risks involved in the purchase of meat and meat products. GÓRALCZYK (2006,

pp. 26–32) says that the importance of meat product brands for consumers is higher than commonly believed. This finding is confirmed by GÓRSKA-WARSEWICZ (2006, pp. 41, 42), who found that consumers treat the brand of meat products as a synonym of a guarantee of quality and health safety.

DE BOER et al. (2005, pp. 241–265) state that consumers' knowledge and awareness of threats involved in food has increased during recent years; however, the risk as perceived by the consumers still differs from the risk found by the experts, and consumers still do not take scientific information into account. It was shown that the gender or nationality could be a variable differentiating the respondents in this range (JAKUBOWSKA et al. 2010, pp. 29–37). It was found that women had less confidence in the health safety of food than men (BERG et al. 2005, pp. 103–129), DE JONGE et al. 2004, pp. 837–849). It was demonstrated that young people perceived food-related risk essentially lower than older individuals (DOSMAN et al. 2001, pp. 307–317); however, the data on this issue is not unambiguous (KIRK et al. 2002, pp. 189–197, DE JONGE et al. 2004, pp. 837–849).

## Conclusions

The results indicate that the perception of meat and meat product safety depends on the confidence of consumers in legal regulations and food producers, as well as in the provision of exhaustive information on potential risks.

The survey found that young consumers are aware of the causes and reasons of risks involved in meat and meat products, but, at the same time, their knowledge is not systemized. It was also shown that the year of studies and the education profile constituted characteristics to differentiate the perception of risk and the methods of minimizing it.

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# BUILDING RELATIONSHIPS WITH STAKEHOLDERS – AS A KEY SUCCESS FACTOR IN PUBLIC SECTOR ORGANIZATIONS

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Key words: organization's stakeholders, success factors, public administration, building relations.

Abstract

Success factors are all sources which ensure an organization's prosperity. These are mainly factors which produce a competitive position on the market. The differences between the private and public sector have a major impact on identifying and categorizing key success factors.

The purpose of this article is to analyze relationship building with stakeholders as a key success factor in public sector organizations. The main tool used by the author of this article was subject-based literature. In terms of the public sector, the process of building relationships with stakeholders is complex due to the complexity and diversity of groups involved in the sector. Despite these, it needs precise exploration because it is one of the main success factors for public sector organizations. The literature review is supplemented by sample results of empirical research conducted by the author.

## BUDOWANIE RELACJI Z INTERESARIUSZAMI JAKO PODSTAWOWY CZYNNIK SUKCESU ORGANIZACJI SEKTORA PUBLICZNEGO

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Słowa kluczowe: interesariusze organizacji, czynniki sukcesu, organizacja publiczna, budowanie relacji.

Abstrakt

Czynniki sukcesu to wszystkie zasoby warunkujące powodzenie organizacji. Zalicza się do nich te, które przesądzają o osiągnięciu konkurencyjnej pozycji na rynku. Różnice występujące między sektorem prywatnym a publicznym w znacznym stopniu wpływają jednak na ich identyfikację i hierarchizację.

Celem artykułu jest analiza budowania relacji z interesariuszami jako głównego czynnika sukcesu organizacji sektora publicznego. Autorka zastosowała analizę literatury przedmiotu jako podstawową metodę badawczą. W przypadku organizacji sektora publicznego proces budowania relacji z interesariuszami jest złożony, gdyż grupy otoczenia tych podmiotów cechuje złożoność i różnorodność. Mimo to jest to jeden z głównych czynników sukcesu tych podmiotów, dlatego wymaga on dokładnej eksploracji. Uzupełnieniem przeglądu literatury jest prezentacja wycinka wyników badań empirycznych przeprowadzonych przez autorkę.

## Introduction

Key factor analysis is a method to rate sources and qualities of certain organizations. This approach is based on limiting the research to certain criteria which are considered to be the most important in determining the competiveness and development of the company. This criteria group is called the key success factors and this method is based on the 80–20 Pareto Rule.

The economic sectors vary according to the list of key success factors. Although this subject has been previously discussed, the subject of the key success factors requires more focus. The private sector is equipped by subject literature by means of ready-made sets describing those factors; however, the public sector lacks these means.

The aim of this paper is to analyze building relationships with the stakeholders as the key success factor in public sector organizations. Both Polish and foreign economic literature sources are the basic research material analyzed by the author, with a focus on contemporary knowledge on the subject. The literature review is supplemented by a sample empirical study conducted by the author.

## Key Success Factors as Fundamental Methods in Organization Management

The efforts of managing an organization are taken to obtain the fundamental aim which is the success the organization. Success can be understood in terms of prosperity, or a satisfactory result of some activities (PENC--PIETRZAK 2010, p. 109), as well as the organization's long-term ability to develop (DRUCKER 2000, pp. 78–84). Modern organizations have lost their stability, which before was the basic feature guaranteeing the stability of their existence. Nowadays, companies must function in a world without permanent business rules or universal management style, which results in a risk of failure, rather than success (SKRZYPEK 2007, p. 7). The identification of success factors serves a diagnostic purpose – its realization can explain the

reasons for uneven development pace in an organization and serves a normative purpose for providing direction to management staff (LEMAŃSKA-MAJDZIK 2007, p. 44).

The source for key success factor analysis is described in the subject literature as rule "80–20", according to it only 20% of events that take part in the organization decide about 80% of the effects while, on the other hand, 80% of events impact up to 20% of the effects (OBŁÓJ 1994, p. 21). According to this rule, there is no need to analyze all success factors, it is sufficient to focus attention only on those 20%, because this number is responsible for the success or failure of the organization. However, this is a very simplified way of thinking since resource distribution and key skills often vary widely and depend on the economic sector in which the organization is present. Moreover, accepting key success factors without consideration of this fact can cause serious problems and failures (LISIŃSKI 2004, p. 180).

Key or critical success factors are those sources, competences and abilities (FLORES, FADDEN 2000, p. 33), which create an organization's competitive position on the market and can determine future prosperity possibilities (ROCKART 1979, p. 81–93). They are characterized by their dynamism – they have the possibility to change and adjust to the situation and condition of the organization. Those qualities determine the management field activity (MEIBODI, MONAVVARIAN 2010, p. 124–133) and impact the achievements of the organization (SIRUS, MOGHADDAM 2007). The key success factor is every factor which ensures the organization's success (BOYNTON, ZMUD 1984, p. 17–27). Jenster, Johnson and Scholes presented a very important definition for critical success factors. They defined key success factors as all criteria to which the organization must adjust, because criteria and other indicators are important for stakeholders and they are the fundamental for the organization's functionality, prosperity and presence on the market (JENSTER 2002, p. 102–110). The authors stressed the importance of interests of organization surrounding groups and how the fulfillment of those interests leads to the organization's prosperity.

There are four possible sources for success factors (BARTES, STRZEDNICKI 2003, p. 42):

– own, specific conditions set out by the organization's field of activity,

– the organization's position in its own sector,

– the organization's environment, customer preferences, economic factors and legal issues,

– the current organizational factors, whose importance is based on the present situation.

Sirus and Moghaddam also add a fifth key success factor source – the uniqueness of the organization management (ROCKART, BULLEN 1981).

Despite the critical factors responsible for organization's prosperity, the subject literature divides them into two groups according to time criteria:

– current – they vary according to actual issues which the organization has to manage,

– planning strategy – responsible for the company's schedule.

The number of factors depends on the size, expanse of the organization and time dedicated by management to managing it (ROCKART, CRESENZ 1983).

The literature search conducted on the basis of Emerald and Ebsco works has allowed the author of this paper to distinguish ten key success factors for a public sector organization:

1. Management involvement – the most important success factor for a public organization (YOUSSEF, ZAIRI 1995, p. 3–19); it is closely related with leadership and requires achieving the most important aims for the organization without using force towards employees, a good leader should be able to motivate employees and create a goal-oriented employee staff (GRIFFIN 1998, p. 491–492).
2. Building relationships with stakeholders – with every person or group which may impact the organization or be impacted by the organization (FREEMAN 1984).
3. Employee involvement – the fundamental element in managing a modern organization (FREEMAN 1984).
4. Clear mission of the organization, its aspirations as a range of socially demanded actions (PESZKO 2002, p. 42) and clear vision – as the future view and role of the organization in the surrounding world (KRUPSKI 2001, p. 108).
5. Managing product quality – an increasingly important element in the management of a modern organization (LISIECKA 2002, p. 9).
6. Constant learning, which acquires the necessary knowledge and interprets it; this kind of process should allow the stakeholders to integrate with the organization's environment and gain a strategic advantage (GARTNER 1985).
7. Team work – necessary for organizations if they want to be competitive and effective (MIKUŁA, PIETRUSZKA-ORYL 2002).
8. Crisis management – actions closely connected with an organization's public relations, designed to foresee anti-crisis actions, create emergency communications and control financial operations to minimize the negative impact on an organization's public image, its employees and the organization's external surrounding groups (BUDZYNSKI 2002, p. 169).
9. Process Management – should be based on many economy priorities, however, the most important is to create quality for the customers (not only external – final, but also internal – associates from other functional divisions) it should rely on continuous quality assessment and improvement of functioning processes by introducing corrections if the results are not satisfactory (BRILMAN 2002, p. 293).

10. Strategic planning – its fundamental aim should be the presumption that organizations create their future according to reasonable strategies (FILIPCZUK 2003, p. 27).

According to this article, it is necessary to build stable relations between a public organization and its stakeholders.

## Public organization – stakeholders. Building the relationships

Nowadays, it is emphasized that an organization is a collection of stakeholders' interests who, thanks to their position, determine the action taken by the organization (MITCHELL et al. 1997). Economic literature presents definitions describing stakeholders. One of the best was created by E. Freeman (FREEMAN 1984), according to which a stakeholder is any person or group of people which may have an impact on the organization or may be impacted by the organization (FREEMAN 1990, p. 337–359). However, M.B Clarkson describes stakeholders as "risk carriers" (CLARKSON 1991). Clarkson divided stakeholders into voluntary and involuntary stakeholders. Voluntary stakeholders carry risks connected with the investment they made in a company, but involuntary stakeholders are subjected to risk – the result of a company's business actions (CLARKSON 1995). Stakeholders can also be referred to as group of people directly or indirectly interested in the activities of the organization and its efforts to achieve certain goals (STONER 1997). The definitions presented by Freemann and Reed are also worth considering:

1. The narrower approach – assumes that the organization cannot meet the expectations of all stakeholders and should therefore focus on the objectives of a limited group of stakeholders, those who have a real impact on the performance of an organization, because they expect real benefits. Such stakeholders can be called the key stakeholders (legal and physical) and are related to the organization by means of formal legal contracts or agreements. Without their commitment a project or the entire company cannot survive or develop (these include: employees, shareholders, investors, finance companies, customers, suppliers and partners).

2. The broad approach – includes the group of stakeholders and anyone who can influence the organization or is under its influence, that is, groups which are in any way involved in the interests of the organization, or submit requests to it. The importance of broad stakeholders (they can be called "auxiliary stakeholders") are also groups or individuals, which may relate to specific activities within the project (these are government agencies, competition companies, protest groups, associations and non-government organizations, trade unions) (FREEMAN 1983). Those stakeholders are divided into two groups: internal stakeholders (in organization), which include: the owners

(predominant shareholders/supervisory board), managers and employees; and external stakeholders (ambient), including: suppliers and business partners, investors and partners in other forms of cooperation, the public (customers), competitors, financial institutions (banks, insurance companies, creditors), trade unions, state and local government authorities (local), educational institutions, social and pressure groups (Frooman1999). It is worth noting that the organization of internal stakeholders such as employees, unions, groups of managers, may substantially affect the value of the company.

According to Freeman, business can be understood as "a set of relationships between groups that have participated in activities that make up the business. [...] To understand the business, there is a need understand how these relationships work" (KURASZKO 2010). In the process of building and maintaining relationships, or interactions between organization and stakeholder, there must be a high level of care about those relationships. It is worth adding that, in the long-term, the interpersonal relations between the partners are interdependent, but they have clearly defined boundaries in their behavior, and also maintain their identity (SVEDSEN 1998, p. 66).

The process of creating relationships based on cooperation is permanent. Table 1 presents an individual Cycle of Relationship Creation.

Table 1

The basic cycle of relationship creation: organization vs. stakeholder

| Stage | Tasks | Tools/Methods | Results |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| Creating the Assumptions | – rating the relation as a strategy task<br>– review and improvement of social tasks and its values<br>– Communications obligations | – strategic and plenary sessions with management<br>– employee participation<br>– dialogue with the staff | – making decisions and taking into account their impact on relations with stakeholders<br>– creating group responsible for relations issues<br>– updated mission<br>– aware and work committed employees |
| Internal arrangements | – organizational preparedness assessment<br>– identification of gaps and the lack of coherence actions<br>– the system and structure assessment<br>– implement of the necessary changes | – surveying the workers<br>– system review<br>– the crew participation process to facilitate<br>– the clarified obligations | – rating the employees<br>– improving the system for building better relationships |

cont. table 1

| 1 | 2 | 3 | 4 |
|---|---|---|---|
| Development strategy | – review and evaluation of existing relationships<br>– benchmarking for best solutions in terms of building and maintaining relationships<br>– meetings with stakeholders<br>– developing strategy and defining new strategy goals<br>– establishing internal structures<br>– dynamic planning | – the questionnaire to review and assess the relationships<br>– group classes devoted to relationships with stakeholders<br>– reviewing the current environment<br>– informal dialogue with stakeholders<br>– meetings with stakeholders groups<br>– formed strategies and operations | – reporting the relationships' progress<br>– introducing the best solutions<br>– identifying the priorities<br>– understanding business' partners point of view and their needs<br>– defined aims<br>– formed stakeholders' |
| Building Trust | – information exchange<br>– determining the expectations and needed operations<br>– creating common aims<br>– developing the organizational structures<br>– determining the roles and responsibilities<br>– development and implementation of "first project"<br>– defining the problems and finding the solutions<br>– ensuring resource availability | – "face to face" meetings<br>– on-line information system (like: e-mail contact)<br>– improvement meetings<br>– experimental meetings like: incentive travels; special sponsored excursions for stakeholders<br>– dialogue<br>– finding solutions for solving special problems | – greater database access<br>– trust increase -co-operation vision<br>– more integrated relationships between entitles<br>– innovative solutions<br>– the elevation of the organization's good name |
| Evaluation | – designing and conducting stakeholders audit<br>– celebrating success<br>– avoiding and not repeating previous mistakes | – stakeholders' audit<br>– internal dialogue system relationships | – balanced organization's impact on building<br>– launching permanent communication channels<br>– equalization of values between the organization and the stakeholders |
| Repeating | – repeating the procedure<br>– improving the process | – group classes devoted to relationships with stakeholders<br>– consulting the representatives of stakeholders' groups | – continuous improvement of relationships |

Source: SVEDSEN (1998, p. 66).

The organization should systematically review the existing solutions. The review allows updating and improving those solutions. There is high need of considering whether there are specific solutions and how they can be improved, and how to overcome emerging barriers. Using this procedure allows to intensify and improve the quality of relationships between the organization and stakeholders.

R.E. Freeman presented a slightly different approach to building relationships with the organization's stakeholder groups. He distinguished three levels that can be used to analyze the process (DOWNAR 2005, pp. 7–8):

- rational – to understand who is the stakeholder and what are his interests;
- transactional – the identification of links between the organization and stakeholders, as well among stakeholders;
- processing – understanding how the organization manages the relationships with stakeholders, are the organization's procedure appropriate, is the level of integration providing stakeholders' knowledge about strategic processes in the organization.

In terms of the public organization sector, the main character of the interaction of these entities with their surroundings reflects their mission and formal objectives. These goals are complex, vague and sometimes even impossible, thus they are under a kind of pressure:

- are subordinated to the main coalition support;
- a general formulation makes it possible to indicate that they have been realized at least in part;
- vague formulating could be used to defend their own position, to avoid liability and the introduction of virtual innovation in the process of political debate (KOŻUCH 2004, p. 96–97).

It is worth noting that in the case of a public organization, the major organizational interactions occur in relationships such as: responsibility and the stakeholders. There can be several types of liability distinguished because they combine with the functioning of the public organization. The external accountability of public organizations is determined by law. The activity of all of their organs is strictly defined by the basis of legal issues. The responsibility towards users, customers and consumers of public goods and services is carried out mainly by the complaints to an ombudsman or other attorneys. Public managers are directly or indirectly responsible to political authority. Public organizations also have an internal responsibility which can be seen in the responsible action of the people employed in these institutions (BRYSON 1996, p. 27). Responsibility is an important element in building relationships between the organizations and their stakeholders. Moreover, managers have a duty to take into account while making the decisions the fact that environmental groups are interested both in the decision-making process and its results. (FARNHAM et al. 1996, pp. 29–36).

It should be also pointed out that the stakeholders of public organizations are often characterized by conflicts of interest, which generates conflicts. Therefore, the process of creating lasting relationships with stakeholders in the organization is a long-term. However, there is need to remember that time and resources incurred for the construction of solid relationships with strategic partners will be compensated by increasing the competitive advantage of the organization by capital growth, a reduction of operating costs and risk cost (SUSNIEN 2008, p. 847).

## Building relationships with stakeholders as a key success factor in a health unit

The results of the survey presented in this paper are the element of the research conducted by the author in a public hospital in the province of Silesia. These studies were conducted in 2011. The empirical study consisted of two stages. The first stage was a focus group conducted among the management of the hospital. The key issue was the stakeholders' analysis. The research was supposed to:

- identify stakeholders (a specially designed list of them), defining their expectations for the organization,
- to assess the strength of their impact and relevance to the organization being tested.

The aim of stakeholders' analysis is to clarify and analyze the expectations and behavior in the relationship between stakeholders and the organization, the directions and possibilities of their influence to change organization's objectives, functionality and efficiency and to assess their significance. Influence is the force with which the stakeholder can affect the project. It is important to indicate the validity which has been assigned to fulfill stakeholder needs and the stakeholder's benefits gained thanks to the project effectiveness and its implementation (LISIŃSKI 2004). The obtained results present a certain profile of the stakeholders, according to which they were divided into four groups: key stakeholders, the stakeholders of high influence and low importance, stakeholders with little impact but high importance and stakeholders with a negligible impact and importance. According to respondents the key stakeholders, both in terms of the impact and importance for the functioning of the health unit are: the National Health Fund (Narodowy Fundusz Zdrowia), doctors and nurses working in hospital, trade unions, the founding body and the hospital management.

The second stage was designed to carry out surveys conducted on a group of hospital patients and staff of various levels in the organization. The research goal was to analyze the process of building relationships between the hospital

with its environment. These studies were supposed to evaluate issues such as: admission to hospital, medical care, the patient's role in the healing process, the hospital's information materials and its image.

The obtained results have presented the importance of building relationships with stakeholders in a public organization. The health sector is very diverse field characterized by a multiplicity of goals of the organizations, increasing dynamism, complexity and a large number of stakeholders. The results show that there is need for taking activities aimed at strengthening the process of building relationships between the organization and various entities, if the entities have an impact and importance on decision-making and implementation. This is possible only through mutual trust and openness at all levels in all the stakeholders' groups.

## Summary

Determination of the key success factors in public sector organizations should be one of the fundamental tasks of these organizations' managers. These factors are of key significance in making correct decisions for the public organization, they also decide which areas, procedures, or processes should be improved and in which way – as the shortest way to achieve success. It cannot be omitted that building lasting relationships with stakeholders is one of the most important factors. In the case of public sector organizations, this process is complex because the entities which surround them are complex and diverse.

The results obtained by the author can be seen as a prelude to further research aimed at creating a model for verification of key success factors and how to measure their impact.

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# MODEL FOR EVALUATION OF THE ECONOMIC-SOCIAL-ENVIRONMENTAL OUTCOMES OF INVESTMENTS IN ROAD TRANSPORT INFRASTRUCTURE

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Key words: road infrastructure, benefit-cost analysis, municipality.

Abstract

This paper presents a model for valuation of the economic-social benefits and costs of investments in road transport infrastructure. The analysis of benefits and costs was based on three research areas: economic, social and environmental. Currently, the valuation of benefits and costs resulting from investments in road infrastructure is increasing in importance from the perspective of local development assigning a special role to road investments. Modernisation of road infrastructure has an indirect influence on the economic development of municipalities in the form of so-called economic-social-environmental outcomes that are of both a direct and indirect nature.

## MODEL OCENY EFEKTÓW EKONOMICZNO-SPOŁECZNO-ŚRODOWISKOWYCH INWESTYCJI W INFRASTRUKTURĘ TRANSPORTU DROGOWEGO

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Słowa kluczowe: infrastruktura drogowa, analiza korzyści i kosztów, gmina.

Abstrakt

W opracowaniu przedstawiono model wyceny korzyści i kosztów ekonomiczno-społecznych inwestycji w infrastrukturę transportu drogowego. Analizę korzyści i kosztów oparto na trzech obszarach badawczych ekonomicznym, społecznym i środowiskowym. Obecnie wycena korzyści i kosztów wynikających z inwestycji w infrastrukturę drogową z punktu widzenia rozwoju lokalnego nabiera znaczenia, a inwestycjom drogowym przypisuje się szczególną rolę. Modernizacja infrastruktury drogowej ma pośredni wpływ na rozwój gospodarczy gmin, co przejawia się w postaci tzw. efektów ekonomiczno-społeczno-środowiskowych, które mają charakter bezpośredni i pośredni.

## Introduction

In economic literature, many definitions of the notion of infrastructure can be found (BRZOZOWSKA 2005 p. 5, KOWALSKI 2006 p. 13, SADOWY 2003 p. 24, PISKOZUB 1998 p. 15, BIEHL 1986 p. 37).

In the majority of these definitions, the physical characteristics of the infrastructure and the qualitative characteristics related to the product or service are identified. The direct and indirect impact on the local development represents an important feature of infrastructure. Infrastructure forms the basis for providing transport services for households and indirectly influences the productivity of businesses on the supply side as a production factor. It also indirectly promotes technological development while having an indirect influence on increasing work productivity.

Thanks to the development of infrastructure, the so-called "accumulation of outcomes" occurs and the consequences of those effects can impact economic development via various channels such as the improvement of transport technologies, decreasing the time and costs of travel, improvement of health and education and, in the long term, improvement of economic results of municipalities. On the demand side, infrastructure facilitates providing services that the people want and need for normal functioning, including water and sanitary facilities, heat and electrical power, telephone lines and improvement of transport access.

It is estimated that almost half of the infrastructural services are consumed at businesses (PRUD'HOMME 2005 pp. 13–15, FAY and MORRISON 2007 p. 35).

**Road infrastructure** is one of the main areas of widely-understood technical infrastructure responsible for the mobility of people and goods in space, resembling a blood circulation system for every economy.

Road infrastructure development contributes to the rapid movement of goods and passengers, the establishment of new businesses and the development of public sector infrastructure. In the case of passenger and goods transport, road transport is the most frequently chosen option. The number of enterprises providing road transport services is around 240,000 representing ca. 7% of all businesses in Poland. The share of road transport companies in the GDP amounts to ca. 4% while their trade receivables in 2010 amounted to ca. 53 billion PLN. In 2010, Polish transport enterprises transported ca. 1.2 billion tons of freight. In Poland, similar to the larger European Union countries, almost 90% of road transport operations are performed within the country.

The domination of road transport is a consequence of its particular characteristics:

– almost unlimited accessibility,

– high service efficiency,
– high travel flexibility,
– high travel speed is of particular importance in the case of short and medium travel distances,
– timeliness and punctuality of service provision (WOJCIECHOWSKI 2010, pp. 12–15).

Development and modernisation of the road network is necessary to maximize road transport potential. On a global scale, road transport infrastructure occupies 100 million ha representing ca. 2/3 of the global area developed for transport purposes (MAZUR 1992. pp. 8–9).

National roads of general national importance for the economy, defence or tourism which allow continuous connection between provincial cities as well as local economic centres and the capital of the province represent a strategic area from the perspective of the so-called economic development of individual regions,.

**The aim of the paper** is to develop a model for analysis of social-economic-environmental benefits and the costs of investments in road infrastructure.

The section of the National Road No 16 Wójtowo – Barczewo, 9.7 km in length is the **object of the research.** The detailed project data is presented in Table 1.

Table 1
Road investment project data for the section of the National Road No 16 Wójtowo – Barczewo

| Section | Section length [km] | Investment outlays [PLN] |
|---|---|---|
| Wójtowo – Barczewo | 5.5 | 78,423,120 |
| Barczewo bypass | 4.2 | 35,440,511 |
| Total | 9.7 | 113,863,631 |

*Source*: own work.

The studied road section is a part of National Road No 16 which connects the most important economic centres of the province of Warmia-Mazury such as: Olsztyn, Iława, Ełk, Ostróda, Barczewo, Biskupiec, Mrągowo, Mikołajki, and Orzysz. This indicates the immense importance of this road for the transport of the people living in the region. From a national perspective, National Road No 16 connects the Great Masurian Lakelands with the rest of Poland and, consequently, influences access to one of the most attractive tourist regions of the country. From a European perspective, the subject road is a transit connection between Via Hanseatica and Via Baltica.

The subject section is situated within the area of Barczewo municipality and runs mainly through agricultural areas. The major objectives for the investment project in the modernised section are:

– streamlining of transit traffic,
– improvement of road safety,
– improvement of travel comfort,
– socio-economic integration of Poland, Lithuania, Latvia and Estonia within the European Union,
– increasing the attractiveness of investment, development of trade and development of tourism,
– efficient access to the region,
– decreasing negative environmental impact (*Annex to the feasibility study No 4*... 2008).

The basic research methods applied in the study included the project method and the method of analysis and comparisons. The timeframe covers the years 2007–2010.

## Model for valuation of the outcomes from investments in road infrastructure

Valuation of the effects in economic, social and environmental aspects represents an important issue in assessment of investment in road infrastructure profitability. Development of a valuation methodology for road infrastructure investment outcomes as an instrument supporting the decision-taking process with particular consideration for social and environmental aspects represents a challenge for practitioners in road investment management. The model presented in the paper assumes analysis of outcomes of an economic, social and environmental character (Fig. 1).

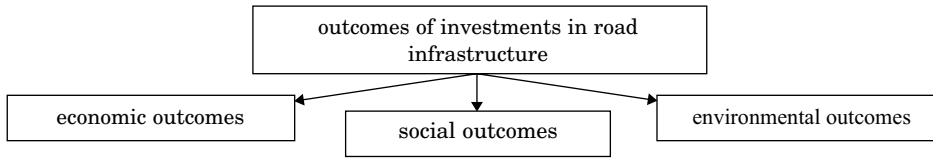


Fig. 1. Types of outcomes obtained through road investment project implementation
*Source*: own work.

**Economic outcomes** – savings on time and a decrease in costs of travel represent the basic outcomes obtained through investments in road infrastructure, which induce further outcomes of importance for local development (Fig. 2).

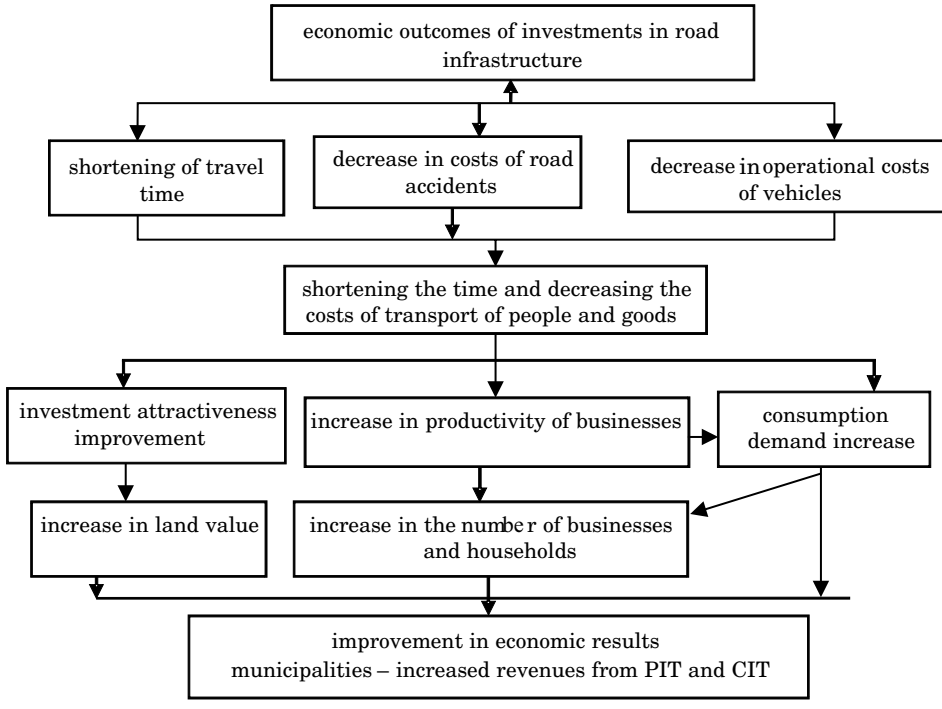


Fig. 2. Economic outcomes of investments in road infrastructure
*Source*: own work.

Economic outcomes obtained from investments in road infrastructure can be divided into direct and indirect ones. The direct outcomes include[1]:

– decreased operational costs of vehicles – lower fuel consumption,

– decreased travel time – faster trips, (indicator: Value Time Transport Saving),

– decreased costs of road accidents.

The indirect effects (deferred in time) include:

– increased investment attractiveness of areas around the road infrastructure,

– increased real estate prices,

– increased number of businesses and households,

– increased revenues for municipalities from the PIT and CIT.

**Social effects** – the basic outcome of a **social character** induced by road investments is a decrease in unemployment caused, on one hand, by employ-

[1] Direct outcomes related to the decrease in travel time, operational costs and road accidents costs are currently valued according to the formula developed by the Road and Bridge Research Institute in Warsaw (IBDiM 2005).

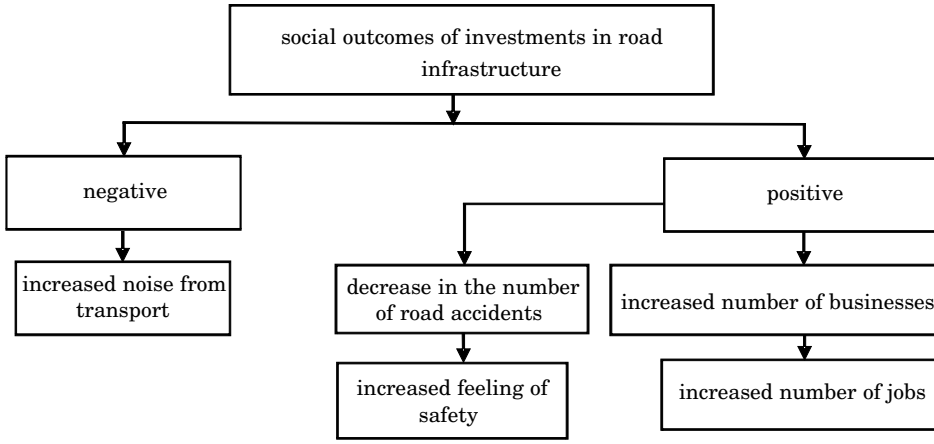


Fig. 3. Social outcomes of road investment projects
*Source*: own work.

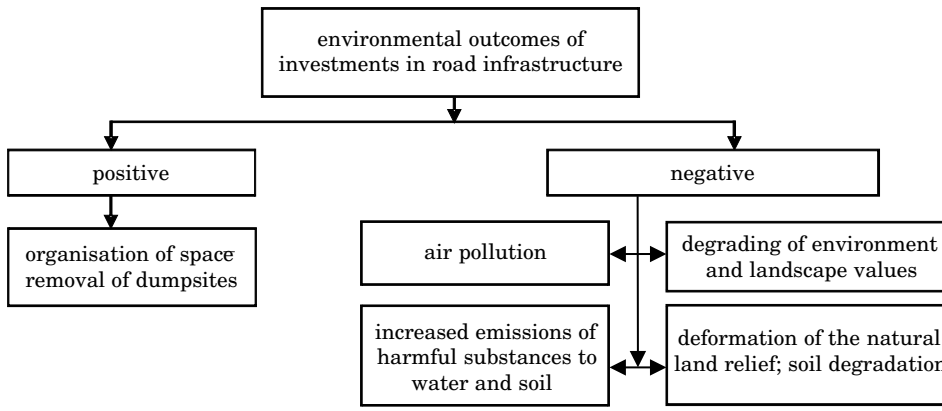


Fig. 4. Environmental outcomes of investment in road infrastructure
*Source*: own work.

ment for roadworks and as a consequence of the emergence of new businesses resulting from improvement in transport access to a given municipality (Fig. 3).

Social outcomes can be divided into positive and negative outcomes. The positive outcomes may include the improvement of safety and an increase in the number of businesses around the improved road infrastructure. The negative outcomes may include an increase in the level of noise caused by an increase in the number of vehicles using the given infrastructure.

**Environmental outcomes** resulting from implementation of a given road project can also be divided into positive and negative outcomes. As opposed to the economic and social outcomes, in this case negative, outcomes dominate.

Development of road infrastructure generally has a negative influence on the environment, which leads to conflicts concerning investment projects. As of the end of 2010, 66 road projects were blocked as a consequence of violating the Natura 2000 Act. (GDDKiA 2010).

For this reason, the transport system in Poland should be improved and subject to further streamlining[2]. Nevertheless, valuation of the environmental costs resulting from road infrastructure development or modernisation currently represents one of the major issues of importance from the perspective of allocation of a given project, e.g. the Valley of the Rospuda River.

## Analysis of the outcomes obtained from the road project based on the example of the National Road No 16 section Wójtowo – Barczewo

The formulated thesis is that road infrastructure development influences the development of municipalities situated around the infrastructure invested in various analytical areas. The method goes beyond the standard valuation of benefits and costs developed by the IBDiM for implementation of road investment projects. The surveyed outcomes were compared between the year 2007 (W0) and the year 2010 (W1).

### Analysis of economic outcomes 2007–2010

The major direct and indirect outcomes that from the application perspective can be subject to valuation and offering the given Municipality the largest economic benefits were considered in the analysis.

The largest part of the savings resulting from the subject investment project was represented by time savings in transport operations by 39%, which, converted into monetary values, gave the amount of PLN 2,300,000. A decrease in the costs of road accidents by 31% was the second largest economic outcome which, converted into money, offered the amount of PLN 5,245,259. The operational costs of vehicles were decreased by 22% as a consequence of increasing the travel speed for the subject road section which, in fiscal terms,

[2] The detailed partial regulations concerning the EU transport policy are contained in the EU directives: 70/157/EEC; 72/306/EEC; 80/1268/EEC; 80/1269/EEC; 97/27/EC.

Table 2

Analysis of the economic outcomes of the subject project

| Benefit / cost name | Verification source | Outcome of benefit / cost 2007(W0) / 2010 (W1) [%] | Year value obtained in PLN |
|---|---|---|---|
| Direct outcomes | | | |
| Travel time benefits | Feasibility study | ↓ 39 | 2,300,000 |
| Operational benefits | Feasibility study | ↓ 22 | 4,097,000 |
| Costs of road accidents | Feasibility study, Police statistics | ↓ 31 | 5,245,259 |
| Indirect outcomes | | | |
| Benefits from revenues of individuals and corporate entities | Barczewo Municipality budget Resolutions by Barczewo Municipality Council | ↑ 20.2 | 1,474,943 |
| Benefits of increases in prices of industrial real estate per 1 ha | Data from real estate agencies | ↑ 54 | 140,000 |
| Total | | | 13,257,202 |

*Source*: own work.

offered the amount of PLN 0.85 per vehicle which, in turn, produced a yearly benefit at the level of PLN 4,097,000. The average traffic density on the subject road section was estimated at 20,000 vehicles per day (General Traffic Survey, GDDKiA 2010).

The other outcomes were of an indirect nature. The increase in own revenues of the municipality from local taxes and charges by 20.2% can be classified as one of the most important indirect outcomes. In 2007, the revenues from taxes from individuals and corporate entities and local charges amounted to PLN 7,286,032 while in 2010 the municipality budget revenues amounted to PLN 8,760,975, which resulted mainly from an increase in the number of businesses and in productivity.

The increase in the value of real estate for investment in the area by 54%, despite the financial market crisis of 2008-2009, represents another indirect outcome.

## Analysis of social outcomes 2007–2010

The social benefits and costs were analysed from the perspective of the major problems encountered by Barczewo municipality, which include a high level of unemployment and lack of investments.

Table 3

Analysis of the social outcomes of the subject project

| Benefit / cost name | Indicator / Verification source | Outcome benefit / cost 2007(W0) / 2010 (W1) [%] | Measure of the given variable |
|---|---|---|---|
| Benefit of population increase | municipal statistics | ↓ 3 | 472 persons |
| Benefit of businesses number increase | municipal statistics | ↑ 33 | 298 businesses |
| Number of the unemployed | provincial Labour Office | ↑ 4 | 43 persons |
| Benefits related to the increase in the number of jobs | Municipal statistics County Labour Office | ↑ 22 of the total number of the unemployed | 235 jobs |

*Source*: own work.

An analysis of the social benefits and costs showed that modernisation of the subject road section offering favourable economic outcomes also contributed to improvement of the important social outcomes. The most important outcomes include establishment of a large number of businesses (298) during a period of 4 years, which resulted mainly from improvement of transport access to the municipality. In addition, 235 new jobs were created, although that did not contribute to a decrease in the unemployment rate, which increased by 4% over the period covered. That phenomenon is a consequence of the lack of appropriate human capital in the municipality, which might also offer a starting point for the municipality to implement an effective programme of vocational improvement for the unemployed. This example shows that road infrastructure development should be supported by social infrastructure development, including a general vocational improvement policy targeted particularly at the unemployed.

## Analysis of the environmental outcomes 2007–2010

The environment costs for the subject investment project covered the costs related to the emission of toxic components of exhausts generated as a consequence of the increase in the daily traffic density and the costs related to mortality of animals. Among the different taxonomic groups considered in the models describing the road infrastructure influence on the environment, mammals dominate at 55%, followed by birds – 11%, reptiles – 3%, amphibians – 7%, invertebrates – 10% and others – 14% (MIKUSIŃSKI 2010).

Table 3

Analysis of the environmental outcomes of the studied project

| Benefit / cost name | Indicator / Verification source | Outcome benefit / cost 2007(W0) / 2010 (W1) [%] | Measure of the given variable |
|---|---|---|---|
| Increase in costs of emissions of toxic exhausts | Road and Bridge Research Institute | ↑ 25 | 345,000 PLN |
| Costs of mortality of animals | Provincial Administration Office in Olsztyn Town Police Headquarters in Barczewo | ↓ 30 | 70 animals (mammals) |

*Source*: own work.

The costs related to emissions of exhausts increased by 25% during the period covered, which translates into an increase in the monetary costs in the amount of PLN 345,000. The increase in the costs was caused by the increase in demand for the modernised road section expressed by the increase in day traffic density by 45%. The level of accidents fatal for mammals decreased by 70 individuals.

## Conclusion

The subject of this paper represents one of the research areas within the general research covering evaluation of the road transport infrastructure role in local development. Direct allocation of the influence of road infrastructure investments on the economic development of a given municipality is very difficult in itself and may cause numerous objections of a methodological and practical nature. That is why each road investment project should be approached individually by focusing on specific outcomes. That would both streamline the decision-making process and eliminate misrepresentations of the effectiveness of a given investment project. This paper presents the material benefits and costs represented in the form of outcomes that can be verified on the basis of reliable sources assuming a study period of 4 years.

This paper presents a model that serves for categorisation and systematisation of economic-social-environmental outcomes which represents the starting point for further analytical work on a comprehensive assessment of road infrastructure projects. It also identifies and defines the direct outcomes, such as savings on travel time, savings on the operation of vehicles, a decrease in the number of road accidents, the assessment of which is not complex. It also

presents the indirect outcomes – the evaluation of which may take place a few years after the project, which undoubtedly represents a methodological challenge for valuation of such outcomes.

On the basis of the conducted studies it can be concluded that modernisation of the subject road infrastructure offers a number of outcomes in the form of benefits and costs, among which the benefits significantly dominate.

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# CLUSTER DEVELOPMENT IN POLAND A DIAGNOSTIC STUDY

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Key words: cluster, cluster attributes, cluster development.

Abstract

The objective of this study was to evaluate cluster development in Poland based on the results of research conducted over the last decade as well as current information published by the Polish Agency for Enterprise Development and the "Portal Innowacji" web portal. Research results show that Polish clusters are relatively new structures, and the majority of them are still at the embryonic stage of development. The structure of some Polish clusters differs from that described in the classical cluster theory, while the attributes of other are typical. In Poland, cluster development is financed mostly from the European Structural Funds. Thus, changes in EU policy and focus on international cluster initiatives may considerably slow down the process.

## DIAGNOZA ROZWOJU KLASTRÓW W POLSCE

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Słowa kluczowe: klaster, atrybuty klastra, rozwój klastra.

Abstract

Celem artykułu jest próba oceny rozwoju klastrów w Polsce na podstawie badań nad nimi prowadzonych w ostatniej dekadzie, a także bieżących informacji publikowanych m.in. przez PARP oraz internetowy "Portal Innowacji". Z badań wynika, że klastry w Polsce należą do struktur młodych, w przeważającej większości znajdujących się w fazie embrionalnej. Część zidentyfikowanych gron w swojej konstrukcji odbiega od teorii klasteringu, a część ma atrybuty dla nich charakterystyczne. Rozwój klastrów w Polsce jest stymulowany głównie przez wsparcie finansowe oferowane w ramach funduszy unijnych. Zmiana polityki UE i skupienie się na finansowaniu przede wszystkim klastrów o zasięgu międzynarodowym może ten rozwój znacząco ograniczyć.

## Introduction

Clusters have become a topical issue and the subject of extensive scientific research over the past decade. In the US alone, approximately a thousand scientific papers on clusters were published at the beginning of the 21st century, and in 2003 the Clusters Profile website of the Institute for Strategy and Competitiveness at Harvard Business School provided a set of standardized descriptions of more than 800 industry clusters in 52 countries (KETELS 2003, p. 2). Recently an increased interest in clusters has been accompanied by changes in the views of both theoreticians and practitioners of economic development. For many years, cluster development was believed to be determined primarily by macroeconomic factors. Today the above approach seems oversimplified, and the ongoing debate points to the importance of microeconomic factors and institutions responsible for regional growth. The practical manifestation of this approach is the diamond model developed by Michael Eugene Porter, described in his famous book *The Competitive Advantage of Nations* (1990), proposed as an analytical tool to capture the quality of business environment at a given location (KETELS 2006, p. 119).

At present clusters attract the attention of researchers from many branches of science, including economic sciences and management. Clusters contribute to enhancing the competiveness of enterprises and regions under conditions of knowledge-based economy, globalization and a turbulent business environment. According to M. E. Porter, management guru and promoter of cluster policies, the competitive advantage of enterprises is largely dependent on external factors therefore a major role is played by supporting institutions and business entities as well as by location. He claims that "clusters are a driving force in increasing exports and magnets for attracting foreign investment" (PORTER 2001, pp. 246–247). The growing popularity of clusters in Poland is confirmed by an increasing number of publications and books addressing various aspects of cluster development.

The objective of this study was to evaluate cluster development in Poland based on the results of research conducted over the last decade as well as current information published by the Polish Agency for Enterprise Development and the "Portal Innowacji" web portal.

## Definition of a cluster

The term "cluster" is used in different branches of science, including geography, medicine, physics, informatics, and music. The English word "cluster" is usually translated into Polish as "kiść" or "grono" (Webster's New

Encyclopedic Dictionary 1997). In Poland, the concept of cluster was popularized in 2001 by M.E. Porter's book *On Competition*. The term "business cluster", also known as an industry or a competitive cluster, was introduced already at the beginning of the 1990s by M.E. Porter, whose analyzed the potential of clusters to affect the competitive advantage of companies and regions based on their geographical location, while Paul Krugman focused on the importance of international trade and geographical economics (PORTER 1990, KRUGMAN 1991).

Clusters are defined in a variety of ways in the professional literature, depending on the perspective taken. According to one of the most common and most quoted definitions, proposed by M.E. Porter, a cluster is "a geographic concentration of interconnected companies, specialized suppliers, service providers, firms in related industries and associated institutions" (e.g. universities, standards agencies, trade associations) in a particular field that compete but also cooperate (PORTER 2001, p. 246). Clusters include companies in the same or a related field, located within a close geographical proximity, able to gain the competitive advantage of a location, including access to specialized human resources and services, knowledge and collective learning, in order to achieve better economic results (PORTER 1998, pp. 214–223).

Table 1 present the most common and widely accepted definitions of a cluster, relying on Porter's approach.

According to Jacobs and De Man, different definitions of a cluster can be classified into one of the following three categories:

1. Clusters as geographic or spatial concentrations of economic activity of a group of companies that operate in related market segments and cooperate with universities, research and development centers. This approach is popular among regional policy makers.

2. Clusters as vertically integrated production chains, in which adjacent stages of the production process form the core of the cluster (e.g. supplier – producer – distributor – consumer chain). The vertical interconnections between businesses are based on Porter's value chain approach and the French concept of filiere[1].

3. Sectoral clusters (e.g. chemical clusters) or segmental clusters (e.g. food clusters). According to this approach, clusters of businesses operate together within the same commercial sector or segment (JACOBS, DE MAN 1996, p. 426).

According to the specialists dealing with business clusters, the following four elements are common to all high performing clusters (Cluster Navigators Ltd.):

[1] The term "filiére" was developed in France by researchers who studied spatially concentrated production chains. The concept, proposed by J. Montfort, refers to a system in which goods and services are supplied to the end user in the production chain, based on a cooperation of interconnected but independent economic entities (MONTFORT 1983).

Table 1

Definitions of a cluster

| Year/Author | Definition |
|---|---|
| 1994 REDMAN | a pronounced geographic concentration of production chains for one product or a range of similar products, as well as linked institutions that influence the competitiveness of these concentrations (REDMAN 1994, p. 37) |
| 2004 UNIDO | sectoral and geographical concentrations of enterprises that produce and sell a range of related or complementary products and, thus, face common challenges and opportunities, including access to specialized human resources and suppliers, collective learning, etc. to enhance competitiveness (UNIDO 2004) |
| 1995 ROSENFELD | a loose, geographically bounded agglomeration of similar, related firms that together are able to achieve synergy. Firms "self-select" into clusters based on their mutual interdependencies in order to increase economic activity and facilitate business transactions (ROSENFELD 1995, p. 12) |
| 1995 RABELLOTTI | a geographic concentration of specialized firms (mostly small- and medium-sized enterprises), in the same or a related sector, based on market and non-market exchange of goods and information, connected with a network of public and private local institutions supporting the cluster. Cluster members feel to be part of a cohesive professional community (RABELLOTTI 1995, p. 30) |
| 1996 JACOBS, DE MAN | a network of suppliers that surround a core enterprise (JACOBS, DE MAN 1996, p. 425) |
| 1996 ENRIGHT | a group of enterprises and institutions whose membership in the group is an important element of competitiveness of individual firms (members). Firms in a cluster are held together by buyer-supplier relationships, common technologies, distribution channels or common labor pools (ENRIGHT 1996) |
| 1997 ROSENFELD | a geographically bounded concentration of similar, related or complementary businesses, with active channels for business transactions, communications and dialogue, that share specialized infrastructure, labor markets and services, and that are faced with common opportunities and threats (ROSENFELD 1997, p. 8). |

*Source*: own study based on literature cited in Table 1.

– core business,
– support businesses,
– soft infrastructure,
– hard infrastructure (GORYNIA, JANKOWSKA 2008, p. 35).

## Cluster attributes

The above definitions of a cluster are only a few examples, since there is not one "correct" and universally applicable definition of the concept. Thus, the present paper focuses on the most common attributes of clusters. Jacobs and De Man distinguished seven key dimensions, essential to describe any cluster:

a) geographical dimension – the spatial concentration/clustering of economic activity;

b) horizontal dimension – horizontal relationship between several competitors in the same or related industry sectors;

c) vertical dimension – vertical relationship between businesses – adjacent phases of the production process, forming a value system;

d) lateral dimension – use of common base such as labor poll, knowledge/skills and resources, sharing different capabilities by different sectors;

e) technological dimension – sharing a basic technology by industries/firms in a cluster;

f) focal dimension – a cluster of firms surrounding a central actor that can be a core enterprise, a research and development center, or an educational institution;

g) quality of network – the way and level of cooperation between firms (JACOBS, DE MAN 1996, pp. 428–429).

Using the above dimensions, Jacobs and de Man demonstrated that clusters may be characterized by a large number of direct competitors, adjacent stages in the production chain, aggregation of connected sectors using common resources and basic technologies, and the impact of the dominant/core organization. The discussed dimensions cannot be identified with different cluster types, but they can be used for cluster classification, thus contributing to the development of a widely accepted definition of a cluster.

Other distinguishing features of clusters have been determined by Meyer-Stamer:

– positive external effects emanating from the existence of a local pool of skilled labor and the attraction of buyers;

– forward and backward linkages between firms inside the cluster;

– intensive information exchange between firms, institutions and individuals in the cluster, which gives rise to a creative milieu;

– joint action geared to creating locational advantages;

– the existence of a diversified institutional infrastructure supporting the specific activities of the cluster;

– a sociocultural identity made up of common values and the embeddedness of local actors in a local milieu which facilitates trust (MEYER-STAMER 1999, p. 1694).

According to Ketels, clusters share four critical characteristics:

– proximity – firms should be located in a close proximity in order to share common resources, and to allow positive spill-overs;

– linkages – the activities of firms need to share a common goal;

– active interactions between firms inside the cluster;

– critical mass – only a significant number of participants has a major impact on the companies' performance (KETELS 2004).

The following characteristics of clusters have been described by Mary Jo Waits:

– business interdependence – businesses relate to each other through the buyer-supplier "food chain" as competitors or as partners;

– export orientation – many of the companies in the cluster sell products and services to companies outside the region;

– concentration – employment in the cluster is more concentrated in the region than is shown by the national average, and the cluster is an existing or emerging area of specialization for the region;

– significant size or rapid growth – the cluster is of a significant size or, if new, has an above-average growth rate, compared to that of the country as a whole (WAITS 2000, p. 42).

In her work, Waits focused on clusters in Arizona and their importance for national economy.

Similar attributes of clusters were described in a report on enterprise clusters and networks, prepared by a group of EU experts in 2002. According to the definition proposed in the report, clusters are groups of independent companies and associated institutions that are:

– collaborating and competing,

– geographically concentrated in one or several regions, even though the cluster may have global extensions,

– specialized in a particular field, linked by common technologies and skills,

– either science-based or traditional,

– either institutionalized (they have a proper cluster manager) or non-institutionalized (*Final report*... 2002, p. 16).

There exists a wide variety of cluster attributes, which results from different approaches to defining a cluster, as mentioned before. Nevertheless, their analysis may provide a basis for a better understanding of the concept, and help determine the key factors of their successful development.

## Cluster development in Poland

The idea of clustering has been promoted in Poland since 2002. The number of cluster initiatives has increased significantly in recent years. The experience of Western European countries, where first clusters were established a long time ago, suggests that the many advantages of clusters and networks include an increase in the competitiveness and innovativeness of enterprises and regions, through access to information and new technologies, human capital development, availability of deficient resources and skills due to their complementarity in cluster structures, lowering business-related barriers

and risks, developing flexibility and adaptability skills of enterprises, taking advantage of market opportunities, etc.

An interactive map of clusters, compiled by the Polish Agency for Enterprise Development, shows that there are a total of 147 clusters and cluster initiatives in Poland (Tab. 2), although other sources quote different numbers, i.e. 128 and 122.

Table 2

Number of clusters and cluster initiatives in Poland

| Voivodeship | Number of clusters and cluster initiatives |
|---|---|
| Wielkopolskie | 21 |
| Mazowieckie | 19 |
| Podlaskie | 15 |
| Małopolskie | 14 |
| Lubelskie | 13 |
| Warmińsko-Mazurskie | 12 |
| Podkarpackie | 11 |
| Świętokrzyskie | 11 |
| Śląskie | 11 |
| Kujawsko-Pomorskie | 9 |
| Łódzkie | 9 |
| Dolnośląskie | 7 |
| Pomorskie | 6 |
| Zachodniopomorskie | 6 |
| Lubuskie | 5 |
| Opolskie | 3 |

*Source*: own work based on Interactive map of clusters and cluster initiatives in Poland http://www.pi.gov.pl/PARP/data/klastry/index.html (13.04.2011 r.).

The highest number of clusters and cluster initiatives are located in Lubelskie, Świętokrzyskie and Podkarpackie voivodeships, whereas the lowest in Lubuskie and Opolskie voivodeships.

A study investigating cluster development in Poland was initiated in 2002 by the Gdańsk Institute for Market Economics, in order to identify clusters, determine their potential and chances for cluster structure development in Poland. The first attempt to estimate the development potential of Polish small- and medium-sized clusters was made in the 1990s, while the "Terza Italia" (Third Italy) phenomenon was studied already in the 1970s. Terza Italia is a term used to describe the concentration of firms in selected sectors and regions of Italy, which led to the rapid growth of small- and medium-sized industrial enterprises. Such clusters could enjoy a strong position in the global

market in the segment of traditional, regional products (*Benchmarking*... 2010). Numerous studies have been conducted in Poland over recent years to assess cluster development. Some authors followed a comprehensive approach to clustering, while other focused on clusters situated in selected voivodeships and regions. The first group comprises the following studies:

– Cluster support policy, best practices, recommendations for Poland (BRODZICKI et al. 2004),

– Clusters in the EU-10 new member countries (KETELS, SÖLVELL 2006),

– Cluster development in Poland (HOŁUB-IWAN, MAŁACHOWSKA 2008),

– Clusters in Poland (KOSIŃSKA 2008),

– Proposal for an instrument to optimize knowledge and technology transfer within cluster initiatives (BRODZICKI, TAMOWICZ 2008).

Examples of cluster analyses accounting for the specific character and geographical location of clusters include:

– Development of cluster structures in eastern Poland (*Rozwój*... 2007),

– Strategy for cluster development in the Świętokrzyskie voivodeship (OLESIŃSKI 2008),

– Cluster development in the Lower Silesia region (FABROWSKA et al. 2009),

– Trade clusters in the Kujawsko-Pomorskie voivodeship – an analysis of the printing and electronics sectors (BARON 2008).

An analysis of published source materials revealed that many business initiatives referred to as clusters in fact do not fulfill the definition of clustering and the classical concept of a cluster. The findings of Brodzicki and Tamowicz, who performed a thorough analysis of cluster initiatives in Poland (cited above) to determine the general understanding of a cluster, are not too optimistic. The above authors distinguished three groups of cluster initiatives. The first group comprised undertakings that did not meet the requirements of a cluster initiative. The analyzed projects referred to the idea of clustering, but they had nothing in common with clusters. Such clusters were usually created based on top-down decisions made by municipal bodies and research or educational establishments, poorly rooted in economic reality, mostly for promotional reasons or as part of thematic strategies. As a result, no efforts were made to invest in technology transfer projects or to get funding from the EU structural funds. The second group consisted of undertakings rooted in the business environment, but no concentration of companies in the same of a related sector could be observed. In contrast to the first group, the second-group clusters were characterized by simple forms of innovation transfer, including information exchange, the organization of seminars, training courses and business meetings for all cluster members. Such forms of contact are today most popular among partners within cluster structures. The third group comprised initiatives that most closely resembled the cluster model. They relied on a strong concentration of enterprises, interdependencies

between institutions (machine suppliers, associations, cultural centers), and transfer of innovation (BRODZICKI, TAMOWICZ 2008, pp. 19–20).

An example of a cluster initiative in the third group is the Boiler Cluster established in 2003. Next to the Aviation Valley, this is one of the most dynamically developing clusters in Poland. The Boiler Cluster, which gathers broiler production companies in the Pleszew region, has been co-financed by the EU structural funds. In 2008, the cluster registered the "Innovative Pleszew Boiler" trademark. Cluster members carry on joint advertising and marketing campaigns to strengthen the cluster's market position, and they cooperate with research and development centers. As part of its innovation strategy, the cluster has applied for two patents, "Methodology and a boiler for controlled fuel combustion" and "Heating device housing", and it has developed an innovative product, "RetCluster25 Premium Boiler". Efforts have also been made to establish the Research and Development Center of the Boiler Cluster and to prepare cluster participants for entering into a partnership with research and development institutions (KUBERKA 2010).

Clusters in Poland have been analyzed and mapped by the European Cluster Observatory (ECO). The strength of regional clusters was evaluated with the use of the following three parameters in respect of which one, two or three stars were awarded to each cluster: cluster size, cluster specialization, and employment concentration. The above factors indicated whether the cluster reached critical mass. The attainment of critical mass determined the achievement of economic results that supported the growth of the region and industries in a given cluster category. A total of 147 clusters were identified, of which 10 were awarded three stars, 39 received two stars, and as many as 98 only one star (ROMANIUK 2011). The obtained results show that the cluster potential in Poland is generally average or low.

A recent study of cluster development in Poland, conducted in 2010, covered 47 clusters that agreed to participate in the survey. Most of them were located in the Małopolskie voivodeship, and the fewest were situated in the Kujawsko-Pomorskie, Lubuskie, Opolskie, Świętokrzyskie and Warmińsko-Mazurskie voivodeships. The vast majority of the analyzed clusters were established three to four years ago as grassroots undertakings in the form of associations. Enterprises dominate among cluster participants (79%), and most clusters are still at the embryonic stage of development (53%). The majority of the investigated clusters have their development strategies, although many of them have not been formalized yet. The most common goals of cluster organizations are to promote and support their respective sectors, to detect new project opportunities with the use of investment funds and through cooperation with cluster partners (e.g. offering common services), to exchange knowledge and experience as part of collaboration between enterprises and research and development centers (*Benchmarking*... 2010).

An analysis of data available at the "Portal Innowacji" website and relevant professional literature shows that the formation and development of clusters in Poland are limited by a number of factors, including administrative, legislative, technological and cultural barriers, primarily fear of entering into cooperation which results from mistrust towards firms, institutions and potential cooperators. Strong economic and business ties have not yet been developed in Poland, while trust between competitors and the realization of common goals lie at the core of the cluster concept. A comprehensive cluster-based policy is needed to support cluster creation and development. In Poland, first clusters were established in 2004–2006, when the EU structural funds were made available through measure 2.6, Regional Innovation Strategies and Transfer of Knowledge, within the framework of the Integrated Regional Development Operational Program. Some of the clusters have survived until today, while the activity of other was suspended or limited with the end of funding. In 2007, the Polish Agency for Enterprise Development implemented a pilot program, Support for Cluster Development. Another interesting initiative was the implementation of a cluster support program, Innovation Express, promoting international cooperation in the field of research, development and innovation. The INNET project (networking of national/regional funding and innovation organizations for the involvement of SMEs in technology-based innovation clusters in Europe), financed from the funds of the Sixth Framework Program, focused on identifying mature cluster structures, followed by designing and implementing the First Pilot Program (Pilot Call) in selected clusters. The Polish Agency for Enterprise Development invited cluster coordinators from eastern Poland to apply for EU funding. The prerequisite for program participation was conducting business activity within a cluster by at least five enterprises, one research establishment and one business entity promoting economic development or innovation. The deadline for submitting applications was the end of April 2011, and the total budget was over PLN 15 mln (KOŁTUNIAK 2011).

In Poland, cluster development is stimulated with the involvement of innovation policy instruments, and actively supported from EU structural funds. One of them is the Innovative Economy Operational Program for 2007–2013 and measure 5.1, Support for Cooperative Connections of Supra-regional Importance. It should also be noted that some specialists share the opinion that clusters are sometimes established merely to get funding from the EU structural funds, that their members do not really intend to cooperate or formulate common goals and strategies, and that they do not believe in the benefits of clustering. If this opinion proved true, EU funds should be allocated based on more restrictive criteria, as part of a comprehensive national policy supporting the development of clusters and cluster initiatives in Poland.

## Summary and Conclusions

The clusters' operating time in Poland is relatively short, which is why the majority of them are still at the embryonic stage of development. This is the first step towards mature structures. The European Commission has recognized clusters as important settings for enhancing competitiveness and innovation in the European Union member states. Initiatives to support cluster creation and development are nowadays widespread in Europe. The European Cluster Observatory has complied a cluster policy map in Europe. A total of 130 cluster support instruments have been identified in 31 countries, yet the cluster support mechanisms in Poland are insufficient. Most of them rely on the EU structural funds which in the future will be increasingly allocated to international cluster organizations rather than individual initiatives. The European Union aims to increase critical mass through cross-border economic cooperation, which may slow down cluster development in Poland, or lead to cluster polarization and a decrease in the number of new cluster initiatives.

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# PERSONAL LIABILITY INSURANCE

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Key words: personal liability, insurance, insurance market.

Abstract

Personal liability insurance is still not popular as a way to cover accidental injury or damage to the property of a third party. The aim of the conducted research was to identify the limit of coverage and popularity of personal liability insurance on the Polish insurance market. This article presents the number of insurers offering personal liability insurance, the number of policies and the gross written premiums from 2004 until 2009. In depth analysis of the personal liability insurance, general conditions was conducted and the popularity of personal liability insurance among the employees of the Marshal's Office in Olsztyn was surveyed.

## UBEZPIECZENIE ODPOWIEDZIALNOŚCI CYWILNEJ W ŻYCIU PRYWATNYM

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Słowa kluczowe: odpowiedzialność cywilna, ubezpieczenia, rynek ubezpieczeń.

Abstrakt

Ubezpieczenia odpowiedzialności cywilnej w życiu prywatnym są wciąż mało popularnym sposobem na uchronienie się przed konsekwencjami spowodowanymi wyrządzeniem szkody osobom trzecim. Celem przeprowadzonych badań było określenie zakresu i popularności ubezpieczenia odpowiedzialności cywilnej w życiu prywatnym oferowanego przez ubezpieczycieli na polskim rynku. W badaniach określono liczbę ubezpieczycieli oferujących ubezpieczenie OC w życiu prywatnym. Przedstawiono liczbę zawieranych polis oraz wysokość składki przypisanej brutto z tego tytułu w ostatnich latach. Przeanalizowano ogólne warunki ubezpieczenia OC oraz zbadano popularność tego rodzaju ubezpieczenia wśród pracowników Urzędu Marszałkowskiego w Olsztynie.

## Introduction

Changes taking place in the Polish market since the beginning of the 1990s have had effects on the insurance market. On the one hand, the changing realities have led to the emergence of new risks as well as higher exposure to risks treated earlier as marginal. On the other hand, the increasing competition between insurers has resulted in a rapid reaction to adjust the offers to the customers' needs and demands. Currently, we can already see an increase in insurance awareness among Poles. This phenomenon is reflected in the increasing expectations from the insurers and a more critical approach to the insurance products offered (WOLIŃSKA 2003).

The insurance market development is expressed in the more extensive choice of voluntary insurance products. Personal liability insurance is one of such products. As at the 31st of December 2009 it was offered by 31 insurance companies out of 35 operating in segment II.

## Research results

The study aimed at determining the scope and popularity of the personal liability insurance offered by the insurers in the Polish market.

The studies encompassed all the insurance companies operating in the Polish market offering personal liability insurance. For the purpose of this study, the general insurance conditions offered by the insurers with gross written premiums from such insurance exceeded PLN 1 billion for the period of 01.01.2009 – 31.12.2009 (on the basis of the latest verified data at www.knf.gov.pl 16.03.2011) were analysed in depth. The research was conducted in two stages.

Stage One: The development of personal liability insurance.

The development of personal liability insurance in the USA and Western Europe dates back to the middle of the 20th c. According to the data by the Comite Europeen Des Assurances (www.cea.assur.org of 28.03.2009), the share of personal liability insurance in the portfolio of property insurance (excluding means of transport insurance) in the United States of America was as much as 70%. It should be highlighted that both voluntary insurance (such as, for example, personal liability insurance) and compulsory insurance (such as professional liability insurance) were represented jointly. The following factors can be assumed for the cause of such a large share of the insurance of that type among the property insurance:

- increase in the claims and insurance awareness in society,
- more stringent liability principles in the regulations and enforcement by courts,
- contractual insurance requirements.

In analysing the popularity of liability insurance (except means of transport insurance) in Western European countries, the share of almost 50% of such insurance in property insurance portfolios was found. With the changing economic and social conditions, the demand for specific types of insurance coverage has changed. The data at the website of the Insurance Ombudsman indicate that the share of liability insurance (excluding means of transport insurance) in all the property insurance in Poland is around 10%.

The insurance statistics for the last couple of years indicate the increasing popularity of (voluntary) liability insurance in our country. The specifications published by the Polish Insurance Association show that the growth dynamics of such insurance (defined by the share of the gross premium written) is at a relatively high level of 9.4% (www.piu.org.pl of 30.09.2010). The popularity of insurance products can be measured by the number of policies purchased or the size of the gross premium written. The following table presents the compilation of the number of policies as well as the gross premium written for personal liability insurance during the years 2004–2009.

Table 1

Number of policies sold and the gross premium written for personal liability insurance during the years 2004–2009

| Year | Number of policies | Gross premium written (in PLN '000) |
|---|---|---|
| 2004 | 2,278,468 | 115,523 |
| 2005 | 2,456,697 | 115,997 |
| 2006 | 2,702,463 | 121,982 |
| 2007 | 3,257,482 | 169,667 |
| 2008 | 4,336,198 | 197,605 |
| 2009 | 5,170,006 | 226,643 |

*Source:* own work based on the data by the Polish Financial Supervision Authority.

As indicated by the data presented in table 1, a continual increase in the number of personal liability insurance policies sold has been observed during the last six years. From 2004 to 2005 the number of policies sold increased by 178,229 (increase by 107.8%). In 2006 the increase was by 245,766 policies as compared to the preceding year (increase by o 110%). In 2007, the number of policies sold was higher by 555,019 than in 2006 (representing the increase by 120.5%). Similarly, in 2008 the increasing trend was maintained with the result of 1,078,716 policies more than in 2007 (increase at the level of 133%). 2009 also follows this trend with an increase in the number of policies sold by 833,808.

The progressive development in personal liability insurance can be noticed in analysing the general conditions of insurance offered by the individual insurers. The analysis of the offered coverage scope deserves particular attention. Table 2 presents the comparison of the insurance coverage scope offered by standard products of the insurers: PZU S.A., TUiR Warta S.A., STU Ergo Hestia S.A., and TU Allianz Polska S.A.[1].

Table 2

Differences in standard personal liability insurance coverage with different insurers

| Insurance coverage | Insurer | | | |
|---|---|---|---|---|
| | PZU | Warta | Ergo-Hestia | Allianz |
| General liability insurance against third parties claims | covered | not covered | covered | not covered |
| Damage caused by problems with water installation, e.g. open tap | covered | covered | not covered | covered |
| Damage caused by use of bicycles, paddle boats, kayaks, water cycles, surfing boards, pontoons, water scooters | covered | covered | not covered | not covered |
| Transfer of fire to other flats or buildings, e.g. iron left on | not covered | not covered | not covered | not covered |
| Damage caused by negligence of the duty to maintain real estate property, e.g. broken leg by pedestrian due to iced sidewalk in front of the house | covered | not covered | not covered | covered |
| Liability relative to employment of a housekeeper that takes care of a flat or other real estate | covered | covered | covered | covered |
| Possession of apiaries up to 5 beehives | covered | covered | not covered | not covered |
| Damage caused outside the territory of Poland, including the USA and Canada | not covered | not covered | not covered | not covered |
| Damage caused by dogs with visible characteristics of the following breeds* | covered | covered | not covered | not covered |

* Independent of possessing a pedigree certificate: Caucasian Shepherd Dog, English Bulldog, Doberman, Rottweiler, German Hunting Terrier, Sealyham Terrier, Karelian Bear Dog, Wachtelhund Dog, Chow-Chow, Borzoi, Afghan hound, Sloughi, Saluki.

*Source:* own work on the base of the individual insurer's General Insurance Conditions.

[1] The choice of the insurer was mainly determined by the gross premium written value (over PLN 1 billion) for the period of 01.01.2009 – 31.12.2009. According to the data by the Polish Financial Supervision Authority (www.knf.gov.pl of 16.03.2011.), the surveyed insurers had the following gross premium written values: PZU S.A. – 7,791,169,000 PLN, STU Ergo Hestia S.A. – 2,183,866,000 PLN, TUiR Warta S.A. – 1,859,463,000 PLN, TU Allianz Polska S.A. – 1,597,259,000 PLN.

The above table presents the most frequently encountered insurance coverage scopes for the individual insurers. Even in the standard (the simplest) versions of the insurance products a relatively wide range of coverage can be observed. The above listing confirms the hypothesis that a combination of products by different insurers would be the best product. In that case, the coverage at the standard level would be complete. As well-known such a situation is impossible to be achieved in practice so the applicant must specify their needs precisely and study the General Conditions of Insurance in detail.

Personal liability insurance as a component of the individual client's property insurance package was the next area of the survey.

Insurance packages have started playing an increasing role. The most important reason for this situation should be assumed to be the possibility of insuring many types, frequently highly different risk types with a single policy. Additionally, package insurance is frequently simply cheaper than purchasing individual risk insurance coverage separately.

Personal liability insurance is, next to the accident insurance and assistance insurance, the most frequently encountered component combined with flat or house insurance. The figure 1 presents the percentage share of such insurance in the insurance of flats sold during the last four years.

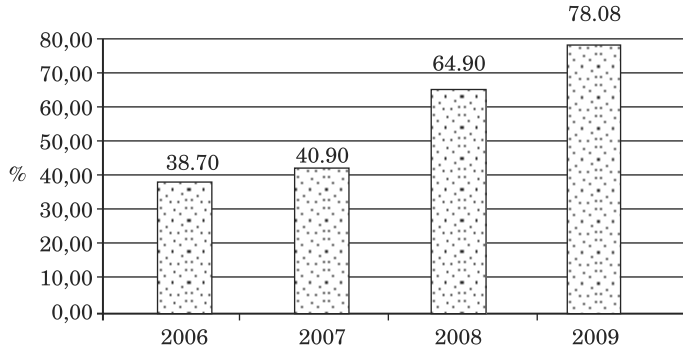


Fig. 1. Share of personal liability insurance in the insurance of flats during the years 2006–2009 [%]
*Source:* own work based on data by the Polish Financial Supervision Authority.

As indicated by the above figure 1, the share of personal liability insurance in the total number of flat and house insurance policies[2] sold had been increasing systematically from 38.7% in 2006 to 78.08% in 2009.

The results presented represent a part of the survey conducted at the Marshal's Office in Olsztyn in 2009. The survey concerned the general

[2] The above data do not differentiate between flat and house insurance, treating them jointly.

insurance of flats and houses of individual clients. Persons declaring possession of a house or flat represented 88% of the population surveyed.

In the survey, particular attention was paid to property insurance packages. The division of the insured according to the selected insurance product design is presented in figure 2.

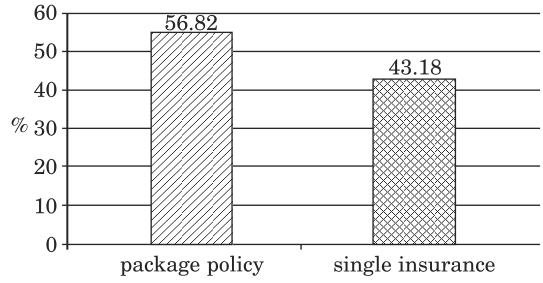


Fig. 2. Division of the insuring according to the insurance product design
*Source*: own work based on the survey conducted.

Among the population surveyed, the vast majority declared possessing a package insurance for the property. Each person possessing a package product indicated personal liability insurance as a component of that package. In addition, 56.82% of the population surveyed who insured a house or flat also possessed private liability insurance.

Determining who chooses the package insurance more frequently was another component of the study – house owners or flat owners? The answer to that question is presented in figure 3.

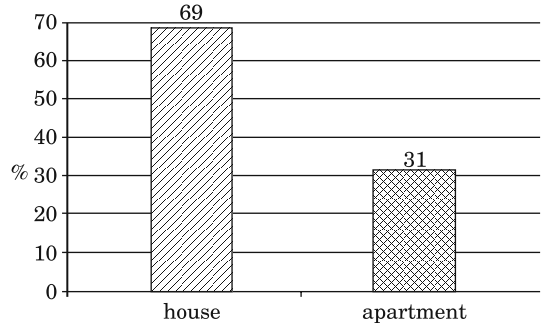


Fig. 3. Percentage of insurance clients who selected package insurance due to the insurance object
*Source*: own work based on the survey conducted.

The conducted surveys showed that 69% of respondents choosing package insurance were house owners. Owners of flats represented only 31% of the respondents. This result indicates that owners of houses prefer comprehensive

(package) coverage against various risk types. They use insurance package more frequently than people living in multi-family houses.

Figure 4 presents a comparison of the results obtained for the population surveyed with the national results concerning the share of personal liability insurance in the insurance of houses and flats.

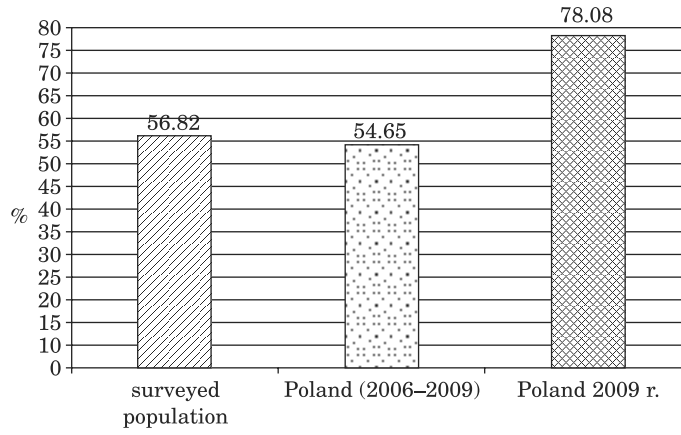


Fig. 4. Share of the personal liability insurance in the insurance of flats and houses in the population surveyed compared to the results for Poland
*Source*: own work based on the survey conducted.

As indicated by the above figure, in 2009, 78.08% of the people in Poland possessing a house or flat insurance also had the personal liability insurance. At the same time that share in the population surveyed was 56.82% of all insurance clients, which gave a gap of 21.26%. On the other hand, the national average for the years 2006–2009 was 55.65%.

## Conclusions

As a result of the survey conducted, it was determined that the number of personal liability insurance policies sold has been increasing systematically. In 2009, the number of such policies sold in the country was more than double the number of the policies sold in 2004. It can be concluded that the popularity of this type of insurance has been increasing significantly. Insurance clients have a wide choice of insurance products. Personal liability insurance is offered by 88.6% of the insurers operating in segment II, i.e. 31 out of 35 insurance companies (as at 31.12.2009). The results of the survey conducted in Olsztyn indicate that the popularity of this insurance in the surveyed population did

not differ significantly from the national average. On the other hand, personal liability insurance is significantly more frequently taken out by owners of single family houses than by residents in multi-family housing.

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General Conditions of the personal liability insurance with Allianz Polska S.A., Ergo Hestia S.A., PZU S.A., Warta S.A.

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Polska Izba Ubezpieczeń, www.piu.org.pl

Rzecznik Ubezpieczonych, www.rzu.gov.pl

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# APPLICATION OF THE SERVQUAL METHOD IN STUDIES ON THE QUALITY OF SERVICES PROVIDED BY THE AGRICULTURAL SOCIAL INSURANCE FUND

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Key words: Servqual method, service quality, customer service quality, Agricultural Social Insurance Fund – KRUS.

Abstract

This paper presents the application of the Servqual method in studies on the quality of services provided among the clients of the Agricultural Social Insurance Fund (KRUS). The clients evaluated five dimensions of the service provided in three aspects: the expected quality, the actual quality and the minimum quality. Thanks to the studies conducted, identification of gaps that emerged in the service provision process was possible. The respondents rated the quality of service provided by the KRUS as representing a relatively high level.

## ZASTOSOWANIE METODY SERVQUAL W BADANIACH POZIOMU JAKOŚCI USŁUG ŚWIADCZONYCH PRZEZ KASĘ ROLNICZEGO UBEZPIECZENIA SPOŁECZNEGO

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Słowa kluczowe: metoda Servqual, jakość usług, jakość obsługi klienta, Kasa Rolniczego Ubezpieczenia Społecznego – KRUS.

Abstrakt

W artykule przedstawiono zastosowanie metody Servqual w badaniach poziomu jakości usług świadczonych klientom Kasy Rolniczego Ubezpieczenia Społecznego. Klienci ocenili pięć wymiarów świadczonej usługi w trzech płaszczyznach: jakość oczekiwana, jakość aktualna, jakość minimalna. Dzięki przeprowadzonym badaniom możliwe było wychwycenie luk, które pojawiają się w procesie świadczenia usług. Respondenci ocenili jakość usługi świadczonej przez KRUS na dość wysokim poziomie.

## Introduction

Businesses are attaching increasing value to the quality of services provided and customer service quality. This is because clients now have wider access to products and services as well as information and have become resistant to manipulation by businesses. Service quality and related customer service allow companies to diversify in the market (DEMBIŃSKA-CYRAN et al., p. 38).

Customer service is defined very widely (DEMBIŃSKA-CYRAN et al., p. 36) as the:

– concept for development of relations with the customer,
– system of contacts with the customer,
– part of the distribution system,
– defined functions and activities of the enterprise,
– system of products, capital and information stream flows to the customer,
– set of various decisions related to the utility of place and time of product,
– combined marketing and logistical processes.

Consequently, customer service quality represents a holistic approach to the process of providing products and services to the customer. It also represents establishing long-term bonds with the customer based on mutual relations which plays an important role in the case of providing services.

The Servqual method allows service quality evaluation using five dimensions: tangibles, reliability, responsiveness, professionalism and empathy. It was elaborated by A. Parashurman, L. Berry and V. Zeithaml during the late 1980s. The method allows surveying the quality of services from two perspectives: the first from the customer's decision-making process and the second from the perspective of the service organisations interpreting service quality as the gap between the perception and expectations. The method can be used in surveying the customers, direct contact personnel and enterprise management and serves the segmentation of company clients. In-depth analysis allows defining the actions necessary for improvement of the company image (WITKOWSKA 2007, p. 33).

In the Servqual method, customers evaluate the actual quality, the expected quality and the additional area of minimum quality by means of a questionnaire. In the last part, the surveyed customer is asked to allocate 100 points according to his/her discretion to the five components of quality identified in the questionnaire.

Determination of the perceived quality of services is done through computation of the difference between the quality experiences and the ideal (demanded, expected) quality. This allows determination of the gap between the

expectations and the perception of services. Additionally, the gap between the experienced quality and the minimum quality that the customer is able to accept, although it does not satisfy his/her level of expectations is determined.

The Agricultural Social Insurance Fund is a financial institution. During times of difficult economic situations, confidence in institutions of this type represent an important element of the assumed policy of such an institution. Confidence increases thanks to the quality of the services provided. The most recent *Social Diagnosis 2011* survey shows that the confidence in the Social Insurance Institution (ZUS) (the surveys did not cover the KRUS) decreased from year to year. In 2007, 39% of the respondents still had confidence in the ZUS, while in 2011 that ratio was 33%. The ZUS enjoys greater confidence among women, the elderly, residents of smaller towns and people with lower education (*Diagnoza społeczna*... 2011).

The Agricultural Social Insurance Fund deals with the social insurance related to the operation of agricultural farming activity. In Poland it serves ca. 2.9 million people (*KRUS w liczbach*... 2011). Farmers are offered two types of insurance: pension and disability pension insurance and accident, disease and maternity insurance. This institution consists of a headquarters, 16 regional branches, 220 local offices and other organisational units (5 Rehabilitation Centres and 2 Farmers' Rehabilitation Centres).

## Analysis of the KRUS clients surveyed

The survey was conducted at one of the KRUS local offices in north-eastern Poland during the period of May and June 2011 on a group of 100 people, of which 63% were women and 37% men. The age range of the respondents was very wide, from people under 20 years of age to people over 66 years of age. Among the surveyed KRUS customers, the people from the 36–44 years age group dominated, representing 44% of the sample. The group of people under 20 years of age was the smallest, representing 1% of the sample. The other data concerning the age and education are presented in Table 1. People with secondary education represented the largest group surveyed, representing 44% of the sample, while those with elementary education, representing 6% of the sample, formed the smallest group of respondents. Among 100 respondents, 19 had vocational education and 31 tertiary education.

People visiting the KRUS are mainly residents in rural areas (62%). The detailed data concerning the place of residence and the net monthly income of the respondents are presented in Table 2. In the population surveyed, 7% of the respondents marked the net per capita monthly income of up to PLN 500 while 30% of the respondents marked the income range of PLN 501 to 1,000.

Table 1

Age and education of the survey participants

| Age group | Share [%] | Education | Share [%] |
|---|---|---|---|
| Up to 20 yeats | 1.0 | elementary | 6.0 |
| 21 to 35 years | 16.0 | vocational | 19.0 |
| 36 to 50 years | 44.0 | secondary | 44.0 |
| 51 to 65 years | 7.0 | tertiary | 31.0 |
| Over 66 years | 32.0 | total | 100.0 |
| Total | 100.0 | | |

*Source*: own work based on the survey conducted.

The largest group – 45% – generated a monthly income ranging from PLN 1,001 to PLN 2,000 while 14% of the respondents reported an income ranging between PLN 2,001 and PLN 5,000. Only 4% of the respondents generated a per capita income in the family exceeding PLN 5,000 per month.

Table 2

Place of residence and net monthly income of the respondents

| Place of residence of the respondents | Share [%] | Net monthly per capita income of the respondents | Share [%] |
|---|---|---|---|
| Rural area | 62.0 | up to PLN 500 | 7.0 |
| Town up to 10,000 residents | 1.0 | PLN 501 to 1,000 | 30.0 |
| 10,000 to 50,000 | 34.0 | PLN 1,001 to 2,000 | 45.0 |
| 50,000 to 100,000 | 2.0 | PLN 2,001 to 5,000 | 14.0 |
| 100,000 to 200,000 | 1.0 | over PLN 5,001 | 4.0 |
| Over 200,000 | – | total | 100.0 |
| Total | 100.0 | | |

*Source:* own work based on the survey conducted.

## Results presentation and discussion

The non-weighted (straight) arithmetic average was applied to more precisely determine what quality of service is offered by the KRUS office to its customers. It represents the sum of the values from all observations for the population surveyed divided by the number of population members. The obtained results will help to improve the work of the KRUS, because the provided service level represents a very important issue from the perspective of the KRUS employees as well as the customers contacting the office on various matters.

The **tangibles** dimension encompassed evaluation of the use of modern equipment, software, employee appearance as well as legibility and transparency of the forms and printed materials.

In the aspect of the use of equipment and software by the KRUS employees, the expected service quality was rated at the level of 6.1. The actual service quality in that aspect was rated at the level of 4.9 while the minimum quality was 4.2. The appearance of the employees was rated by those surveyed at 6.1 as concerns the expected service quality, 6.0 as the actual service quality and 5.1 as the minimum service quality. Legibility and transparency of forms and printed materials was rated at 6.1 as concerns the expected quality while the actual and minimum service qualities were rated at 5.1 and 4.7, respectively.

The survey indicates that the average actual service quality for the tangibles area was rated by the respondents at the level of 5.3 while the expected service quality was 6.1. It should be concluded that the tangibles dimension satisfies the expectations as the minimum service quality was expressed at the lower level of 4.7.

The average rating of the quality level of services provided in the tangibles dimension by women differed significantly from that rating by men in the category of expected service quality. The women rated that category at the level of 6.3 while men at 5.7. The men rated the actual quality (5.5) higher than women 5.3, while both men and women rated the minimum quality at the same level of 4.6.

**Reliability** was the second area evaluated. It covers KRUS employees meeting the defined timelines and promises made, solving customer problems and appropriate delivery of the first-time service.

As concerns keeping the defined timeline and promises made by the KRUS employees, the expected service quality was rated 6.2, the actual service quality 6.0 and the minimum service quality 5.0. In the category of solving customer problems, the ratings of service quality were as follows: expected 6.1, actual 5.6 and minimum 5.9. Appropriate delivery of every service the first time by the KRUS employees was rated at 6.0 in the expected service quality category while the actual quality was rated at 5.5 and the minimum quality at 4.7.

Comparing the data collected for the tangibles area and the reliability area, it was determined that the distribution of responses was very similar. For both the tangibles and the reliability the expected service quality rating was the same at 6.1. The actual service quality for the tangibles was 5.3 while for reliability 5.7, which means that the respondents rated the quality of service provided in the dimension of reliability higher.

In the case of both women and men, the ratings of the reliability dimension were similar. Women rated the expected service quality at 6.1 while the men rated it at 6.0. Similar ratings were also obtained in the case of the actual

service quality where the average for the women was 5.8 and for the men 5.6. On the other hand, women rated the minimum service level lower (4.8) than the men (5.0).

The survey questionnaire contained questions concerning **responsiveness (reaction to the customer expectations)**. They concerned the KRUS employees providing honest information on the service delivery time, providing services efficiently and in a timely manner, willingness to provide help and solve problems as well as the time and reaction of the KRUS employee to customer requests.

The expected service quality as concerns providing honest information to the customer by the KRUS employee was 6.2. The actual service quality was rated at 6.1 according to the scale from 1 to 7 while the minimum service quality was rated at the level of 4.9.

The actual and minimum service quality as concerns efficient and timely provision of services were 6.0 and 5.0 respectively. The expected service quality was rated at the level of 6.2.

For the following question of whether the KRUS employee is always willing to help and solve customer problems, the respondents rated the expected service quality at 6.2. The actual service quality was rated at the high level of 6.0 while the minimum service quality was rated at the level of 5.0. The time that the KRUS employee has for the customer, as well as the reaction to customer requests, were rated at 6.1 in the expected service quality category with the actual service quality rated at 5.8 and the minimum quality at 5.0.

The average for the presented categories was 6.2 for the expected service quality, 6.0 for the actual and 5.0 for the minimum service quality.

Recapitulating the data collected on the third dimension, it should be highlighted that the respondents highly rated both the expected and the actual customer service quality.

Women rated the dimension of the reaction to customer expectations as high concerning the actual service quality (6.0) while men's ratings were lower at 5.8. The expected service quality was 6.3 in case of the women and 6.0 in case of the men. It can be concluded that the evaluation of the responsiveness area by the women was very high as the level of actual service quality is very close to the expected service quality level.

In the dimension of **professionalism**, the following aspects were included in the evaluation of KRUS employees: customer confidence, customer feeling of safety, kindness to customers, knowledge allowing answers to customer questions and skills of passing the knowledge to every customer.

All the above-identified aspects were rated highly as concerns the expected service quality (at the level of 6.0) (Fig. 1). The lowest level of the actual service quality was recorded in the responses concerning the customer feeling of safety

(5.7) while the remaining categories were rated within the range of from 5.9 to 6.3.

The average level of expected satisfaction was 6.6 while the actual level was 6.0 and the minimum was 5.1. It is worth noting that the respondents rated the KRUS employees' professionalism as very high.

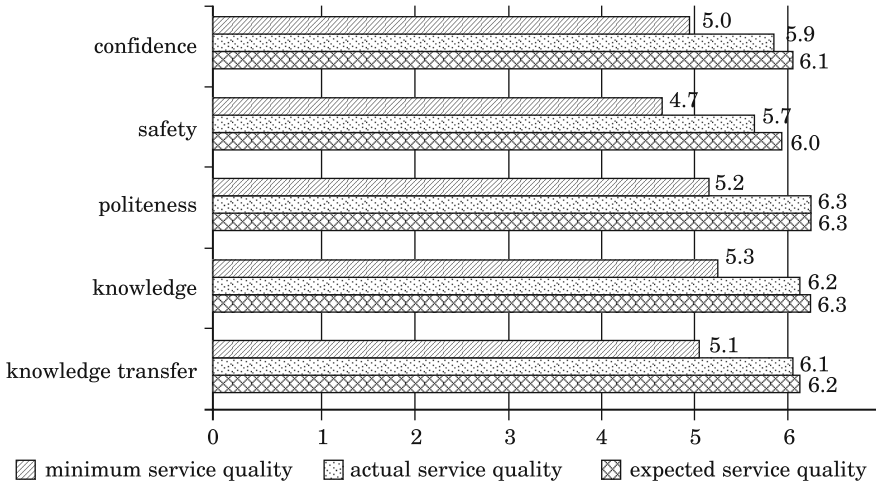


Fig. 1. Evaluation of service quality in the professionalism dimension
*Source:* own work based on the survey conducted.

The women and the men rated the dimension of professionalism in an almost identical way and only minor differences were recorded. The women rated the expected, actual and the minimum service quality at 6.2, 6.0 and 5.0 respectively. The men rated those categories at 6.0, 6.0 and 5.1 respectively. It can be concluded that both the women and the men rated the dimension of professionalism as very high.

The survey respondents also evaluated the dimension of **empathy** (Fig. 2), within which five categories were covered: the individual approach to every customer, work hours of the KRUS office, empathy and kindness of employees, understanding of the specific needs of the customers and the best satisfaction of the customers' needs.

The average results indicate that the respondents rated the expected service quality within that dimension the highest of all the categories (6.2) while the actual service quality was rated at a comparably high level (6.0).

The respondents rated both the expected and the actual service quality the highest in the category of the KRUS employee being nice, kind and friendly. The lowest level was recorded in the category that the KRUS employee

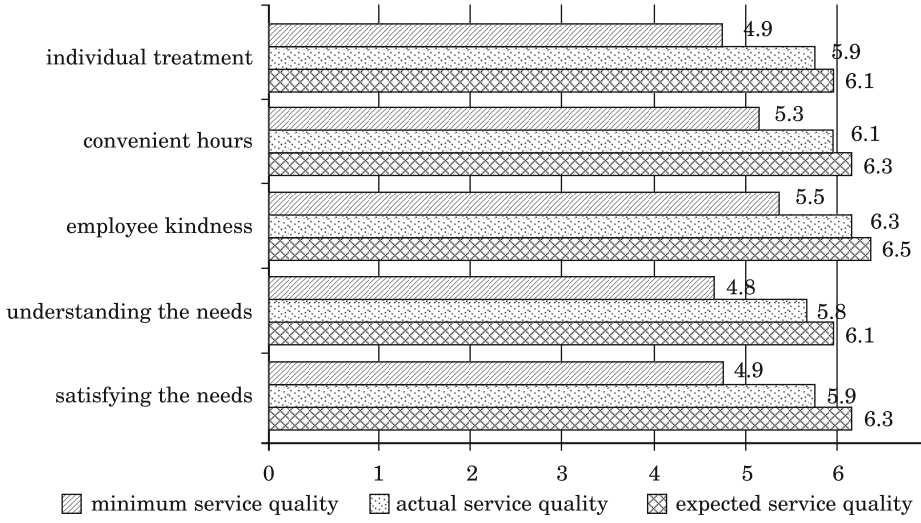


Fig. 2. Evaluation of service quality in the empathy dimension
*Source:* own work based on the survey conducted.

understands the specific needs of his customers in both the expected and the actual service quality rating.

The rating of the empathy dimension was high. Women rate that dimension as concerns the expected and the actual service quality at the level of 6.3 and 6.0. Men rated that category at 6.1 and 5.9 respectively. The ratings by the women and the men concerning the minimum service quality were the same at 5.1.

The following table presents the ratings for the individual dimensions of services for the expected, actual and minimum service quality (Fig. 3).

Customers rated the dimension of empathy very high as concerns the expected service quality. It was rated at 6.3 in the scale of from 1 to 7, giving it a high position. The respondents rated the dimensions of professionalism and responsiveness slightly lower. The results obtained in those dimensions were at the same level (6.2). The material and reliability dimensions were rated the lowest (6.1). It should be highlighted that despite the diversity of the dimensions rated, all of them were rated at the level exceeding 6.0.

The survey indicated the lowest satisfaction level in the tangibles dimension. It was rated at the level slightly exceeding 5. It was followed by reliability that was rated significantly above 5 (5.7). The conducted survey showed that both the responsiveness to customer expectations and professionalism, as well as empathy, all scored high on the actual service quality, reaching the level of 6.0.

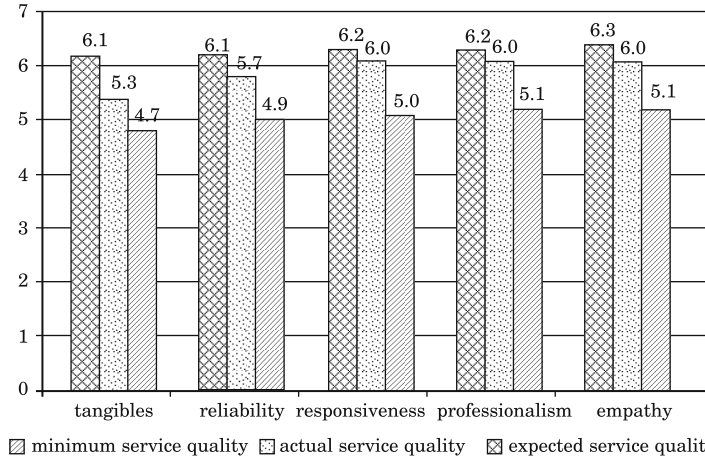


Fig. 3. Expected, actual and minimum service quality
*Source:* own work based on the survey conducted.

This means that the survey participants classified the individual components of the highest scoring dimensions positively, meaning that the respondents were satisfied in the dimension of responsiveness, with the KRUS employee providing honest information on the service delivery time, providing services efficiently and in the timely manner, willingness to provide help and solve problems as well as the time devoted to the customer. In the dimension of professionalism, according to the respondents, the behaviour of KRUS employees builds confidence, a feeling of security, the personnel are kind, possess knowledge to provide necessary information and transfer that knowledge skilfully.

In the dimension of empathy, the respondents appreciated an individual approach to the customer, convenient work hours of the office, kindness of the KRUS employees and the skills of understanding the specific needs of the customer.

The minimum service quality means the level of service provision that the customer is able to accept. The tangibles dimension scored the lowest in that aspect. This indicates low requirements of the customers concerning the tangible assets of the institution surveyed. The data analysis indicates that customers had higher expectations concerning the other four dimensions. This can be indicated by the results obtained in those dimensions as concerns the expected and the actual service quality.

In the last part of the questionnaire, the respondents were to allocate 100 points to the individual dimensions, which enabled determining the level of their importance.

The dimension of professionalism proved the most important for the respondents, who allocated as many as 30 points to it, which might indicate its high importance. The responsiveness to the customer expectations dimension ranked second, scoring 21 out of 100 points. Reliability ranked slightly lower, scoring 20 points and it was followed by empathy and tangibles, scoring 16 and 13 points respectively (Fig. 4).

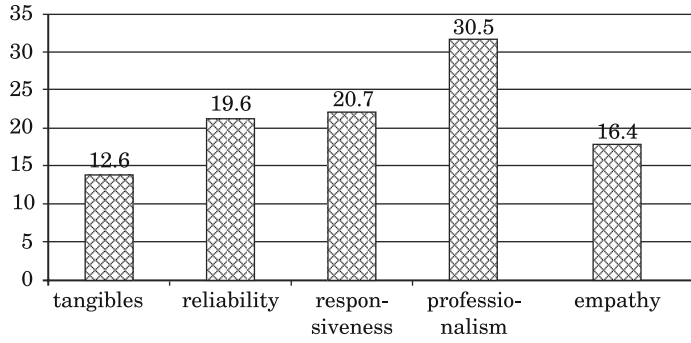


Fig. 4. Importance of service dimensions
*Source:* own work based on the survey conducted.

The quality gaps model presents the differences between the customers' expectations and the level of service received. The total service quality gap may consist of several partial gaps.

The highest difference between the expected and the actual value (Fig. 5) was observed in the tangibles dimension (0.8).

It should be concluded then that the dimension is within the "tolerance zone" because the minimum value is set at the level of 4.7, which means that according to the customers it is already satisfactory.

In the next dimension of services – reliability – the gap between the actual service quality and the expected service quality is lower by a half, reaching the value of 0.4. The result indicates that the KRUS customers rated the actual service quality relatively high (5.7) while their expectations were at the level of 6.1. The tolerance zone starts at 4.9, which means that the minimum service quality in the reliability dimension was set at that level.

The smallest gaps were found in the dimensions of responsiveness to customer expectations and professionalism (0.2). In both of those service quality dimensions the expected and the actual service quality were set at the same levels (6.0 and 6.2 respectively) which indicates that the respondents ranked professionalism and responsiveness to their needs at an equal level.

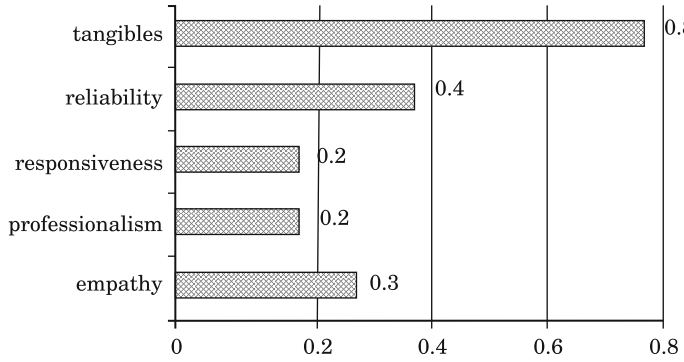


Fig. 5. Gap size in the individual service dimensions
*Source:* own work based on the survey conducted.

In the case of empathy, the difference between the actual service quality and the expected service quality was 0.3. The size of that gap rates the KRUS employees relatively highly because both the actual and the expected service quality are at almost the same level of 6.0 while the tolerance zone starts at 5.1.

## Conclusion

The gap size is the most important factor. A larger customer satisfaction increase is usually obtained by closing the larger gap and made smaller by closing a smaller gap. The studies indicate that the largest gap existed in the tangibles dimension (0.8). Reduction of that gap, however, is not dependent on KRUS employees. Closing a smaller gap which concerns a high customer priority, may result in larger satisfaction increase than dealing with the issue of a larger gap but concerning an area of lesser importance. According to that theory, closing the gaps in the dimensions of professionalism and responsiveness to customer expectations (0.2) would increase satisfaction more than closing the gap in the tangibles dimension (0.8) as the professionalism dimension is a high priority for the KRUS customer, while the tangibles dimension is not.

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# DETERMINANTS OF CHANGE IN PRODUCTION FACTORS AS INDICATORS OF FARM STRUCTURE TRANSFORMATIONS IN HIGHLY FRAGMENTED AGRICULTURE

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Key words: production factors, changes, structural transformation, regional policy.

Abstract

This paper presents the relationship between changes in production factors and selected production conditioning. Due to the type of data used, the analysis was based on a Kruskal–Wallis statistical test and the $\chi^2$ test. This analysis determined the farmer's most manageable processes of change and their direct factors. The research findings should be used to develop effective instruments of regional policy towards agribusiness.

## DETERMINANTY ZMIAN ZASOBÓW CZYNNIKÓW PRODUKCJI JAKO WYZNACZNIKI PRZEKSZTAŁCEŃ STRUKTUR W ROZDROBNIONYM ROLNICTWIE

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Słowa kluczowe: czynniki produkcji, zmiany, przekształcenia struktur, regionalna polityka gospodarcza.

Abstrakt

W artykule przedstawiono zależności między zmianami w zasobach czynników produkcji a jej wybranymi uwarunkowaniami. Ze względu na charakter danych analiza była prowadzona na podstawie statystyki testu Kruskala–Wallisa oraz testu $\chi 2$. Ocena zależności pozwoliła na ustalenie najbardziej sterowalnych przez rolnika procesów zmian oraz ich bezpośrednich determinant. Wyniki badań powinny posłużyć do konstrukcji instrumentów regionalnej polityki gospodarczej wobec agrobiznesu.

## Introduction

The relationships between the various elements of economic system and their roles within the system capture the very essence of the economic structure. The efficiency of a given economy at the macro level is determined by the condition of the structure (MARCINIAK 1995, p. 54). It is a commonly accepted notion nowadays that a key role among a range of factors affecting economic structures is played by endogenous factors which are crucial for initiating adaptation processes. Past experience proves that structural changes involve transformation of both the immediate and distant economic environment, which makes it difficult to assess the changes merely from a sectoral perspective (CZYŻEWSKI 2003). Using the definition of problem areas the starting point for further analysis, we could attempt to determine one abnormal element of the economic sphere which accounts for economic underdevelopment (BAŃSKI 2000, p. 45). Regarding agriculture, it is the poor agrarian structure which determines the existence of areas with undeveloped agriculture. The agrarian factor is critical in this respect and it is commonly accompanied by a range of others: low production inputs, low qualifications of the farm holders and the rising age of the farm population.

However, it would be a major oversimplification to understand agricultural structure in terms of agrarian structure solely; there are other equally important structures which relate to other aspects of the complex agricultural system. Agrarian structure is directly related to agricultural holdings, whereas other structures may also determine the functions and processes taking place on the premises and by means of agricultural holdings. Agricultural structure is characterized by relative inertness: as a non-technical phenomenon it refuses to follow simple economic, administrative and legal measures. Changes in the structure of agriculture are subject to various macro- and microeconomic limitations such as the objective function, system of values and farm family demographics. Another factor connecting the macro- and micro-spheres is the increasing reliance of farm families on off-farm work and income. Moreover, merging sustenance holdings, or simply family farms, with agricultural holdings significantly contributes to the low rate of transformation of the socio-economic structure of agriculture. On the other hand, specific structural dimensions of agriculture are critical for making it sustainable and multifunctional as nowadays they allow agriculture to perform various fundamental public functions, i.e. economic, production, social, environmental and others. The real issue is that development of one dimension of structure related to one function of agriculture can affect, even adversely, another dimension and basis for another function. A frequently made mistake hence stems from focusing on one structure without accounting for its impact on others (ZEGAR 2009, pp. 9–10).

The organization of production determines economic reasoning and the market system should effectively change it, whereas government interventionism should provide for non-food functions of agriculture on social grounds. Yet the disparities in agrarian structures are widening, which is exemplified by the fragmented structure of agriculture in the south-east of Poland. The rate of arable land decline is higher than in other parts of Poland. Furthermore, the higher decline rate of arable land and permanent grassland is a clear manifestation of the on-going process of extension of agriculture in the region. Despite the gradual increase in average size of arable land in the holdings in the region, it still lags well behind the rest of the country and contributes to the growing disparity at the national level in this respect. This fact significantly limits the competitive advantage of the holdings in the region mainly due to their relatively small scale of production. The poor ratio between human capital and arable land size is still worsening and continues to adversely affect the fragmented agricultural structure of the region. This is because the increase rate of fully employed persons per 100 ha of arable land is higher than in the other parts of the country. Another negative fact is the growing disparity with regards to investment capital and the use of utility buildings for agricultural purposes. Moreover, the higher increase rate of holdings with own tractors, compared to the rest of the country, in a region with a highly fragmented farming structure, continues to highlight the unreasonable relationships between various production inputs. Consequently, it leads to a further decrease in profitability and leads to more farmers deciding to exit the market: this strategy seems justified as a way to shift production away from self-sufficiency. The highlighted processes stimulate the need to identify factors contributing to the change of production factors in the agricultural holdings of the south-east of Poland. Such identification may help to recognize policy instruments to be used for the benefit of the regional agricultural and development policies. The past experience gained in the process of implementing the European Union Common Agricultural Policy and the related sectoral programs have proven their low efficiency. The significance of these measures for the areas characterized, on the one hand, by vast production inputs in agribusiness and, on the other, by undeveloped structures, cannot possibly be overestimated, not only in view of the region's perspectives for agricultural development, but also for the socially-desired non-agricultural functions of rural areas.

## The objectives, data resources and methodology

The aim of the paper is to identify the determinants of change of major production factors in agricultural holdings (i.e. arable land size, labour capital, head of basic herd cattle, livestock building area and agricultural machinery

value) and tendencies affecting structural changes in the fragmented agriculture.

The data is based on the findings of the questionnaire surveys conducted in 2007[1]. The results of this sample-based research were obtained by means of proportional stratified random sampling. The questionnaire surveys were carried out among farmers – owners of agricultural holdings in the south-east of Poland, i.e. the area of Świętokrzyskie, Małopolskie and Podkarpackie provinces. Altogether, the survey was conducted on a sample of 856 farmers[2].

Changes in major production inputs were defined in the three-grade scale (i.e. decrease, no change and increase), which further affected the division of the holdings into three groups. Consequently, the allocated groups of holdings were analysed with regard to variables of production conditions. Under these circumstances, the correlations between changes in production factors and their conditioning were identified on the basis of the observed differences in conditioning intensity in the allocated holding groups. The choice of the applied statistical methods was limited by the fact that the variables defining production conditioning tended to fail to present the normality of distribution and homogeneity of variance in the distinguished groups of holdings. Hence, the analysis of the research findings used methods applied for ordinal traits whose criteria meet all the tested variables except for the farmer's gender.

In order to test the occurrence of significance of differences in characteristics (excluding the characteristics of farmer's gender) the statistical Kruskal–Wallis test was used to determine between the farm groups. The critical value of the least significant difference based on the $\chi^2$ statistical test was used to assess the significance of differences between the ranks for characteristics within the distinguished groups. Statistically significant differences between the variables defining production conditioning confirmed their correlation with the variables used to distinguish different holding groups.

Before application of the statistical Kruskal–Wallis test, the null hypothesis was assumed that the examined populations demonstrate the same distributions. It boiled down to determination of the position of equal populations and, in this respect, the Kruskal–Wallis test is particularly sensitive to deviations from this assumption.

Having sorted out the values and assigned ranks, the statistics of the Kruskal–Wallis test were calculated according to the formula (ACZEL 2000, s. 731–735):

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[1] The research was conducted as a part of the research grant "The role of local institutions in the process of transformation of agriculture with fragmented structure of holdings (following the accession of Poland to the European Union)" No. N114 009 31/2320 financed by the Ministry of Science and Higher Education and managed by prof. dr hab. Adam Czudec.

[2] For more on the sampling method used see CZUDEC et al. 2008, pp. 15–17.

$$H = \frac{12}{n(n-1)}\left(\sum_{j=1}^{k}\frac{R_j^2}{n_j}\right) - 3(n+1),$$

were $n$ denotes the number of observations, $n_j$ is the number of observations in the sample $j$, and $R_j$ define observation ranks in the $j^{\text{th}}$ group, whose total number equals $k$.

The statistics of this test generally allow determination of the differences between populations, yet in order to verify which of the populations were affected more specifically, we compared the modules of differences between the mean ranks of samples $i$ and $j$:

$$D = |\bar{R}_i - \bar{R}_j|$$

and the value of $C_{\text{KW}}$:

$$C_{\text{KW}} = \sqrt{\chi^2_{\alpha,k-1}\left[\frac{n(n+1)}{12}\left(\frac{1}{n_i} + \frac{1}{n_j}\right)\right]},$$

where $\chi^2_{\alpha,k-1}$ is the critical size of distribution $\chi^2$, at $\alpha = 0.05$ and $\alpha = 0.01$ for defining statistically significant and highly significant differences respectively.

Regarding the farmer's gender, the statistical $\chi^2$ test was applied to assess the gender correlation with the variables determining the criteria for distinguishing various holding groups. The data used to calculate the test statistics was organized in two-dimensional arrays, yet due to the adopted classification of the changes in major production factors, three classes were always isolated and two classes were used for the other variable (man/woman). The assessment of correlations between the examined variables allocated in a two-dimensional array was proceeded by adoption of the null hypothesis concerning their independence. If $p_{ij}$ defines the probability of belonging of a randomly selected element to the class $i$ and $j$ with respect to the characteristics accounted for in the array and, when $p_{i.}$ and $p_{.j}$ are respective boundary probabilities, the null hypothesis takes on the form (JÓŻWIAK, PODGÓRSKI 1998, pp. 358–362):

$$H_0\text{: } p_{ij} = p_{i.}\, p_{.j} \text{ for pairs of } i, j \text{ indexes}$$

and the alternative hypothesis is:

$$H_1\text{: } p_{ij} \neq p_{i.}\, p_{.j} \text{ for some pairs of } i, j \text{ indexes.}$$

The boundary probabilities can be calculated:

$$\hat{p}_i = n_i/n$$

and

$$\hat{p}_{.j} = n_{.j}/n$$

Assuming independence of variables, the expected values in the array can be calculated:

$$\hat{n}_{ij} = n\hat{p}_i\,\hat{p}_{.j} = n(n_{i.}/n)\,(n_j/n) = (n_{i.}\,n_{.j})/n.$$

The statistics of the $\chi^2$ test was calculated followed the formula:

$$\chi^2 = \sum_{i=1}^{k}\sum_{j=1}^{l}\frac{(n_{ij}-\hat{n}_{ij})^2}{\hat{n}_{ij}}.$$

The number of the degrees of freedom is determined by the product $(k-1)(l-1)$.

The null hypothesis was rejected at the significance level $\alpha = 0.05$, when $\chi^2 \geq \chi^2_{\alpha,(k-1),(l-1)}$.

## The research findings

The analysis of the researched issues began with a description of changes in the size of arable land in relation to the major conditionings of production in agricultural holdings in the five years prior to the research: in this respect, the statistical Kruskal–Wallis and $\chi^2$ tests were applied. Their values are presented in the second column of table 1 and the fact when they refer to the $\chi^2$ statistics has been noted.

Following the results of the statistical Kruskal–Wallis test, we can observe that changes in the arable land size (decrease, increase or no change) were most strongly related to changes in the actual size of arable land in farms. It means that the more arable land farmers possessed, the more they enlarged the amount of their agricultural resources' it is worth noting that all differences in arable land size in the distinguished holding groups related to changes in this production factor were statistically highly significant. This denotes a trend of growing stratification of farms with regard to the above characteristics. At a somewhat lower, yet still statistically significant level, the increase in arable land size was correlated with an increase in economic strength of holdings, farm machinery value, the EU financial support and intensity of farmer's interaction

with the institutional environment. At the lowest, yet still statistically significant level, we can observe a correlation between an increase in arable land size and a decrease in farmer's age and his farm management experience. The only factor which was not statistically significantly correlated with changes in arable farm size was the farmer's gender (Tab. 1).

The next issue which was the subject of our analysis was the relationship between changes in labour capital and factors affecting the production capabilities of agricultural holdings (Tab. 2).

Firstly, it should be noted that the results of the statistical Kruskal–Wallis test demonstrated much lower values in this case when compared with the former. Among the variables affecting production, share of farm income in the total family income had the highest statistically significant correlation with increase in labour capital. The correlation was slightly lower in the case of arable land size in holding, its economic strength, value of machinery, smaller labour capital in relation to arable land size and the volume of EU financial support. Hence, the findings show that labour capital grew in the holdings where farming constituted the major source of family income as well as in the largest in size and

Table 1

Changes in size of arable land by selected factors affecting production in agricultural holdings

| Production conditioning | Kruskal–Wallis statistics and $\chi^2$ tests | Assessment of differences in production conditions among the holding groups by changes in arable land size | | |
|---|---|---|---|---|
| | | decrease – no change | decrease – increase | no change – increase |
| Arable land size [ha] | 134.75** | ** | ** | ** |
| Labour capital [full-time employment] | 33.58** | ** | ** | ** |
| Labour capital [full-time employment/ha of arable land] | 71.69**** | ** | | |
| Value of agricultural machinery [zł] | 95.97** | ** | ** | ** |
| Livestock buildings' area [m$^2$] | 21.21**** | ** | | |
| Economic strength of the holding [ESU] | 100.01** | ** | ** | ** |
| Farm income share in the total family income [%] | 59.55** | ** | ** | ** |
| Farmer's gender | $\chi^2$ = 1.27 | | | |
| Farmer's age [years] | 24.63**** | ** | | |
| Farm management experience [years] | 7.25* | ** | | |
| Farmer's contacts with institutions [0:1] | 94.28** | ** | ** | ** |
| European Union financial support [zł] | 95.97** | ** | ** | ** |

* – significance at probability $p$=0.05

** – significance at probability $p$=0,01

*Source*: own calculations following the questionnaire – based research.

Table 2

Changes in labour capital by selected factors affecting production in agricultural holdings

| Production conditioning | Kruskal–Wallis statistics and $\chi^2$ tests | Assessment of differences in production conditions among the holding groups by changes in labor capital | | |
|---|---|---|---|---|
| | | decrease – no change | decrease – increase | no change – increase |
| Arable land size [ha] | 15.85** | | ** | ** |
| Labour capital [full-time employment] | 3.81 | | | |
| Labour capital [full-time employment/ha of arable land] | 5.78* | | | * |
| Value of agricultural machinery [zł] | 13.12** | | * | ** |
| Livestock buildings' area [m$^2$] | 4.63 | | | |
| Economic strength of the holding [ESU] | 14.35** | | ** | ** |
| Farm income share in the total family income [%] | 16.5** | | ** | ** |
| Farmer's gender | $\chi^2$ = 1.33 | | | |
| Farmer's age [years] | 5.08 | | | |
| Farm management experience [years] | 2.42 | | | |
| Farmer's contacts with institutions [0:1] | 4.07 | | | |
| European Union financial support [zł] | 12.59** | | ** | ** |

* – significance at probability $p$=0.05
** – significance at probability $p$=0.01
*Source*: own calculations following the questionnaire – based research.

economically strongest agricultural holdings which also took the most advantage of the EU financial assistance – the correlation among these factors tends to be high and positive. Half of the distinguished conditions proved statistically insignificant for changes in labour capital: farmer's gender again, their age, experience in farm management, intensity of interactions with institutions, livestock buildings area size and labour capital in holding (Tab. 2). It seems there are problems in identifying specific factors accounting for a farm labour capital increase among the elements of farm production.

The next focus of our analysis was to test the correlation between changes in head of basic herd cattle and factors determining production capabilities of agricultural holdings (Tab. 3).

Increase in head of basic herd cattle was most strongly correlated with increase in the holding's economic strength, which means that the economically strongest farms focused on livestock production predominantly. Similarly, yet at a slightly lower degree, an increase in head of basic herd cattle was related to the size of arable land and the share of farm income in the total family income.

Table 3

Changes in head of basis herd cattle by selected factors affecting production in agricultural holdings

| Production conditioning | Kruskal–Wallis statistics and $\chi^2$ tests | Assessment of differences in production conditions among the holding groups by changes in head of basic herd cattle | | |
|---|---|---|---|---|
| | | decrease – no change | decrease – increase | no change – increase |
| Arable land size [ha] | 61.65** | | ** | ** |
| Labour capital [full-time employment] | 27.79** | | * | ** |
| Labour capital [full-time employment/ha of arable land] | 17.58** | | ** | ** |
| Value of agricultural machinery [zł] | 44.99** | ** | ** | ** |
| Livestock buildings' area [m$^2$] | 40.33** | | ** | ** |
| Economic strength of the holding [ESU] | 76.86** | * | ** | ** |
| Farm income share in the total family income [%] | 54.08** | * | ** | ** |
| Farmer's gender | $\chi^2$ = 4.06 | | | |
| Farmer's age [years] | 10.84** | | * | * |
| Farm management experience [years] | 0.39 | | | |
| Farmer's contacts with institutions [0:1] | 36.36** | | ** | ** |
| European Union financial support [zł] | 40.22** | | ** | ** |

* – significance at probability $p$=0.05

** – significance at probability $p$=0.01

*Source*: own calculations following the questionnaire – based research.

Not as strong as in the former case, but still statistically highly significant, were the correlations between the increase in head of basic herd cattle with higher values of agricultural machinery in holdings and EU financial support, larger livestock building area size, more frequent farmer's contacts with institutions, higher labour capital as well as lower ratio of labour capital per 1 ha of arable land and lower farmer's age. In the instances of farmer's gender and his farm management experience, no statistically significant correlation with change in head of basic herd cattle was proven. However, a moderately strong correlation of change in head of basic herd cattle with the size of livestock building area was observed, which may result from the impact of the specific economic conditions of cattle breeding on agricultural producer's decisions (Tab. 3).

The aim of the next assessment was an attempt to determine the relationship between changes in the possession of livestock building capital and factors affecting production capabilities of agricultural holdings (Tab. 4).

Table 4

Changes in livestock building capital by selected factors affecting production in agricultural holdings

| Production conditioning | Kruskal–Wallis statistics and $\chi^2$ tests | Assessment of differences in production conditions among the holding groups by changes in livestock building capital | | |
|---|---|---|---|---|
| | | decrease – no change | decrease – increase | no change – increase |
| Arable land size [ha] | 59.91** | | | ** |
| Labour capital [full-time employment] | 6.36* | | | * |
| Labour capital [full-time employment/ha of arable land] | 35.18** | | | ** |
| Value of agricultural machinery [zł] | 40.27** | | | ** |
| Livestock buildings' area [m$^2$] | 23.68** | | | ** |
| Economic strength of the holding [ESU] | 55.06** | | | ** |
| Farm income share in the total family income [%] | 24.15** | | | ** |
| Farmer's gender | $\chi^2$ = 0.03 | | | |
| Farmer's age [years] | 2.83 | | | |
| Farm management experience [years] | 0.39 | | | |
| Farmer's contacts with institutions [0:1] | 42.17** | | | ** |
| European Union financial support [zł] | 40.54** | | | ** |

* – significance at probability $p$=0.05

** – significance at probability $p$=0.01

*Source*: own calculations following the questionnaire – based research.

The highest increase in the size of livestock building area was noted in the economically strongest holdings and those with the largest amount of arable land: here we can observe a correlation similar to the former ones in the analyses of factors affecting changes in arable land size, head of basic herd cattle and labour capital in the holdings. In this light, these factors should be assessed as the major determinants of the above changes. Among the factors affecting agricultural production which did not show any statistically significant correlation with changes in the size of livestock building area were, again, farmer's age, gender and his farm management experience (Tab. 4).

The final characteristics used to group the holdings were changes in the value of agricultural machinery. Its correlation with factors affecting agricultural production is presented in Table 5.

Table 5

Changes in value of agricultural machinery by selected factors affecting production in agricultural holdings

| Production conditioning | Kruskal–Wallis statistics and $\chi^2$ tests | Assessment of differences in production conditions among the holding groups by changes in value of agricultural machinery | | |
|---|---|---|---|---|
| | | decrease – no change | decrease – increase | no change – increase |
| Arable land size [ha] | 133.03** | | ** | ** |
| Labour capital [full-time employment] | 35.58** | ** | ** | ** |
| Labour capital [full-time employment/ha of arable land] | 68.52** | * | | ** |
| Value of agricultural machinery [zł] | 181.96** | * | ** | ** |
| Livestock buildings' area [m$^2$] | 27.38** | | | ** |
| Economic strength of the holding [ESU] | 128.04** | | ** | ** |
| Farm income share in the total family income [%] | 90.01** | | ** | ** |
| Farmer's gender | $\chi^2$ = 2.70 | | | |
| Farmer's age [years] | 28.87** | | | ** |
| Farm management experience [years] | 2.08 | | | |
| Farmer's contacts with institutions [0:1] | 92.04** | | ** | ** |
| European Union financial support [zł] | 167.69** | | ** | ** |

* – significance at probability $p$=0.05

** – significance at probability $p$=0.01

*Source*: own calculations following the questionnaire – based research.

The increase in value of agricultural machinery was surveyed primarily in the holdings which already possessed high worth of machinery and statistically significant differences of their average values were observed among all holding groups. Another variable highly correlated with changes in agricultural machinery in holdings proved to be the volume of the EU financial support which, in fact, was most often used to subsidize purchase of this resource. A weaker, if compared to the others, yet still high with a positive correlation of increase in the worth of agricultural machinery was observed with arable land size, holding's economic strength and the intensity of the farmer's interaction with institutions (Tab. 5).

## Conclusions

The undertaken analysis makes it possible to determine groups of holdings and their most effective regulation by means of regional policy instruments in order to facilitate transformation of production organization in agriculture with a highly fragmented structure.

a) The policy tools stimulating arable land size should be addressed primarily to larger-in-size farm holdings.

b) The statistically low significance of correlation of changes in labour capital with various production factors proves the rather limited absorption capabilities of free labour by fragmented agriculture. Moreover, these relationships are affected by a variety of other hard-to-define factors which still influence the use of free labour.

c) The rise of economic efficiency and profitability in fragmented agriculture could be accomplished by developing livestock production, which is highly plant-dependent[3], and as was demonstrated by the research findings, the larger-in-size farms should take advantage of the relevant policy programs in the first place.

d) The most efficient incentive to develop agricultural machinery capital is to make use of the EU subsidies and this strategy tends to have been most widely employed by the farmers owning larger – in terms of area – holdings. It should also be noted that the use of tools of regional policy for encouraging transformation of production structure and improving the economic situation in fragmented agriculture should take advantage of the benefits of the synergy effect between all of the above-mentioned factors.

The presented research demonstrates that the use of a regionally individualized economic policy towards agribusiness is fully justified (*cf.* LAGNEVIK, KOLA 1998, pp. 286–297, after: STROJNY 2010, pp. 139–150). The presented incentives should be taken into account in the process of formulation of the appropriate policy programs. However, the question arises whether local governments can fully rely on legal and organizational support and expertise of a wide spectrum of institutions in the process of development and implementation of regional agribusiness management policy.

In conclusion, although the real issue is the fragmented structure of agriculture, it is also an issue of the process of elimination of farming in small

[3] Agriculture in developed countries relies primarily on livestock production on which crop production is largely dependent. This approach is supported by a simple economic calculation: animal-based products tend to be characterized by a much higher degree of processing than plant-based ones. Livestock production also plays a very important role in Poland both in terms of its share in overall agricultural production and as a source of a farm family's income (cf. MUSIAŁ 2011, pp. 19, 20).

and economically inefficient holdings in favour of the development of non-farming activities. In this way, a new image of a more efficiently managed intensive farm suitable for a fragmented agrarian structure can be created.

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# COMPLIANCE AND NON-COMPLIANCE COSTS IN SELECTED MANUFACTURING ENTERPRISES

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Key words: quality cost, compliance costs, non-compliance costs.

Abstract

Quality cost analysis is considered a very important instrument used in quality economics. Interpretation of changes in the quality cost level, cost optimisation effectiveness and indicating the directions for quality improvement plan verification represent the subject of this analysis.

Evaluation of the compliance and non-compliance costs in the development of quality costs in a selected enterprise during the years 2004–2009 was the main goal of this study. A limited liability company conducting manufacturing activity in the province of Warmia and Mazury was selected which mainly produces accessories to automotive vehicles and machines.

As the result of the conducted studies, the following ultimate conclusions were formulated:

– quality costs in the enterprise surveyed showed an increasing trend during the years 2004–2007 and as of 2008 a decreasing trend was observed (in 2009 they decreased by 17% as compared to 2008),

– the ratio of losses from the total defective production during the years 2004–2006 showed a decreasing trend; the significant change in the value of defective products manufactured proves the efficiency of the quality management system applied in the company,

– with the increase in the costs of activities related to preventing poor quality, the costs of defective products and the total quality costs decrease.

## KOSZTY ZGODNOŚCI A KOSZTY NIEZGODNOŚCI W WYBRANYM PRZEDSIĘBIORSTWIE PRODUKCYJNYM

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Słowa kluczowe: koszty jakości, koszty zgodności, koszty niezgodności.

Abstrakt

Analizę kosztów jakości uznaje się za bardzo istotny instrument wykorzystywany w ekonomice jakości. Przedmiotem tej analizy jest interpretacja zmian w kształtowaniu się poziomu kosztów jakości, ocena skuteczności optymalizacji kosztów oraz wskazanie kierunków weryfikacji planu doskonalenia jakości.

Głównym celem badań jest ocena roli kosztów zgodności i kosztów niezgodności w kształtowaniu się kosztów jakości w wybranym przedsiębiorstwie w latach 2004–2009. Podmiotem badań jest spółka z o.o., prowadzącą działalność produkcyjną na terenie województwa warmińsko-mazurskiego. Dominującym rodzajem działalności tej firmy jest produkcja akcesoriów do pojazdów samochodowych i maszyn.

W wyniku przeprowadzonych badań sformułowano następujące wnioski końcowe:

– koszty jakości w badanym przedsiębiorstwie wykazują w latach 2004–2007 tendencję wzrostową, a począwszy od 2008 r. tendencję spadkową (w 2009 r. zmniejszyły się o 17% w porównaniu z 2008 r.);

– wskaźnik strat z tytułu produkcji wadliwej ogółem w latach 2004–2006 ma tendencję malejącą; istotna zmiana wartości wytwarzanej produkcji wadliwej dowodzi, że funkcjonujący w spółce system zarządzania jakością przynosi odpowiednie efekty;

– wraz ze wzrostem kosztów działań związanych z zapobieganiem złej jakości następuje spadek kosztów produktów wadliwych oraz kosztów całkowitych jakości.

## Introduction

Achieving and maintaining high product quality generally requires implementation of appropriate quality management methods and procedures in an enterprise. A functioning quality management system shows the commitment of the enterprise to increasing the quality of products which, at the same time, offers the opportunity of winning higher customer confidence and increasing the enterprise's rank. Those activities lead to strengthening the market position of the enterprise and gaining a competitive advantage.

Quality costs represent an economic instrument to evaluate the quality management system in an organisation. Identification and indication of the places and causes of their appearance are crucial elements in the quality cost analysis. A correctly conducted quality cost analysis determines the quality of decisions taken on its basis by the staff managing the quality systems of the organisation.

John Bank lists three major types of quality costs (they are divided further into numerous components), namely:

– compliance costs (they are divided into prevention costs and evaluation costs),

– non-compliance costs (divided further into internal errors costs, external errors costs and costs of exceeding the requirements),

– costs of lost benefits (BANK 1997, p. 33)

The internal quality assurance costs represent the sum of compliance and non-compliance costs. The term "compliance" describes the extent to which the product shows compliance with the design specification while from the

perspective of the client it should describe the extent to which the product satisfies his requirements. The term "non-compliance" refers to deviations from customer requirements, which is simply called the error (*Zarządzanie przez jakość...* 2003, p. 421). The non-compliance costs include the costs of internal errors and costs of external errors. The place of non-compliance detection and revelation is assumed as the criterion for that division. The costs of internal errors are the costs related to detection of non-compliance prior to transferring the product to the buyer. The external costs are the costs which appear after transferring the product to the user (BALON 2006, p. 18).

Evaluation of the role of compliance and non-compliance costs in quality costs development in the selected enterprise during the years 2004–2009 was the major goal of the studies.

The following detailed objectives were formulated for achievement of the main goal:

– determination of the quality cost structure in the company surveyed,

– determination of the level of losses for defective production in the total revenues of the enterprise,

– determination of the correlations between individual quality cost items recorded in the enterprise.

## Goals and principles of quality cost analysis

Quality cost analysis is considered the basic instrument used in quality economics. Interpretation of changes in the development of quality cost level, cost optimisation effectiveness evaluation and indicating the directions for a quality improvement plan are the subject of this analysis. Providing data on the development of costs according to different groups of cost types as well as explaining the reasons for such costs represents the main task of cost analysis in the organisation.

The goals of quality cost analysis are:

– identification of all type of activities that lead to obtaining the required product quality, regardless of the organisational division in the given enterprise,

– determination of the costs of those actions and operations,

– interpretation of the data obtained and making it available to the interested persons and entities,

– seeking opportunities to optimise the manufacturing quality costs,

– organising regular observation and registration of trends for the quality costs recorded (KOLMAN 2009, p. 397).

This analysis should also allow determination of the influence of quality costs on the financial result of the entity (KOLMAN 2009, p. 397). Quality cost

analysis implementation and including it in the quality management system fulfils the following functions:

– it creates the opportunity to increase the quality management system effectiveness,

– it provides a basis for making decisions on quality issues in the enterprise,

– it surfaces the areas and opportunities for quality cost optimisation (NOWAK et al. 2004, p. 245).

To achieve the above-specified goals, quality costs may be analysed employing different indicators and measures or diversified contextual variables and employ diversified tools and techniques (Fig. 1.).

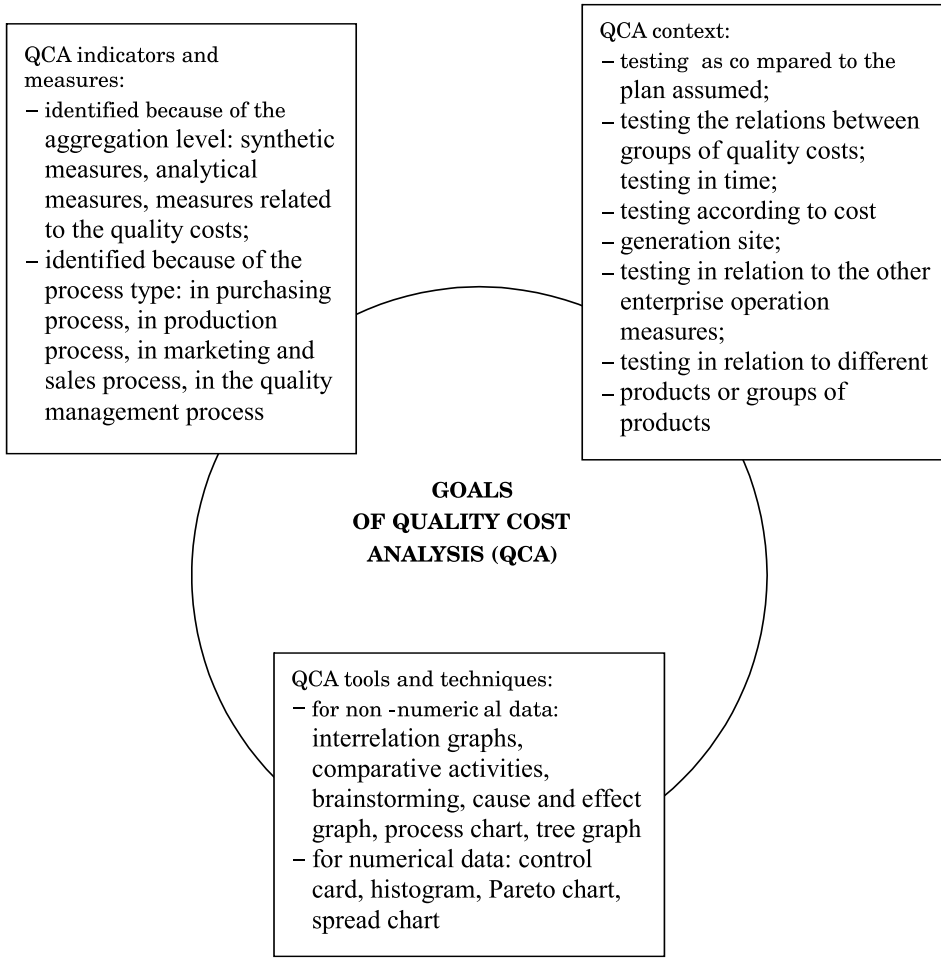


Fig. 1. Fundamental variables in the quality cost analysis
*Source*: based on JEDYNAK 2007, p. 143.

Quality cost measurement and analysis offers numerous benefits to organisations. The most important are:

– they provide a basis for understanding the processes occurring in the enterprise,

– they provide the possibility for making the right decisions by revealing places where high quality costs occur,

– they form the foundations for rational material, financial and human asset management,

– they lead to increasing the operational effectiveness by focusing efforts and resources within the area of priority from the perspective of enterprise efficiency,

– they provide information relating to the level of quality control system performance in the organisation (KISTER 2003, p. 16).

As a consequence, quality cost analysis should represent a kind of a test and verification tool concerning the quality management system efficiency and effectiveness. It is also a tool to evaluate the specific enterprise management processes (SZCZEPAŃSKA 2009, p. 6).

## Methodological assumptions of the survey

A limited liability company conducting manufacturing activities in the province of Warmia and Mazury was the object of the study. The company was mainly involved in the production of accessories for automotive vehicles and machines.

In the context of the goals assumed, the following research hypothesis was formulated: the increase of costs of preventing defective quality causes a decrease in the costs of losses resulting from production of defective products and, as a consequence, assures a decrease in the total quality costs.

The research material was gathered by applying the documentation method. Documents concerning the quality policy as well as periodic reports on quality costs made available by the company surveyed were used. The method of vertical comparisons which serves to compare phenomena in the economic entity during different survey periods was employed. The inductive method was used for drawing conclusions.

## Results of surveys

Table 1 presents the total costs of quality and their components recorded in the surveyed company during the years 2004–2009.

Table 1

Total costs of quality (in PLN) and sales of the enterprise surveyed during the years 2004–2009

| Item | Year | | | | | |
|---|---|---|---|---|---|---|
| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
| Compliance costs, including | 14,000 | 14,000 | 14,400 | 14,400 | 17,200 | 19,400 |
| – costs of preventing poor quality | 6,000 | 6,000 | 6,200 | 6,200 | 6,800 | 6,800 |
| – quality evaluation costs | 8,000 | 8,000 | 8,200 | 8,200 | 10,400 | 12,600 |
| Non-compliance costs | 59,790 | 63,003 | 70,253 | 110,632 | 100,640 | 78,369 |
| Total quality costs | 73,790 | 77,003 | 84,653 | 125,032 | 117,840 | 97,769 |
| Sales [K PLN] | 2,193.90 | 3,075.30 | 3,224.90 | 3,530.30 | 3,107.60 | 5,078.30 |

*Source*: own work based on the registry of quality costs during the years 2004–2009.

Table 2 presents the structure of quality costs in the enterprise surveyed.

Table 2

Structure of the total quality costs during the years 2004–2009 (%)

| Item | Year | | | | | |
|---|---|---|---|---|---|---|
| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
| Costs of preventing bad quality | 8.13 | 7.79 | 7.32 | 4.96 | 5.77 | 6.96 |
| Quality evaluation costs | 10.84 | 10.39 | 9.69 | 6.56 | 8.83 | 12.89 |
| Non-compliance (defects) costs | 81.03 | 81.82 | 82.99 | 88.48 | 85.40 | 80.15 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

*Source*: own work based on the register of quality costs during the years 2004–2009.

The costs of defective products (over 80%, and in 2007 almost 89%) have the largest share in the quality costs every year. Resignation from contractors that, as was discovered, until the end of 2006 performed some of the production work reliably was the main cause for the increase in the share of defective products in the quality costs in 2007. An analysis of the total quality costs during the surveyed period also indicated that the share of the prevention costs in the total quality costs decreased during the years 2004–2007 reaching a low in 2007 and then showed an increasing trend during the following years. The same situation occurred regarding the evaluation costs. The share of the costs of defects in the total quality costs, after the period of increase during the years 2004–2007, decreased during the years 2008–2009 (in 2007 – 88.48%, and in 2009 – 80.15%).

The costs of internal defects during the period surveyed represented over 90% of the total non-compliance costs and year-upon-year their share increased (Tab. 3 and Fig. 2): from 91.87% in 2004 to 96.68% in 2009. This means that almost all cases of non-compliance with the client requirements were

detected at the enterprise prior to the delivery to the buyer. The costs of external defects represent, as a consequence, less than 10% of the total non-compliance costs, which indicates an effective system for detecting defective products was in operation in the enterprise.

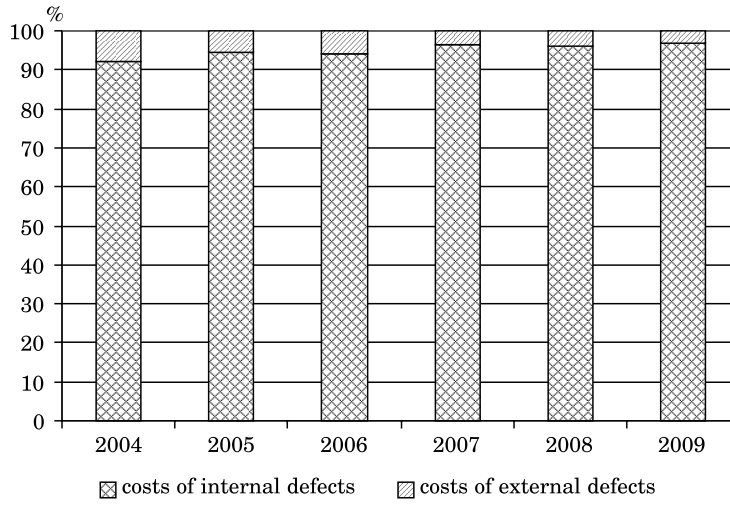


Fig. 2. Structure of non-compliance costs during the years 2004–2009 [%]
*Source*: own work based on the register of quality costs during the years 2004–2009.

The indicator of total losses from defective production represents the percent ratio between the value of total losses from defective production (i.e. total non-compliance costs) and sales (Fig. 3).

Figure 3 indicates that the indicator of total losses from defective production during the years 2004-2005 was decreasing (from 2.73% to 2.05%) and then increased, reaching the maximum at 3.24% in 2008. In 2009, a rapid decrease of this indicator to the level of 1.54% occurred. Such fluctuations of the indicator of losses from defective production indicate, on the one hand, that the organisation must develop a more efficient system to decrease the losses resulting from defective production, while on the other hand, it can be assumed that the significant decrease in the value of defective production in 2009 is a sign of improvement in that area over the consecutive years.

The indicator of losses on internal defects represents the ratio of losses on internal defects to the total value of sales. The value of losses on internal defects, the dynamics of the losses and their share in total losses during the years 2004–2009 are presented in table 3.

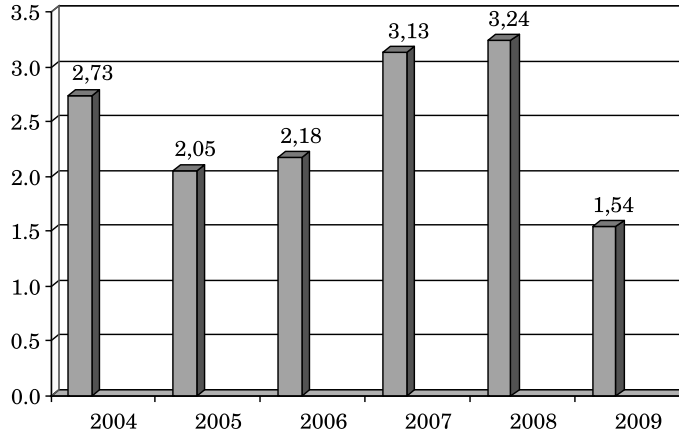


Fig. 3. Indicator of overall losses on faulty production during the years 2004–2009 [%]
*Source*: own work based on the register of quality costs during the years 2004–2009.

Table 3

Value of losses on internal defects

| Year | Value of losses on internal defects [PLN] | Dynamics [%] (value of losses for the current year / value of losses for the past year) | Losses ratio [%] (value of losses on internal defects / value of sales × 100) |
|---|---|---|---|
| 2004 | 54,990 | – | 2.51 |
| 2005 | 59,403 | 108.03 | 1.93 |
| 2006 | 66,053 | 111.19 | 2.05 |
| 2007 | 106,532 | 161.28 | 3.02 |
| 2008 | 96,740 | 90.81 | 3.11 |
| 2009 | 75,769 | 78.32 | 1.49 |

*Source*: own work based on the register of quality costs during the years 2004–2009.

On the basis of the data presented in table 3 it can be concluded that the value of losses on internal defects increased during the years 2004–2007, e.g. in 2005 the value of losses on internal defects increased by 8.03% as compared to 2004 while in 2007 it represented over 161% of the value for the preceding year. Only during the years 2008–2009 that value started decreasing to the level of PLN 75,769 (in 2009). The average ratio of losses during the period covered (arithmetic average) was at the level of 2.35%. In 2008 it reached the level of 3.11% (the maximum during the period surveyed) while already in 2009 it decreased by more than a half. Losses caused by the employees, losses resulting from the process and losses caused by other undetermined causes were the main causes for losses on the internal defects in both 2007 and 2008.

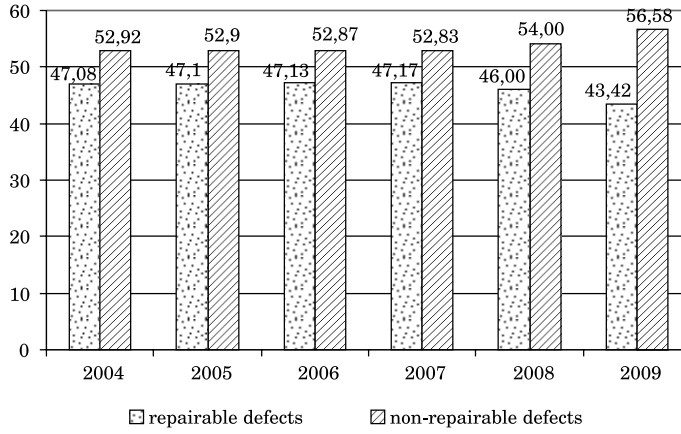


Fig. 4. Structure of costs of the internal defects during the years 2004–2009 [%]
*Source*: own work based on the register of quality costs during the years 2004–2009.

Figure 4 presents the structure of the internal defect costs and shows that irreparable defects were the main cause of these costs. This means that a proportion of products manufactured are unsuitable for repair and those products cannot be used according to the original intended use. The costs of repair are, in this case, so high that the products are withdrawn from trade and passed for physical liquidation. During the years 2004–2007, the costs of irreparable defects averaged 53% of the internal defects costs. During consecutive years, an increase was recorded and in 2009 their share in the costs of internal defects reached almost 57%, representing around 44% of the total quality costs.

Figure 5 presents the structure of the costs of external defects which include the costs of claims, costs of guarantee repairs and losses from withdrawal of finished products. The costs of claims have the highest share in the external defect costs, representing 80%-90% of such costs. In 2009, a decrease in the costs of claims by exactly 20% as compared to 2008 was recorded. Despite the evident increase in production, the value of products covered by claims decreased. The lowest costs related to returns of products were incurred during the years 2005, 2007 and 2008; they represented ca. 8% of the total external defects costs.

The highest costs caused by returns of defective products occurred in 2009, increasing almost three-fold as compared to 2008. The costs of guarantee repairs were incurred in 2007 only and they represented slightly less than 4% of the total external defect costs.

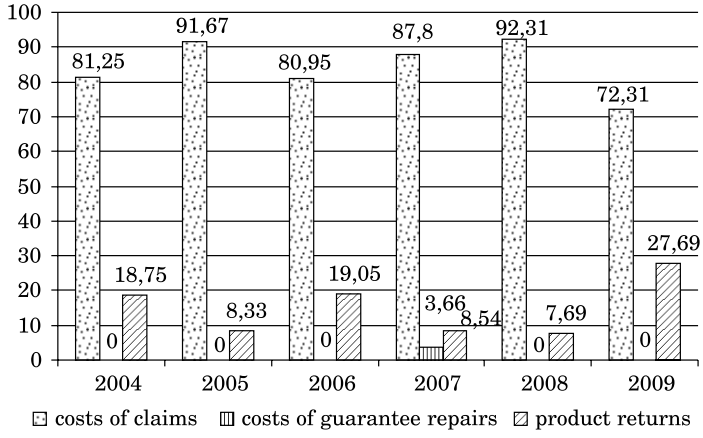


Fig. 5. Structure of the external defects costs during the years 2004–2009 [%]
*Source*: own work based on the register of quality costs during the years 2004–2009.

Table 4

Value of losses on external defects

| Year | Value of losses on external defects [PLN] | Dynamics [%] (value of losses for the current year / value of losses for the past year) | Losses ratio [%] (value of losses on external defects / value of sales × 100) |
|---|---|---|---|
| 2004 | 4,800 | – | 0.22 |
| 2005 | 3,600 | 75.00 | 0.12 |
| 2006 | 4,200 | 116.67 | 0.13 |
| 2007 | 4,100 | 97.62 | 0.12 |
| 2008 | 3,900 | 95.12 | 0.13 |
| 2009 | 2,600 | 66.67 | 0.05 |

*Source*: own work based on the register of quality costs during the years 2004–2009.

Table 4 indicates that the value of losses on external defects in 2005 decreased by 25% as compared to 2004 while in 2006 it increased to 16.67%. During the subsequent years the value of those losses decreased slightly. In 2009, the value of losses on internal defects decreased by as much as 33.33% as compared to 2008. The ratio of losses in 2004 was 0.22% and during subsequent years it decreased to remain at the level of 0.12%–0.13% and it reached just 0.05% in 2009.

Figure 6 illustrates the relationship between costs of low and high quality in the surveyed company.

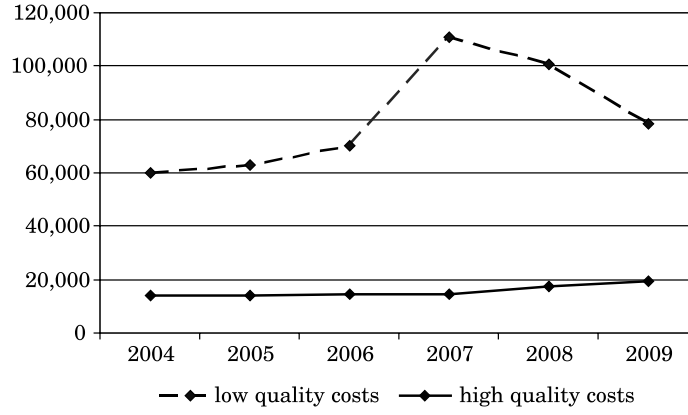


Fig. 6. Level of low and high quality costs during the years 2004–2009 [PLN]
*Source*: own work based on the register of quality costs during the years 2004–2009.

High quality costs during the years 2004–2007 amounted to ca. PLN 14,000 to increase slightly to the amount of almost PLN 20,000 in 2009. Figure 6 shows that the low quality costs increased during the years 2004–2007 from slightly under PLN 60,000 (2004) to over PLN 110,000 (2007). In 2008, the low quality costs decreased by just over 9% as compared to 2007. At the same time, an increase in high quality costs by almost 20% was recorded. In 2009, with the increase in preventive activity costs and evaluation costs, the low quality costs also decreased.

Figure 7 presents the curve of total quality costs during the period surveyed. In its shape, the curve resembles the curve illustrating the low quality costs (Fig. 6).

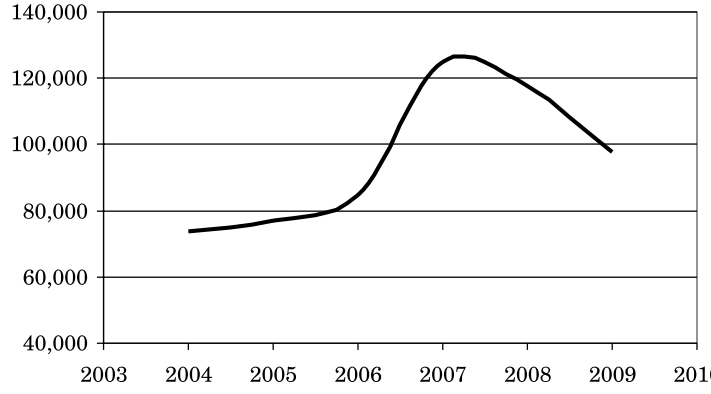


Fig. 7. Curve of total quality costs for the years 2004–2009 [PLN]
*Source*: own work based on the register of quality costs during the years 2004–2009.

The company surveyed incurred the highest quality related costs in 2007 (over PLN 125,000). In 2008, the level of total quality costs decreased by almost 6% as compared to 2007. On the other hand, in 2009, the level of those costs was more than 17% lower than the year before and amounted to PLN 97,769. Along with the decrease in low quality costs, the total quality costs also decreased.

## Summary and conclusions

Quality cost analysis allows evaluation of the quality management system functioning in the given enterprise. Thanks to the conclusions from this analysis, undertaking appropriate activities to limit the quality costs incurred and prevent poor quality is possible.

As a result of the conducted studies, the following ultimate conclusions were formulated:

– quality costs in the enterprise surveyed showed an increasing trend during the years 2004–2007 and as of 2008 the decreasing trend was observed (in 2009 they decreased by 17% as compared to 2008,

– the ratio of losses from the total defective production during the years 2004–2006 showed a decreasing trend; the significant change in the value of defective products manufactured proves that the quality management system applied in the company was effective,

– with the increase in the costs of activities related to preventing poor quality, the costs of defective products and the total quality costs decreased.

Translated by Jerzy Gozdek

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# CONDITIONS FOR BENCHMARKING IMPLEMENTATION AND ITS USE IN ENTERPRISES IN NORTH-EASTERN POLAND

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Key words: benchmarking, management, enterprises.

Abstract

Determining the scope and extent of the use of benchmarking in the surveyed enterprises from the province of Warmia and Mazury was the main goal of this paper.

The surveys conducted showed that benchmarking is not used on a wide scale in Poland. This method was applied by only 17% of the enterprises surveyed. Those were mainly large enterprises in which the value of assets exceeds EUR 5 million. The high costs to the enterprises and labour input required for implementation, as well as maintaining the method in the enterprise were the main barriers to implementation of the method in enterprises.

## UWARUNKOWANIA WDROŻENIA I WYKORZYSTANIA BENCHMARKINGU W PRZEDSIĘBIORSTWACH PÓŁNOCNO-WSCHODNIEJ POLSKI

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Słowa kluczowe: benchmarking, management, enterprises.

Abstrakt

Głównym celem artykułu jest określenie, zakresu i stopnia wykorzystania benchmarkingu przez badane przedsiębiorstwa województwa warmińsko-mazurskiego.

W przeprowadzonych badaniach wykazano, że w Polsce benchmarking nie jest jeszcze wykorzystywany na dużą skalę. Metodę tę stosuje zaledwie 17% badanych firm. Są to przede wszystkim przedsiębiorstwa duże, których wartość aktywów przekracza 5 mln euro. Za główne bariery wdrożenia tej metody w przedsiębiorstwach uważa się wysokie koszty i nakłady pracy implementacji i utrzymania tej metody w przedsiębiorstwie.

## Introduction

Identification and understanding the processes observed in other organisations which might be transferred to an enterprise is the essence of benchmarking. Different methodologies can serve identification of such processes such as, for example, the Universal Process Classification Framework developed by the Andersen company which identifies 13 business processes encompassing: understanding markets and customers, design of products and services, marketing, sales, management, human resources, information systems, finance and accounting or the Standard Processes Classification System developed by the American Productivity & Quality Centre, Inc.(International Benchmarking Clearinghouse) (ASKIM et al. 2007, pp. 297–320). This is a mechanism that is used increasingly commonly which may contribute to:

– an entity's operational performance improvement,
– analysis of strengths and weaknesses of individual processes,
– an increase in employee activity in entity management.

Numerous methods of benchmarking exist. The most frequently mentioned ones are:

– benchmarking to competitors involving searching for model organisations belonging to the same industry and then transferring and adapting new solutions to the activities to one;s own entity;

– functional benchmarking involving analysis and comparison of own solutions with the solutions applied in enterprises from outside the industry;

– strategic benchmarking involving comparison of the visions, missions and strategies of other entities to identify the factors of their success;

– benchmarking of processes which analyse the cost effectiveness of the entity's activity;

– management methods benchmarking comparing the management methods applied, tools supporting that process, human resources management policy, motivational systems as well as the principles of medical materials, devices and equipment management methods.

Activities based on internal comparisons are the most common (WACŁAW 2003, p. 22). They, in most cases, encompass evaluation of organisational units in the area of quality and productivity.

In benchmarking, the shift from tasks defined rigidly in the budget towards comparative objectives which evolve with the changes in the environment of the entity takes place. According to this approach it was decided that instead of the tasks identified for performance in advance and defining what means and what level of funding are necessary for performance of those tasks, the managers should be given freedom in that area assuming that they know the continually changing market the best and how to win with competitors and assure the development of the enterprise.

Supporters of this method claim that it triggers the workers' ingeniousness, initiative in searching for new and better ideas as well as ways for improving the results achieved so far. The tasks of the employees in this case are focused on employing the current opportunities offered by the market for improvement of the enterprise position as compared to the competitors.

Consequently, the main objective of this paper is to determine which entities employ benchmarking the most often in the management process, which are the major reasons for implementing that system in those entities and what are the major barriers to effective implementation and utilisation of that system in the enterprises surveyed.

## Methodology of studies

Utilisation of benchmarking in the practice of Polish enterprises was the subject of the studies. The study encompasses enterprises from the province of Warmia and Mazury. The sample consisted of 159 entities which agreed to complete the questionnaire[1]. The survey questionnaire was completed by members of management boards, financial directors, chief accountants as well as controlling department managers or employees (where departments of that type had been established).

Statistical data analysis encompassing sample structure analysis according to the characteristics of the enterprises surveyed and analysis of interrelations of immeasurable characteristics were applied for processing the data obtained from the questionnaire-based survey.

Testing and evaluation of the significance of the correlations between selected characteristics was conducted by applying the $\chi^2$ test. If the correlation between tested characteristics was found to be significant ($p \leq 0.05$), the values of the V Cramer coefficient were additionally presented in the tables while the distributions of the surveyed characteristics were presented in tabulations.

The survey covered enterprises from various segments and sectors of the national economy. The enterprises are diversified in their ownership structures, organisational-legal forms, type of business and financial results.

[1] The non-random sample selection format, the so-called sample of convenience, was applied (Frankfort-Nachmias, Nachmias, 2001, pp. 198–199).

## Characteristics of the surveyed enterprises

The survey covered enterprises from various segments and sectors of the national economy. The enterprises are diversified in their ownership structures, organisational-legal forms, type of business and financial results. Enterprises participating in the survey represented various industries. Construction companies (19 entities) were the largest group. The furniture industry was represented by a similar number of entities (18 enterprises). Telecommunications and transport, as well as agriculture and forestry were represented by 8 entities each. They were followed by the banks and insurance institutions (6 entities), meat and poultry as well as the chemical industry (5 enterprises each). The other industries did not exceed 3% of the total number of enterprises surveyed.

Of the 159 enterprises surveyed, more than a half represented manufacturing, 27.7% were service enterprises while every fifth enterprise surveyed was a trade enterprise.

Table 1

Ownership structure of the enterprises surveyed

| Enterprise ownership form | No | % |
|---|---|---|
| State-owned | 27 | 17.0 |
| Private without foreign capital | 109 | 68.5 |
| Private with under 50% foreign capital share | 4 | 2.5 |
| Private with over 50% foreign capital share | 5 | 3.2 |
| Private 100% foreign capital company | 14 | 8.8 |
| Total enterprises surveyed | 159 | 100.0 |

*Source*: own work.

Enterprises without any share of foreign capital formed the most numerous group (68.5%). The share of enterprises with foreign capital was below 50% and those with a domination of foreign capital represented 5.7% of the sample population. Enterprises with entirely foreign capital did not exceed 9% of the entities surveyed.

Enterprises employing 51–100 employees (converted in full-time jobs) were the most numerous while enterprises employing 101 to 250 persons represented almost 20.1% of the population surveyed. The largest enterprises (employing more than 250 people) represented 21% of the total number of enterprises surveyed.

Table 2

Organisational-legal forms of enterprises surveyed

| Legal form of the entity | No | % |
|---|---|---|
| Individual conducting a business activity | 24 | 15.1 |
| Partnership | 14 | 8.8 |
| State-owned enterprise | 6 | 3.8 |
| Cooperative | 8 | 5.0 |
| Limited liability company | 75 | 47.2 |
| Joint stock company | 16 | 10.0 |
| Other legal form | 16 | 10.06 |
| Total enterprises surveyed | 159 | 100.0 |

*Source*: own work.

Limited liability companies (75 enterprises) and individuals conducting business activity (24 enterprises) dominated in the sample. Joint stock companies were represented by 16 entities. The survey also covered the other forms of companies (partnerships, registered partnerships and professional partnership), cooperatives, state-owned enterprises and state-controlled organisational units (Tab. 2).

An analysis of the financial data concerning the enterprises surveyed showed their diversification as concerns profitability, revenues and assets. Enterprises with profitability ranging between 0% and 5% were the most numerous (Tab. 3). Among the entities surveyed, 19 achieved profitability exceeding 20% while 4.4% of the companies surveyed showed negative profitability.

Table 3

Achieved profitability, revenues and value of assets in the enterprises surveyed

| Profitability [%] | No | % | Revenues [EUR] | No | % | Assets [EUR] | No | % |
|---|---|---|---|---|---|---|---|---|
| Negative | 7 | 4.4 | up to 400,000 | 27 | 17.0 | up to 800,000 | 32 | 20.1 |
| 0–5 | 57 | 35.8 | 400,000–800,000 | 18 | 11.3 | 800,000–1.5 mln | 28 | 17.6 |
| 5.1–10 | 29 | 18.2 | 800,000–2.5 mln | 23 | 14.4 | 1.5 mln–2.5 mln | 18 | 11.3 |
| 10.1–20 | 33 | 20.8 | 2.5 mln–5 mln | 34 | 21.4 | 2.5 mln–5 mln | 23 | 14.5 |
| Over 20 | 19 | 11.9 | over 5 mln | 51 | 32.1 | over 5 mln | 49 | 30.8 |
| No response | 14 | 8.9 | no response | 6 | 3.8 | no response | 9 | 5.7 |
| Total enterprises | 159 | 100.0 | total enterprises | 159 | 100.0 | total enterprises | 159 | 100.0 |

*Source*: own work.

In the volume of turnover, enterprises with revenues exceeding EUR 5 million were the most numerous (32.1%) (Tab. 3). Almost every fifth enterprise generated revenues ranging from EUR 2.5 to EUR 5 million. The

sample was dominated by enterprises possessing fixed and working assets exceeding EUR 5 million (30.8%). Enterprises with assets value not exceeding EUR 800,000 also formed a large group (20.1%).

## Utilisation of benchmarking by enterprises surveyed – survey results

Only 27 of the enterprises surveyed declared using benchmarking, which represents 17% of the population analysed. A much smaller number, just 6 enterprises, were considering implementation of that method in the future. The definite majority of the enterprises surveyed, 115, representing 72% of the population surveyed, have never considered implementation of this cost management method (Fig. 1).

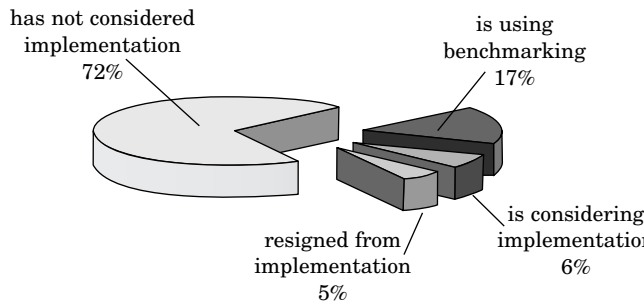


Figure 1. Evaluation of benchmarking used in the enterprises surveyed
*Source*: own work.

Appropriate hypotheses were formulated to check whether utilisation of benchmarking depended on characteristics of the enterprises surveyed and those hypotheses were verified by applying the chi-squared ($\chi^2$) test to evaluate the stochastic independence on immeasurable characteristics. Where the results of statistical analysis indicated a correlation between the characteristics surveyed, the VCramer coefficient was applied to measure the strength of the correlation tested. The computation results are presented in table 4.

The analysis showed the existence of a statistical correlation of benchmarking utilisation with only one parameter – the assets value. The V-Cramer coefficient value of 0.244, however, indicates the weak strength of the above correlation. The extent of benchmarking utilisation depending on enterprise size measured by the value of assets is presented in table 5. It indicates that benchmarking is used mainly by entities whose value of assets exceeds

EUR 5 million. They form 30% of the companies with assets value exceeding EUR 5 million and 60% of all the entities applying benchmarking in their operations. This means that benchmarking is used mainly by large companies that generally possess financial and human resources allowing implementation of this method. Additionally, the fact should be considered that such enterprises are generally required to publish their financial statements, which also allows conducting a range of diversified comparative analyses.

Table 4

Utilisation of benchmarking depending on selected parameters of the enterprises surveyed

| Item | Stochastic independence test | | |
|---|---|---|---|
| | $\chi^2$ | *P* | *V* |
| Legal form | 22.994 | 0.520 | – |
| Employment | 14.480 | 0.848 | |
| Ownership structure | 43.748 | 0.099 | – |
| Profitability | 15.507 | 0.215 | |
| Value of revenues | 17.954 | 0.117 | |
| Value of assets | 26.767 | 0.008 | 0.244 |

*Source*: own work.

Table 5

Utilisation of benchmarking depending on the value of assets in the enterprises surveyed

| Assets value [mln EUR] | Benchmarking | | | |
|---|---|---|---|---|
| | utilises | considers | resigned | does not consider |
| Up to 0.8 | 2 | 1 | 3 | 26 |
| 0.8–1.5 | 2 | 4 | 2 | 20 |
| 1.5–2.5 | 1 | 0 | 2 | 15 |
| 2.5–5 | 5 | 1 | 1 | 16 |
| Over 5 | 15 | 0 | 0 | 34 |

*Source*: own work.

Numerous works on benchmarking indicate that the method is also being increasingly employed by service organisations such as health care entities and entities providing educational services (ASKIM et al. 2007, pp. 297–320; MCDONNELL, JONEM 2010, LENT 2010, LANGFORD 2010).

Numerous reasons for the interest in this cost management method have been indicated. The studies conducted indicated that entities declaring benchmarking utilisation indicated increased competition (74% of entities utilising benchmarking), head office requirements (44% of the entities) and aiming at reduction of costs and financial results improvement (41% of the entities) as the major reasons for implementation of the system (Tab. 6).

Table 6

Factors determining benchmarking implementation according to enterprises surveyed

| Factors determining benchmarking implementation | No | % |
|---|---|---|
| Head office requirements | 12 | 44 |
| Increased competition | 20 | 74 |
| Lack of information allowing efficient decision-making | 3 | 11 |
| Dissatisfaction with the current methods | 8 | 30 |
| Change in the management information needs | 8 | 30 |
| Organisational structure change | 3 | 11 |
| Management change | 3 | 11 |
| Strategy change | 4 | 15 |
| Implementation of new technologies | 5 | 19 |
| Willingness to reduce costs and improve results | 11 | 41 |
| Willingness to win new sales markets | 9 | 33 |
| Aiming at control improvement | 6 | 22 |
| Change-supportive atmosphere among employees | 3 | 11 |
| Availability of financial resources | 3 | 11 |
| Availability of human resources | 2 | 7 |

*Source*: own work.

In analysing the barriers to benchmarking implementation, it should be noted that entities considering implementation of this cost management method in the future and those which declared the application of this method were already afraid the most of the high labour input involved in implementation and maintenance of the ABC system in the enterprise and the high costs of system implementation and maintenance in the enterprise (41%) of entities. Not many fewer enterprises (38%) indicated that a lack of support from the management was the main barrier to implementation of the system (Tab. 7).

Analysis of benchmarking implementation in other entities has also revealed that the system is implemented frequently in those areas where obtaining data for comparison is easy and not necessarily where it would be recommended from the perspective of efficient management (McDonnell, Jones 2010).

Enterprises that have not considered benchmarking implementation at all or resigned from such implementation (122 entities) see satisfaction with the currently-applied cost management methods applied in their organisations (75% of enterprises that do not apply and do not consider implementation of the method) and insufficient knowledge of the method among employees (57%) as the major reasons for the existing situation (Tab. 8). More than a half of the entities surveyed also indicated a lack of management support, high costs of

implementation and maintenance of the method and other priorities existing in the organisation, such as, e.g. implementation of the quality management system, as the reasons for resigning from implementation of this management method.

Table 7

Barriers to benchmarking implementation according to the enterprises surveyed

| Barriers to benchmarking implementation | No | % |
|---|---|---|
| Lack of management (management board, head office etc.) Support | 14 | 38 |
| High ABC method implementation and maintenance costs | 15 | 41 |
| High labour input on ABC method implementation and maintenance | 15 | 41 |
| Other priorities (e.g. Implementation of iso, erp, etc.) | 9 | 24 |
| Insufficient knowledge of the ABC method among employees | 10 | 27 |
| Difficulties with model design (e.g. Choice of activities) | 9 | 24 |
| Enterprise computer resources status | 6 | 16 |
| Lack of IT solutions | 8 | 22 |

*Source*: own work.

Table 8

Reasons for resignation from benchmarking implementation according to the enterprises surveyed

| Reasons of resignation from benchmarking implementation | No | % |
|---|---|---|
| Satisfaction with current methods | 91 | 75 |
| Lack of management (management board, headquarters etc.) Support | 65 | 53 |
| High method implementation and maintenance costs | 64 | 52 |
| High work input on method implementation and maintenance | 58 | 48 |
| Other priorities (e.g. Implementation of iso, erp, etc.) | 62 | 51 |
| Insufficient knowledge of the method among employees | 69 | 57 |
| Difficulties with model design | 45 | 37 |
| Enterprise computer resource status | 34 | 28 |
| Lack of IT solutions | 25 | 20 |

*Source*: own work.

## Conclusion

Utilisation of benchmarking in Poland, as well as knowledge of the methodology of applying this management tool, are increasing every year, although a formalised procedure for comparing ourselves to those that are better is still under-appreciated by many managers. The reasons for that situation include problems with databases and a suspicion that the effects and benefits of benchmarking may exceed the labour input for its implementation.

The studies conducted showed that benchmarking is not yet widely used in Poland. The method is being applied by only 17% of the organisations surveyed. Those are mainly large organisations with assets exceeding EUR 5 million. The high costs and labour input related to implementation and maintenance of this method in the enterprise are considered the main barriers to its implementation.

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# FINANCING COMMERCIAL PROPERTY IN POLAND AND THE UK

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Key words: finance, real estate, Poland, United Kingdom, credit.

Abstract

The following work is a comparison of real estate financing methods in Poland and Great Britain. A comparison of the data from both countries shows that the most popular method of real estate financing in both countries is through mortgages.

External financing of commercial real estates in Poland is accomplished by: universal and mortgage banks, leasing companies, investment funds-loan, private investors and through the issue of ownership or debt securities. Another method of financing commercial real estate is financing it through the establishment of a special, separate company designed to carry out the project, which is known as "project financing".

The availability of a variety of grants, preferential loans and time loans, is the strong point of the Polish system of financing commercial property purchases.

## FINANSOWANIE NIERUCHOMOŚCI KOMERCYJNYCH W POLSCE I WIELKIEJ BRYTANII

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Słowa kluczowe: finansowanie, nieruchomości, Polska, Wielka Brytania, kredyt.

Abstrakt

W pracy porównano sposoby finansowania nieruchomości komercyjnych w Polsce i Wielkiej Brytanii. Porównanie danych z obu krajów pokazuje, że najbardziej popularnym sposobem finansowania nieruchomości komercyjnych, zarówno w Polsce, jak i Wielkiej Brytanii, są kredyty hipoteczne.

Finansowanie zewnętrzne nieruchomości komercyjnych w Polsce jest realizowane przez: banki uniwersalne i hipoteczne, towarzystwa leasingowe, fundusze inwestycyjne i poręczeniowe, prywatnych inwestorów oraz emisję papierów wartościowych o właścicielskim lub dłużnym charakterze. Innym rodzajem finansowania projektów zakupu nieruchomości komercyjnych jest ich finansowanie przez założenie specjalnej spółki do przeprowadzenia danego projektu, zwanej spółką celową (z ang. *project finance*). Mocną stroną polskiego systemu finansowania zakupu obiektów komercyjnych jest dostęp do różnego rodzaju dotacji oraz kredytów preferencyjnych.

## Introduction

Purchasing commercial real estate is a popular method of investment in Poland as well as in the UK.

The economic boom in the Polish market in 2007–2008 was related to a rising number of investments and the ability to obtain EU funds. The boom also strongly influenced the general demand for commercial real estate.

Investors seeking a source of funding for projects involving the commercial real estate sector have several major types of financial institutions (which offer so-called "external funding") to choose from. These include:

1. Universal banks; institutions that have no limitations in their banking activity. They have the broadest range of commercial banking services. That is why these banks can be classified as institutions which combine deposit and credit transactions with transactions in securities and assurances. They serve natural persons as well as economic entities and may operate in joint activity – which means combining both ways of serving their customers.

2. Mortgage banks; these banks specialize in issuing mortgage bonds, granting loans secured on real estate mortgages and buying the debts of other banks for mortgage secured loans.

3. Leasing companies; where a lessor transfers the rights to use a particular object to a lessee for a period of time contained in the leasing agreement; in which the lessor will receive payment in installments from the lessee.

## Most important elements of a leasing agreement

- The leasing agreement must be in a written form under pain of nullity.
- The sum of installments which the Lessee is obliged to pay the Lessor must be at least equal to the price of the agreement subject.
- It is Lessee's obligation to pay for repairs, inspections and maintenance at his own cost and to cover taxes related to ownership of the subject.
- Upon signing the sales contract by Lessor with the Provider, all powers tied with the warranty are transferred to the Lessee. The ability to withdraw from the sales contract by the Lessor is an exception to this.
- It is the Lessee's obligation to pay installments regularly, according to a schedule he accepts. In case of delays in paying an installment, or lack of them, it is the Lessor's right to terminate the contract and regain the subject.
- Upon completion of the contract, ownership of the subject is usually transferred by Lessor to the Lessee, unless both sides agree upon another way to dispose of the subject after the contract is completed.

Given the number of sides taking part in a leasing transaction, two types of leasing are distinguished:

- **Direct leasing** (when the manufacturer signs a contract directly with the user)
- **Indirect leasing** (more than two sides take part; i.e. a specialized leasing company exists between the manufacturer and the user)

**Operational leasing**

The main features of an operational leasing contract are:

- If the real estate is amortized, the period of contract should be at least 10 years.
- The sum of the installments contained in the contract must be at least equal to the subject's price.
- Depreciation is done in the Lessor's accounting books.
- Leasing installments are the Lessee's cost of revenues.
- The Lessor may repurchase the subject upon the completion of the contract; the price of repurchase depends on the amount of depreciation for that particular subject or leasing period. The repurchase value is calculated as the beginning value reduced by depreciation calculated by taking factor 3 into account.

**Financial leasing**

The main features of a financial leasing contract are:

- The contract is signed for a period of time; in this type of leasing contract there are no limitations for a minimal or maximal period.
- The sum of installments contained in the contract must be at least equal to the subject's price.
- The contract states that depreciation is done by the Lessee during the contract's period.
- Leasing installments are made up from two shares: the capital share, making payments for the subject's value, and interest share, being the Lessor's salary.
- The customer's cost of generating revenues constitutes only the interest part of the leasing installment.

**Denominated leasing, indexed to the exchange rates of EUR/USD/CHF**

- The concept of denominated leasing, indexed to the exchange rates of EUR/USD/CHF is a contract of financial or operation leasing, where leasing installments are determined as equivalent in zlotys, given in foreign currencies (EUR/USD/CHF) (GETIN Leasing.pl, access 2011).

**Methods for financing purchase of commercial real estates**

The most popular method of financing commercial real estates is a loan. Banks holding large equity capital can fund expensive investment projects on their own, without a need to create a loan banking consortium.

Limitations in credit concentrations are comparatively high and the equity capital of universal banks is definitely higher than mortgage banks. They make use of different financing sources, which include:

– Deposits belonging to customers.
– Deposits belonging to other banks.

Additionally, universal banks do not have limitations to the loan value or the subject's value (the so-called LTV proportion – loan-to-value, which is a proportion of granted credit to the proportion of the real estate value) and in the range of their commercial activity (full range of bank services), contrary to mortgage banks. The majority of large universal banks possess an extended, bureaucratic process of decision-making concerning credit granting and on possible annexes to the credit agreement. It can happen that certain investment projects may be treated carelessly, without a thorough review of their specifications. The advantages of a mortgage bank over an universal bank may include narrower specialization, experience in financing various forms of commercial real estates, a shorter bureaucratic process and an individualized approach to customers.

Recently, the economic crisis in Great Britain was a period of both the largest and longest downturn since World War II and 2010 was filled with uncertainty about its outcome. In 2010, the British economy periodically achieved good growth values, nevertheless, it is not widely believed to be headed for a fast recovery to pre-crisis economic status.

The crisis in the commercial real estate market in Great Britain developed in accordance to particular phases. The crisis phases in the sub-prime loans market proceeded as follows: (*Financial Stability Report*, no 22, Park Communications Limited, London 2007):

– Growth of the sub-prime loan market in the United States of America.
– Losses and reduction of value on related property protection markets and other compound financial instruments.
– Uncertainty of values in the global property protection market.
– Widespread flight from risk on credit market as well as on other markets.
– Risks flow into bank balance sheets.
– Tightening credit requirements and reduced liquidity.
– Problems with financing activity in some banks.

According to KEN data, in June 2008 British banks issued mortgage loans totaling £23.6 billion, which was 4% less than in May 2008 and 32% less than in June 2007. (*Finansowanie nieruchomości przez banki w Polsce* 2008).

Financing commercial real estate in Poland is mainly based on bank credits and self-owned funds. According to an analysis from June 2009, the yearly growth rate for receivables from commercial real estate credits was 43% (whereas in April 2009 it was 5.9% in the Euro zone) which constituted one of the highest levels among all 27 EU countries. (*Finansowanie nieruchomości przez banki w Polsce* 2009).

A large number of credits for purchasing commercial real estate were given in foreign currencies, which has generated the persistence of a rather high risk level, resulting from the fact that credits were contracted for very long terms, reaching even up to 50 years. This may lead to the occurrence of a currency crisis, or larger and longer depreciation of the zloty in comparison to foreign currency. Such a depreciation may lead to a rapid debt crisis among developers who contracted credits in a foreign currency, resulting in a reduction in the credit capacities of particular banks and deteriorating their financial situations. Quality losses in particular foreign currency credits, along with a drop in the value of the zloty, may cause a need to create a comparatively larger amortization deduction, which in turn, will increasingly weigh on the financial results of banks. Recent years have shown that, together with the rise of receivables from credits contracted on residential properties, real estate prices have also risen. This situation stems from an insufficient supply of residential property on the real estate market and the continuing process of adjusting prices to other EU countries. This rise has slowed, and a downward trend was even observed in 2008 and 2009.

Financing the purchase of commercial real estate in Great Britain as well as in Poland mainly involves contracted credits. Lowering interest rates could have been a step toward increasing the availability of those credits, but on 10.01.2007 the Bank of England decided not to reduce interest rates and left them at the previous level of 5.5%. Concerns of an inflation increase in Great Britain were much stronger than a willingness to revive the Britain economy. Even in 2007, forecasts for 2008 mentioned 2% economic growth, which would have been the worst result for the British economy in over 16 years. In reality, those forecasts have proven to be optimistic. The Bank of England decision wasn't greeted well by some economists, and after the information about interest rates was revealed the main stock market index in London, the FTSE 100, fell by 0.4%, which showed that investors were be disappointed by this decision. It was some analysts' opinion that the following years would bring further cuts in interest rates, even to 5%. The decisions made by the Bank of England may be related to the fact that more and more developers were encountering difficulties in getting credits. Nevertheless, most British financial experts say that possible cuts in interest rates rather won't affect the situations of those companies which have already contracted mortgages.

Analysts explain that the interest rates established by Bank of England do not correspond directly with mortgage interest. If banks should start to give mortgages with quite attractive interest rates, they will also include very high preparatory fees to align this (MELUCH, WYDRA 2008).

"Buy-back" is a popular way to finance commercial real estate in Great Britain and other Western Europe countries. In Poland, this method is little-known.

The buy-back method of purchasing commercial real-estates allows funding the project and acts as a warrantor for repayment of financial funds on the basis of an agreement concluded with the producer and manufacturer of the project. This warrantor gains future tenants and buyers for a period of credit repayment.

In this way, he limits the risk for a subject carrying out a purchase project. Additionally, during the credit repayment period he will collect rent and an appropriate salary (KUCHARSKA-STASIAK 2006).

Another method of financing commercial real estate projects is financing them through establishing a special company separate from the project, which is called "project finance". Project finance created for this purpose should become the owner or administrator of a financed property, which would be the only area of this company's activity. This company also controls employment and salary budgets. In the "project finance" formula, it becomes a party to the contracts accompanying the project. In this type of financing, a ready cash surplus (derived from leasing, renting, or sale contracts) is a source of credit repayment. The choice of business partners, agreements and methods of managing the project should, as far as possible, increase the viability of the project and achievement of financial plans (Spółka celowa czyli project finance BRE Hipoteczny).

The method of financing projects realized in the commercial real estate sector through "project finance" (as described above) is widespread, especially by banks with foreign capital.

Most banks prefer "project finance" to be of a joint-stock, limited liability form. Beyond protection in the form of a mortgage on the credited property, banks also usually require legal security for credit repayment in the form of a pledge registered in shares. Bank can seize such a pledge in an extrajudicial way, which is equivalent to seizing the whole project. Other common legal securities are cessions of incomes from renting contracts, cessions of rights to insurance policies and rights to contractual warranties. The rights of contractual warranties are ceded by banks, if the bank funds the construction. If the renting contracts terminate or if the tenants violate their contracts, banks may also submit reserves destined for debt payment – a form of a special deposit, from which the credit is serviced if the property ceases to generate sufficient financial income.

According to the majority of analysts, even though for the first time since 2007 an increased tendency in financing purchases of commercial real estates has been observed, there will not be any visible acceleration in the commercial real estate market until 2012.

"Respondents expect further limitations in trade in Poland and Great Britain, primarily because of difficult access to capital. The upcoming year 2012 may bring a lack of access to traditional sources of debt capital for refinancing secondary real estates, although new funding sources will appear in the form of government-owned financial funds and insurance companies" – states John Forbes, a partner in PwC.

An increased availability of capital funding sources is expected in 2011 due to the growing number of investors from Asia and Pacific countries, insurance companies and private equity funds. However, financing appearing with new creditors on the market will only partially solve problems with the supply of capital.

## Conclusion

The development of the Polish commercial real estate market will depend on lending opportunities offered by banks active in our country. Their condition is definitely better than their competitors and shareholders in Western Europe.

The situation in the commercial real estate market in Poland has never had the same influence on economic trends and economic expansion as in developed countries. The simple reason for this is that this sector's share of the national GDP is far lower in Poland. While it reaches 25 to 27% of Britain's GDP, in Poland it is merely 3.4%. (CYBURT 2010).

Various grants and preferential loans are used to fund the purchase of commercial property in Poland. Governments or other organizations partially fund the interest, making credits more available. This is an advantage of the Polish banking system.

The strengths of the British system lie in modern methods of financing. One of them is the popular buy-back method, allowing investors without sufficient creditworthiness a chance to buy real estate.

€1.112 billion was put solely into commercial real estate in Poland – estimates Jones Lang LaSalle in his August analysis. Warsaw Mokotów Gallery, Wars-Sawa-Junior and Promenada changed owners as commercial properties enjoyed the most attention – as many as seven were sold. The total amount of these deals was €611 million, making them more popular than office buildings (four transactions with a total amount of 501 million zlotys) and storehouses – logistics centers (two transactions with a total amount of €79 million).

According to the Royal Institution of Chartered Surveyors (RICS), Poland is one of the rising stars, next to countries like Russia, Malaysia and Brazil, where rates of return may be the highest. However, the organization also noted that the European market is becoming increasingly diversified due to financial problems in countries like Greece, Portugal and Ireland. (PolskieRadio.pl, access 2011).

Lack of access to ready cash is definitely a problem in the Polish and British commercial real estate sectors. Each company that wants to start construction must reckon with the increased cost of acquiring money. Higher margins are one of the causes. Before the crisis, an investor could attempt to undertake an investment with a contribution of only over a dozen percent. Now, after the recession brought the downfall of numerous financial institutions, more than 50–60 percent is required. It has led some developers to focus on one project at a time instead of doing several simultaneously. The unstable economic situation and increased risk has led to a situation on the financial market where there are practically no banks willing to fund land purchases or developer activity in commercial real estate construction.

The banks which survived the crisis have definitely tightened up the procedures for granting credits and – unfavorably for borrowers – changed the requirements for credits designed to purchase commercial real estate.

Because of the current situation in the market for financing commercial real estate, only the best credit applications have a chance to receive funding by banks. Most experts agree that it will cause the disappearance of weak applications from the market, and – in turn – lead to further bankruptcies since many banks are only interested in financing applications from reliable companies. Due to the increased attention to a developer's know-how and his experience in the commercial real estate market, the developer's brand is now becoming a key aspect in the loan-approval process.

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