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TABLE OF CONTENTS

SPIS TREŚCI

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FACTORS DETERMINING THE PURCHASING BEHAVIOURS OF CONSUMERS IN THE MARKET OF DAILY USE GOODS

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K e y w o r d s: purchasing behaviours, fast-selling goods.

A b s t r a c t

The paper presents the results of studies concerning the purchasing behaviours in the market of fast-selling goods. Economic and demographic factors were the subject of the analysis. The results of studies showed, among others, that the behaviours of consumers are influenced mainly by the quality of products associated mainly with absence of defects, durability and brand as well as the product price. The studies also showed significant influence of the gender on purchasing behaviours of the consumers, as women are more willing to visit shops, they make spontaneous purchases more frequently, and they review the offer in detail while men go shopping rather out of the necessity to make a specific purchase.

CZYNNIKI KSZTAŁTUJĄCE ZACHOWANIA NABYWCZE KONSUMENTÓW NA RYNKU DÓBR CODZIENNEGO UŻYTKU

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S ł o w a k l u c z o w e: zachowania nabywcze, dobra szybkozbywalne.

A b s t r a k t

W pracy przedstawiono wyniki badań dotyczących zachowań nabywczych na rynku dóbr szybkozbywalnych. Przedmiotem analizy były czynniki ekonomiczne oraz demograficzne. Wyniki badań wykazały między innymi, że na zachowania konsumentów wpływa przede wszystkim jakość produktów kojarzona głównie z brakiem wad, trwałością produktu i marką oraz ceną produktu. Badania wykazały również istotny wpływ płci na zachowania zakupowe konsumentów. Kobiety chętniej odwiedzają sklepy, częściej dokonują zakupów spontanicznie, szczegółowo zapoznają się z ofertą, a mężczyźni udają się do sklepu raczej z konieczności w celu dokonania konkretnego zakupu.

Introduction

The problems related to consumer purchasing behaviours represent a continual subject of interest not only among marketing specialists. This results from the fact that wining and retaining a client decides the enterprise existence. Appropriate identification of client needs and expectations concerning the ways of satisfying them represents the base for development of effective enterprise market strategies. As the old saying has it – "the business has just one boss – the client" as without the client/consumer there is no revenue and, consequently there is no business. Under the circumstances where the supplies increase significantly faster than the demand, i.e. under the consumer market conditions, coaxing and winning the client is a common phenomenon, sometimes taking even impudent. Only the companies that identified the client needs the best and are able to meet the expectations stand a chance to win the client and secure his loyalty. Under conditions of post-modernism and consumerism, the client lives from temptation to temptation, which results in variability of his needs and purchasing behaviours. This also applies to the markets of daily use goods that also (or rather first of all) include the food products. That market encompasses products satisfying the daily needs where the consumers make regular purchases. In addition to food products, also cosmetics, household chemistry and means of hygiene, tobacco products, clothing, shoeing and small technical household goods belong to group of goods forming that market. Such goods are frequently referred to as fast-selling or fast-rotating goods. This is a relatively stable sector because it satisfies the fundamental (existential) needs of the consumers. On the other hand, it is characterised by continual growth and high dynamics of internal changes as concerns the offer of products, marketing activities, sources of competitiveness and market organisation. This induces the continual need for conducting studies on the factors influencing consumer behaviour and determining the scope and structure of demand. The aim of the studies presented in this paper was the identification and determining the hierarchic structure of factors influencing consumer behaviour in the market of daily use products. Particular attention was given to economic factors associated with the perception of product prices confrontated with consumer's income, the role of brand and quality of products and also with the personal factors, such as, especially, the role of gender in shaping the buying behaviour. The analysis was based on the information obtained from questionnaire-based surveys conducted via the Internet among 116 residents of Warmia and Mazury. Among the respondents were 54 women and 62 men with domination of people with secondary (58%) and tertiary (34%) education as well as people belonging to the age group of 21–30 years (65%). The vast majority of survey participants lived in cities of different sizes.

Market conditions of consumer behaviour

Different approaches concerning identification and typology of factors influencing market behaviours of consumers can be found in the literature. Obviously, those considerations also take into account the possibility of occurrence of spontaneous unpredictable behaviours that are not subject to the rationality rules, which is not infrequent. The typologies (classifications) of the consumer behaviour determinants are in their nature of just averaging character indicating certain regularities (BYWALEC, RUDNICKI 2002, p. 87). For example, G. Światowy identifies mental, social and economic determinants of consumer market behaviours (ŚWIATOWY 2006, p. 115). Among the psychological factors, he includes motivations, attitudes and emotions. The social factors according to him include the influence of the community and family, reference group, social acceptance (prestige), influence of culture and influences of advertising. The economic factors are related to the income (purchasing power), prices and availability of goods. L. Garbarski, in turn, divides the factors determining the consumer market behaviours into psychological, social and demographic-economic ones (GARBARSKI 1998, p. 167). The classic of marketing, Ph. Kotler, on the other hand identifies the social, personal and psychological factors attributing the highest importance to the cultural factors (KOTLER 1999, p. 267). The diversified criteria and approaches to the typology of factors determining consumer behaviour are reflected I the classification proposed by J. Kramer, who identifies the following factors (KRAMER 1995, p. 186): economic and personal, internal and external, objective and subjective, measurable and non-measurable, of macro and micro character.

The referenced classifications of factors influencing consumer behaviour are of general character while every market has its specific characteristics and hence a specific set of factors determining behaviours. This also applies to the market of daily use goods. That market satisfies the fundamental (existential) needs of the man and hence the individual factors, i.e. in addition to the general economic determinants, the psychological determinants play a special role in determining behaviours. In most cases, they include the needs, motivations, perception, attitudes, personalities, customs, traditions and propensity to assume risk (SZWACKA-SALMONOWICZ 2006, p. 186, RUDNICKI 2006, p. 116). As concerns personal-demographic factors, those that influence consumer behaviour include age, gender, life style, profession and education (RUDNICKI 2006, p. 92). During the analysis of consumer behaviour in the discussed market, it is impossible to dismiss the social-cultural factors, including the influence of the family and reference persons and groups as well as the economic factors, including the level of income and consumption structure (ZMITROWICZ-TKACZYK 2009, p. 68).

The market of fast-selling good develops very rapidly. This applies to the width and depth of the products range as well as the organisational solutions. In this market, consolidation and internationalisation take place. The rivalry between trade networks intensifies. The methods of consumer service, distribution and storage, promotion and brand position, etc. change. The range of products differing in usable properties as well as packaging, aesthetics, unit weight, added values and other characteristics expands rapidly. This results from producers and retailers striving at satisfying the diversified expectations of the client expressed by market behaviours.

Influence of economic factors on consumer behaviour

Among economic factors, the consumer income and product price influence purchasing behaviours of consumers directly. The influences of those factors may cross each other or mutually level each other (ZALEGA 2011, pp. 26–27). In 2011, the households with per capita income of from PLN 801 to PLN 1,000 represented the largest group of households in Poland (35.6%). The situation was similar in the population surveyed where the share of respondents with per capita income not exceeding PLN 1,000 was the largest (38%). Men were not satisfied with the level of their incomes more frequently than women (61% and 39% respectively). As many as 42% of the respondents stated that the money they had was enough to just satisfy their fundamental needs while only 37% possessed savings.

Consumers purchase only the products they can afford at a given time. Over 90% of consumer perception is focused on the product price first (MRUK 2009, pp. 48–50). Of course, nobody buys anything just on the price (because it is cheap) and other factors are also considered such as those related to product quality. However, particularly in low-income level cases, the consumer checks the price first. With the general price increase trend in the market of daily use products, and particularly the food products (in 2011 the food prices increased by 6.7%), seasonal fluctuations of prices occur. Price increase had strong influence on the purchasing decisions of the population surveyed as 68% of the respondents declared that increase in the products' price forced them to limit the volume purchased or/and to choose products of poorer quality. Respondents considered quality decrease and shorter life of products the basic threats to the interests of consumers. Quality was considered the main product choice criterion by as many as 66% of the respondents. They interpreted the quality mainly with absence of defects and appropriate durability (58%). The price and the brand are linked to the quality so they were considered in the purchasing decisions very frequently (Tab. 1). A. Baruk obtained similar results of surveys. She established that brand is associated mainly with quality (67%).

This is confirmed by the results of studies concerning the relation between the price and the brand. Although brand is the purchasing decisions influencing factor that was indicated less frequently than the price by the respondents, still the price was less important than the brand for those decisions. This means that consumers would be more willing to choose a brand product despite its higher price than a product without established brand. In addition, advertising and packaging have significant influence on purchasing decisions (respectively 70% and 71% of the responses as high and very high). Out of four promotion tools, advertising has the highest positive influence on consumer behaviour (75% of the responses). Promotion of sales is of slightly lower importance (72%), while public relations activities (54%) and personal sale (44%) score significantly lower. Those results also find confirmation in the results of studies by A. Baruk, who, however, showed a significantly lower than in the presented studies role of packaging in determining the purchasing decisions (BARUK 2010, pp. 17–21).

Table 1

Factors influencing perception of the daily use goods

Factor/characteristic	Frequency of indication $N = 116$	The intensity indicator for the characteristic*
Quality	115	3.57
Price	112	2.87
Packaging	108	2.65
Brand	107	3.20
Advertising	96	2.98
Recommendations	96	2.68
Innovativeness	94	2.94

* – according to the scale from 1 (very low importance) to 4 (very high importance).

The surveyed consumers of daily use products chose supermarkets as the shopping location the most frequently, however here the evident differences in preferences between the women and the men manifest (Tab. 2). The shopping place choice is influenced by closeness to the place of residence (64% responses), large range of products (51%), good quality of products (52%), good working hours (50%) and low process of products (44%). Additionally to the above listed, the shopping location choice is also influenced by sensor factors influencing the consumer's emotions and mood such as nice and competent service personnel (79% of the responses), nice interior design (69%) and atmosphere (music, smell). For respondents communicativeness (56% of the responses) and speed of the personnel operation were also of high importance. Shopping at corner stores offering a limited range or products and generally higher prices than the hypermarkets usually have the form of "crisis" shopping in case of sudden exhaustion of the home stocks.

Table 2

Preferred places of daily use goods purchasing (% of the responses)

Place of purchase	Women	Men
Hypermarkets/supermarkets	47	51
Discount shops	41	24
Corner stores	33	36
Commercial centres	31	17
Markets/bazaars	20	8
Shops on-line	4	10

Source: own research.

Purchasing behaviours of women and men

There is no doubt as concerns differences in purchasing behaviours between women and men. There are even products that attributed to a specific gender. This is confirmed by numerous results of studies. Among others, women are more independent in purchasing decisions because, as indicated by the studies by J. Barbeka, 43% of women and only 38% of men take independent decisions concerning purchases (BARBEKA 1999, p. 21). Similar results were obtained in the here-presented studies where 46% of female respondents and 35% of male respondents declared independent taking decisions concerning purchase.

Women are less susceptible to the influence of the environment than men are. This applies in particular to purchases of clothing, cosmetics and furniture (BARBEKA 1999, p. 19). In addition, the purchasing path differs between the women and the men. According to the opinions by respondents, a woman, before making purchase, confirms it by visits in numerous shops (72% of the responses) and conducts the careful review of the offers (45%). Women frequently make unplanned purchases in case they find a product satisfying all the requirements during the search. On the other hand, the man visits a specific shop (68% of the responses) with the intent of purchasing a specific product (53%), and makes the purchase possibly fast (Tab. 3). Presented research results are confirmed, inter alia, by studies of M. Jerzakowska-Synoradzka, who claimed that the man must be interested in the product, he makes the rational choice, in most cases, he trusts selected brands, and he analyses and compares the functional parameters. At the same time, more frequently than women, men are persuaded by promotions, they use ready solutions more frequently. They are more willing than women to purchase ready sets and they also make purchases for reasons of prestige more frequently (JERZAKOWSKA-SYNORADZKA 2010, pp. 27–28).

The presented studies showed that men value exceptionality and exclusivity. They purchase luxury goods more frequently (48%) than women dobra (37%).

The men appreciate technical novelties and gadgets that can be used to impress others. Women like shopping much more frequently than men do. The studies showed that shopping was a pleasure for as many as 57% of women and only for 32% of men. The women also manifested higher sensitivity to the influences from advertising. This applies in particular to purchases of clothing (78% of the responses) and cosmetics (64%). Men, on the other hand attributed less importance than women to the package, while they consider advertising mainly during purchases of the radio and television equipment (75% of the responses) and household mechanical goods (61%).

Table 3

Purchasing behaviours of the women and the men along the "purchase path" (% of the responses)

Purchasing behaviour	Woman	Man
The purchase is preceded by visits in many shops to which I return several times	73	5
I frequently purchase something spontaneously, additionally	55	15
I review the offer carefully until I find the appropriate product	45	27
I have the shopping list prepared	33	53
If I do not find the ideal product, I will take what is available	23	31
I enter a shop for shopping only	24	35
I enter a specific shop/target	23	68
I rather do not return to an earlier visited shop	17	44
I do the shopping as fast as I can	14	63

Source: own research.

Conclusions

The results of studies confirmed the influence of the majority of typical factors determining consumer purchasing behaviour in the market of daily use goods. Among others, the studies confirmed that economic factors related to the level and dynamics of prices and incomes represent important determinants. Another factor differentiating purchasing behaviours significantly is gender. Men and women differ in preferences and purchasing behaviours as well as the decision process. Quality, understood as absence of defects, durability and brand as well as the product price were factors with the highest influence on purchasing decisions. Promotional activities (especially in case of men) and advertising (more in case of women) gain increasing importance.

Translated by Jerzy Gozdek

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EUROPEAN PORK CHAINS. THE ROLE OF STAKEHOLDERS IN DIVERSIFICATION OF QUALITY MANAGEMENT SYSTEMS

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K e y w o r d s: supply chains, pork market, quality management strategy.

A b s t r a c t

The paper presents the results of the diagnose concerning the characteristics of pork chains in 6 European Union countries: France, Greece, Spain, The Netherlands, Germany and Hungary. The aim of the paper is to present the differences and fragmentary character of the chains in the pork sector in Europe and diversification of demand for pork products in rapidly developing European markets. Determination of presence of differences in the quality management systems in 6 chosen European countries, i.e. France, Greece, Spain, The Netherlands, Germany and Hungary is the main hypothesis of the paper. Three of those differences apply to specialised pork chains (Spain, The Netherlands and Hungary) while the other three the regional pork chains (France, Greece and Germany). The nature of those chains results from the differences in utilisation of public and private quality management systems and the differences between inter-organisational quality management systems within the chains of supplies strengthening quality cohesion and safety between the links of the chain. The comparison of them allows formulating conclusions for reconstruction of the pork chains in Poland.

EUROPEJSKIE ŁAŃCUCHY DOSTAW WIEPRZOWINY. ROLA INTERESARIUSZY W RÓŻNICOWANIU SYSTEMÓW ZARZĄDZANIA JAKOŚCIĄ

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S ł o w a k l u c z o w e: łańcuchy dostaw, rynek mięsa wieprzowego, strategia zarządzania jakością.

A b s t r a k t

W artykule przedstawiono wyniki diagnozy i charakterystyki łańcuchów dostaw wieprzowiny kształtujących się w sześciu krajach Unii Europejskiej: Francji, Grecji, Hiszpanii, Holandii, Niemczech i na Węgrzech. Celem artykułu jest przedstawienie różnic i fragmentaryczności łańcuchów

dostaw w sektorze wieprzowiny w Europie oraz zróżnicowania popytu na produkty z wieprzowiny na szybko rozwijających się rynkach europejskich. Główną hipotezą artykułu jest stwierdzenie występowania różnic w systemach zarządzania jakością w wybranych sześciu państwach europejskich. W trzech z nich występują wyspecjalizowane łańcuchy dostaw wieprzowiny (Hiszpania, Holandia i Węgry), w pozostałych trzech – regionalne łańcuchy dostaw wieprzowiny (Francja, Grecja i Niemcy). Charakter tych łańcuchów wynika z różnic w wykorzystaniu publicznych i prywatnych systemów zarządzania jakością oraz różnicy między organizacyjnymi systemami zarządzania jakością wewnątrz łańcuchów dostaw, wzmacniających spójność jakościową i bezpieczeństwo między ogniwami łańcuchów. Ich porównanie pozwala na sformułowanie wniosków, które można wykorzystać w rekonstrukcji łańcuchów dostaw wieprzowiny w Polsce.

Introduction

The influence of globalisation processes on development of relations between food producers, particularly producers of pork products and their buyers diversified and changing as concerns its principles. Food is one of the basic factors determining human health. Changes in food production technology (among others, pork products and diversification of product range on the nutritional, health and taste values) create new hazards such as the BSE, dioxins, avian influenza that must be solved by applying new instruments concerning General Food Law (EC178/2002, EU Directives on Hygiene 852/2004, 853/2004 and 854/2004, or within the area of the European pork market – EC 2004), as well as the institutional solutions. Processes of international trade liberalisation, including food trade, at the times of the development of global corporations producing those goods, create new challenges as concerns the functions of the national states and international institutions. They also create the necessity for establishing new principles of cooperation between the public sector and the private sector institutions. The European Union as a whole is a second largest pork producer in the world after China. The changes presented below that take place in the chosen pork quality management systems of specialised nature, which applies to, inter alia, Spain – the 5th largest pork producer, or regional nature, among others in Germany – the 3rd largest pork producer in the world (FAOSTAT 2005), allow formulating conclusions for reconstruction of pork chains in Poland.

Methodology of studies

The methodology of studies that lead to obtaining the results presented below encompassed:

– applying the process approach to analyses and concepts of reconstruction of the traditional distribution systems with diversified quality, fragmentary

and ineffective, into modern pork supply chains networks (LAZZARINI et al. 2001, SCHULZE et al. 2005);

– use of the achievement of strategic management, in particular those by M. Porter, for formulation of the competition strategy for supply chains and networks management (SZYMANOWSKI 2008);

– adjusting the benchmarking method to analysis of the "best practices" concerning the solutions in the European scale in the field of modern pork distribution systems within the chosen geographic markets (*European Pork Chain* 2009);

– consideration of food specificity and the necessity of using its quality and safety management systems thanks to the possibility of designing and monitoring their transparency applying the information technologies (LUNING, MERCELIS 2005, LUNING et al. 2006);

– adaptation of the continuous improvement to gradual reconstruction of the food distribution system by applying the method of continuous improvement by E. Deming as the uniform base for the redesign of distribution systems in the food supply chain (DEMING 1993).

The diagnose of differences in pork quality management systems was made on the example of 6 chosen European countries, i.e. France, Greece, Spain, The Netherlands, Germany and Hungary. Three of those differences apply to specialised pork chains (Spain, The Netherlands and Hungary) while the other three the regional pork chains (France, Greece and Germany).

Information requirements for participants in food supply chains and networks

The food supply chain network concept formulated by Lazzarini, Chaddad and Cook in 2001 defines the Food Supply Chain Network (FSCN) as the direct ties connecting the actors (participants) that cooperate with one another in supply of products to consumers. Those entities may play different roles in different chains (FSCN) in which the vertical and horizontal partnership relations between them change dynamically. Schulze, Althoff, Ellebrecht and Petersen developed that concept further in 2005 for the pork chains with the focus on the possibility of determining the added value obtaining efficacy and effectiveness increase while satisfying the client requirements and minimising the costs. Such supply chain management involves gathering information on:

– reduction of uncertainty and risk resulting from unpredictable demand and supply of food that represent the source of ineffectiveness in supply, production, logistics and marketing and increased importance of security achieved through increasing transparency and quality along the entire supply chain;

– time saving resulting from shortening the product life cycle allowing increased flexibility and appropriate reaction to the market needs;

– reduction of costs possible thanks to the information from partners that is provided on time and reliable, increasing the effectiveness, reducing stocks, improving distribution effectiveness and eliminating contamination;

– effectiveness increase that allows, knowing the needs of the consumers and partners in the supply chain, adjustment of the volume and structure of deliveries to the volume and structure of demand;

– value added thanks to innovations in new products and customer service that remains the only sustainable source of competitive advantage difficult to achieve but also to copy;

– quality improvement allowing elimination of quality differences within the supply chains.

If the raw materials or semi-finished products are of low quality, the effectiveness of supply chains will decrease. Collecting information in the above areas allows exchange and information quality evaluation between all the stages: procurement, production and distribution. To achieve the quality management level satisfying the defined requirements the process of collecting the data, the documents describing the status of information concerning individual processes as well as product quality assurance planning and control should be secured.

In well-defined information systems, confidence between partners forms the base for success, which leads to a high level of loyalty and hence an increase in profitability. Confidence-based exchange creates transparent networks and chains. Network transparency means then that the stakeholders have full understanding of the information on the product that they expect, without losing it, delays, redundancy and adulteration (HOFSTEDE et al. 2004). The above definition indicates that the data should be appropriate, accurate, reliable, actual, provided on time and in appropriate volumes. Moreover, the information should be legible and its exchange should be defined appropriately. To improve transparency, the system of tracing and assuring food safety in supply chains and networks should be improved.

Assuring safety of products delivered to the market involves registration of data concerning them at every stage in the food supply chain, particularly fresh products, i.e. at the level of each of the enterprises participating in it. Short life products stored under inappropriate conditions, contaminated at one of the steps of the chain, represent actual hazard to human health. Awareness of that risk was the baseline for the European Union legislation. The Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures

in matters of food safety[1] is one of the most important among them and the one that is compulsory. The aims of that Regulation include not allowing dangerous food for trade, identification of food safety problems to assure appropriate operation of the internal market as well as protection of health and life of the citizens. Organisation of a system for monitoring food trade and procedures for withdrawing products from trade in case of risk for health or life is necessary for achievement of those objectives. Establishment of the entire system of legal acts in that area involved implementation of the Regulation (EC) No 1935/2004 on materials and articles intended to come into contact with food that came into force in October 2006. This means that the sector of suppliers of raw materials and packages related to the food industry is also required to observe the principles of traceability. The key of traceability is the possibility of applying the above-mentioned monitoring of movement and origin of the given product (batch of product) at every stage of the supply chain, i.e. the possibility of obtaining the data from the earlier stage in the chain (what was received and from whom) coupled with feeding the information to the next stage (to whom and what was sent). Use of global standards for identification of movement of the individual loads and information accompanying them satisfies the requirements of traceability.

The possibility of determining the source of actions with specific structure and the locations where other actions with equivalent structure are located in the supply chain forms the base for traceability. That is why traceability is treated as equivalent to tracking the movement of products and tracing their origin. Among many, two traceability definitions deserve attention (TRIENEKENS, VAN DER VORST 2006). Those are[2]:

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[1] The detailed regulations of the Regulation (EC) No 178/2002 have been described in paper 18 concerning monitoring:

1. The possibility of monitoring food, animal feed, breeding animals and all substances intended for addition to food or feed or which can be added to them at all stages of production, processing and distribution should be provided;
2. Entities operating in the food and feed market should be able to identify every person that supplied to them a food product, feed, breeding animal or a substance intended for addition to food or feed or which may be added to them. For those purposes those entities should establish systems and procedures allowing transfer of such information on request by competent authorities;
3. Entities operating in the food and feed markets should establish systems and procedures for identification of other enterprises to which they delivered their products. Such information should be transferred to competent authorities on request;
4. Foods or feeds introduced to the market or which can be floated to that market in the Community should be properly labelled and marked to facilitate monitoring them using appropriate documentation or information according to the applicable requirements or more detailed regulations;
5. According to the procedure specified in article 58 section 2, separate regulations can be enacted for the purpose of applying the requirements of this article to specific sectors.

[2] Other definitions of traceability concern:

– batches for dispatch of freight *identification* (place and quantity) *and tracing* (from where and where they will be used) the information on the material. Batches for dispatch are quantities produced together with the costs incurred and their characteristics (VAN RIJK et al. 1993);

– traceability means the ability to trace and follow a food, feed, food-producing animal or substance intended to be, or expected to be incorporated into a food or feed, through all stages of production, processing and distribution (EC No 178/2002); and

– traceability means the ability of the quality management system to trace the history, application or identification of the object or activity or similar objects or activities thanks to their identification (ISO series 9000).

Traceability may be defined in the narrow or wide meaning of that term. In the narrow meaning, it allows people determining where the products are situated at every moment of time. In real time, the tracking function allows identification of not only the product but also the components of which it consists and the methods of use of every single final product. In the wide meaning, traceability means that the information on products and processes of their production may be used for optimisation and control of processes within and between the individual links in the supply chain to provide the possibility of decreasing the costs of damages, increase productivity and guarantee the quality.

Traceability has a separate meaning for organisations and for the supply chain. At the enterprise level, it allows providing information on location and placement of products and their history. At the supply chain level, it allows obtaining, in addition to the information on location of products, the information on the origin of those products.

Considering a large number of participants (the industry, government administration entities, consumers), the possibility of guaranteeing the composition of their products by developing the information system allowing cooperation within the supply chain is particularly important for enterprises. Traceability also allows:

– identification of the product and products within the supply chain. The aim of that identification is to allow data corresponding to individual operations using codes (barcodes, labels, etc.);

– tracking the movement of objects allowing location of them along their entire travel on the supply chain;

– tracking the movement of objects within the food chain allowing determination of their composition at the individual supply chain stages. In the lower

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– information necessary for description of the history of food production and the following operations or processes concerning the food along the path from the farmer to the place of consumption (WILSON, CLARK 1997);

– identification and tracking as modern tools offering insight into the sources of producing the products and their ties to all the links in the supply chain (WEIGAND 1997);

a) characteristics allowing location of the flow,

b) recording and tracking the numbers of dispatched batches, processes and materials used for production (APICS)

part of the supply chain, determination of the history of the object and sources of problems related to damage is the aim of tracking. In the upper part of the chain, tracking aims at determining the location of products manufactured using e.g. contaminated raw materials.

Characteristics of pork chains and their stakeholders

Characteristics of pork chains and their stakeholders are presented in figure 1.

Pork chains worldwide cover the same stages of production and distribution although they may be performed by different actors (participants) that will be discussed in the following point. Figure 1 presents the basic stages taking place within the pork chain including the primary and auxiliary processes as well as the most important stakeholders operating in their environment. In the majority of European pork chains, the most important stages cover processes performed by separate organisations referred to as actors. Those stages are genetic selection, growing of piglets, growing of pigs, slaughter, processing, retail trade and sales channels, consumption (see fig. 1). In many chains, there is no differentiation between the stages of piglets growing and pigs growing or there are combined slaughter and processing plants. The seven stages identified in figure 1 contain the following processes:

1. Genetic selection organisations that provide piglets to growing farms. Those enterprises specialise in genetic improvement of pigs. They conduct tests concerning piglets; production improvement and optimisation;

2. Organisations dealing with production of piglets after fertilisation of sows. From 8 to 12 piglets are separated from sows after 2 weeks and after around 10 weeks they reach the weight of ca. 25 kg. Such companies generally provide sows for further reproduction;

3. Organisations producing mature pigs that purchase piglets to grow them to ca. 100 kg, which is usually achieved after 6 months. In some chains, those are separate companies. In the majority of cases, those are companies producing both piglets and fattened pigs;

4. Slaughter should take place in organisations established especially for that purpose. The piglets and mature pigs are not slaughtered immediately to mitigate the transport related stress. The process of slaughter is effective and conducted according to sanitary standards. After slaughter, the meat is sold to processing plants, wholesalers or retailers. For this purpose the entire meat that was subjected to cutting is used;

5. Processing plants, in most cases independent, although they may be combined with the abattoir. They produce a whole range of products such as hams, sausages and convenience food;

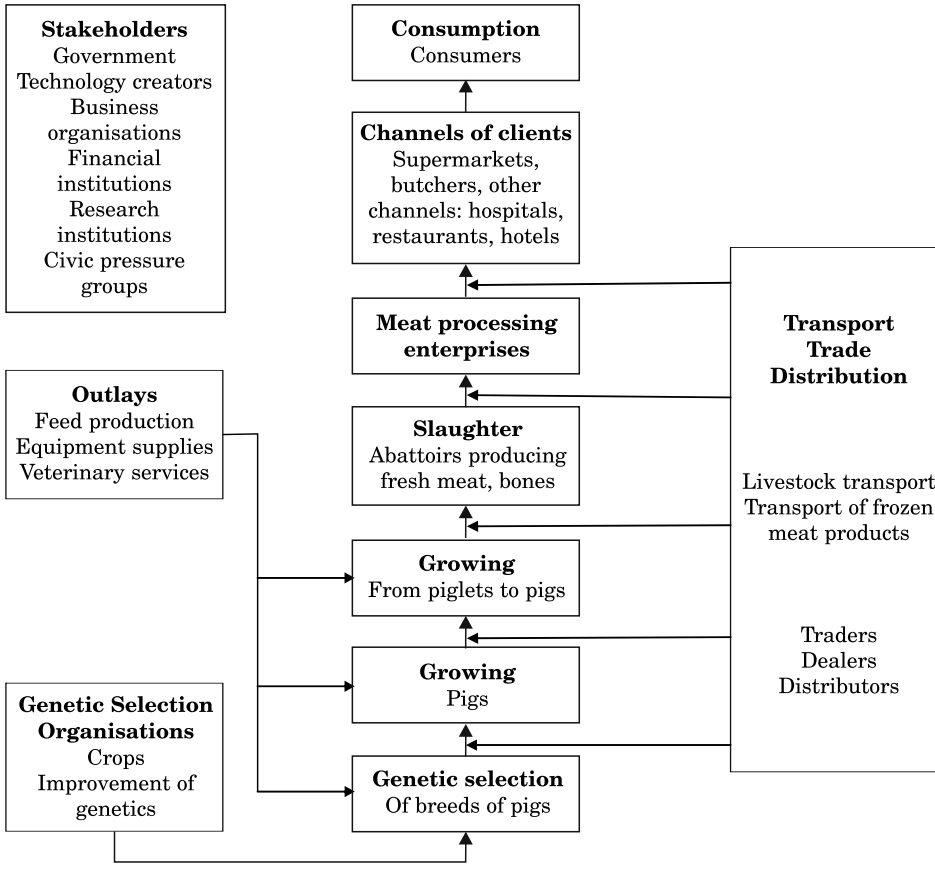

Fig. 1. Pork chains and their stakeholders' description
Source: TRIENEKENS, WOGNUM 2009, p. 27.

6. Pork is sold primarily to supermarkets but also restaurants, hospitals, hotels and canteens;

7. Consumers represent the end customers of the pork chain. Hence, they have significant influence on the nature of pork products' production.

In figure 1, other actors positioned in the environment of the chain such as feed industry were included because the feed represents one of the basic components of costs in the pork chain. The industry manufacturing equipment for pork production and processing and veterinary services related to dosage of medical drugs into the feed were also included. Food safety depends in particular on monitoring the paths animal feeds and their components take from their places of origin. Available equipment allows processing technologies

development as well as meeting the appropriate requirements concerning climate and hygiene.

Other stakeholders also have significant influence on organisation and operation of the chains. Here the public administration institutions that create appropriate regulations and monitor compliance with them are positioned. Research institutions and universities support improvement of processing processes and long-term improvement of organisation of the chains. Financial institutions offer credit and conditions facilitating the pay-off of it. Logistic operators, forming either components of finished products' manufacturers or independent logistic companies, facilitate transport of livestock, semi-carcasses and meat products between the links in the chain. Traders and dealers facilitate sales and providing services. The pork chain in figure 1 presents the network of interactions between organisations supporting supply of meat products to the consumer.

Diversification of the demand in the market, manifesting through market segments, is reflected in the upper part of the chain concerning genetic selection and feed. Innovations in that area result in increased diversification of the range of products and market organisation methods. We can identify two perspectives from which pork supply chains can be viewed. The first one is the public perspective representing the perspective applied by government and consumer organisations considering also the environmental perspective (its importance), animal welfare (during production and transport) or ethical practices (related to additives and medications in feed and aspects of transparency). This is reflected I the design of the organic pork chains that are in plans in numerous European countries. The second perspective is the economic one related to the design of market-oriented chains in which the actors gain competitive advantage creating added value based on product, process or organisational innovations. This is reflected in production of food that is ready for consumption, convenient, healthy, safe and based on pork raw material.

Structures and standards of pork chains

Further here, the conditions of higher quality pork products supplies to the European consumer as well as hose of better matching the structure of supply and the structure of demand in the European pork chains will be presented. This will be linked to the quality standards, organisation of supply chains and the quality management systems in them.

The new food safety principles are implemented by institutions and mechanisms established for that purpose that must cooperate in a defined way. The

governmental food safety control institutions such as the European Food Safety Authority (EFSA) cooperating with the World Trade Organisation (WTO) and the World Health Organisation (WHO) influence the development of the buyer – seller relations in the food chain. Their task is to shape the public standards and appropriate behaviours of participants in food trade. The control of quality and safety of supply in raw materials and means of protection is also performed using the private standards such as e.g. the EUREPGAP. Such standards are implemented by non-public institutions such as associations of food producers, consumer interests protection associations and, first of all, the food chains; integrators i.e. the retail networks such as Tesco. Mixed market – administrative mechanisms are implemented between the public and private sector institutions. On the one hand, they order implementation of hygiene standards such as Good Hygiene Practise (GHP) and Good Manufacturing Practice (GMP) and, on their base, the HACCP system (Hazard Analysis and Critical Control Points). On the other, they employ the market mechanisms such as production limited by quotas (milk, sugar) and limitation of natural environment pollution such as carbon dioxide and trade in them. Mixed mechanisms implemented by both public and private institutions possess control competences and instruments for enforcement of compliance with the food safety principles.

As concerns the conditions of the European pork market, the organisation of the pork supply chains is implemented employing both public and private food quality standards and the relations between the actors of fresh pork chains that determine the quality management systems organisation.

The public food quality standards in the European Union countries include, among others the HACCP (implemented in pork supply chains). They are applied in particular in the countries of Northern Europe where public demand for pork is governed by the domestic law regulations. On the base of those general public systems, the EKO identification has been developed for organic foods as well as the Protected Designation of Origin (PDO) identification and the Protected Geographical Indication (PGI) system. That later type of chains presented above supplies six types of ham in Spain and the Bayonne ham in France (WOGNUM et al. 2009).

Private food quality standards are established by private institutions to assure quality and safety within food chains. Those standards concern norms encompassing food safety, product and process management, personnel hygiene conditions and natural environment protection. For example, large retailers in Europe developed standards adjusting their suppliers to the requirements of quality management systems aiming at protection of their consumers against specified hazards. Table 1 presents examples of private Quality Management Systems (QMS). In their majority, those sys

Table 1

International quality management systems in the food supply chain

System	Based on	Source	System application
British Retail Consortium Standard (BRC)	HACCP ISO	British retailers	The operational quality management system and the HACCP plan covering the requirements: environmental concerning the product, processes, personnel, at the stage of processing/distribution
International Food Standards (IFS)	HACCP ISO BRC	Germany, France and Swiss retailers	Food safety and quality of branded food products in retail trade. Concerns the stages of processing and distribution
Safe Quality Food (SQF)	HACCP ISO	Australian retailers	Segmented food safety as well as its quality, animal welfare, environmental influence, organic production at all chain stages
Dutch HACCP	HACCP	Danish retailers	Segmented food safety based on the HACCP for stages of growing, processing, distribution and logistics
International Standard Organisation (ISO-22000)	HACCP	ISO	Segmented food safety based on the HACCP for every entity in the chain including feeds and service suppliers
Retailer Produce Good Agricultural Practice (Global-GAP formerly Europe-Gap)	HACCP	European and American retailers	Global-GAP supports use of the HACCP and the members must implement national and international legislation. Growers must reduce environment pollution, make effective use of natural resources, care for health and safety of the employees, assure traceability
Qualität und Sicherheit (QS)	Eurep-GAP IKB	German retailers	Testing compliance with legal requirements and food safety criteria at all stages of the food chain

Source: WOGNUM et al., 2009, pp. 43.

tems are based on the HACCP and ISO systems and they are similar to one another.

For the suppliers such as food producers or traders delivering to the retailers directly, the Global Food Safety Initiative (GFSI) has been developed to harmonise the standards in the global scale. Although the retailers operate on their own standards such as the BRC (British Retail Consortium standard), IFS (International Food Standards), Dutch HACCP or SQF 2000 (Safe Quality Food), some of them accept their standards, e.g. British Tesco accepts BRC or IFS standards. The majority of French retailers enjoy the right to operate their

own quality policies although they participate in the work by the IFS. The Belgian retailers on the other hand are required to apply the GFSI standards. The Global-GAP system has been developed for producers of raw materials to support the HACCP principles and reduce the natural environment pollution (SZYMANOWSKI 2011a).

The quality management systems applied in pork chains – the Dutch IKB (Integrated Chain Control) and German QS (Qualitat und Sicheetheit), are compatible with the Global-Eurep/GAP[3] system. Almost all the pork chain actors, i.e. suppliers of raw materials, abattoirs and processing industry in the Netherlands and Germany participate in the IKB (Integrated Chain Control) or QS (Quality and Security)[4] system. In 2006, the IKB system covered 98% of porkers in the Netherlands while the QS system in Germany – 85% of porkers at abattoirs. The IKB and QS participants are under continual control by independent organisations as concerns food safety. Audits are conducted a number of times a year. In case of noncompliance, the actors are subject to sanctions that extend up to exclusion from the control system. The IKB and QS as well as Global-GAP systems are based on the HACCP, GMP and ISO 9004 systems. Similar systems are organised in Denmark as QSG (Quality Assurances Guarantee) covering 96% of porkers from abattoirs and in France as VPF (Viande de Porc Francaise) covering more than 90% of pork production.

The relations between the main pork chain actors were subject to fundamental changes during the last decade (WOGNUM et al. 2009). They concerned, first of all, a change in the structure of pork products production and sales in different countries of the European market. In the Netherlands and Germany large volumes of fresh meat are the object of trade while the volumes of organic meat are small representing 2% share in the Dutch market and 0.5% at the German market. In Spain, in addition to the fresh meat market, we have a large regional market with 6 types of ham. Changes in the market show the move towards convenience food, health products and packaged meat. In Hungary, in addition to trade in meat, traditional regional products are marketed such as Mangalia products representing an example of the market for traditional products for which the government administration prepared a special program. In Greece, the fresh meat market is the dominating market with 80% share. Other chains operate at the regional level where abattoirs sell their products to the consumers directly.

[3] The Global-Gap System was created in 2007 as the platform for cooperation of the main European food retail networks that developed the quality control system as concerns fruit, vegetables as well as flowers, meat and fish.

[4] More in W. Szymanowski: Analysis of the European pork chains. Role of stakeholders in diversification of quality management systems, material prepared for publication, July 2011, p. 203.

The concentration of participants in the individual stages of the pork chain and the types of relations between them represent the second phenomenon in the aspect of relations between the main actors of pork chains. The phenomenon of concentration occurs at all stages of the pork supply chain.

At the level of retail trade, the phenomenon of concentration is observed as particularly pronounced in the countries of Northern Europe where the 5 largest retail networks control 90% of the market. In France, super and hypermarket networks sell over 80% of the fresh meat. In the Netherlands, supermarkets sell 74% of the meat. In Southern Europe, on the other hand, meat sales go through food shops. In Spain traditional shops sell 39% of meat while in Greece in 2006, abattoirs sold 77% of fresh meat while 90% of the processed meat was sold through retail networks.

In Europe, concentration at the slaughter level is even greater. The largest abattoir in the Netherlands has the market share of 70% while in Germany three largest abattoirs have 50% of the market. On the other hand, in Spain, the 10 largest abattoirs have the market share of 25% only. In Hungary, the concentration process is at the early stage whit the six largest abattoirs supplying 50% of the market while around 150 abattoirs supply the other 50%. In Greece, the concentration process is not seen.

Concentration processes can also be observed at the level of meat processing. Large numbers of small processing plants can be seen in the south of Europe. They are involved mainly I production of regional products. In both the Netherlands and Germany, an increase in number of the processing plants can be observed. Some of them are large processing plants. In Spain, two processing plants control 40% of the market. The total number of processing plants in Spain is close to five thousand and 25% of them produce regional products (hams) while 5% the PDO products. In Greece, 75% of pork is processed pork in the form of hams and sausages. Six processing plants covering the full range of products control almost 60% of the Greek market.

The level of final growing exists and develops, although in Southern Europe it shows a decreasing trend. In the Netherlands there are close to 8,000 farms growing 50,000 heads of pigs. In Germany there are close to 80,000 farms of which a proportion are small farms situated in the south of the country. There are close to 100,000 farms in Spain and 13,500 of them produce regional products. France has 75 cooperative groups of farms. The number of pig growers in Hungary is close to 300,000 but it decreases rapidly while 80 largest farms produce over 50% of the total production. In Greece, there are close to 1,000 farms but their number decreases.

Strong concentration processes take place in the feed industry. Ten largest feed mills in the country supply 65% of the market in the Netherlands

and 50% of the market in Germany. The Spanish feed market is dominated by 15 feed mills while in Greece 13 feed mills supply 88% of the market with feeds. Only in France, the number of feed mills exceeds 250. In Hungary, despite the significant role of small feed mills, imports of feeds play an important role.

Finally, the first link in the pork supply chain is also characterised by concentration processes. The Netherlands, Germany and Denmark possess large genetic selection organisations that supply the entire Europe. Also at that level reduction in the number of enterprises is observed, which is coupled with effectiveness increase in the organisations remaining in the market.

The type of market relations existing between their actors both at a given chain level and between the levels also determines the supply chains organisation. Contracts are the dominating form of transactions at the genetic selection level in different European countries while market transactions dominate at the connection between the production farm and the abattoir in, e.g. the Netherlands and Germany. Mixed or hierarchic management structures can be found in Spain and Greece as well as in Denmark. In Greece, the trend of vertical integration of all the supply chain links is observed although the integration between abattoirs and retail outlets is less pronounced. In majority of the European pork chains there are no formal contracts. More frequently vertical integration can be encountered as the base for standardisation, based on private standards such as the IKB and the QS.

Communication systems are implemented in case of ties between more than two actors in the supply chain where the quality standards are implemented (SZYMANOWSKI 2011a).

The form of ownership of the actors in the supply chain is another factor determining integration. When cooperatives or cooperative associations are the dominating form, as is the case in Northern Europe, then the cooperative of producers take decisions at the level of slaughter (the Netherlands) or at the regional level. In Germany, 60% of relations between the grower and the slaughter as well as 30% at the level of genetic selection – growing are of cooperative contract types. This causes that the pork sector is the best-organised market in Europe. In Spain, cooperative organisations are encountered at the stage of feed supply to producers of piglets. In total, cooperatives have 20% of pork production and 10% of the sales market.

The information technology is the last factor influencing the choice of vertical relations. In Germany, the Netherlands, France and Denmark inter-organisational information systems are created concerning in particular the relation between growing and slaughter that allow determining appropriate prices for deliveries of meat and optimise their processes within a short or

long-term. Those systems are extended by information from all stages of delivery from genetic selection through feed production, growing up to slaughter (SCHULZE, PETERSEN 2004).

Operation areas of public and private quality management systems in pork chains

Below, the quality management systems organisation and structure of exchange in different European countries will be presented. The quality of products leaving the processes covered by quality management systems is influenced by (WAGNUM et al. 2009):

– the ownership – whether this is a public entity or a private entity that is responsible for the product leaving the system;

– the standards that the owner of products or processes applies in the quality management systems;

– markings communicated and guaranteeing the quality of product or process to the consumer.

The markings such as logos, trademarks or names differentiating products provide information on specific characteristics of the product and process conducted according to appropriate specifications. The logo owner, which may any of the chain participant be, that is a public or private partner, does not have to participate in the transaction within the chain. Testing transaction compliance with quality standards does not have to be performed by the logo owner. It may be performed by another public organisation or a certification agency, e.g. Lloyds. Such systems facilitate monitoring compliance with quality standards. Different quality management systems are found in pork chains in different European countries. Those differences concern not only public or private system ownership but also whether the system encompasses the selected links or the entire pork chains. We may identify two types of quality management organisations: public binary systems involving two entities from the supply chain and private quality management systems covering the entire supply chains.

The binary relations in public quality management systems are widespread in countries such as Greece and Hungary. Fresh meat chains in Spain may serve as examples of regional public pork supply chains. They are based on formalised contracts in which genetic selection organisations coordinate the upper part of the supply chain (SZYMANOWSKI 2011).

Private quality management systems covering entire chains are found in the fresh pork sector in Germany where the QS systems have the character of private quality management systems. The situation is similar in the Nether-

lands where the IKB as the integrated chain control system represents a private pork trade quality management system. Agricultural cooperatives operating on the base of contracts are coordinators in the chain (SZYMANOWSKI 2011a).

Finally, there are regional systems in which private or public organisations can be the integrators. Management of regional or national chains based on private standards may take place in cases such as chains organised by agricultural cooperatives coordinating their operations by means of formalised contracts. Compliance control in those quality management systems is based on private standards (the QS system in Germany adapting horizontal quality management standards such as the GMP+ and the IFS).

In case of public quality management systems in which public quality standards are applied, the control is conducted by public inspection agencies and public veterinary service. Examples of such systems include the organic pork supply system (EKO) in the Netherlands or the regional systems in Spain such as the Protected Designation of Origin (PDO) system or the Protected Geographical Indication (PGI) system for production of regional products (6 types of ham) coordinated as concerns compliance with the European Union and domestic standards by the regional administrative authorities (SZYMANOWSKI 2011a).

Conclusion

The paper presents analysis of pork supply chains in six European Union countries: France, Greece, The Netherlands, Spain, Germany and Hungary. Differentiation was performed into the public and the private quality management systems as well as binary quality management control systems and comprehensive quality management systems with national and regional coverage. Considering the environmental aspects in Europe, we can identify the "intensive systems" in Northern Europe, the "soft systems" in Southern Europe and the "system of low effectiveness" in Central Europe. The diversity of those systems is presented in figures 2 and 3[5].

The concentration at various chain levels is the fundamental characteristic of European pork chains. Particularly in Northern Europe the slaughter stage is of major significance today and will continue to be in the future[6]. Consolida-

[5] More in W. Szymanowski: Analysis of the European pork chains. Role of stakeholders in diversification of quality management systems, material prepared for publication, July 2011, p. 203.

[6] The largest European abattoir of Danish Crown integrating the Danish meat sector and Dutch-German Vion Food Group covering over 50% of pork processing sector can serve as examples.

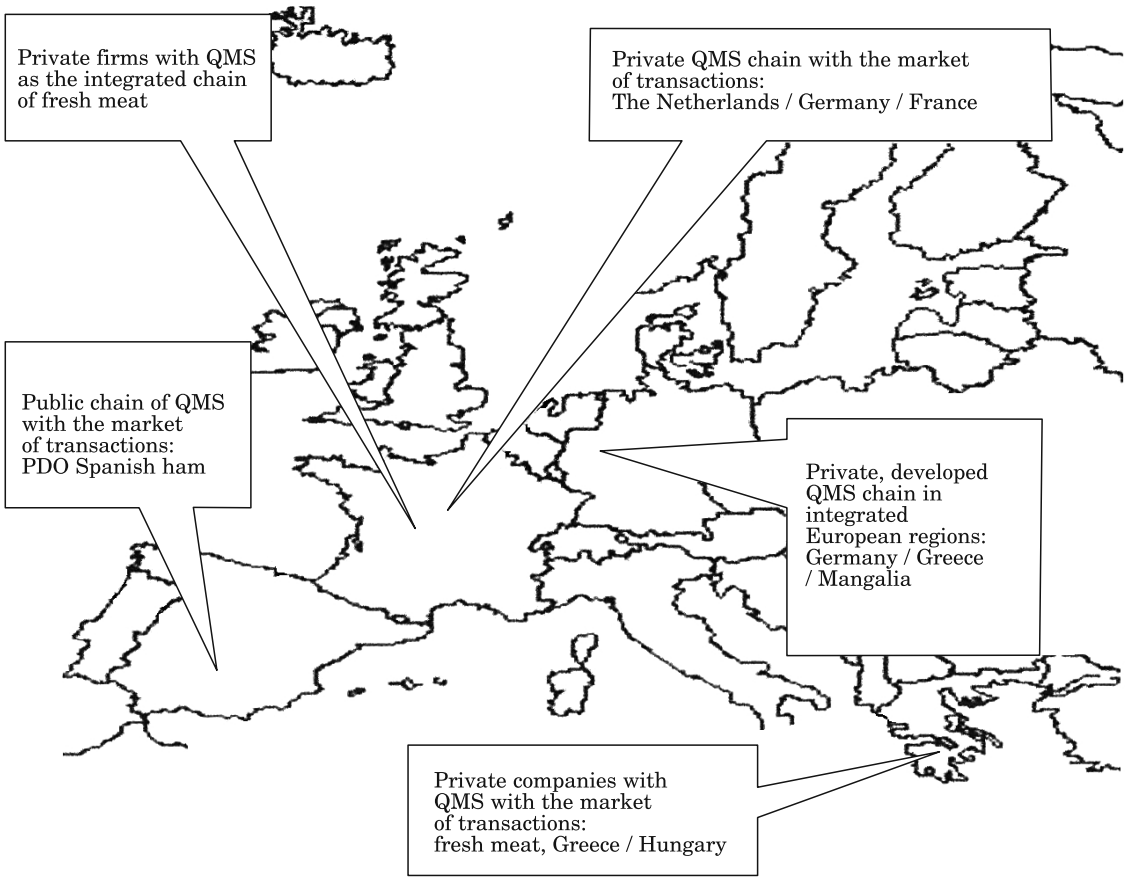

Fig. 2. Quality management systems organisation and principles of cooperation in pork supply chains in Europe
Source: TRIENEKENS, WAHNUM 2009, p. 280.

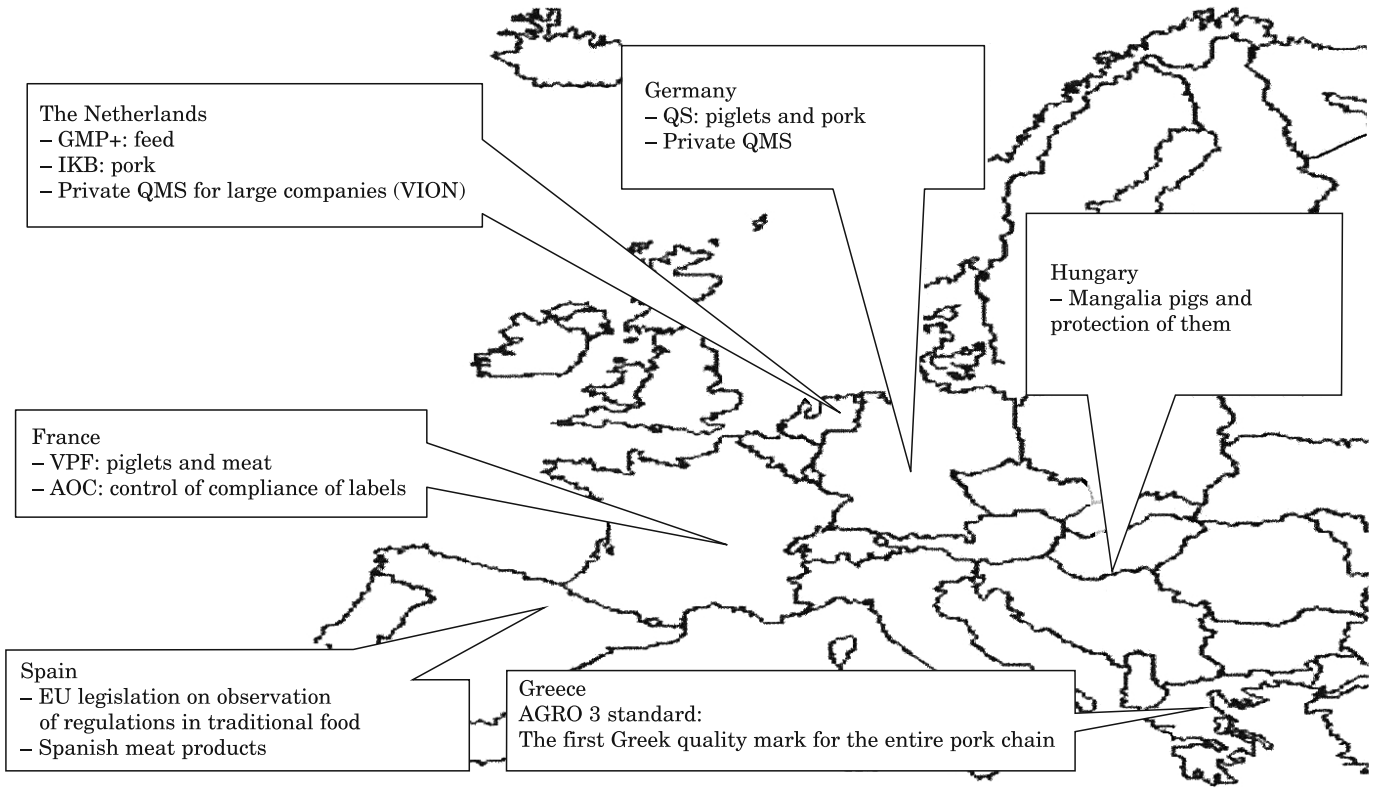

Fig. 3. Typical pork chains quality management systems in different parts of Europe
Source: TRIENEKENS, WAHNUM 2009, p. 281.

Table 2

SWOT analysis of the pork sector for six European Union countries

Strengths	Weaknesses
The Netherlands: use of knowledge in the sector, high productivity, IKG quality system, exports, **Germany**: high level of technology, regional products, QS quality system, strong cooperative sector; **France**: strong traditions, strong cooperative organisations, quality brands and special products, effective institutional activity; **Spain**: growing sector, market flexibility, strong regional brands; **Hungary**: traditions of regional products, good quality of feed cereals, low labour costs; **Greece**: rapid growth in processed products, investments by government administration, personal sales;	**The Netherlands**: focus on mass production, poor sector image, increasing production costs**;** **Germany**: lack of communication within the chain, lack of systemic solutions for pollution problems, dependence on imports of piglets; **France**: many small producers, competition from poultry, small abattoirs, image of pork as fat product; **Spain:** poor image of pork, fragmentation of production, shortage of labour; **Hungary**: outdated production technology, little investment, low productivity; **Greece**: dependence on genetic material, low technological adaptation, high production costs, large black market;
Opportunities	Threats
The Netherlands: sector image improvement, improvement of logistics and information exchange, foreign investments thanks to cooperation with foreign manufacturers of mass products; **Germany**: large producers, increase of exports, development of market niches, development of network coordinators; **France**: high production capacity, progressing concentration, raw material quality, technological progress, targeted exports; **Spain**: development of products: health, convenience, immigration of labour (South America) development of local brands; **Hungary**: development of product niches (Mangalia), government administration support, technology improvement, exports to Croatia and Greece; **Greece**: improvement of the sector image, new product development, consumer preferences concerning domestic meat.	**The Netherlands**: decrease in acceptance for industrial forms of production, lack of solutions for environment pollution, production costs increase; **Germany:** high numbers of small producers, federal system of taking decisions, unstable relations within the chain; **France:** lack of leadership balance in the chain, absence of large companies at the EU level, domination of domestic legislation over the EU legislation, competition in the EU markets, competition from poultry, high process of raw materials; **Spain:** increase of production costs (feed), inrease of internal consumption, increase of institutional costs; **Hungary:** poor image, illegal slaughter, high fluctuation of prices, absence of sectoral strategy; **Greece**: competition of environmental tourism for pork production, high costs compering to competitors, decreased acceptance for industrial production.

Source: TRIENEKENS, WOGNUM 2009, p. 266.

tion, however, does not mean integration of the chain, which is exemplified by independent abattoirs in the Netherlands or the situation in Germany where the chains are integrated by implementation of appropriate quality management systems integrated with the information systems. Concentration occurs

not only at the stage of slaughter but also within the other links of pork chains in Northern and Western Europe. Pork chains of Southern and Eastern Europe are more fragmentary with fierce competition between individual stages of the chain, which represents a future challenge for those countries. Those processes started taking place in the countries of Northern Europe some 10–15 years ago.

Currently the trend of diversifying fresh pork products in Europe is weak, although there are possibilities for producing special and regional products. The PDO products from Spain or Mangalia pork from Hungary can provide the examples here. Opportunities for production of very high quality regional products for niche markets increase. This covers, for instance, production of various types of sausages, which will promote the meat sector in Northern Europe as diversified in its range of products.

Quality systems in North-Western Europe cover entire pork chains and they are supported by integrated logistics and IT systems. Those systems are developed for small and medium companies. Quality management systems are initiated by the level of abattoirs and not as is the case in other food chains by retail networks. A particular role is played by cooperatives in Germany, France and Denmark and they create implementation of quality management systems in the meat sector, which is then followed by the countries of Southern Europe. In North-Western Europe we deal with meat production in industrial form, which allows maintaining the competitive advantage in pork products trade and sale of technical knowledge on mass production to other countries. The weaknesses of such production criticised by consumers are low animal welfare and poor natural environment protection, which, among others, hinders development of tourism. The summary of the above analysis concerning the pork chains diversification status in six European countries is presented in table 2 (TRIENEKENS, WOGNUM 2009).

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INFLUENCE OF TAXATION ON INVESTMENT DECISIONS BY ENTREPRENEURS

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> "The tax burden is not the given value, determined by the environment of the enterprise, but rather the value that can be influenced by development or establishment of specific structures".
>
> (KUDERT, JAMROŻY, 2007, p. 17)

Key words: taxation and investment decisions, net present value before taxation method, net present value after taxation method, linear and digressive depreciation method, taxation paradox.

Abstract

The example presented in the paper explains operation of the phenomenon known in the literature as the "taxation paradox" that means that the net present value of the investment after considering taxation is higher than the net present value after taxation or the other way round. The aim is to present that dismissing the taxation aspects in the decision taking processes may result in inappropriate choices or lead to resignation from a profitable investment project by investors.

WPŁYW OPODATKOWANIA NA DECYZJE INWESTYCYJNE PRZEDSIĘBIORCÓW

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Słowa kluczowe: opodatkowanie a decyzje inwestycyjne, metoda wartości bieżącej netto przed opodatkowaniem, metoda wartości bieżącej netto po opodatkowaniu, liniowa i degresywna metoda amortyzacji, paradoks podatkowy.

Abstrakt

Na przykładzie zaprezentowanym w artykule wyjaśniono funkcjonowanie zjawiska znanego w literaturze jako „paradoks podatkowy", który polega na tym, że wartość bieżąca netto inwestycji po uwzględnieniu opodatkowania jest wyższa niż wartość bieżąca netto przed opodatkowaniem lub odwrotnie. Celem badań było pokazanie, że pominięcie aspektów podatkowych w procesach decyzyjnych może skutkować nietrafionymi wyborami lub doprowadzić do zrezygnowania przez inwestorów z rentownego przedsięwzięcia inwestycyjnego.

Introduction

Taxes represent pecuniary services to the benefit of the State Treasury or territorial government based on the tax Act that in their nature are public-legal, free of charges, compulsory, not reimbursable and unilateral. Three basic economic consequences of taxation can be identified:

1) Consequences concerning liquidity. Tax payments of direct taxes, first of all the income taxes, have basically negative influence on the financial liquidity of enterprises. However, as concerns the indirect taxes, i.e. the VAT and excise tax, the straight opinion cannot be formulated. According to the conceptual assumption, the indirect taxes stipulate passing the tax burden upon the consumer. If, however, payment by the consumer for, for example consulting services, takes place after the date of emergence of the tax duty then we can talk about the negative influence of the VAT on the financial liquidity.

2) Consequences concerning the property. Taxes also have negative effect on the entrepreneur's property. Decreasing the value of property results, among others, from charging the entrepreneurs with property taxes (real property tax) and income taxes (capital companies – corporate income tax, partnerships – personal income tax).

3) Organisational consequences. They can be considered at two levels. The first concerns projects that assure timely performance of tax liabilities (maintaining the ledgers, drafting the tax declarations and returns, passing the tax information, transfer of withholding taxes). The second level concerns considering taxes in the management process, which also requires creating adequate organisational conditions (establishment by the entrepreneur of own tax department or using the services of an external tax consultants).

For small and medium enterprises in particular it is unprofitable to maintain their own financial accounting services (costs of employment, costs of work environment organisation, office equipment, maintaining computer equipment). On the other hand, large enterprises in most cases possess their own financial – accounting services although in case of specialist issues they also employ external experts. The external tax consultants offer the possibility of passing to a significant extent the penal fiscal liability of the enterprise for correctness of settlement with the fiscal authorities on them (KUDERT, JAMROŻY 2007, pp. 18–21). The cost of tax consulting services in such situations is sometimes questioned by the tax authorities when booked as the cost of generating revenue, in particular because the performance of service is not documented (JAMROŻY 2000).

The difference between legal control of tax burdens (i.e. decreasing taxes) and illegal avoidance of taxation should be highlighted. Avoidance of taxation involves undertaking actions forbidden by the tax law (not reporting the tax

duty, not revealing all the sources of revenues or falsification of documents) Avoidance of taxation is illegal and unethical (GOMUŁOWICZ, MAŁECKI 2004. p. 251). Legal control of tax burden means taxation optimisation that should be understood as the choice of the form and structure of the planned transaction within the frameworks and limits of the effective tax legislation allowing decreasing the level of the tax burdens. There is no legal base that would order assuming the masochistic principle that the parties should settle their civil-legal relations in the form that is the most beneficial for the fiscal authorities (RADWAŃSKI 1999). The point is not the absolute minimisation of the tax burdens, because that would lead to the absolutely senseless recommendation: "Cease any business activity for the purpose of minimising the tax burden" (KUDERT, JAMROŻY 2007, p. 25).

In the enterprises decisions are taken all the time and some of those decisions are characterised by higher sensitivity to taxes while in case of others that sensitivity is lower. There are, nevertheless, no decisions that are free of tax implications. We can identify **strategic decisions** (concerning the form of taxation, the form of the direct investment, registered office of the company or the restructuring decisions) and the **current decisions** (investment decisions, financial decisions, decisions concerning representation of revenues or decisions concerning transfer prices) (KUDERT, JAMROŻY, 2007, p. 27).

Taxation and investment decisions

The basic methods of measuring the tax burdens include the:

1. Casuistic simulation of tax accounting is widely spread in practice and it involves computation of the tax liability in case of the specific actual situation assumed, which means that even in case of minor changes in the assumptions made the alternative variant may prove more favourable.

2. Partial tax calculus provides the so-called partial tax rates for every economic extent of planning that, without referring to the individual kinds of taxes, may be considered for determination of the tax burden.

3. Complementary methods:

– Verbal comparison of tax burdens that is the intuitive estimation of the benefits from the considered decision options. It is limited to the general assessment of tax burdens in case of the individual options. In practice of the tax consultant it is helpful in presenting the initial solutions that as a rule should be subjected to verification using precise statistical methods to the client.

– Determination of the break even tax rates or break even income is used when the profitability of the analysed alternatives is subject to change. The so called break-even point in which such a change takes place is searched for.

4. Dynamic methods:

– The net end value method – represents the difference between the end property obtained from implementation of a given investment project (interest-bearing cash flows) and the end property obtained from an alternative investment (taking the interest into account).

– Net present value method in which the time aspect is considered by discounting the cash flows. For the investment options covered by the analysis the net present values (NPV) are computed that are then compared. The investment project showing the highest net present value is the most favourable in the aspect of profitability. Negative net present value means that the interest on the capital involved in the analysed option is lower than the weighted average cost of capital – (WACC) expressed by the discount rate. The WACC is the appropriate discount rate assuming that the investment project considered is characterised by the same risk profile as the enterprise (KUDERT, JAMROŻY 2007, pp. 28–45). The net present value before taxation is expressed by the following formula:

$$NPV_0 = -I_0 + \sum_{k=1}^{K} \frac{CF_k}{(1+r)^k}$$

where:

NPV_0 – net present value before taxation for the period 0,
I_0 – initial investment outlay for the period 0,
k – time variable ($k = 1, ..., K$), where K means the last year of the computation period,
CF_k – cash flow (difference between revenues and expenditures) during year k of investment project operation before income tax,
r – discount rate (WACC).

Dynamic methods are the most appropriate for investment projects profitability assessment as they consider both the interest effects resulting from cash flow distributions over time (projected flows of revenues and expenditures) and the alternative investment project effectiveness.

In the net present value method the initial value of the investment outlay becomes the tax cost through depreciation deductions made according to the principles provided in art. 16a–16m of the Act on the corporate income tax and 22a–22o personal income tax. This applies in particular to fixed assets as well as intangible and legal assets. The tax law allows application of the linear method or the digressive method. The taxpayers make the choice of one of the methods for the individual fixed assets before commencement of depreciation. In case of applying the linear depreciation method the taxpayers use the

"Specification of year depreciation rates". Under special circumstances the taxpayers may increase the depreciation rates, for example in relation to machines and devices that are subject to rapid technological progress the depreciation rates can be doubled. In case of digressive depreciation, during the first year the depreciation rate is increased by the coefficient applied and during the consecutive years the depreciation deductions are made from the initial value each time decreased by the depreciation applied so far. Transition to the linear method takes place during the year during which the depreciation amount determined by means of the digressive method was lower than the depreciation amount determined by means of the linear method.

Considering the influence of taxation, the net present value of investment projects may be presented in the following way:

$$\mathrm{NPV}_{0t} = -I_0 + \sum_{k=1}^{K} \frac{\mathrm{CF}_k - t \cdot (\mathrm{CF}_k - D_k)}{(1 + r \cdot (1 - t))^k}$$

where:
NPV_{0t} – net present value after taxation during the period 0,
I_0 – initial investment outlay during the period 0,
k – time variable ($k = 1, ..., K$),
CF_k – cash flows during year k of the investment project operation,
t – income tax rate,
D_k – depreciation during the period k,
r – discount rate (WACC).

That formula contains numerous simplifications. The assumption that uniform income tax rate is applicable to all categories of income would be unrealistic. In case of capital companies – depending on the allocation of the profit – the proportional corporate income tax rate is applicable ($t^{\mathrm{prawne}} = 19\%$), or the accrued rate on the income of the capital company and on the dividends ($t^{\mathrm{dywidendy}} = 19\%$) disbursed to the shareholders that are individuals, i.e. $t^{\mathrm{prawne}} + t^{\mathrm{dywidendy}} \times (1 - t^{\mathrm{prawne}})$, which gives 34.39%.

In case of incurring losses Polish taxpayers are eligible to decrease the income during the consecutive five years where the decrease of the income during one tax year may not exceed 50% of the loss (art. 9 section 3 of the Act on personal income tax and art. 7 section 5 of the Act on corporate income tax). This means the possibility of accounting for the loss during two consecutive tax years the soonest.

In case of investment projects evaluation the special effect referred to in the literature as the "taxation paradox" occurs not infrequently. It means that the

net present value after considering the taxation is higher than the net present value before taxation. The situation may also take place where the net present value before taxation is negative and after taxation positive (and the other way round).

Example

The enterprise in the form of a limited liability company is planning purchasing a specialist machine at the purchase price of PLN 500,000 for the purpose of renting it out. As a consequence of that investment project the cash flows presented in table 1 are expected.

Table 1

Cash flows in the analysed investment project

Initial outlay I_0	Current surplus of revenues over expenditures CF_k			
k_0	k_1	k_2	k_3	k_4
–500,000	125,000	150,000	175,000	190,000

Source: Own computations based on KUDERT, JAMROŻY (2007, p. 64).

Assuming that the cash surplus may be invested at any time in the form of an interest bearing financial deposit at the interest rate of $r = 10\%$ (the best investment alternative) the net present value without considering the taxation is presented in table 2.

Table 2

Net present value of the analysed investment project without considering the taxation

K	0	1	2	3	4
CF_k	–500,000	125,000	150,000	175,000	190,000
CF_k after discounting	–500,000	113,635	123,965	131,480	129,775
NPV_0	–1,145				

Source: Own computations based on KUDERT, JAMROŻY (2007, p. 64).

$$CF_1 = \frac{125{,}000}{(1 + 0.1)^1} = 113{,}635$$

$$CF_2 = \frac{150{,}000}{(1 + 0.1)^2} = 123{,}965$$

$$CF_3 = \frac{175{,}000}{(1 + 0.1)^3} = 131{,}480$$

$$CF_4 = \frac{190{,}000}{(1 + 0.1)^4} = 129{,}775$$

$$NPV_0 = -500{,}000 + 113{,}635 + 123{,}965 + 131{,}480 + 129{,}775 = -1{,}145$$

The computations indicate that the investment in the asset is less profitable than the financial deposit. The investor will have PLN 1,145 less as compared to the alternative investment.

For the purpose of computing the net present value after taxation we assume that the machine depreciation period while applying the linear method is 4 years and the discount takes place according to the discount rate after taxation according to the tax rate $t = 19\%$. During the planning period there are no disbursements of profits to the benefit of shareholders. Determination of the net present value after taxation is presented in table 3.

Table 3

Net present value of the analysed investment project after taxation (linear depreciation)

K	0	1	2	3	4
Cash flows CF_k	–500,000	125,000	150,000	175,000	190,000
Linear depreciation deduction D_k	–	125,000	125,000	125,000	125,000
Taxable income	0	0	25,000	50,000	65,000
Tax liability T_k	0	0	–4,750	–9,500	–12,350
CF_k after taxation: $CF_k - T_k$	–500,000	125,000	145,250	165,500	177,650
CF_t after discounting	–500,000	115,635	124,300	131,015	130,095
NPV_{0t}	**1,045**	–	–	–	–

Source: Own computations based on KUDERT, JAMROŻY (2007, p. 65).

$$CF_{t1} = \frac{125{,}000 - 0.19 \cdot (125{,}000 - 125{,}000)}{(1 + 0.1 \cdot (1 - 0.19))^1} = 115{,}635$$

$$CF_{t2} = \frac{150{,}000 - 0.19 \cdot (150{,}000 - 125{,}000)}{(1 + 0.1 \cdot (1 - 0.19))^2} = 124{,}300$$

$$CF_{t3} = \frac{175{,}000 - 0.19 \cdot (175{,}000 - 125{,}000)}{(1 + 0.1 \cdot (1 - 0.19))^3} = 131{,}015$$

$$CF_{t4} = \frac{190{,}000 - 0.19 \cdot (190{,}000 - 125{,}000)}{(1 + 0.1 \cdot (1 - 0.19))^4} = 130{,}095$$

$$NPV_{0t} = -500{,}000 + 115{,}635 + 124{,}300 + 131{,}015 + 130{,}095 = 1{,}045$$

The computations presented in table 3 show that the net present value after considering the taxation is positive, i.e. the investment in the asset is profitable. This is an example of the so-called "taxation paradox".

In table 4 we assume that depreciation is applied according to the digressive method (coefficient 2.0). Starting with the tax year during which the depreciation rate according to the digressive method would be lower than the year depreciation amount computed by applying the linear method, i.e. the period $k = 3$, we shift to the linear method. The taxation occurs according to the accrued rate applicable to the profits disbursed to the shareholders, i.e. $t = 34{,}39$.

Table 4

Net present value of the analysed investment project after taxation (digressive depreciation)

K	0	1	2	3	4
Cash flows CF_k	–500,000	125,000	150,000	175,000	190,000
Digressive depreciation deduction D_k	–	250,000	125,000	125,000	0
Income or loss during the period k	0	–125,000	25,000	50,000	190,000
Accounting for the loss	–	–	–25,000	–50,000	–50,000
Tax liability T_k	0	0	0	0	–48,145
CF_k after taxation: $CF_k - T_k$	–500,000	125,000	150,000	175,000	141,855
CF_t after discounting	–500,000	117,305	132,100	144,625	110,015
NPV_{0t}	4,045	–	–	–	–

Source: Own computations based on KUDERT, JAMROŻY (2007, p. 66).

$$CF_{t1} = \frac{125{,}000 - 0.3439 \cdot (125{,}000 - 125{,}000)}{(1 + 0.1 \cdot (1 - 0.3439))^1} = 117{,}305$$

$$CF_{t2} = \frac{150{,}000 - 0.3439 \cdot (150{,}000 - 150{,}000)}{(1 + 0.1 \cdot (1 - 0.3439))^2} = 132{,}100$$

$$CF_{t3} = \frac{175{,}000 - 0.3439 \cdot (175{,}000 - 175{,}000)}{(1 + 0.1 \cdot (1 - 0.3439))^3} = 144{,}625$$

$$CF_{t4} = \frac{190{,}000 - 0.3439 \cdot (190{,}000 - 50{,}000)}{(1 + 0.1 \cdot (1 - 0.3439))^4} = 110{,}015$$

$$NPV_{0t} = -500{,}000 + 117{,}305 + 132{,}100 + 144{,}625 + 110{,}015 = 4{,}045$$

As the consequence of applying the modified assumptions, the net present value after taxation increases significantly, which results from the higher depreciation deductions during year $k = 1$, that is shifting the tax costs in time

and accounting for the entire tax loss incurred during $k = 1$, as well as the decrease of the discounting coefficient as a consequence of the higher taxation of the financial deposit according to the accrued tax rate.

Summary and conclusions

Taxes represent a significant element of costs for companies and their owners (shareholders). As a consequence, persons managing enterprises should consider taxation during the decision-taking processes. Managers are taking economic decisions continually at both the institutional and functional level. Those are decisions concerning the choice of the legal form, choice of the location for conducting business activities, decisions concerning the choice of the investment project or sources of financing for it, policy of income generation and distribution, accounting for tax losses or policy of transfer prices.

Maximisation of profit or minimisation of tax burden may be the goal of the entrepreneur. Both those goals are mutually competitive. If we maximise the profit than the income tax burden is also relatively high. The appropriate definition of the goal then may be: maximise the profit after taxation (KUDERT, JAMROŻY 2007, p. 25).

Knowledge of the relations taking place between economic transactions and the actual tax-legal situation set in the individual tax Acts results in the situation that those managing the enterprise have the possibility of influencing the level of tax burdens.

Given that, the managers should know the fundamental possibilities of controlling tax burdens and apply them in practice to the highest extent possible to achieve the goals of companies and their owners.

Taxation, generally, is one of the factors determining attractiveness of a given investment project. Differences in taxation of alternative projects may lead to the change in their relative profitability. It may not be excluded that considering the tax factor would cause that the net present value of the investment before taxation is negative and after taxation positive, or the other way round. Neglecting the taxation aspects in the decision-taking processes may result in inappropriate choices.

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INCOME DISTRIBUTION AND REGIONAL CONVERGENCE IN POLAND AND THE EUROPEAN UNION

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K e y w o r d s: analysis of regional convergence, income distribution, kernel density estimation.

A b s t r a c t

The main aim of this paper is to analyze regional convergence in the period 1995–2007 in Poland and European Union. Main hypothesis is statement that convergence (understood as reducing income disparities) perceived from system wide perspective is not identical with diminishing income disparity among inhabitants of regions in particular countries, even though broad range of EU cohesion policy means were applied.

The analysis was carried out in several steps. Initially, the authors referred to the classical convergence hypotheses (unconditional β convergence) within the EU-27, then the same assumptions were examined taking into account population – weighted indicators. However, the main aim of research undertaken in this study was to investigate the regional (within – country) distribution of income for the selected years. The results allows to state that despite growing mean income in the analyzed systems (EU-27 and Poland) and strong support by EU funding, one can observe increased disparities between regions.

ROZKŁAD DOCHODÓW I REGIONALNA KOWERGENCJA W POLSCE I UNII EUROPEJSKIEJ

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S ł o w a k l u c z o w e: analiza konwergencji regionalnej, rozkład dochodów, jądrowa estymacja gęstości.

Abstrakt

Podstawowym celem artykułu była empiryczna analiza procesu regionalnej konwergencji w Polsce oraz Unii Europejskiej w latach 1995–2007. Główną hipotezę stanowi stwierdzenie, że konwergencja (rozumiana jako zmniejszanie różnic w dochodach) postrzegana z perspektywy całego systemu ekonomicznego nie może być utożsamiona z zanikiem zróżnicowania poziomu dochodu mieszkańców regionów poszczególnych państw i to mimo zastosowania wielu instrumentów europejskiej polityki spójności.

Badanie przeprowadzono w kilku etapach. Początkowo odniesiono się do klasycznej hipotezy bezwarunkowej β konwergencji w skali UE-27, a następnie uwzględniono wskaźniki dochodu ważonego rozmiarami populacji. Najważniejszą częścią analizy było przeprowadzenie dla wybranych lat estymacji gęstości regionalnego (wewnętrznego) rozkładu dochodu. Uzyskane wyniki uzasadniają wniosek, że mimo rosnącego przeciętnego dochodu (zarówno w UE-27, jak i w Polsce), można zauważyć pogłębiający się dysparytet zamożności regionalnej.

Introduction

The main aim of regional convergence analysis conducted in this paper is to compare situation between Poland and enlarged EU. Subject of the article is important due to a couple of reasons. First and most important of them are still discussed cost and results of transition, especially when validity of term "Poland A" and "Poland B" is considered. In the above-presented division first group is to be a synonym of well-developed modern area, while so called "Poland B" represent poor, underdeveloped "eastern wall". One can find opinions that this kind of order stems from removal of regional issues from main areas of interest by policy makers founding basement for Polish transition (*Stanisław Gomułka i transformacja*... 2010). Administrative reform implemented in 1999 enforced more detailed and complex view on scale and form of regional divergence which should result in improvement of regional policy.

Another important reason for analysis of domestic convergence is a need to develop suitable regional policy that can face challenges stemming from Polish membership in the EU, especially at the stage of development and implementation of new budget perspective. Honest and objective research is very important and useful tool for supporting EU cohesion policy. Issues of domestic incomes disparity are not only Polish problem but also refer to other EU countries such as Italy, Spain, or Netherlands, where strong regional divergence has significant influence on the whole economic situation. Similar problem concerned also new EU members, for instance Hungary, Romania and Slovenia, where insufficient "integration effect" was observed (KALIORIAS, PETRAKOS 2010), thus one can consider scientific analysis of this phenomenon reasonable.

For the purpose of the research presented in the paper two attitudes towards convergence were employed. First, theoretical, which is presented in

the next part of the article, refers to the idea of convergence linked with neoclassical growth model. Core of second look are institutional and practical dimensions referring to the EU cohesion policy, which is aimed at diminishing differences in socio-economic development between various regions.

Such policy became very important after 1993 when Maastricht Treaty, establishing European Union, was put into the force. Treaty regulations introduced convergence criterions, actually called nominal. Meeting these criterions determined adoption of common currency in EU. Simultaneously a support tool for achieving this goal – Cohesion Fund was implemented in the EU legal instruments. Main objective of the fund was to reduce development differences in particular countries in order to help meeting nominal convergence criterions[1].

Another milestone in the history of regional policy was EU enlargement in 2004. It imposed broad and deep changes in financial and legal framework of this policy. Such situation stemmed from the fact that for the first time in the history of EU so many less developed (in comparison to earlier enlargement) countries entered community.

One has to underline that since 1988 EU cohesion policy has based on long term expenditure programming periods. Simultaneously, funds allocation guidelines, which impose spending in regions with below average EU income, suggest presence of formal linkages between economic convergence and EU structural policy (GŁODOWSKA 2012). This resulted in growing importance of regional policy in the global EU spending. In the financial perspective 1989–1993 regional policy accounted for 20% of budget while in programming period 2007–2013 such share increased to 36%. Financial plan ending 2013 is the first which allows all new members to obtain financing from three support tools: Cohesion Fund, European Regional Development Fund and European Social Fund. Considering scale and importance of this policy one can ask about results and efficiency of its instruments.

Economic convergence and neoclassical growth model

In the second half of 80-ties of XX century one could observe a return to research on economic growth. The main reason boosting this change was statement that long run economic development is much strongly affected by economic growth factors than by countercyclical policy (monetary and fiscal) and business cycles. One of the backbones theories of economic growth was

[1] Detailed rules of the Fund activity are defined in Council Regulation (EC) No 1164/94 of 16 May 1994 establishing a Cohesion Fund (OJ L 130, 25.5.1994).

convergence. Research on convergence was aimed at answering questions whether we were witnessing growing divergence of welfare between countries or whether diminishing divergence followed increase of welfare.

The biggest development of research on economic convergence took place in 90-ties of the XX century. The guide point of reference for modern convergence, interpreted as heading of group of economies towards common steady state, (which is characterized by comparable welfare and growth rate) is publication of BAUMOL (1986). One has to remember that Baumol was inspired by ABRAMOVITZ (1986). Abramovitz on the basis of long run observations for the period 1870–1979 found significant changes in the labor productivity for selected OECD economies. He also claimed that productivity level heads towards common steady state. Very similar conclusions were achieved by Baumol for identical period and comparable set of developed economies (OECD countries). Abramovitz and Baumol findings were questioned by DE LONG (1988). Author stated that convergence hypothesis is strictly linked with arbitrary choice of economies, and expanding this set makes results unclear. Baumol together with Wolff responded to his criticism (BAUMOL, WOLFF 1988). One has to say that listed above publications are milestones of research on convergence understood as process implied by economic growth and diminishing return on capital[2].

Analysis of convergence was aimed at answering question whether modern economies are heading towards common steady state and simultaneously one can expect worldwide wealth convergence. In the literature most popular are classical β and σ convergence hypotheses[3]. First assumes negative relationship between economic growth rate and initial welfare level (usually GDP *per capita*). Sigma convergence assumes diminishing dispersion in the group of countries. Contrary to convergence one can observe σ divergence

Problem of welfare distribution is one of the most commonly discussed issues both by scientists and politicians. Presented results suggest two dimensional divergence[4]: Poor countries developed more slowly than well developed (β divergence), moreover cross economy *per capita* income dispersion was rising (σ divergence). Additionaly QUAH (1996, 1997) presented a model of world economy heading towards bimodal income distribution with two sets of countries: poor (Asia, Africa, South America) and rich (OECD). However

[2] The most important research on convergence can be found in Sala-i-Martina (2002), De La Fuente (1997) and considered to be most often cited ISLAM (2003). Also Polish authors have some valuable publications see: NOWAK (2006) or MALAGA (2004) and PRÓCHNIAK and RAPACKI (2010).

[3] Terms of β and σ convergence (divergence) were introduced by SALA-I-MARTIN in his Ph. D. thesis from 1990 while idea became widely spread by works of Barro (SALA-I-MARTIN 1992).

[4] Due to a lack of consistent, trustworthy data analyses are not conducted for periods earlier than first half of XIX century.

repetition of this research proved that results are not robust to changes of analyzed sets of countries (KREMER et al. 2001).

Research on classical convergence usually bases on research in which, one country equals to one observation (country is treated as analytical unit). In case of searching for growth factors such attitude is fully reasonable because development may stem from many factors such as institutions, education or economic policy influencing growth rate. However if one wants to find out whether poor countries develop faster than the rich ones such attitude has some drawbacks- population of the whole world and sets of both rich and poor countries has to be considered. In case of poor, fast developing country with small population reasoning should be different than this applied to unit with significant share of population.

Presented above drawback can be partially smoothed by using population-weighted data. After such adjustment one can assume that bimodal income distribution doesn't exist (JONES 1997). Moreover, the use of population weighted data allows one to assume that both β, and σ divergence hypotheses should be rejected, and even income of poor countries was growing faster that this of rich, resulting in diminishing income differences (SCHULTZ 1998). Using single country as analytical unit β convergence cannot be observed. After applying population weighted analysis negative relationship between initial welfare and later growth rate is fully confirmed, due to the fact that high population countries (China, India, Indonesia) were in the group of poor and fast growing countries (SALA-I-MARTIN 2006).

The use of *per capita* income weighted by population doesn't allow to assess income distribution and welfare disparities within the country. Such situation stems from the assumption that all citizens have income equal to mean. One can state that such attitude eliminates possibility to analyze convergence from citizen's perspective. As a result idea aimed at finding rising or diminishing income disparities on the basis of empirical income distributions was developed.

References to population weighted GDP and domestic income distribution can be found in: SCHULTZ (1998), SQUIRE, DENINGER (1996), BHALLA (2002), QUAH (2002), SALA-I-MARTIN (2006). However one has to consider that all listed authors based on highly aggregated data (continent, world), putting aside regional or within country analysis. Also transition issues are almost omitted. There are minor exemptions: for example research conducted by FISCHER and STIRBÖCK (2006) which covered 256 EU regions and suggested presence of regional level convergence clubs. Also BATTISTI and DI VAIO (2008) analyzed regional convergence in the EU, however they did not achieve clear results.

Starting from the first half of 90-ties of XX century one can observe consensus that convergence is phenomenon of conditional character which

implies that it can be observed in the selected group of countries. Examples of such sets are OECD countries or EU members (BAUMOL 1986, MANKIW et al. 1992). Typical in-club analysis treated each economy as analytical unit omitting within country distribution.

Such situation boosted authors of this paper to combine both presented attitudes. Set of analyzed countries was reduced to EU members. On the other hand both classical convergence and population-weighted hypotheses were verified. Additionally income distribution within whole EU was analyzed. For this purpose each member of EU-27 was defined as a set of regions. The last aim of the paper was to assess regional convergence in Poland and compare it to EU-wide experience.

Referring to institutional attitude towards convergence one can notify that European cohesion policy tools should stimulate diminishing of income disparities between regions, and therefore boost real convergence. Such hypothesis stems from the fact that all three instruments of EU regional policy: Cohesion Fund, European Regional Development Fund and European Social Fund present convergence as their main objective[5]. Such hierarchy of targets allows to ask about efficiency of regional policy.

Method for Testing β Convergence Hypothesis

Convergence phenomenon is strictly linked with neoclassicał growth theory. In this case convergence is understood as positive correlation between initial distance from steady state and later speed of heading towards it. Let y^* be GDP per capita in steady state, while $y(t)$ represents product per capita at time t. Speed of convergence can be estimated using formula:

$$\dot{y}/y = \beta^*[\ln(y^*) - \ln(y(t))] \tag{1}$$

where:
β^* – convergence speed describing pace of heading towards y^*.

Solution of differential equation (1) is given by:

$$\text{in}(y(t)) = (1 - e^{-\beta t}) \ln(y^*) + e^{-\beta t} \ln (y(0)) \tag{2}$$

where:
$y(0)$ – initial value of per capita product in given region at initial time.

[5] European Commission (2008) notify that this priority is to be understood as reducing gap between GDP per capita in the regions benefiting from EU policy and EU average

Equation (2) can be transformed into pace of production per capita formula:

$$(1/t)[\ln(y(t)) - \ln(y(0))] = (1 - e^{-\beta t})/t] \ln(y^*) - [(1 - e^{-\beta t})/t] \ln(y(0)) \quad (3)$$

Above presented relationship was estimated using regression (4), which created a basis for unconditional β-convergence hypothesis verification.

$$(1/t)[\ln(y(t) - \ln(y(0))] = b_0 + b_1 \ln(y(0)) + \varepsilon_t \quad (4)$$

where:
$y(t)$ – GDP per capita in given region in last year;
$y(0)$ – GDP per capita in given region in initial year;
b_j – estimated parameters (where $j = 0; 1$);
ε_t – error term with normal distribution, fixed variance and null expected value.
Heading towards steady state requires b_1 values to be negative.

One has to notify that thanks to equality $b_1 = -(1 - e^{-\beta t})/t$ empirical value of β coefficient can be found. β describes pace of heading towards steady state in case of set of economies/regions:

$$\beta = -\ln(1 + b_1 t)/t \quad (5)$$

Research on β convergence is commonly followed by verification of σ-convergence hypothesis. In this case one has to find dispersion of GDP per capita. For this purpose most often standard deviation (s) is employed, however it is a measure of absolute dispersion. Other commonly adopted tool is coefficient of variation (Vx), which allows to obtain relative dispersion. In the paper authors resigned of this method in favour of estimation of regional income distribution for EU and then for Poland. Simplifying one can assume that diminishing dispersion of GDP per capita around mean value (or median) will imply σ convergence. More details of this method were presented in the further part of the article

Complying with presented assumptions authors attempted to verify classical β convergence hypothesis for EU-27 economies. Both indicators, these not directly referring to population and those population weighted were employed simultaneously. The main source of quantitative data was European Commission (*Eurostat*) database. GDP per capita values in Euro were in 2000 constant prices.

Regions were separated on the basis of common, legally binding taxonomic benchmark. (NUTS – *Nomenclature d'Unites Territoriales Statistiques*)[6].

[6] See: Regulation (EC) No 1059/2003 of the European Parliament and of the Council of 26 May 2003 on the establishment of a common classification of territorial units for statistics (NUTS). For

NUTS as classically defined statistical classification has hierarchical construction with three levels: NUTS 1, NUTS 2 and NUTS 3[7]. Each tier consists of administrative units of average size with limits for each level. If there are no NUTS compliant units in the country, than existing structure has to be tailored by merging smaller and neighboring units into bigger ones. As a result NUTS units cannot be treated as real administrative departments in spite of the fact that main aim of NUTS developers was to achieve high level of comparability.

Analysis of regional convergence conducted on the basis of NUTS 2 units is followed by per capita dispersion estimations. Lower and upper limits of population for this tier are 800 thousand and 3 million people respectably. In case of Poland such classification is similar to voivodships, but for example for UK it's not compliant with any existing classification of administrative districts[8].

Due to many events and processes observed at the beginning of 90-ties of previous century (transition of majority of 2004 EU entrants, geopolitical changes such as reunification of Germany, independence of former the USSR republics; technical revolution-internet; and integration within EU) and changes in the methodology of national accounts (standard ESA 1995), further analysis covers period 1995–2007. Only in case of Romania data was collected for years 1997–2007. Such attitude allows to omit transition shock which usually deforms results of empirical findings.

Results of Testing Classical β Convergence Hypotheses for EU-27 and Poland: Cross Regional Attitude

Classical β convergence hypothesis was verified in two ways. First attitude assumes that every analyzed region has the same importance so its influence on the whole situation is not different than other regions. In the another method such assumption was repealed and NUTS 2 population criterion was employed. In this case one can consider that importance of each region depends on its population. As a result region with bigger population has stronger influence on estimations and region with small population has weaker.

Poland corresponding document is Rozporządzenie Rady Ministrów z 14 listopada 2007 r. w sprawie wprowadzenia Nomenklatury Jednostek Terytorialnych do Celów Statystycznych (NTS), DzU nr 214, poz. 1572.

[7] More detailed levels called *Local Administrative Units* (LAU) are not subject to regulation no. 1059/2003. For example in Poland LAU 1 are poviats while LAU 2 gminas. Due to this fact Poland is not obliged to transfer to Eurostat LAU complaint data.

[8] List of NUTS 2 is appendix to Regulation no. 1059/2003.

Results of convergence estimation (4) together with diagnostics statistics are presented in Table 1. Additionally estimated relationship is presented on Figure 1. Influence of each region on estimation results is presented by bubble. In the first attitude which assumes each region to have identical importance all "bubbles" have one diameter.

Table 1

Estimated β convergence results for regions in EU-27 and Poland for the period 1995–2007

Country	Convergence hypothesis	b_0	b_1	R^2	$p(F)$	β
EU-27	β non weighted	0.084 (0.013)	–0.006 (0.001)	0.076	0.000	0.65%
	β weighted	0.078 (0.003)	–0.006 (0.000)	0.057	0.000	0.59%
Poland	β non weighted	–0.081 (0.100)	0.018 (0.013)	0.124	0.182	–1.75%
	β weighted	–0.151 (0.020)	0.027 (0.002)	0.231	0.000	–2.63%

Explanations: Standard errors in (parenthesis).
Source: own calculation.

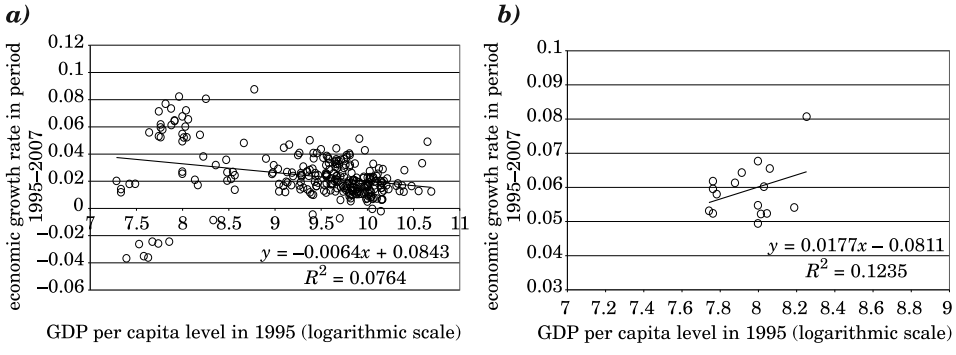

Fig. 1. Non weighted β convergence EU-27 and Polish regions in the period 1995–2007: *a* – EU-27, *b* – Poland

Source: own calculation.

On the basis of conducted analysis one can say that:

– For EU-27 sample one can observe negative slope while in case of Poland slope is positive. This allows to state that EU-27 regions were heading towards steady state at rate 0,65% yearly while in Poland there was divergence -1,75% per year (see-results from table 1).

– b_1 is statistically significant with significance level at 1% for EU-27, while insignificant for Poland;

– R squared for EU-27 and Poland are 7,6% and 12,4% respectably, which implies that differences in the production growth rate are poorly explained by initial GDP per capita level;

– F statistic significance allows to reject hypothesis assuming lack of joint influence of explanatory variables on explained variable only in case of EU-27 regions (with 99% confidence).

In the second attitude towards β convergence assumption of equal weight of each region was lifted In the analysis conducted for UE-27 regions and Poland for the period 1995–2007 importance of each region depended on its population. Estimated results are presented in rows No. 3 and 5 in Table 1 and on Figure 2. Complying with above accepted rule each region is depicted by circle, however in this case their importance is proportional to population.

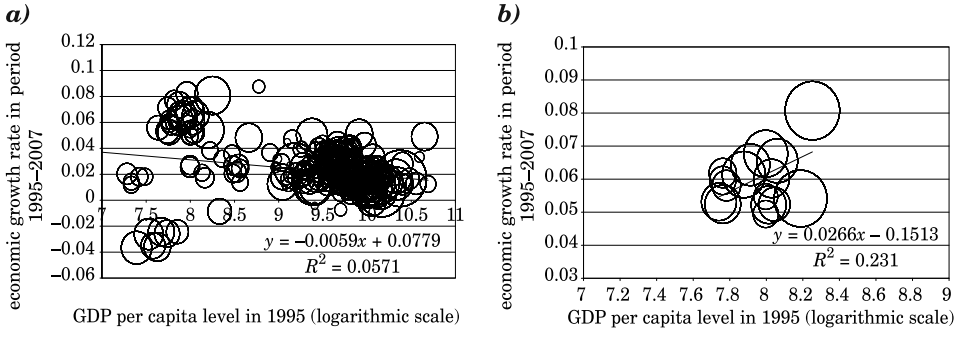

Fig. 2. βconvergence (population weighted) EU-27 and Polish regions in the period 1995–2007: a – EU-27, b – Poland

Source: own calculation.

One the basis of analysis one can state that applying population weighting does not have strong statistical influence on the situation in EU countries while in case of Poland such influence can be found. As a result for Poland divergence with rate of 2.63% can be observed together with statistically significant b_1 coefficient and relatively high R-squared (almost 25%). According to these findings one can state that $^1/_4$ of changes in the growth rate can be explained by initial per capita GDP level. One has also to notify that F statistics level allowed to reject hypothesis assuming lack of joint influence of explanatory variables on explained variable (with over 99% confidence).

Within-Country Regional Income Distribution

Following recently presented remarks, convergence of all types will be used for cross-country analysis, assuming that each country is a separate element of the set. Alternative solution is to analyze within country income distribution, preferably per capita. Due to the assumed analytical targets authors decided to

use also regional cross-section. This allows considering population's size and repeals strict assumption of identity between each citizen income and country average[9]. However one has to notify that such attitude sets equality between citizen's of region income and mean per capita income observed in the analyzed unit.

Authors of the paper attempted to recreate cross regional income distribution for UE – 27 and Poland. Achieving such goal required two prior choices. First was to present criterion of regional division. Second: choice of econometric method for estimation of income distribution.

According to earlier remarks regions were identified on the basis of NUTS classification, and NUTS 2 class was employed. Data about population of each region was gained from Eurostat. Period of analysis was analogous and covered years 1995–2007, but in this case individual years were separated: 1995, 1999, 2003, 2007.

Defining subject of analysis was bit more complicated. As it was said before main task was to depict within country and regional per capita income. Due to the requirement for intertemporal comparison of GDP (always denominated in Euro), 2000 constant prices were used[10]. Having data about real GDP in the country and region one can calculate share of each region (in %) in GDP. Such share was defined as u. Simultaneously data about real GDP per capita in NUTS 2 cross section was obtained, (dividing real GDP in each region by its NUTS-2 population). Next step was combining both information. As a result each observation of per capita GDP in year i was given weight obtained by dividing country's GDP and regional GDP for year i. Such weight was noted u. Finally data series for each country and year i with real GDP *per capita* for NUTS 2 unit, weighted by u was created.

Having so prepared data an attempt to assess continuous (or at least *quasi*-continuous) per capita income distribution was made. Then parametric methods requiring a priori assumed probability distribution of analyzed random variable, (in this case per capita income) were used. This can be for example normal distribution, χ^2 or other known distribution of continuous variable. Then one can asses value of crucial parameters. Disadvantage of such attitude is arbitrary choice of distribution, which can be far from empirical results for sample.

Different attitude is employed by non-parametric. In this case on can build histogram which is the simplest non parametric representation of distribution

[9] Having information about domestic income distribution one can aggregate data to set region or worldwide scale. This allows to compare achieved results with "traditional" convergence estimations. See: Bhalla (2002) or Bourguignon, Morrison (2002).

[10] For this purpose a GDP deflator was used (year 2000 = 100). One has to consider that such attitude doesn't consider regional price differences, but this drawback cannot be eliminated due to a lack of regional GDP deflators.

for population. However using histogram has also drawbacks such as arbitrary size of intervals and inability to obtain algebraic form of histogram as continuous function. As a result probability density function cannot be integrated[11].

Non-parametric methods can be kernel density estimators. This idea assumes finding probability distribution in the neighborhood of every point (value) in the sample and simultaneously finding the best possible algebraic form of distribution for population on the basis of sample distribution which analytical form is not known.

Formal framework of this method can be found in SILVERMAN (1992). Let X be economic random variable with unknown probability distribution f. After some experiments (research) one will obtain data about n- element sample form X. Than finding estimator f is possible (approximation from sample). Denote $K(x)$ as the kernel. The kernel must meet conditios:
– domain and codomain of $K(x)$ is a set of real numbers (R),
– $K(x) \geq 0$ for every $x \in R$,
– $\int_{-\infty}^{\infty} K(x)\, dx = 0$,
– $K(-x) = K(x)$ for every $x \in R$.

Function $f1(x)$ is called kernel density f, when:

$$f_1(x) = \frac{1}{nh} \sum_{i=1}^{n} K(\frac{x - x_i}{h}) \tag{6}$$

Numerator in the brackets (6) identifies neighborhood of point (value) from sample, while h is a smoothing parameter of $f_1(x)$ function graph.

Assessment of "kernels' quality" $K(x)$ usually refers to *Mean Integrated Square Error* – MISE, which represents integral of mean square error for the whole set R. *Mean Square Error* – MSE is expected value of squared error value, which is difference between actual and estimated value. Optimal kernel $K(x)$, considering minimalization of MISE is function proposed by EPANECZNIKOV (1969):

$$K(x) = \begin{cases} \frac{3}{4}(1 - x^2), & |x| < 1 \\ 0, & |x| \geq 1 \end{cases} \tag{7}$$

The above presented function $K(x)$ was widely used in the research, which allowed to obtain continuous probability density function for the sample, without assuming a priori its form.

[11] As a result continuous cumulative distribution function for the population cannot be found.

Chosen (h) parameter influences shape of estimated probability distribution graph. Too high h value results in excessive smoothing of graph, while too low results in to boldly exposed local extremes. Both situations do not comply with real properties of analyzed populations. Due to this fact researcher is usually forced for arbitrary choice of this parameter value. Commonly accepted in the literature (SALA-I-MARTIN 2006, WÓJCIK 2004) method for simplified estimation of h, authors used formula given by:

$$h = 0.9 \frac{s}{\sqrt[5]{n}} \tag{8}$$

Regional Per Capita Income Distribution for EU-27 and Poland

According to above presented procedure, income distribution for samples (defined in compliance with NUTS 2) was used to depict income distribution in the analyzed general population. Estimated probability density functions are presented on Figure 3.

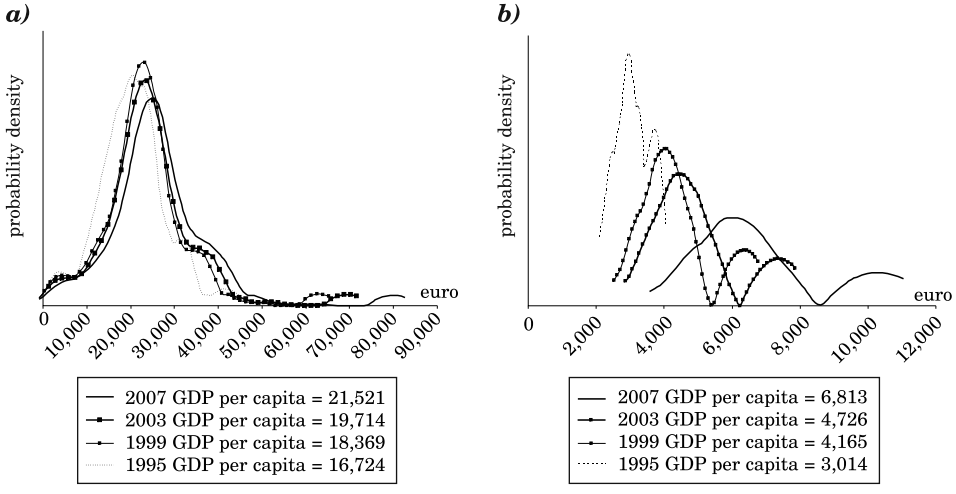

Fig. 3. Regional per capita income distribution for EU-27 and Poland: *a* – EU-27, *b* – Poland
Source: own calculation.

Apart from graphic presentation authors calculated also descriptive indicators showing kurtosis, asymmetry, and dynamic of income changes in population's fractions. Corresponding data is presented in table 2 and 3.

Table 2

Selected properties of regional per capita income distribution

Country	Coefficient of variation				Kurtosis coefficient			
	1995	1999	2003	2007	1995	1999	2003	2007
Poland	14.17	9.69	10.94	10.74	0.28	-0.54	-0.47	-0.67
EU-27	23.59	18.52	18.55	19.14	0.06	0.08	-0.01	0.09

Explanatory note: coefficient of variation (in %): is half of interquartile range divided by median; kurtosis – $(Q_3 + Q_1 - 2\text{Me})/2Q$, where Q_3 – 3rd quartile; Q_1 – 1st quartile; Me – median; Q – interquartile range.
Source: own calculation.

Table 3

Dynamics of chosen deciles of regional per capita income

Country	AI D9 /AI D1				Dynamics AI D1 for year 2007 (AI D1 z 1995 = 100)	Dynamics AI D9 for year 2007 (AI D9 z 1995 = 100)
	1995	1999	2003	2007		
Poland	1.63	1.98	2.02	2.15	216.06	284.33
EU-27	2.28	2.60	3.04	2.76	112.92	136.64

AI D9 – per capita income for 9th decile; AI D1 – per capita income for 1st decile.
Source: own calculation.

On the basis of presented results one can state that economic growth (in this case: increase of real GDP per capita) was followed by increase of mode for every distribution, which can be proved by rightwards movement of extremes. This suggests increase of welfare in the analyzed regions assuming that they are represented by the highest percentage of population.

Probability density functions of European regional GDP per capita have second peak right to the mean. This is even more clearly visible in case of Polish NUTS 2 units. In this case one can state that bimodal distribution are observed. Such situation allows to divide Polish regions into two subsets, one with income clearly below country's average and another, richer. This confirms strong regional divergence in the analyzed economic systems, and implies that assumption about diminishing disparities cannot be verified positively – σ convergence hypothesis should be rejected.

All obtained empirical distributions suggest growing rightwards kurtosis over time. This implies that growth of mean income is followed by rising number of regions which GDP per capita is below country average. As a result one can state that economic growth of particular system is pulled by the few richest NUTS 2 units. This is another condition suggesting rejection of assumption about diminishing regional income disparities.

Volatility of income distribution was also presented as relationship between income per capita observed in the richest and poorest deciles[12] of

[12] For the purpose of presented analysis it was assumed the 1st decile is value of GPD per capita observed in 10% poorest NUTS 2 regions. The 9th decile refers to GDP per capita observed in 10% richest NUTS 2 units respectably.

populations in every analyzed period. Increase of this indicator was observed in all economies, which implies that GDP per capita grew faster in rich regions. This statement can be confirmed by dynamics of real GDP for 1st and 9th deciles of NUTS 2 population. Growth rate for 9th decile was every time higher than similar indicator calculated for 1st decile.

Conclusions

Referring to assumptions of European cohesion policy one can state that achieved results suggest negative trends especially in case of Poland. Regression analysis show that β convergence was not observed in Poland – even adverse trend was found. Poor regions developed slower than the rich ones. This may imply impoverishing large part of society living in the poorer part of Poland. Empirical findings for European regions are not so clear. Negative relationship between initial level of GDP and subsequent growth rate was observed, however with very low goodness – to – fit ratios.

Auxiliary analysis of regional income distribution showed rough income growth. Despite of growing income in the population (both for EU-27 and Poland), one can observe increased disparities between regions. More noticeable bimodality is followed by asymmetry of distribution, which implies growing number of regions with income below mean. Such situation may lead specific "double heterogenity". The income disparities between old and new members will be followed by strong intra-country regional divergence (CAVENAILLIE, DUBOIS 2010)

Above mentioned process questions effectiveness of cohesion policy aimed at smoothing differences in the economic development of regions. This issue becomes more important during crisis that hit Europe. Policy makers will support poor countries less willingly, mainly due to the large public debt. During negotiations on new budget perspective there will be many voices criticizing sense of supporting activities aimed at removing differences in the regional development. It also seems that results presented in the paper are good basis for further analysis aimed at identifying influence of regional convergence on migration within enlarged EU or differences between entrepreneurship in various regions.

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USE OF THE SWOT ANALYSIS FOR EVALUATION OF THE TOURIST POTENTIAL OF OLSZTYN SUB-REGION IN WARMIŃSKO-MAZURSKIE VOIVODSHIP

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K e y w o r d s: tourist potential, evaluation, SWOT analysis, sub-regions.

A b s t r a c t

Evaluation of the tourist potential of Olsztyn sub-region in Warmińsko-Mazurskie voivodship using the SWOT analysis was the aim of the work. The tourist potential was evaluated based on two groups of variables concerning the structural and functional resources conditioning tourist development. The studies showed that the woodiness was the major strength of the Olsztyn sub-region tourist potential. It was followed by investments in environment protection and municipal infrastructure. The major threats to tourist development in Olsztyn sub-region were the decrease in volumes of the German sentimental tourism and increasing demands of tourists concerning quality coupled with insufficient status of tourist facilities.

WYKORZYSTANIE ANALIZY SWOT DO OCENY POTENCJAŁU TURYSTYCZNEGO PODREGIONU OLSZTYŃSKIEGO WOJEWÓDZTWA WARMIŃSKO-MAZURSKIEGO

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S ł o w a k l u c z o w e: potencjał turystyczny, ocena, analiza SWOT, podregiony.

A b s t r a k t

Celem pracy była ocena potencjału turystycznego w podregionie olsztyńskim województwa warmińsko-mazurskiego, z wykorzystaniem analizy SWOT. Potencjał turystyczny oceniano na podstawie dwóch grup zmiennych dotyczących czynników strukturalnych i funkcjonalnych. Badania wykazały, że najważniejszym atutem potencjału turystycznego podregionu olsztyńskiego była największa w województwie warmińsko-mazurskim lesistość. Duże znaczenie dla rozwoju turystyki na tym terenie miały także inwestycje na rzecz ochrony środowiska oraz rozwój infrastruktury komunalnej. Głównymi zagrożeniami dla rozwoju turystyki w podregionie olsztyńskim były spadek wielkości niemieckiej turystyki sentymentalnej, zapotrzebowanie turystów na jakość w połączeniu z niewystarczającym stanem obiektów turystycznych.

Introduction

Warmińsko-Mazurskie voivodship is the area with exceptional natural and landscape values with numerous areas that are subject to legal protection representing over 46% of the total area of that voivodship. Areas of protected landscape represent over 39 percent points out of that, landscape parks almost 6 percent points and natural-landscape complexes over 0.5 percent point. The fact that during the recent years the area under eco-use, from 3.050 ha in 2004 to 20,780 ha now, that is over ten-fold, also deserves attention. More than 18% of the total area of Polish natural sanctuaries is situated in Warmińsko-Mazurskie voivodship. That rich natural values, also in the European scale, caused that following the accession to the European Union structures a relatively large part of the voivodship was covered by Natura 2000 representing 666,751.9 ha that is over 27% of the voivodship area. Warmińsko-Mazurskie voivodship, however, is diversified as concerns the share of the individual nature protection forms, share of different land use types, population density and other demographic indicators. The differences also concern the tourist and recreation facilities as well as accommodation facilities for the potential tourists. According to the Central Statistical Office data, the voivodships and sub-regions of Poland with the highest natural values are often characterised by lower development of tourism while some aspects important for the economy and organisation are related to tourism (NOWAKOWSKA 2004, pp. 11–18). The increasing importance of tourism in some regions causes that conducting appropriate policy becomes necessary for active support to development of tourism where the appropriate potential for its development exists. The development concept at the regional and local level should be based on the results of conducted analyses and evaluations considering the diversity of conditions within the area of the voivodship. Conducting the analyses is possible using the generally available Central Statistical Office data as in addition to the division into the territorial units the Office gathers some data taking into account the division of voivodships into sub-regions. This is of particular importance in case of the voivodships with high values of the natural and cultural environment (e.g. Warmińsko-Mazurskie voivodship) and in which industrial development is not (SZCZEPANOWSKI 2010, pp. 543–553). The SWOT analysis can be used for studies on the tourist potential of the regions. Complemented with systems of points and weights, it can serve not only evaluation of the current status but also defining the strategies of actions to be taken. The SWOT method is classified among comprehensive strategic management methods. It serves identification, evaluation of influence and investigating the strength of correlations of factors in the environment of the investigated unit and the internal factors. It is important that investigation of weaknesses and strengths as well as opportunities and threats resulting from

the environment is done in the combined way allowing investigation of the strength of correlation between the environment factors and the internal factors. Used most frequently for evaluation of the enterprise situation, the method may also be applicable to evaluation of the potential of areas that serves strategic planning, choice of the activities and development. The term potential comes from the Latin word "potential" meaning the ability, might (ZAJADACZ, ŚNIADEK 2009, pp. 35–60).

Methodology of studies

Evaluation of tourist potential of Olsztyn sub-region of Warmińsko-Mazurskie voivodship conducted using the SWOT analysis was the main goal of the studies.

Implementation of the main goal involved the following detailed objectives:

– Identification of elements of the tourist potential occurring in Olsztyn sub-region of Warmińsko-Mazurskie voivodship and evaluation of them from the perspective of positive or negative influence on development of tourism in the given area.

– Determination of factors influencing the tourist potential situated outside the Olsztyn sub-region of Warmińsko-Mazurskie voivodship and establishing, which of them represent opportunities and which the threats to development of tourism in the given area.

The tourist potential evaluation was conducted based on two groups of variables representing structural and functional resources conditioning development of tourism[1]. The structural conditions encompassed four basic elements: tourist values, tourist development, transport access and other elements belonging to none of the earlier indicated groups. The functional conditions included the economic, political, cultural, socioeconomic, psychological and environmental conditions. The study covered the years 2010–2011.

The secondary data originated mainly from the documents generated by the Central Statistical Office, Ministry of Sports and Tourism, Ministry of Agriculture and Rural Development, Statistical Office in Olsztyn, Marshal's Office of Warmińsko-Mazurskie Voivodship, Warmia and Mazury Spatial Planning Bureau and Warmia and Mazury Regional Tourist Organisation. The primary data was obtained through search at the institutions involved indirectly and directly in tourism in Warmińsko-Mazurskie voivodship.

[1] Elaborated based on: *Uwarunkowania i plany rozwoju turystyki*. 2009. Ed. Z. Młynarczyk, A. Zjadacz. Scientific Publishing House of Adam Mickiewicz University in Poznań, after E.P. LEARNED, C.R. CHRISTENSEN K.R., ANDREWS W.D. GUTH, 1965. *Busines Policy*, Texas and Cares, McGraw-Hill, London.

The SWOT analysis method was applied for processing the source data. It was divided into four stages. During stage one, 41 factors of tourist potential influencing the current and future tourist development in Olsztyn sub-region were chosen and divided according to the source of origin (internal and external factors) and the influence (positive and negative factors).

Next, the factors were described using indicators (tab. 1 and tab. 2).

Table 1

Factors of strengths and weaknesses of the tourist potential and indicators describing them

Strengths	
Item	Indicators
1	2
Woodiness	area of forests (km^2) / total area (km^2) × 100%
Share of waters	area under waters (km^2) / total area (km^2) × 100%
Share of legally protected areas	area of legally protected areas (km^2) / total area (km^2) × 100%
Industrialisation level	number of industrial enterprises / total area (100 km^2)
Cleanliness of the environment	wastewaters treated biologically, chemically and with increased removal of biogens in relation to the total wastewaters requiring treatment
Municipal infrastructure	population using water supply and sewer systems / total population × 100%
Population density	total population / total area (km^2)
Activity of territorial government units in development of strategic documents	number of strategic documents / number of counties × 100%
Investments for environment protection	outlays on fixed assets serving environment protection and water management (PLN) / total population
Development of overnight accommodation facilities	number of collective accommodation facilities in 2010 – number of collective accommodation facilities in 2005 / number of collective accommodation facilities in 2005
Road infrastructure	length of roads (km) / total area (km^2)
Weaknesses	
Support of tourism development from budgets of territorial government units	expenditures on tourism (PLN) / total expenditures (PLN) × 100%
Size of accompanying facilities	number of sport facilities / total area (100 km^2)
System of cycling paths	length of cycling paths (km) / total area (100 km^2)
Land development	area covered by the effective and currently prepared local physical development plans (km^2) / total area (km^2) × 100%
Status of roads	length of improved surface roads (km) / total length of roads (km) × 100%
Conditions for out of season tourism development	number of whole year collective accommodation facilities / total number of collective accommodation facilities × 100%

cont. table 1

1	2
Status of overnight accommodation facilities	number of 1, 2 and 3 star hotels / total number of hotels × 100%
Tourist season length	number tourists staying overnight during the months from June until September / number of tourists staying overnight during the whole year × 100%
Internal demand caused by low incomes of the population	average gross month wage as compared to the national average (%)
Status of gastronomy facilities	number of business entities registered with the REGON register operating restaurants and other gastronomy facilities / total area (100 km^2)
Concentration of population in three main urban centres	population in one of the three main urban centres / total urban population × 100%
Status of the tourism organisation sector	number of business entities registered with the REGON register operating as organisers of tourism as well as tourist intermediaries and agents / total area (100 km^2)
Activity in organisation of tourist and sports-recreation events	number of tourist and sports-recreation events / 365 days

Source: own work based on the subject literature and territorial government units' documentation.

Table 2

Factors of opportunities and threats to the tourist potential and indicators describing them

Strengths	
Item	Indicators
1	2
Funds transferred by the European Union	European Union funds for financing EU programmes and projects (PLN) / total population
Entrepreneurship of residents	number of businesses newly registered with the REGON register / total population (10,000 persons)
Demand for domestic tourist services	number of tourists staying overnight per 1,000 residents in 2010 – number of tourists staying overnight per 1,000 residents in 2005
Access to the Baltic Sea	distance from the Baltic Sea (km)
Interest of tourists in new forms of recreation (agro-tourism)	number of agro-tourism farms / total area (100 km^2)
Border location	number of foreigners entering Poland / 365 days
Level of safety and public order	offenders detection index (%)
Level of education of the population	number of graduates from tertiary schools in 2010 – number of graduates from tertiary schools in 2005 / number of graduates from tertiary schools in 2005 × 100%
Demand for eco-tourism	number of eco-farms in 2010 – number of eco-farms in 2005 / number of eco-farms in 2005 × 100%

cont. table 2

Threats	
Share of population in post--productive age group	population in post-productive age group / population in the productive age group (100 people)
Unemployment level	registered unemployment rate (%)
Volume of German sentimental tourism	number of German tourists staying overnight in 2010 – number of German tourists staying overnight in 2005 / number of German tourists staying overnight in 2005 × 100%
Quality requirements of tourists concerning accommodation facilities	number of 5 star hotels / total number of hotels × 100%
External migrations of population to other voivodships and abroad	external migrations balance per 1,000 residents
Peripheral location in relation to the national centres of activity	distance of the main centre to Warsaw (km)
Air transport	passenger traffic in airports (number of persons departing) / 365 days
Transport access	number of express and national roads assuring links with the other voivodships and Europe

Source: own work based on the subject literature and territorial government units' documentation.

Next, the valuation of individual factors within each of the four categories was conducted. Each factor was allocated the point weight within the 1–3 points scale. Allocation of different weights allowed increasing the probability of correctness of the assumptions made and bringing the results closer to the actual conditions.

The weights were determined based on the subject literature concerning development of tourism in Warmińsko-Mazurskie voivodship as well as the analysis of documents developed by units of territorial government such as the regional strategies, local development plan, reports, studies as well as strategic and programme documents.

During stage three, each factor was evaluated by attributing to it the point score according to the 1–3 scale. Factors with positive influence, i.e. strengths and opportunities were allocated positive scores. Factors with negative influence, i.e. weaknesses and threats were allocated negative scores.

For factors belonging to strengths and weaknesses, the score was determined based on the comparison of the indicator for a given factor determined for the sub-region with the value of that indicator for the voivodship. The factor with the indicator value higher than the indicator value for the voivodship scored 3 points; when it was equal to that value – 2 points and when it was lower – 1 point.

A similar procedure was applied in case of factors belonging to opportunities and threats. The score was determined by comparing the value of the

indicator for a given factor determined for the sub-region studied with the value of that indicator for Poland. The factor with the indicator value higher than the value determined for Poland was allocated 3 points; when the value was equal to that for Poland – 2 points, and in case of a lower value – 1 point.

A different method for scoring was applied in case of three factors belonging to the categories of opportunities and threats. For the factors of access to the Baltic Sea and transport access, the highest value of the indicator scored 3 points, the intermediate – 2 points and the lowest – 1 point. The situation was the opposite in case of the peripheral location in relation to the national centres of activity. In this case the factor with the lowest indicator value scored 3 points, the intermediate value scored 2 points and the lowest – 1 point.

During the last stage the aggregated score for each of the four categories of factors was generated using the formula (ZAJADACZ, ŚNIADEK 2009):

$$O_j = \frac{\Sigma\,(R_{ij} \cdot P_{ij})}{\Sigma R_{ij}}$$

where:
O_j – is the aggregated score of category j,
R_{ij} – is the rank (weight) allocated to component i of category j,
P_{ij} – is the point score of component i of category j.

Evaluation results were presented in the descriptive format. Thanks to evaluation of point S positioning development strategy determination was possible. The point S coordinates were determined by balancing the sums of scores for weaknesses and strengths as well as opportunities and threats (*Analiza...* 1997, ZAJADACZ, ŚNIADEK 2009).

SWOT analysis of Olsztyn sub-region of Warmińsko-Mazurskie voivodship

Warmińsko-Mazurskie voivodship was divided into three sub-regions: Elbląg, Olsztyn and Ełk. Olsztyn sub-region is the largest as concerns both the area and the population. It is characterised by the largest area of forests and protected landscape areas among the sub-regions of the voivodship but the smallest area of waters, landscape parks and natural reserves. Olsztyn sub-region possesses the best-developed road and tourist infrastructure, which is probably related to the presence of the largest town, the capital of the voivodship – Olsztyn in it. The largest number of tourists, including also tourists from Germany, visits that sub-region. Using the SWOT analysis with

allocation of scores and weights the weighted scores were computed for individual factors. This allowed evaluation of the tourist potential status in the studied sub-region. It also offered the possibility of comparing it with the other sub-regions and proposing the development concept in the future.

While evaluating the tourist potential of Olsztyn sub-region, its strengths were defined first (tab. 3). The weighted score of the strengths was 1.76. Among all the factors, woodiness of the sub-region scored the highest at 0.36. Also, investments for environment protection and municipal infrastructure scored high at 0.24. The level of industrialisation scored 0.16. The further five factors i.e. share of waters, share of legally protected areas, activity of territorial government units in development of strategic documents, development of overnight accommodation facilities as well as road infrastructure scored 0.12 each. Cleanliness of the environment and population density scored the lowest at 0.08.

Table 3

Strengths of Olsztyn sub-region

Item	Points scored (P_{ij})	Factor weight (R_{ij})	Weighted score $R_{ij} \cdot P_{ij}/\Sigma R_{ij}$
Woodiness	3	3	0.36
Share of waters	1	3	0.12
Share of legally protected areas	1	3	0.12
Industrialisation level	2	2	0.16
Cleanliness of the environment	1	2	0.08
Municipal infrastructure	3	2	0.24
Population density	2	1	0.08
Activity of territorial government units in development of strategic documents	3	1	0.12
Investments for environment protection	3	2	0.24
Development of overnight accommodation facilities	1	3	0.12
Road infrastructure	1	3	0.12
Result		Σ 25	1.76

Source: own work based on the studies.

Evaluation of the weaknesses in Olsztyn sub-region tourist potential was another issue investigated (tab. 4). The weaknesses obtained the weighted score of –1.80. The factors concerning the support of tourism development from budgets of territorial government units and the status of roads scored the lowest (–0.30). Low scores of –0.20 were attributed to tourist development and

the number of tourist and sports-recreational events. The largest number of factors, i.e. the system of accompanying facilities, system of cycling paths, conditions for out of season tourism development, status of overnight accommodation facilities, tourist season length, status of gastronomy facilities and concentration of population in three main urban centres scored –0.10 each. The status of the tourism organisation sector (–0.07) and internal demand caused by low incomes of the population (–0.03) scored the lowest meaning that they had the smallest negative influence on tourist development of Olsztyn sub-region.

Table 4

Weaknesses of Olsztyn sub-region

Item	Points scored (P_{ij})	Factor weight (R_{ij})	Weighted score $R_{ij} \cdot P_{ij}/\Sigma R_{ij}$
Support of tourism development from budgets of territorial government units	–3	3	–0.30
Size of accompanying facilities	–1	3	–0.10
System of cycling paths	–3	1	–0.10
Land development	–3	2	–0.20
Status of roads	–3	3	–0.30
Conditions for out of season tourism development	–1	3	–0.10
Status of overnight accommodation facilities	–1	3	–0.10
Tourist season length	–1	3	–0.10
Internal demand caused by low incomes of the population	–1	1	–0.03
Status of gastronomy facilities	–1	3	–0.10
Concentration of population in three main urban centres	–3	1	–0.10
Status of the tourism organisation sector	–1	2	–0.07
Activity in organisation of tourist and sports--recreation events	–3	2	–0.20
Result		Σ 30	–1.80

Source: own work based on the studies.

Next, evaluation of the tourist potential opportunities was conducted (tab. 5). The weighted score of the factors was 1.75. Interest of tourists in new forms of recreation and demand for eco-tourism with the score of 0.45 each were considered the major opportunities for tourist development on Olsztyn sub-region. Access to the Baltic Sea (0.20) as well as demand for domestic tourist services and border location (0.15) scored significantly lower. Factors such as the funds transferred by the European Union, entrepreneurship

of residents, and level of education of the population scored 0.10 each. The level of safety and public order scored the lowest at 0.05.

Table 5

Opportunities of Olsztyn sub-region

Item	Points scored (P_{ij})	Factor weight (R_{ij})	Weighted score $R_{ij} \cdot P_{ij}/\Sigma R_{ij}$
Funds transferred by the European Union	1	2	0.10
Entrepreneurship of residents	1	2	0.10
Demand for domestic tourist services	1	3	0.15
Access to the Baltic Sea	2	2	0.20
Interest of tourists in new forms of recreation (agro-tourism)	3	3	0.45
Border location	1	3	0.15
Level of safety and public order	1	1	0.05
Level of education of the population	2	1	0.10
Demand for eco-tourism	3	3	0.45
Result		Σ 20	1.75

Source: own work based on the studies.

Evaluation of threats to the tourist potential of Olsztyn sub-region was conducted next (tab. 6). The weighted score was –2.34. The lowest scores (–0.50 each) were attributed to the volume of German sentimental tourism, quality requirements of tourists concerning accommodation facilities and air transport. The factor of external migrations of population to other voivodships and abroad scored –0.33. The other factors generated higher scores. The unemployment level and transport access scored –0.17 each while peripheral location in relation to the national centres of activity scored just –0.11. The share of population in post-productive age group with the score of –0.06 was considered the smallest threat to the tourist potential of Olsztyn sub-region.

The SWOT analysis performed for Olsztyn sub-region allowed concluding that the weaknesses of tourist potential that obtained the weighted score of -1.80 exceeded slightly the strengths that scored 1.76. The opportunities in the environment of the studied sub-region scored similar to the strengths of the tourist potential, i.e. 1.75. The highest weighted score, –2.34 was generated by the threats. The set of the external factors indicated clearly the significant domination of threats to the tourist potential that could have negative influence on development of tourism in Olsztyn sub-region.

Based on the results of the aggregated evaluation (fig. 1.) it should be highlighted that although to a minimum extent but still weaknesses dominate over the strengths (–0.04), and threats over opportunities (–0.59).

Table 6

Threats for Olsztyn sub-region

Item	Points scored (P_{ij})	Factor weight (R_{ij})	Weighted score $R_{ij} \cdot P_{ij}/\Sigma R_{ij}$
Share of population in post-productive age group	–1	1	–0.06
Unemployment level	–3	1	–0.17
Volume of German sentimental tourism	–3	3	–0.50
Quality requirements of tourists concerning accommodation facilities	–3	3	–0.50
External migrations of population to other voivodships and abroad	–3	2	–0.33
Peripheral location in relation to the national centres of activity	–1	2	–0.11
Air transport	–3	3	–0.50
Transport access	–1	3	–0.17
Result		Σ 18	–2.34

Source: own work based on the studies.

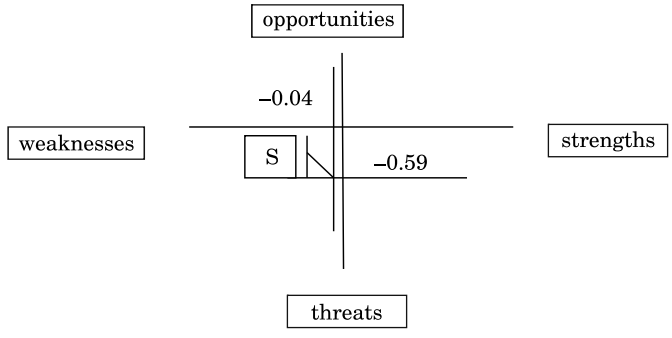

Fig. 1 Aggregated evaluation

Source: own work based on studies.

Positioning of point *S* in the MINI-MINI position causes that in practice that area could develop more intensively towards tourist use only in case of implementing urgent activities aiming at liquidation of weaknesses. The domination of weaknesses over strengths is small so it offers chances for sub-region development in that direction. Support of tourism development from budgets of territorial government units and the status of roads are the major weaknesses. The more difficult and larger differences exist between opportunities and threats. The decreasing volume of German sentimental tourism and quality requirements of tourists concerning tourist infrastructure are the major problems.

Conclusion

Analysis of the presented studies allows concluding that the highest woodiness in the entire Warmińsko-Mazurskie voivodship at almost 34% represents the major strength of the tourist potential in Olsztyn sub-region. Investments for environment protection and municipal infrastructure development were also highly important for development of tourism in that area. Investment outlays in fixed assets serving environment protection and water management amounted to PLN 266,380,300 a year. In the sub-region studied, over 78% of the residents had access to water supply installations and sewers. Environment cleanliness improvement and strengthening the image of Olsztyn sub-region as environmentally valuable among the potential tourists was the intended outcome of those activities.

The largest number of weaknesses in Olsztyn sub-region resulted from bad tourist development. Poor status of the roads was the major problem. Within the area covered by the studies, roads with improved surface represented only 30% of the total length of roads. Poor development of the sub-region area had negative influence on tourism-related investments. Only 11% of the studied area was covered by effective or currently drafted local physical development plans. In many cases, that situation contributed to resignation by the investors from the planned undertakings in the field of tourist development. That situation was also amplified by insufficient support to tourism from budgets of the territorial government units. The expenditures on tourism in Olsztyn sub-region represented only 0.2% of the total expenditures of territorial governments.

It should be noticed that increased interest of tourists in new forms of recreation that include agro-tourism and eco-tourism represented the major opportunity for development of tourism in Olsztyn sub-region. The sub-region studied had 409 agro-tourism farms and 1,212 eco-farms. That number increased year by year. During the years 2005 to 2010, the number of eco-farms increased from 203 to 1,212, i.e. by 497%. The authorities could also use the opportunities for tourist development resulting from the border location of Olsztyn sub-region and small distance of some counties to the Vistula River Lagoon.

Analysis of the presented data allows noticing that the decrease in the volume of German sentimental tourism represented a large threat for tourist development of Olsztyn sub-region. Visitors from Germany had a large share among the foreign visitors in the sub-region where it was almost 57%. During the years 2005–2010, the number of German tourists staying overnight decreased from 116,485 to 53,012, i.e. by over 54%. The increased quality demands of tourists as concerns the overnight accommodation facilities repre-

sent a factor that is also classified a significant threat to tourist development of Olsztyn sub-region. The sub-region had only three five-star hotels. Unavailability of air transport represents a significant threat not only for the studied sub-region but also for the entire Warmińsko-Mazurskie voivodship. In Olsztyn sub-region, three airfields are located: in Olsztyn, Szymany and Kętrzyn. Those airfields do not have appropriate surfacing and equipment allowing landing of aircrafts under difficult weather conditions. This caused their unavailability for servicing domestic and international air traffic. Also migrations of population to other voivodships and abroad represented a threat to tourist development of Olsztyn sub-region.

The aggregated evaluation indicates the *S* point positioning in the MINI-MINI position meaning that care should be taken to improve on the weaknesses of the sub-region, which can be influenced. The domination of weaknesses over strengths is small, just –0.04. This may indicate that chances for improvement of the internal conditions exist. The domination of threats over opportunities is much larger at –0.59 and influencing the external environment is not always possible.

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IMPLEMENTATION OF THE STATE RESEARCH AND TECHNOLOGY POLICY AS A BASIS FOR MANAGEMENT OF THE SCIENTIFIC PROCESSES IN THE REGION

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K e y w o r d s: science, science and technology policy, economic mechanism, regional level.

A b s t r a c t

At present, one of the most important lines of state policy is regulation of development of scientific, research and innovative sphere, which is to a large extent reasoned by significant influence of scientific processes on modernization of the present economy.

In this connection, issues of effective management of scientific activity both at the federal and at the regional levels become the most important ones. Inter alia, we speak of creation of system for stimulation of interaction of economic entities and scientific organizations with the purpose of development, testing and implementation of advanced Russian technologies into production processes. Individual regions in the framework of their powers frequently use their own stimulation mechanisms, and as a result of implementation thereof, significant differentiation of innovative activity level of Russian enterprises in various subjects of the Russian Federation takes place.

Peculiarities of state scientific and engineering policy, preconditions and lines of improvement of state regulation of development of scientific activity in Russia are considered in the article.

The author paid special attention to development of recommendations on improvement of this mechanism at the regional level under the current conditions.

REALIZACJA BADAŃ PAŃSTWOWYCH I POLITYKI TECHNOLOGICZNEJ JAKO PODSTAWA DO ZARZĄDZANIA PROCESAMI NAUKOWYMI W REGIONIE

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Abstrakt

Jednym z najważniejszych kierunków polityki państwowej jest obecnie regulacja rozwoju nauki, badań i sfery innowacyjnej, która w znacznym stopniu jest uzasadniona dużym wpływem procesów naukowych na modernizację gospodarki. W związku z tym najważniejsze stają się zagadnienia związane z efektywnym zarządzaniem działalnością naukową na poziomie federalnym i regionalnym. Między innymi mówi się o stworzeniu systemu pobudzania współpracy między podmiotami gospodarczymi a organizacjami naukowymi w celu rozwoju, testowania i wdrażania zaawansowanych rosyjskich technologii do procesów produkcyjnych. Poszczególne regiony w ramach swoich kompetencji często stosują własne mechanizmy stymulowania, co powoduje znaczne zróżnicowanie poziomu aktywności innowacyjnej rosyjskich przedsiębiorstw w różnych podmiotach Federacji Rosyjskiej.

W artykule rozpatrzono specyfikę naukową państwa i politykę technologiczną, uwarunkowania oraz kierunki regulacji stanu rozwoju działalności naukowej w Rosji. Szczególną uwagę zwrócono na opracowanie zaleceń ulepszenia danego mechanizmu na poziomie regionalnym w obecnych warunkach.

About the features of the state science and technology policy

Over the past decade was developed a number of concepts on the basis of which the national government build scientific policy. In the works of many contemporary scientists the development of policy, starting from the first stage – task assignment, and to the final – implementation of the measures, represents a conceptual process that requires significant resource costs (GAUDIN 2010).

From an economic point of view the essence of the state research and technology policy consists, above all, in the improvement of forms and methods of management, functions of the state at the level of regulatory mechanisms that enhance the modernization processes through availability of synergetic effect from research and innovation activity at all levels of management.

Conditions improve of the state science and technology policy in Russia

If we consider the changes that have occurred in the Russian science and technology policy in 1990s, it should be noted the following. The economic transformation of those years have required a clear state definition of national priorities in terms of their balance, including in the long run. In relation to science this balance was constantly violated in favor of tactical targets related to the problems of "survival" of scientific organizations. Goals and objectives of research and technology policy were inconsistent with the funds, available at the state level for their implementation. There was no proper coordination of the industrial, financial, credit, tax and science policy.

At the same time, in this period have been accepted and partially implemented solutions such as denationalization and commercialization of individual segments in the field of research and development, accreditation of public research organizations, strategies for the protection of intellectual property and its introduction into the economic turnover. In whole, however, the socio-economic and political changes in Russia, have significantly changed the image of Russian science.

At the beginning of market reforms, science to a lesser extent than other fields, was ready to changes of functioning and management mechanisms. However, the task of restructuring the national science complex already in this period required the development of a new concept of scientific and technological development of the country. In reality, only few fragments of this concept have been identified, and the main task of scientific institutions consisted in looking for a new ways of self-organization.

In addition, almost continuous throughout the 1990s. the process of reorganization of the system of public administration, restructuring of departments, change of the system of delineation of powers between public authorities have led to the absence of proper succession of their activity.

Relatively rapid economic transformation of the 2000s contributed to the rapid development of specific scientific processes. In recent years, was updated the task of strengthening the role of such sources of financing of research and technology and innovation process, as commercial banks, insurance organizations, governmental organizations, non-budgetary funds, foreign sources.

During two recent decades, much interest of economists is raised by additional type of tax exemptions – so called tax credit. It allows industrial companies of some countries to reduce their already charged profit tax by the amount equal to certain percentage from the expenses incurred for R&D. In some countries (Canada, the Netherlands) such tax exemption in increased in proportion to the amount of expenses incurred for R&D, and in others (the USA, Japan, France) – in proportion to increase of R&D expenses as compared with statutory time limit. Certain countries (Italy, Australia) nowadays use both approaches in practice (TODOSIYCHUK 2010).

Also was raised the issue of improving the model of the state tax system in the direction of stimulating of investment and innovation activity. However at the present time the main source of funding for Russian science remains the federal budget (tab. 1) (TODOSIYCHUK 2010).

Research activity of regional significance is often financed using the funds of budgets of the Russian Federation entities and on rare occasions – using the funds of local budgets. However, in many regions, the amount of this funding is negligible.

Table 1

Provisions for civil science from the federal budget

Provisions	2004	2005	2006	2007	2008	2009	2010	2011
For civil science in current prices, mlrd. rubles	48.7	58.2	76.5	107.3	130.8	166.2	172.9	227.8
In percentage of the gross domestic product	0.29	0.27	0.28	0.33	0.30	0.32	0.40	0.41
In percentage of the federal budget expenses	1.81	1.66	1.79	1.79	1.74	1.84	1.85	2.13

Source: calculated by the author based on the data of Rosstat.

About regional science-technology and innovation programs

However, in recent years in the majority of the Russian Federation entities were developed research and technology and innovative programs in which are designated the targets and priorities of development of research activities in a particular region, the ways and means of achieving them (*Information-analytical bulletin* 2011).

However, the results of the study showed that not all of these conceptual or policy papers provide a qualitative analysis of the state of research and technology complex of the region, the reasonable determination of the territory specificity and issues, and most importantly, the plans for the development and implementation of effective tools for achieving desired goals.

Indeed, the goals of regional program should be based not only on the availability of resources and opportunities, but on the contrary, it is advisable to form a resource program based on established goals. At the same time there is a need in correlation of regional objectives with the overall concept of research and technology development of the country in the light of specific features of the region, its reproduction, industrial and technological structures (*Information-analytical bulletin* 2011).

In this process should be used, as smoothly as possible, opportunities of federal and research programs aimed at provision of start assistance in technological transformation of the region.

Against a background of reduction of rights of the Russian Federation entities in the field of research and technology and innovative activity management, the cooperation with federal center creates some opportunities for the development of science in the region.

The legal basis of such interaction relate to the formation of economic mechanism of implementation of research and innovative policy, including the provision of subsidies and grants for regional projects out of the federal budget.

However, the analysis of the Russian regulatory and legal framework in the field of research and tecnological activity shows that with the adoption of the Federal Law of August 22, 2004 No 122-FZ was significantly reduced the role of administrations of the Russian Federation entities in the formation of a national innovation policy.

Changes made by the said Federal Law to the Federal Law of August 28, 1996 No 127-FZ "On Science and State research and technological policy" deprived the Russian Federation entities of right to joint with the federal center powers in the field of formation and implementation of state research and technology policy.

Since 2005, restrictions were partially lifted from the regional authorities. So, now the Russian Federation entities shall have the right to adopt legal acts in the field of scientific and technological activities, create the stat scientific organizations, to adopt and implement the scientific, technological and innovative programs and projects of the Russian Federation entities.

Now the Russian Federation entities shall have the right to adopt legal acts in the field of research and research and technology activities, to create state scientific organizations, to adopt and implement the scientific, research and technology and innovative programs and projects of the Russian Federation entities.

Currently, federal authorities may cooperate with the Russian Federation entities in the following areas:

– participate in co-financing of regional requests for the implementation of innovative projects;

– support the development projects of innovative infrastructure;

– to provide the transference of effective mechanisms of innovations support to the regional level;

– participate in co-financing of regional projects of public-private partnerships in the area of innovation.

For example, in 2010, the major target-oriented programs, in the implementation of which regional scientific organizations took part, are the following: FTP "Research and elaboration on priority development directions of scientific-technological complex of Russia for 2007–2013", FTP "National Technological Base" for 2007–2011. FTP "Development of nanotech industry infrastructure in the Russian Federation" for 2008–2010 (*Information-analytical bulletin* 2011).

Experts believe that in Russia there is no clear consistent mechanism for coordinating activities of federal, regional and local authorities in the process of development and implementation of state regional research policy.

About mechanism of effective implementation of the state science and technology policy in regions

In general, the basic components of the mechanism of effective implementation of the state research and technology policy in the region are the following: Elaborated legislative framework, budget and financial forecasting regulation, programming and development of scientific areas, including various forms of territorial organization of the scientific area, stimulation of the creation and development of scientific and innovative enterprises, inter-regional, cross-border and international cooperation in the scientific area, etc.

The basis of this mechanism involves the provision of conditions, conducive to the stimulation of rational use of available scientific and innovative potential and its development.

As shown, one of the prerequisites for the effective functioning of the regional research and technological system is the presence of a major center for the management of various research and innovation programs, developing a set of measures to strengthen interaction between the key participants of research and innovation process in the region, including providing consulting services for small and medium-sized enterprises (*Information-analytical bulletin* 2011).

In many Russian regions exists the belief that support of innovation business should be ensured through the establishment of regional networks of business incubators. In particular, the creation of a network of business incubators with the involvement funds of regional and local budgets is provided by the programs support to small entrepreneurship in the Nizhny Novgorod Oblast, Kaluga Oblast, Kirov Oblast, Astrakhan Oblast, Saratov Oblast and Krasnoyarsk Krai.

Very often business incubators seek technological parks, growing small innovative firms for them. Technical parks, recently being created consist of business incubators in the project stage. The examples are the industrial parks in the area of high technologies, being created in Moscow Oblast, Novosibirsk Oblast, Nizhny Novgorod Oblast, Kaluga Oblastand Tyumen Oblast. Business incubators are provided in the projects of Russian technology development special economic zones.

In many regions common practice is the creation of business incubators before universities. This is explained by the fact that before universities it was a high potential of ideas and scientific developments for the implementation of which the organizational and financial support is required.

The emphasis in many regional research and technology programs is made on multipolar territory development by supporting of well-established areas, as

well as the formation of new areas of advanced development. Striving for the development of the innovation sector, supported by an appropriate legislative framework, is most characteristic to the two types of regions: with high scientific and innovation potential and the regions in which there is a decline in the rates of development of traditional industries, but exists the potential in highly specialized divisions of knowledge and production.

In particular, the central macro-region is the leader in developing innovations at the expense of the city of Moscow – a major scientific and industrial metropolis. In addition, in the Moscow Oblast are located two technology development areas – Dubna and Zelenograd. As an example, which reflects the formation of advanced development area, we note Povolzhskiy macroregion, combining different in levels of innovation activity subjects. The base for this macroregion are the Samara Oblast, Nizhny Novgorod Oblast and the Republic of Tatarstan. These areas have a significant level of industrial development and high innovative activity.

Their industrial development is associated with the introduction of new technologies and the production of competitive products, the improvement of management and attracting foreign investors.

Thus, the success or failure of the regional science policy in the modern sense is determined not only by the amount of the resources allocated to science and technology, not only by the art of organization of the process of introduction and use of the achievements if the scientific and technical manufacturing process, but by a much wider range of social and economic factors determining the intensity and effectiveness of the research and innovation activity in the society, and experiencing, by back substitution, its growing influence.

Science management at the regional level is the process of formation and implementation of the certain science policy aimed at turning the science into a first-hand productive power for social and economic development of the territory economy with a more complete and broad list of scientific disciplines.

The implementation of this essential and long-term task includes the solution of three mutually complementary main problems of science management (Fig. 1):

– formation of the system of objectives for the research and development activity and for design-and-engineering, the strategic orientation of the regional state policy towards science;

– ensuring the growth of the scientific potential of the region, the number, structure and quality of which would correspond to the needs of the society, as reflected in the system of tactical and strategic objectives of the science development;

– elaboration and realization of set of measures for improvement of the regional science efficiency both, in the application of the existing research potential and, in particular, in acceleration, intensive growth and complete use of the scientific results.

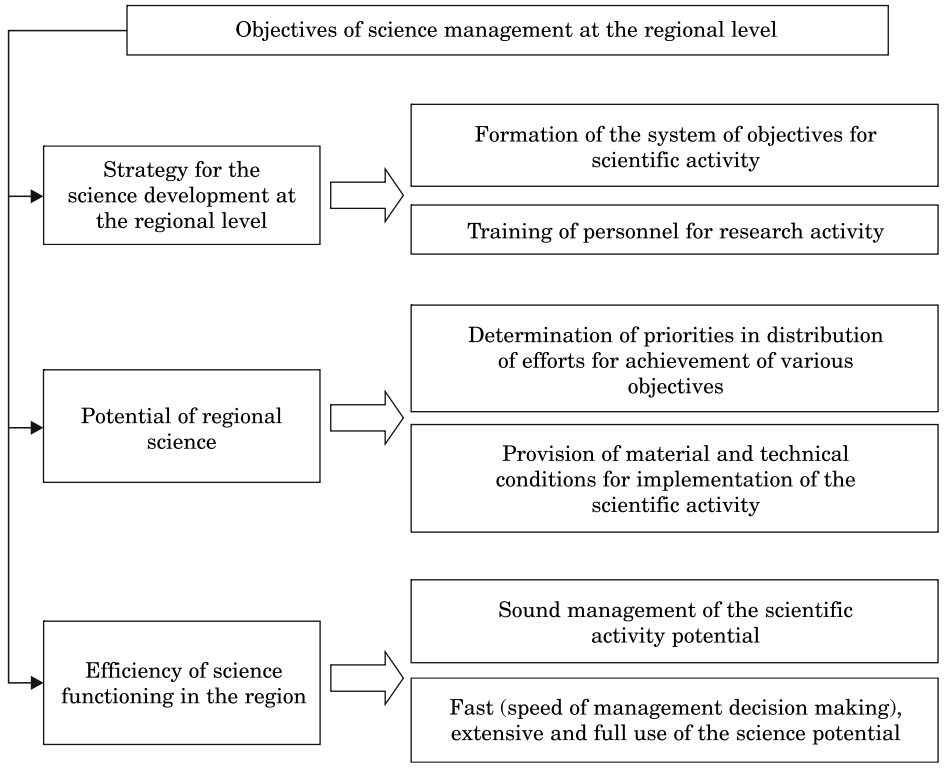

Fig. 1. Structure and content of tasks for science management at the regional level

Each of the mentioned key tasks of the regional research activity management is actually part of the system of objectives of the region and country science policy.

With all the variety of controlling actions available at any level of the research activity management, they can be grouped into four main classes:

– organizational and administrative measures varying within the current legislation, distribution of official rights and duties, etc.;

– economic forms and controls, the diversity and range of which is determined by economic relations and the level of economic development of the country;

– media and management tools, the use of which also results in the direct effect on the technology and technique of scientific production;

– social and psychological control profiles, which vary according to the specific nature of the creative intellectual work in the science.

The set of goals of the state regional science policy can be achieved through the use of a complex of means and measures directing and stimulating the science progress. Understanding and consideration of this important fact, generated by the system properties and the specific nature of the science as the object of control, helps to avoid a number of mistakes in the practice of science policy implementation.

It should also be noted that under the influence of specific circumstances it often becomes necessary to separately consider certain aspects of the object control. This even more strongly determines the necessity to conduct a comprehensive diagnosis of the regional science policy as a whole.

Priorities in the implementation of the state science and technology policy

Projecting the experience in science management into three groups of management objectives: "Strategy", "Potential" and "Efficiency", it is possible to make the following general observations.

Experience in solving the tasks of technical support of the science, as well as many other management tasks, has shown that for the success of each such event, the science needs the long-term strategic directives for science policy in this or that area.

Of course, technical support of science is one of the most important measures generating scientific potential. Due to the active search for modern ways of transition from extensive to intensive methods of solving the problems of science development, optimization of structural relations in the potential of scientific activity is of special importance.

Scientific and technical progress is mainly provided through experienced personnel, high level of material and technical equipment, appropriate level of the organizational potential, promoting the flow, generation and implementation of the most promising ideas.

Improvement of the scientific potential components and rationalization of the ratio in the pace and level of their formation is the promising reserve for optimization of the plans and programs for the development of the national science.

At the modern stage of the science development of great importance is maintaining aspect ratio in provision with potential of all the stages of the

"technological process" of the research activity from the fundamental search to their development and practical application.

Observance of the so-called principle of "cycle completion": provision of concentration of fairly significant capacities of the Russian science in works for realization of the backlog of ideas and science possibilities, now should be under focused attention. This forms another extremely important and promising resource for improvement of the national science efficiency.

Modern science studies any phenomenon in nature and society in a comprehensive manner. In the study of all main issues of science, it is necessary to strive for unification of scientists from various branches of science, with different approaches to the object of research, using different methods of study, different techniques, different conceptual apparatus, etc.

Forecasts form the first stage of the whole work on science management. First of all are prepared forecasts for individual, the most important branches of science and technology. They are the elements of complete forecasts of the entire national economy. Scientific and technical forecasts are always corrected with the new data and new factors.

The forecast subject in science forms its following parts and functions:

– terms of reference (approximate estimation of the time period for settlement of the identified problems and determination of the spectrum of new problems). Here are included the issues of the science structure and interrelation between its various sections;

– social role of science is, above all, the place of science in the system of the society, science and technology, science and culture, that is, science and other social activities;

– problem of scale growth of the science sphere. This problem is considered from the standpoint of the development of the specific system of program activities and choice of the relevant policy providing the development of science and prevention of negative consequences of "spontaneity".

The important part of the state activity on science development is the nationwide system of scientific and technical information. The main objective of all parts of this system is to systematize the materials characterizing the development of the science or its individual branches. This work is intended to bring attention of scientists and engineers, as well as representatives of organizations, managing the scientific policy, to the new areas of science and especially prospective studies.

Transformation of science into the first-hand productive power does not exhaust the entire significance of science. In the present socio-economic conditions, it appears to be the crucial factor for not only economic, but also political, social and spiritual life, the factor of human culture.

Conclusion

Summarizing, we can say that the essence of the strategy of research and technology and innovative activity management in regions is reflected, above all, in the contents of regulatory legal documents, developed and adopted at the level of the Russian Federation entities. These documents are now available in most Russian regions.

Thus, the existing economic mechanism of realization of the state research and technology policy in practice, may be able to ensure the effective development of science in the region. However, this process requires the activation of a regional research and innovation policies, creation of an adequate infrastructure and an increased use of existing territorial potential, which includes such factors as geopolitical location, natural, human and information resources, international relations, etc.

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