

**MAŁGORZATA ROMANOWSKA
RENATA STASIAK-BETLEJEWSKA
ET AL.**

Zbiór prac naukowych.

**I KONGRES MŁODYCH EKONOMISTÓW
W PTE DLA GOSPODARKI POLSKI**
Współczesne problemy ekonomii – między teorią
a praktyką gospodarczą,
20 – 21 października 2016,
Polskie Towarzystwo Ekonomiczne,
Oddział w Częstochowie, Częstochowa, Polska

Collection of scientific papers.

I VISEGRAD YOUNG ECONOMISTS FORUM -
Contemporary problems of economics - between theory and
business practice,
20-21 October 2016,
Polish Economic Society, Branch in Częstochowa, Poland



PATRONAT
PREZYDENTA MIASTA CZĘSTOCHOWY
KRZYSZTOFA MATYJASZCZYKA

POLSKIE RADIO
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MASIKIPOL®

Publisher: CROATIAN QUALITY MANAGERS SOCIETY,
Radoslava Cimermana 36a, 10000 ZAGREB, CROATIA 2016
For Publisher: Dr. sc. Miroslav Drljača
ISBN 978-953-8067-07-5

Publisher: POLSKIE TOWARZYSTWO EKONOMICZNE, 2016
ODDZIAŁ W CZĘSTOCHOWIE, POLSKA, ul. Kilińskiego 32/34, Częstochowa
ISBN 978-83-65343-09-3

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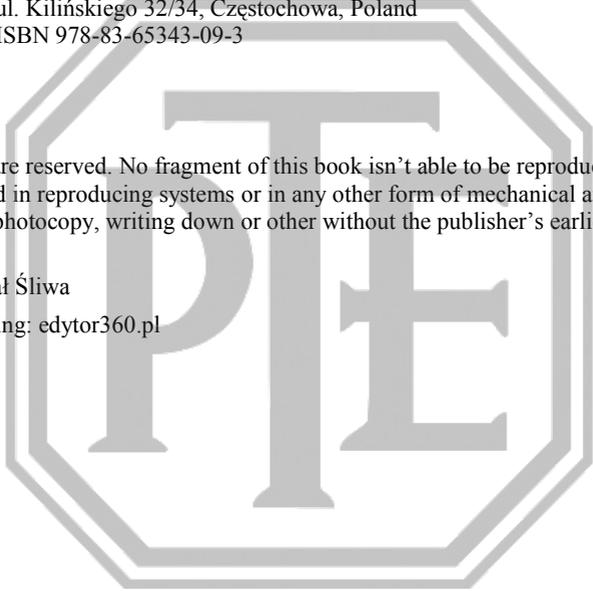
Publisher: CROATIAN QUALITY MANAGERS SOCIETY,
Radoslava Cimermana 36a, 10000 ZAGREB, CROATIA 2016
For Publisher: Dr. sc. Miroslav Drljača
ISBN 978-953-8067-07-5

Publisher: POLSKIE TOWARZYSTWO EKONOMICZNE, 2016
ODDZIAŁ W CZĘSTOCHOWIE, POLSKA,
ul. Kilińskiego 32/34, Częstochowa, Poland
ISBN 978-83-65343-09-3

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Cover: Rafał Śliwa

Print: Printing: edytor360.pl



FOREWORD

Presented scientific monograph is a collection of the scientific papers presented during the international scientific conference named I VISEGRAD YOUNG ECONOMISTS FORUM. Contemporary problems of economics - between theory and business practice, that was held on 20-21 October 2016 in Częstochowa. Conference had a form of Congress since it was idea of representatives of Polish Economic Society, Branch in Częstochowa in Poland.

Theme of the event was a reflection on the wide range of economic problems and issues included in the scientific research works of Economists Forum participants. Economists Forum thematic areas included:

Economics

- 1. Directions of the modern economic thought development.*
- 2. Contemporary problems of the social market economy.*
- 3. Internationalization in the global economy.*
- 4. The idea of sustainable development in the economy.*
- 5. The positive aspects of economic crises.*
- 6. Economic science to the problems of globalization.*
- 7. Quantitative methods in economic research.*

Finances

- 1. Financial markets and economic growth.*
- 2. Public finance and local government.*
- 3. Taxes in organizations and economic systems.*
- 4. Monetary and fiscal policy.*
- 5. Financial management in the banking sector.*
- 6. Financial decisions of enterprises.*
- 7. Accounting in organizations and economic systems.*

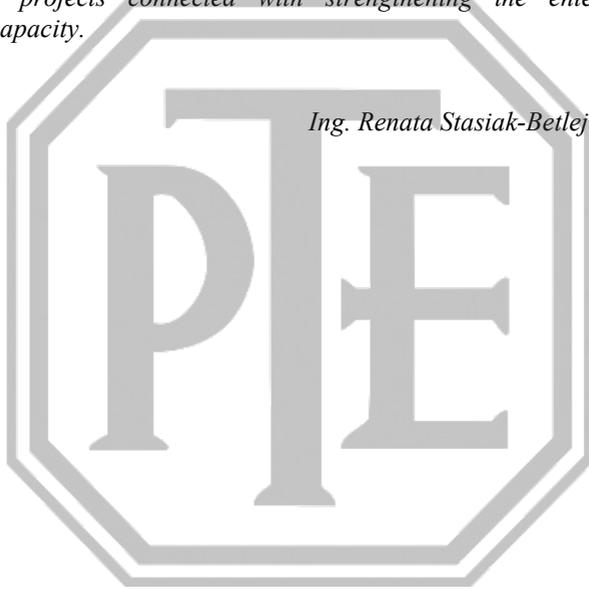
Management

- 1. Strategic and operational business problems.*
- 2. Contemporary problems of corporate governance.*
- 3. Relationship networking in business and the economy.*
- 4. Logistics in the enterprise management.*
- 5. The role and development of the information technology in the organization management.*
- 6. The quality management in the organization.*
- 7. Innovations in the economic development.*
- 8. Intellectual property in the organization management.*

Sessions of this scientific event were held at Czestochowa University of Technology in Poland. Congress was supported by patronage both of local NGO and cultural entities including media. The main business sponsor and donor of Congress was MASKPOL S.A. that hosted conference participants and presented its own economic and market achievements.

The main goal of the conference is an exchange and the knowledge transfer with regard to economic and business problems and its solving.

The conference material includes articles sent by experts, researchers and industry representatives from 5 countries (Slovakia, Czech Republic, Hungary, Romania, Poland.). Authors of articles present different points of view to organization, economics, marketing, trade and production management that can be useful for the business practice and can be source of initiatives for international projects connected with strengthening the enterprises and universities capacity.



Ing. Renata Stasiak-Betlejewska, PhD.,

editor

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STUDY REGARDING THE QUALITY OF MEAT PRODUCTS ON THE MARKET OF ALBA COUNTY, ROMANIA

Abstract: The meat sector represents a significant share of the food industry, and it presents a set of features regarding the raw materials and the machinery used. For a healthy eating, the quality of the raw material is decisive, because the nutrients are transferred through food, which can ensure the smooth running of all biological processes that occur in human nutrition. Meat is a basic food of the human alimentation. It is characterized by a high content of proteins (18-22%), consisting of essential amino acids that cannot be synthesized by the human body, fats which cover the body's energy needs, minerals (iron, phosphorus, calcium, potassium, chloride, magnesium), vitamins and enzymes. Statistics show that the world population is almost constantly interested in meat as the basic food, in order to cover the body's lipids and proteins needs which can be found in meat and meat preparations. This paper shows an important aspect of product quality in relation to their presence on the market. To this effect, we have realised a study aimed at emphasizing the quality characteristics of some products on the Alba market. We used the analysis methods recommended in literature and within the European standards. The research was carried out in collaboration with the Sanitary Veterinary Laboratory and Food Safety within DSVSA Alba and it allowed us to highlight these products' specific psycho-chemical characteristics. The conclusions mark out the existence of procedures and control mechanisms correctly implemented along the entire food chain, aimed at maintaining and improving the quality of the foods that end on the consumers' table.

Key words: quality, meat, market

1.1. General aspects

From everlasting, ensuring the food was one of the vital problems of mankind. Food is said to be a "necessity that gives rise to all the others". Therefore, it is confirmed that: "you do not live from what you eat, but from what you digest".

Resolving the issues related to *food* required a concerted action of the worldwide agriculture and industry. Nowadays, the general concerns are focused both on the food's offer of energy and protein needs, and on the permanent search of new measures to optimize the food structure.

Meat is one of the staples of human nutrition. It is characterized by a high content of proteins (18-22%), consisting of essential amino acids that cannot be synthesized by the human body, fats that cover the energy requirements of the human organism, minerals (calcium, phosphorus, iron, potassium, chlorine, magnesium), vitamins and enzymes (POPA M. 2005, DIMA, D., DIACONESCU, I., PAMFILIE, R. 2006, POPA, G., STĂNESCU, V. 1979, MNERIE, D. 1997, POPA, M., CABULEA, L., ACHIM, M. 2006, *** SR ISO 1841-1:2000).

This valuable food for human alimentation is obtained in butcheries, specialized units, with proper technical equipment, whose work is monitored by a rigorous hygienic and sanitary control. Complex industrial units have been created lately, which carry out a continuous flow: cutting, cold preservation and industrialization as food, cans, semi-cans, etc (POPA, M., CABULEA, L., ACHIM, M. 2006, *** SR ISO 1841-1:2000).

People generally consume or process meat from: butchery animals (cattle, swine, sheep, goats, horses), poultry (chickens, ducks, geese, turkeys). At present, it is annually consumed on average, about 37 kg/inhabitant of the planet. The annual average pace of meat production growth is about 2.5%. Among the countries with larger productions there are: USA, China, France, Germany, Brazil, Argentina, Russia, Australia, etc.

Commercially, the most representative meat quantities are the cattle, swine, sheep and poultry. The world production of bovine meat is 53, 9 million tons, the US holding the first place with 10.6 million tons, followed by the countries of the Common Market (e.g. Brazil, Russia, Argentina, Australia, Canada).

Food quality and safety are important factors in the production and marketing of meat products. Food safety cannot become a fact, unless it is a responsibility of all those involved in the field of food, from professionals to consumers. Various procedures and control mechanisms are implemented along the entire food chain which is focused on food security.

Statistics show that the world population is almost constantly interested in meat as a staple food, in order to meet the need for *glucide*, through animal fats consumption, as well as the need for *lipids* and *proteins* that can be found in meat and in the meat products. Therefore, nutritionists show that there is a daily average consumption of 25 g – *animal fats* and 150 g – *meat and meat products* (POPA, G., STĂNESCU, V. 1979, MNERIE, D. 1997, POPA, M., CABULEA, L., ACHIM, M. 2006, *** SR ISO 1841-1:2000).

This paper shows an important aspect of product quality in relation to their presence on the market.

To this effect, we have realised a study aimed at emphasizing the quality characteristics of some products on the Alba market. We used the analysis methods recommended in literature and within the European standards.

The research was carried out in collaboration with the Sanitary Veterinary Laboratory and Food Safety within DSVSA Alba and it allowed us to highlight these products' specific psycho-chemical characteristics. The conclusions mark out the existence of procedures and control mechanisms correctly implemented along the entire food chain, aimed at maintaining and improving the quality of the foods that end on the consumers' table.

1.2. Experimental part

1.2.1. Methods

The active standards applied within the laboratories for the analysis and certification of goods quality are: SR ISO 1443:2008, SR ISO 1442:1997, SR ISO 937:2007, SR ISO 937:2007, SR ISO 1841-1:2000 (** SR ISO 937:2007, ** SR ISO 1443:2008, ** SR ISO 1442:1997, ** Law 608/2001). The following features were determined:

- Total fat content [SR ISO 1443:2008],
- Water content (moisture) [SR ISO 1442:1997],
- Nitrogen content (proteins) [SR ISO 937:2007],
- Chloride content (salt) [SR ISO 1841-1].

The sample is homogenized by passing it at least twice through the chopper and through blending. The sample is kept in a hermetically sealed container, completely filled and stored so as to avoid any deterioration or change in its composition. It is then analysed as soon as possible after mixing, within at least 24 hours. When new batches of reagents or freshly prepared solutions are used, a blank sample (in duplicate) is always made. It is recommended to periodically make a blank sample for the reagents and solutions that have already been used a few times. If the *repeatability* conditions are met, one shall take as the result the arithmetic average of the two determinations.

1.3. Meat quality characteristics

The chemical composition of meat is determined by the proportion of the different tissues that within the same species vary dependent on age, gender and race, as follows in table 1.1.

Table 1.2 shows the variation of meat's chemical composition depending on the species, and within the species depending on the fattening and the anatomic region.

The meat is classified by classes of quality depending on the anatomic area of the animal's body, the ratio of muscle tissue and other tissues, nutritional value, sensory properties of different anatomical areas, the possibilities for optimal use in culinary arts or in industrial processing if fulfilling the criteria for freshness and sanitation. The criteria for quality classes classification differ from country to country, geographical areas or communities.

The meat carving is the operation through which the meat is divided into sorts and quality classes. By *sort of meat* we refer to that anatomical part of the animal's body which features a precise delimitation and a corresponding class of quality.

Table 1.1. The chemical composition of meat

Species and age	Fattening	Water %	Proteins %	Fats %	Mineral salts %	Calories per 100 of edible product
Cattle	Lean	75,0	20,8	3,0	1,2	110,50
	Medium	66,5	20,0	12,4	1,0	193,60
	Fat	60,0	18,6	20,4	1,0	260,00
Veal	Lean	78,0	20,0	1,0	1,0	91,10
	Fat	72,3	19,5	7,5	0,7	148,20
Pork	Lean	73,0	20,5	5,0	1,1	133,19
	Medium	18,0	16,2	16,2	0,8	221,22
	Fat	50,6	15,0	33,7	0,7	368,17
Sheep	Lean	73,0	20,2	3,7	1,1	116,49
	Medium	65,5	18,0	15,6	0,9	215,76
	Fat	55,3	16,0	28,0	0,7	321,40
Horse	Medium	68,0	20,50	10	1,0	177,1
Domestic rabbit	Medium	71,4	21,30	5,5	1,15	137,38
	Lean	72,5	22,0	4,4	1,1	130,04
Hen	Medium	70,0	19,0	10,0	1,0	168,90
	Fat	63,7	18,0	17,3	1,0	231,53
Turkey	Medium	67,0	23,5	8,5	1,0	173,70
	Fat	55,5	21,0	22,5	1,0	290,85
Goose	Medium	55,7	17,0	26,3	1,0	308,13
	Fat	40,2	16,3	42,8	0,7	456,31
Duck	Lean	71,0	21,5	6,3	1,2	145,48
	Fat	54,3	18,0	26,6	1,1	315,86
Rabbit	-	74,0	23,0	2,0	1,0	112,50
Boar	-	72,0	20,0	6,9	1,1	144,79
Deer	-	75,0	20,5	3,4	1,1	115,00
Wild duck	-	70,0	23,0	6,0	1,0	139,00
Quail	-	68,0	22,5	8,5	1,0	169,60
Partridge	-	72,0	24,0	2,8	1,2	123,88
Pheasant	-	73,5	24,2	1,2	1,1	110,14
Pigeon	-	75,0	22,0	2,0	1,0	108,40

Source: POPA, G., STANESCU, V. 1979.

Table 1.2. The variation of meat's chemical composition

Species	Fattening	Anatomic region	Water [%]	Proteins [%]	Fats [%]	Ashes [%]	Calories/ 100g	
Cattle	Lean	Shin	74.80	20.80	4.00	1.00	120	
	Medium	Shin	66.50	20.0	8.00	0.90	160	
	Fat	Shin	60.00	17.6	16.00	0.80	216	
	Lean	Leg	71.00	19.70	8.00	1.00	152	
	Medium	Leg	67.00	19.30	13.00	1.00	105	
	Fat	Leg	63.00	18.37	17.00	0.90	226	
	Lean	Chuck	64.00	18.60	16.00	1.00	218	
	Medium	Chuck	57.00	16.90	25.00	0.80	292	
	Fat	Chuck	53.00	15.60	31.00	0.80	341	
		Lean	Brisket	55.00	14.20	30.00	0.80	326
Swine	Medium	Brisket	44.00	12.20	43.00	0.80	436	
	Fat	Brisket	39.00	10.30	50.00	0.70	490	
	Lean	Leg	68.00	17.20	14.00	0.80	195	
	Medium	Leg	60.00	15.20	24.00	0.80	277	
	Fat	Leg	54.00	13.20	32.10	0.70	342	
	Lean	Chop	63.00	18.00	17.20	0.80	228	
	Medium	Chop	56.00	17.00	26.20	0.80	304	
	Fat	Chop	48.00	15.00	36.30	0.70	387	
		Lean	Shoulder	71.00	18.00	10.00	1.00	162
	Medium	Shoulder	66.20	16.00	17.00	0.80	218	
Sheep	Fat	Shoulder	60.30	14.00	25.00	0.70	281	
	Lean	Leg	71.70	18.40	9.00	0.90	155	
	Medium	Leg	66.70	17.50	15.00	0.80	205	
	Fat	Leg	62.80	16.50	20.00	0.70	246	
	Lean	Chop	63.40	18.00	18.00	0.90	234	
	Medium	Chop	54.20	15.00	30.00	0.80	330	
	Fat	Chop	47.30	12.00	40.00	0.70	408	

Source: MNERIE, D. 1997.

1.4. Results and discussion

There are five products that have been studied in terms of physico-chemical results: beef meat, salami, ham, minced meat and pork pate, traded on the market of Alba County. The physico-chemical parameters analysed can provide information concerning the quality, wholesomeness and eventual contamination of the products tested. Following the products' analysis, values are shown in table 1.3 have been obtained.

Table 1.3. The physico-chemical parameters

No.	Product	Physico-chemical parameters			
		G [%]	U [%]	Sp [%] Nx6,25	Nalco [%]
1	Beef	14,23	67,61	7,93	1,96
2	Salami	31,84	49,84	14,26	2,12
3	Ham	3,61	73,37	16,53	2,74
4	Minced meat	13,53	69,36	8,68	2,51
5	Pork pate	27,77	54,36	12,25	2,10
Admissible value					

Source: own elaboration.

All the values of the physico-chemical and microbiological parameters obtained fall within the limits accepted by the active veterinary legislation and by food safety. This indicates that the products manufactured/marketed in Alba County correspond in terms of quality.

1.5. Conclusions

The present paper treats important aspects related to food quality, safety and security, which are exemplified in an experimental study on

the meat products existing on the market. The study allowed the physico-chemical analysis of certain samples of meat products that are being sold in Alba County. The results were in accordance with national legislations.

The research was carried out in collaboration with the Sanitary Veterinary Laboratory and Food Safety within DSVSA Alba and it allowed us to highlight these products' specific psycho-chemical characteristics. The conclusions mark out the existence of procedures and control mechanisms correctly implemented along the entire food chain, aimed at maintaining and improving the quality of the foods that end on the consumers' table.

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QUALITY SERVICE CHARACTERISTICS

Abstract: Service quality has become a decisive feature in facilitating enterprises to attain a differential advantage over their competitors, and it consequently makes a considerable contribution to the effectiveness of management processes. Undeniably service quality has become a fundamental concept in a competitive corporate strategy. As services are essentially compound and multidimensional, any given service has a arrangement of attributes and characteristics, which importance is presented in the paper.

Keywords: services, quality, management processes, strategy

2.1. Introduction

The development of the services sphere has been recommended by business analysts to be a component of the common advancement in which business preeminence convert from production to services. It is disputed that if earnings and profits flexibility is greater for services than for products, subsequently, as revenues grow, capabilities will move to services.

Bansal and Taylor (2015), Bareham (1989), Halvorsrud, Kvale and Folstad (2016) interpreted the sustaining increase of the sphere of services by exploration of primary circumstances which have come to dominate the transaction processes, such as:

- cultural changes, as apparent in the extensive involvement with physical condition and environmental protection have constituted different offer for as products as services;
- demographic changes, specially becoming older populace of the majority European countries, which have initiated particular requirements;

- lifestyle changes, containing robust work paradigms and varying assumptions about convenience which have generated orders for individual services, well-planned services and services which maintain specific involvement and provide exceptional needs;
- as service enterprises enlarge in ratio, they are proficient to make use of marketing support to enlarge sale of their offerings.

Service quality has become a decisive feature in facilitating enterprises to attain a differential advantage over their competitors, and it consequently makes a considerable contribution to the effectiveness of management processes (NOGALSKI and RONKOWSKI, 2007). Undeniably service quality has become a fundamental concept in a competitive corporate strategy. As services are essentially compound and multidimensional, any given service has a arrangement of attributes and characteristics, which importance presentation is the aim of the paper.

2.2. Characteristics of services

The most important characteristics of services indicated in scientific descriptions, among others by Bienstock, Mentzer and Kahn (2015), Kandampully, Mok and Sparks (2009), Skowron-Grabowska (2008), are as follows:

- services are intangible,
- the customer is a contributor in the service process,
- usually services are realized and absorbed at the same time,
- services have a comparatively advanced unpredictability in functional inputs and outputs,
- services usually have time-perishable limitation,
- place in services sphere is expressed by the area of customers,
- services in broad-spectrum are effort demanding,
- it is reasonably complicated to recognize proper procedures of service output.

In reference to above mentioned characteristics of services, specially imperative seem to be their various aspects of intangibility. It increases

affairs for equally the customers and the suppliers of services. The customers cannot determine the intangible attitude of service previous to the occurrence and therefore customers frequently apply the prominence of a service enterprise and its representatives to consider quality. Parasurman, Zeithaml and Berry (1988) discovered that services generally cannot be assessed before the use and contrasting to products they do not have numerous of investigate properties. Intangibility moreover involves bearing in mind the customers psychology, as well as confrontation with the dilemmas of exposing their donations, even as arrangement of new or corrected service offer.

Another crucial feature of services in opinion of Blut et al. (2014) is perishability. In production processes manufacturing of finished goods is adopted to separate production from inconsistent require, and manufacturing of raw material is adopted to facilitate scheduling and control, however it is unattainable to accommodate stocks of the exact service component and this lift up a number of appropriate affairs for management processes. This stimulus services to handle with requirement and aptitude more straightforwardly than it typically occurs in production issues, by:

- following requirement by rising and lessening assets,
- pressuring requirement, e.g. by changing prices,
- maintaining excess aptitude to adequate management of inconstancy in demand.

Factor of simultaneity arises as the customers have to be in attendance prior to services can occur. As the result services are liable to constitute in small and spread assembly, and it is complicated to impose of effect of scale. A considerable result of customer contribution in the deliverance of services is that understanding of quality are dominated by scrutiny of the surroundings conditions. Service aptitudes and proceedings should be formed with the customer as first and most important decision maker, as well as environment. In reference to Gronroos (1991) the repercussion of this is that executives require a depiction of the overall duration of the operation so that aptitudes which are essential to service are not ignored.

Furthermore it means that the capacities of marketing and operations cannot be independent in services, as well as that control capacity must be coincident with costs. The employee maintaining the service should primary identify particular assumptions of the customers, next modify the service while taking into the consideration the results the analysis. Moreover the employee has to determine the quality of the accomplishment contrary to the consideration of the customer's belief, as well as should be prepared to discover and react to any unfavorable customers' response which may come about.

Considerable service characteristics is also heterogeneity of services, which appears as result of definite and inherent service components depended on particular preferences of the customers and their perceptions. Dissimilarities occur in the productivity of enterprises attaining the same service, and in the same enterprise at various opportunities. Even though redundant dissimilarity may take place which should be controlled, the diversity featured to evaluation, and then competing, the customer's specification is crucial to customer approval. This basic unpredictability makes it challenging to indicate accurate measurable principles for the whole components of service.

Table 2.1 presents how service delivery characteristics affect various components of the service. This typifies that even though some elements of service are comparable to production operations, important dissimilarities endure in reference to the explicit and implicit service components. These features are probable to influence the assortment of mechanisms used for management processes of services.

**Table 2.1. Relation of service delivery system characteristics
to components of the service**

	Supporting	Facilitating	Explicit services	Implicit services
Intangible	Perceptible	Perceptible	Imperceptible	Imperceptible
Perishable	Permanent Physical	Permanent Physical	Impermanent Social	Impermanent Psychological
Simultaneous	Customer often on the premise	Concurrent	Concurrent	Concurrent
Heterogeneous	Variety under enterprise's control	Variety under enterprise's control	Variety under enterprise's control but not easily specified or measured	Variety not easily controlled

Source: Own elaboration on the base of: Dotchin and Oakland (1994).

2.3. Service quality

In reference to the service characteristics presented in Table 1, service components and relations between them, key factor in evaluation of the issue is service quality. The concept of service quality is defined by Juran (1980), Perez et al. (2007) as achievement which emerges in customer satisfaction or independence from shortage which prevents customer dissatisfaction. Bowersox, Closs and Cooper (2009) concluded that the service quality approach is an enterprise's effort to recognize customer satisfaction from the viewpoint of the dissimilarities between customer consciousness and definite service on a range of service characteristics.

The idea of service quality is compound, disperse and conceptual, in principal referring to the characteristic attributes of a service. If service quality is perceived from a consumer point of view, it is frequently connected with the ranks of customer satisfaction, which makes the

conception a subjective in character, on the base on the quality perceived by customers, rather than objective character. In this consideration, Parasuraman, Zeithaml and Berry (1988) designated perceived service quality as a comprehensive opinion or approach comparative to the level of superiority or advantage of service.

Aforementioned subjective interpretation of quality is connected with idea of expectation. Lewis and Booms (1993) described service quality as a calculation of how appropriately the service delivered adjust customers' expectations. Assumptions of expectation are directly associated with attitude, and quality has also been analyzed from the standpoint of attitude. In agreement with this vision Bitner and Hubbert (1994) considered perceived quality as a universal overall appraisal of a service, intimately connected with attitude.

Gronroos (1991) pointed out that service quality consist of technical and functional quality. Technical quality applies to the consequences that the customers could obtain subsequent to a service. Functional quality applies to those practices through which the service was delivered to the customer.

Lehtinen and Lehtinen (1991) expounded three elements of service quality: physical quality, corporate quality and interactive quality. First one which is physical quality engages the physical matter of the service. Corporate quality engages the representation of the enterprise. Interactive quality engages the relations between contact personnel and customers.

Cavana and Corbett (2007) distinguished dissimilar components in the service package likewise as Dotchin and Oakland (1994):

- physical elements – equally assistance goods and facilitating goods;
- explicit service – physical profits;
- implicit service – psychological profits.

Moreover authors listed the specific characteristics of service delivery, which are intangibility, perishability, simultaneity and heterogeneity.

As Rafele (2004) argued, the subsequent key determinants should be regarded:

- concretes (emergence of physical capacities, equipment, staff and communication);
- dependability (aptitude to achieve the assured service consistently and precisely);
- openness (readiness to assist customers and afford efficient service);
- assurance (acquaintance and good manners of staff and aptitude to express belief and self-assurance);
- empathy (consideration of distinguished awareness which the enterprise offers to the customers).

The characteristic features of services compose the problem of service quality complicated. Principally the imperceptible nature of services causes quality not easy to manage than in the area of perceptible products. Horovitz (1986) recognized three typical characteristics of service quality:

- for the reason that most services are expended at the same time as they are created, the customers distinguish all deficiencies in quality;
- a service is constructed of a set of profits, but it is mainly an experience from practice;
- a fundamental characteristic of service quality originates from the quality of the connection between the service supplier and the customers.

The above mentioned associations affirm that service quality is a multidimensional conception. On the other hand the assumptions about the importance of the compound in management processes fluctuate and it is fairly difficult to form one leading direction.

2.4. Conceptual framework for service quality

The conceptual framework for service quality which consider the characteristics of services in different dimensions was proposed by Parasuraman et al. (1988). Its visual arrangement is developed in three-column model in Figure 2.1.

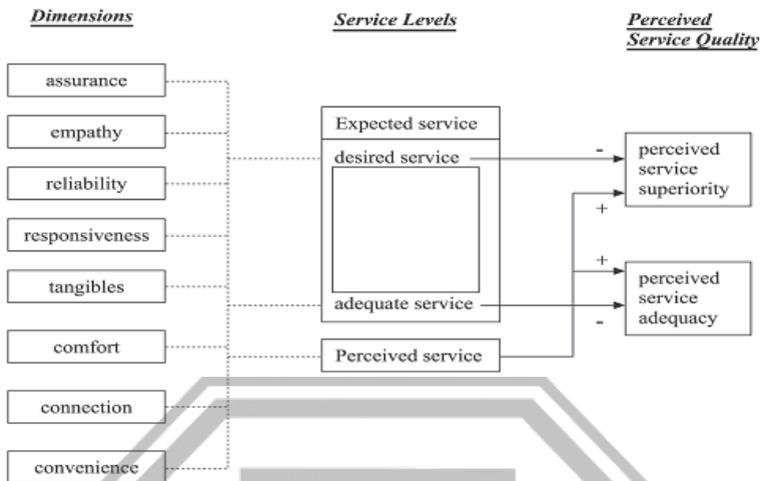


Fig. 2.1. Conceptual framework for service quality.

Source: Cavana and Corbett (2007).

Parasuraman et al. (1988) firstly indicated ten elements for perceived service quality. They were afterward diminished to five components: tangibles, dependability, responsiveness, assurance and empathy. This version was additionally improved by broadening the expectations to two service stages: desired and adequate. Desired service level is identified with the rank of service performing a combination of what customers consider ‘can be’ and ‘should be’ offered. Adequate service is the lowest rank of service the customers are ready to acquire. This developed model is also specified as the three-column model due to the method the authors arranged the service issues in it.

In this conceptual framework the service quality is understood as the diversity among customer assumptions and consciousness of service. Customer assumptions are structured by customer requirements, past experiences and marketing area. In reference to the conception introduced by authors (Parasuraman et al., 1988), customer consciousness of service

is regarded as an activity of service delivery, exterior contacts with customers, enterprise executives' consciousness of customer expectations and interpretation of enterprise executives' consciousness into service requirements (Brewer, Button and Hensher, 2001).

The ambiguous measure of the supposed quality service assemble is indicated as the inequality between the supposed performance and the anticipation. Advantages of using indirect measurements are as follows (Calabrese, 2012):

- Interpretation of customer anticipation about service quality may be helpful for enterprise executives to discover the deficiencies which are mandatory to be enhanced, and to scrutinize the flow of service quality in time periods. Enterprise executives may recognize the anticipation for every imperative management process and expand strategy to enhance customer satisfaction by reducing their anticipation;
- The capability for exaggerated appraisals in indirect assessment which may contribute to incorrect assumptions is much lesser than that in straight assessment;
- The feedback mistakes are small.

Figure 2.2 presents a framework for consideration of the process by which customers literally shape their opportunities of supplier performance. Moreover it recommends that commonly an amount of gaps occurs which a provider have to defeat if it is to establish its stage of customer adjustment on the satisfaction of customers (Bowersox, Closs and Cooper, 2009). Measurements which points up performance gaps offer the enterprise a comprehensible consideration of the level of present performance in contrast to equally customer attitudes, opportunities and compensations appreciated by the branch leaders. Authors have developed a service quality model which emphasizes the gaps involving customer expectations and tangible service performance. The model presented in Figure 2.2 categorizes five gaps restricting service quality sphere (Ross, 1997).

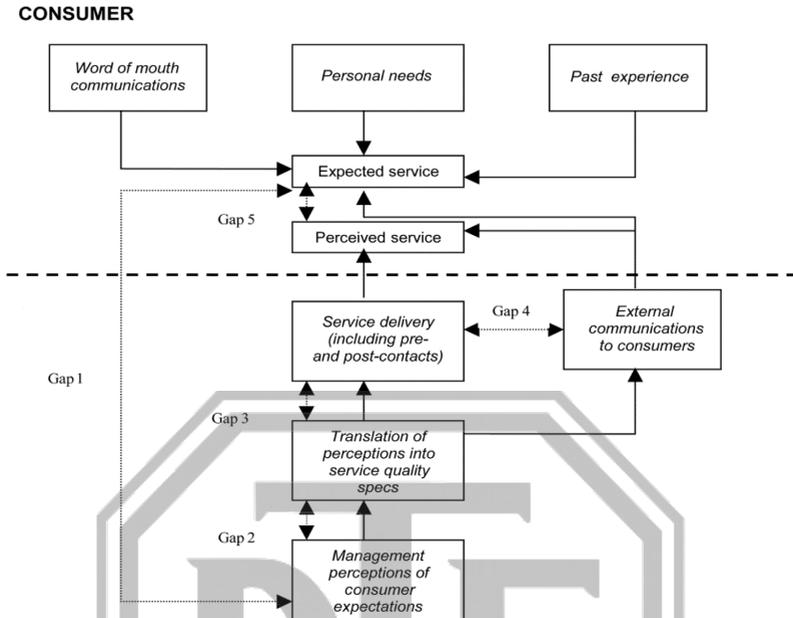


Figure 2.2. A conceptual model of service quality.

Source: Parasuraman et al. (1988).

Figure 2.2 furthermore presents a framework for perception what should be done by enterprise to transfer satisfaction to the customers. For many enterprises to compensate their customers they should be detected to the existence of the gaps recognized in the framework. The gaps are described as follows (Ross, 1997):

- Gap 1: Customer expectations and management perception;
- Gap 2: Management perception and service quality specification;
- Gap 3: Service quality specifications and service delivery;
- Gap 4: Service delivery and external communications;
- Gap 5: Perceived and expected service.

Measurements highlighting the gaps which are connecting the stages of supposed and real customer service performance are decisive in conforming the service quality characteristics strategy (ROMANOWSKA,

2009). Already the gaps have been measured, executives may initiate to remodel organizational frameworks in the management processes, meeting them on permanent development in strategy and operational effectiveness.

2.5. Conclusions

Each of presented quality service characteristics is predictable chance for improvement of management processes in the enterprise. Their indication may efficiently complicate the steady service formation and make service quality an objection for enterprise strategy enhancing and developing. From the customer's viewpoint these characteristics make it complicated, or even impracticable, to estimate or scrutinize quality services before experiencing the service delivery.

Services are basically complex and every service has a mixture of service characteristics. This can be also perceived as a dilemma of contradictory service quality. As inputs as outputs to the management processes absorb services are vastly changeable, as they are the interrelations linking these processes, making it troublesome to sustain reliable service quality. For many services often the key success factor in service economies is an effort concentration on quality characteristics as services habitually engage significant enterprise activity with a exactly determined management process. There is simultaneously customer contribution as most service arrangement obliges a high level of synergy among quality characteristics of service consumer and service provider for long-term business relationships.

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PORTFOLIO ANALYSIS AS AN ESTIMATION TOOL FOR QUALITY OF MANAGEMENT BASING ON THE STATISTICAL DATA 1988-2004 OF THE FORMER NADWIŚLAŃSKA SPÓŁKA WĘGLOWA

Abstract: Section presents the assessment of the quality management of coal mining in Poland in 1988-2004. The assessment was based on an analysis of a portfolio of Markowitz. Optimization is subject to the financial result of the test team mines. Decision variables are the allocation of quotas of extraction of individual mines. The limitation on the value of decision variables arise from the assumed, the total annual production of carbon companions and with a maximum annual production of each mine over the years 1988-2004. The end result is to compare the financial results achieved with the maximum financial result, which was possible to achieve if the management of the mines guided by the results of portfolio analysis.

Key words: quality of management, financial performance, portfolio analysis

3.1. Analysis of the portfolio Markowitz tool in assessing the quality management

One way to assess the quality of the management of a business entity is to compare its financial results with theoretical analyzes that are possible to achieve in the values of maximum profits. Assuming that the company's profit consists of the profits of its entities in the collective agreement and the management is to maximize profit by determining the optimal level of production of each entity to analyze this can be carried out using Markowitz portfolio theory [1, 2, 3]. The example of such an analysis was based on statistical data of the former Vistula Coal

Company consisting of 8 mines operating in its composition from the years 1988 to 2004 [4]. The audited company Carbon is the issue of assessment, quality management and portfolio management involves determining the annual amounts of extraction for each mine. The amounts accepted mining here are analogous shares of shares of companies in the portfolio dywersyfikowanym [5].

Introduced markings called decision variables constituting the amount assigned to each extraction mines: X_1, X_2, \dots, X_p , where p is the number of active mines in a given calendar year. After the $C_1, C_2 \dots, C_p$ marked efficiency of the various mines in a calendar year, where

$$C_i = \frac{R_i}{w_i}. \quad (3.1)$$

R_i and w_i are the result of financial and production-and this mine, respectively. Then the financial result of the mines

$$R_K = \sum_{i=1}^p C_i X_i \quad (3.2)$$

plays the role of portfolio return. [7] Were discussed the theory of portfolio [8] was used to develop a decision in the management of the mines would enter the index portfolio risk S_K , where:

$$S_K^2 = \sum_{i=1}^p \sum_{j=1}^p X_i X_j S_i S_j \rho_{ij} \quad (.33)$$

S_i is the standard deviation [9] profit-and this mine, ρ_{ij} is a correlation coefficient of linear financial results of the i -th and j -th mine¹.

¹ Correlation coefficients were published in the article [6].

In the case of portfolio theory to assess the quality of management optimization problem we can ignore the risk. With such assumptions set restrictions for the decision variables can be reduced to the following inequality:

$$X_1 \leq X_{\max,1}, X_2 \leq X_{\max,2} \cdots X_p \leq X_{\max,p} \quad (3.4)$$

where X_{\max} , and the ability of mining and the mine-termed the maximum annual production of the mine over the years 1988-2004 (Table 1). Additional limitation is due to the demand for coal. It was assumed that for the purposes of evaluation, quality management total output of mines in each year roughly corresponds to the demand. Analogously it is assumed that

$$\sum_{i=1}^p X_i \geq X_{\max} \quad (3.5)$$

where X_{\max} is the total annual mining mines (Table 3.1).

3.2. Portfolio Optimization

Maximization of the objective function (2) was carried out in two regimes:

- a) with a restriction (5)
- b) None (5).

Restrictions (5) means that there are still operating mechanisms of central control economy and the mine is required to implement the annual plan of mining X_{\max} . Solving the problem of linear programming $RK \rightarrow \max$ of conditions (4) and (5) we obtain acceptable theoretical profit or loss "dopuszczalny1 (theor) 'Fig. 3.1 and Table 3.3.

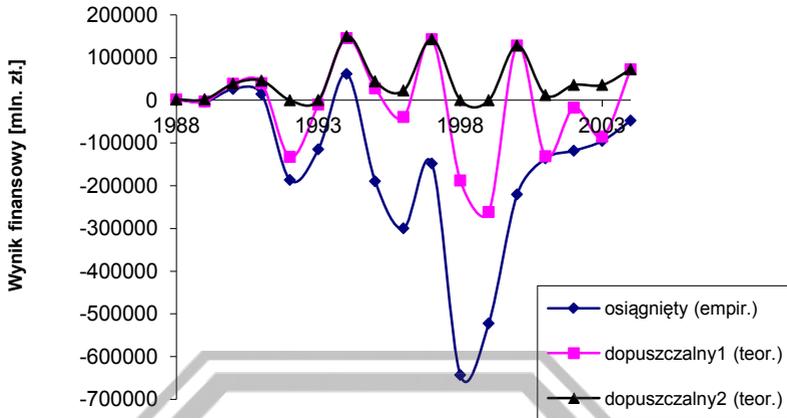


Fig. 3.1. The financial results achieved mines in the years 1988-2004 and the theoretical results obtained on the basis of portfolio analysis with assumptions a) and b).

Source: Own calculations based on data obtained from Coal Company S.A.

If we assume that the mine operated in the conditions of market economy is the condition (5) should be omitted. This means that the mine itself regulates the level of annual production. The corresponding assumption optimization result shows the curve labeled "acceptable 2 (theor.)" and Table 3.3.

3.3. Conclusion

It was assumed that a measure of the quality management m is the difference between the result of portfolio analysis and the result achieved by the mine:

$$m = \text{limit (theor)} - \text{osiągnięty (to Empire)}.$$

A zero value means the measure in the light of the above example perfect management. Negative values have to be interpreted as the result of an incorrect model portfolio that should be rejected.

With two approaches: a) and b) we get two values have a meter and used to assess the quality of management in different external conditions Fig. 3.2.

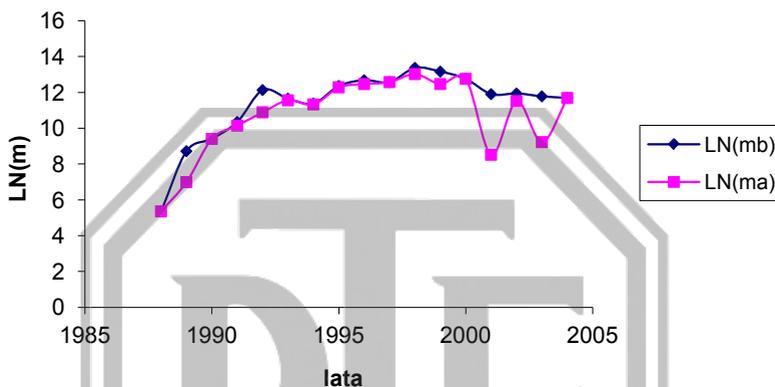


Fig. 3.2. Charts value measurement, quality management in different external conditions.

Source: Own calculations based on data obtained from Coal Company S.A.

In 1988-1991 financial results and theoretical do not differ from each other, which means that in the final period of the centrally planned economy and the beginning of reform in principle, little could be improved in terms of quality management. The years 1992-2000 were the years of trial and error in managing the coal industry. The year 2001 is in the light of the analysis considered a breakthrough Fig. 3.1, Fig. 3.2 and Table 3.3.

The results of the annual value of the optimal extraction obtained with the assumptions a) and b) allow the assessment of the degree of reduction

of coal mining, whereby the financial result will never satisfy the negative value. The results of this analysis is shown in Fig. 3.3.

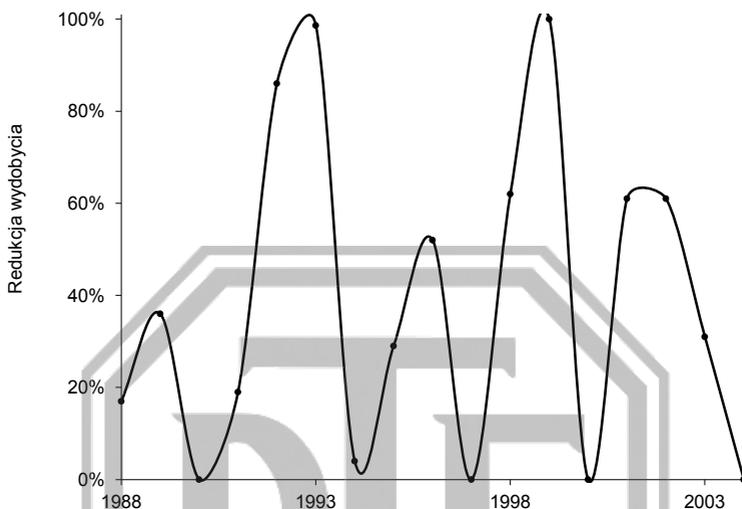


Fig. 3.3. The reduction of coal mining, which in the years 1988- 2004 it possible to maintain a positive financial result.

Source: Own calculations based on data obtained from Coal Company S.A.

Table 3.1. Production of coal in the mines studied over the years 1988-2004 (tons)

Lp.	Mines	Extraction of coal [million tonnes]																
		Research period																
		1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
1.	Brzeszcze	3853750	3613315	3013900	3182600	3076110	2893140	2764000	2764000	2720400	2855000	1363800	1031800	1264200	1262500	290900	1070100	849900
2.	Czeczott	1688905	2008460	2550700	3541100	4050950	3360950	4105500	2764000	3144100	3401300	1479751	298700	0	0	0	0	0
3.	Janina	3754930	3627075	2750070	2995500	2626750	2823500	2473850	2497615	2475240	2521050	1031600	975263	769250	1004150	176700	907900	0
4.	Jaworzno	5067110	4629095	3312850	3152000	2221986	1963598	2132240	1923446	2129059	2268463	774111	0	0	0	0	0	0
5.	Piast	7709300	7377115	6200800	6281800	4993335	4859700	4984740	4936220	5200000	2268463	1908000	1951000	8279000	8410000	3080000	3265000	2663500
6.	Siersza	3879700	3681500	2478440	2228787	1914421	1446010	1129752	1148457	1149694	1134564	499567	306543	0	0	0	0	0
7.	Silesia	1535425	1456850	1201087	1140450	1212950	1133155	1193400	1202500	1135550	1155300	598700	523400	423350	543950	609900	483100	405360
8.	Ziemowit	8471250	7909040	6438780	6733150	6565975	5631565	6006585	5456224	5749425	5842000	2236600	2062800	2005400	2049200	2176200	2238900	1828100
9.	NSW S.A.	35960370	34302450	27946627	29255387	26662477	24111618	24790067	22692462	23703468	1446140	4095941	29814950	67741200	8269800	8333700	8015000	5846860

Source: own study based on data collected in the studied mines

Table 3.2. Efficiency of respondents coal mines in the years 1988-2004 (the financial result / output)

		Efficiency mines (earnings / extraction) million. tone																
		Research period																
Up	Mines	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
1	Bzesczele	9,69E-06	5,37E-07	0,000218	1,78E-05	-0,0073	-0,00913	0,004696	0,009897	-0,01108	0,000756	-0,02867	-0,08243	-0,02499	-0,012	-0,02439	-0,04055	0,001722
2	Czeczott	7,82E-06	5,23E-06	0,000321	-0,00468	-0,00959	-0,02172	-0,0085	-0,02469	-0,04679	-0,02624	-0,07768	-0,04938	0	0	0	0	0
3	Janina	5,84E-05	0,000158	6,78E-06	9,46E-06	1,48E-05	1,82E-05	2,81E-05	3,26E-05	4,2E-5	4,5E-05	0,000127	0,000131	0,000165	0,000138	0,000113	-0,0725	0
4	Jaworzno	3,29E-05	0,000244	0,001004	-0,00094	-0,01522	-0,02134	-0,00949	-0,03799	-0,02805	-0,02592	-0,1816	0	0	0	0	0	0
5	Past	0,000164	-0,00065	0,001903	0,002928	-0,01282	0,000954	0,00913	-0,00248	0,00294	0,01605	-0,05092	-0,03174	0,016931	0,003754	0,010996	0,003525	0,014794
6	Siersza	6,77E-06	2,53E-06	0,00025	-0,00262	-0,01552	-0,02592	-0,02855	-0,04501	-0,04379	-0,0368	-0,13098	-0,15434	0	0	0	0	0
*7	Silesia	3,98E-05	0,000331	0,000516	-0,05088	-0,02181	-0,03243	-0,00437	-0,01301	-0,02714	-0,02225	-0,02577	-0,10073	-0,06622	-0,00802	-0,02156	-0,04781	-0,07795
8	Ziemowit			0,001945	0,002738	-0,00529	0,002952	0,007196	0,000712	-0,00239	0,001885	-0,0556	-0,04045	-0,02512	-0,02862	-0,01051	0,01121	0,010277
9	NSW S.A.	0,000319	8,738E-05	0,006164	0,053430	0,0875328	0,106612	0,029865	0,112532	0,156261	0,0924704	0,531099	0,4589262	0,0992414	0,0447509	0,0453557	0,1461175	0,0511549

Source: own study based on data collected in the studied mines.

Table 3.3. Evolution of financial results: empirical, theoretical and theoretical and b

Financial result	Research period																
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
<i>empirical</i>	159	-	2644	1453	-	-	-	-	-	-	-	-	-	-	-	-	-
Theoretical a (1)	5	3759	0	2	186441	1148366	1689	189549	299728	1480866	429995	222372	203631	359921	181029	51384	7487
Theoretical b (2)	7	2671	8	7	132583	-9915	-4	27908	-39168	142676	187761	261524	127995	130968	-17386	84953	72330
	180		3860	4587			14955										
	7	2372	8	6	50	462	1	44291	22820	142676	477	0	127995	12256	35902	35902	72330

Source: own study based on data collected in the studied mines.

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INVESTMENT PROBLEMS IN THE FIELD OF POLISH ENTERPRISES AUTOMATION

Abstract: National Academy of Engineering has selected and prepared challenges facing science and technology in the twenty-first century. These are: cost-effective use of solar energy, the development of engineering scientific discoveries, securing cyberspace. The lack of automation and robotics in this statement reminds that the processes associated with automation and robotics are generally accepted by society. Automation and robotics introduces a wide range changes in the company production functioning resulting from its interdisciplinary impact on all areas of the company operation and staff, structure and finance. Automation and robotics in various rankings, reports or analyses are presented separately or as new technologies. Paper presents economic aspects of automation and robotics automation in Polish enterprises.

Key words: automation, investment problems, Polish enterprise

4.1. Introduction

Strongly competitive and specialized market requires enterprises to seek new solutions for the optimization of their production, in order to become even more attractive to potential customers. One of the organization development models is the automation that is demanded by Polish manufacturing companies.

Automation of manufacturing processes is treated by Polish producers as an indispensable element in the enterprise development. Increasing requirements in terms of the production efficiency, product quality and safety processes create a big challenge for the engineering department. It should be underlined that the machine life cycle is directly correlated

with the product life cycle. Therefore, all solutions must be adapted to the individual needs of each client, so there should be possible to achieve high productivity, shorten the production cycle, reducing the employment costs and the waste production at the lowest possible financial outlay. Implementing process automation include determining factors of decision taking. The selection of an appropriate solution is the key to production process improvement. A considerable degree of automation in each case is associated with high investment costs.

Therefore, there is a need to analyze production needs and financial capabilities. According to the latest the Polish Central Statistical Office report called "Innovative activity of enterprises in 2012-2014", the total expenditure on innovative activities in Poland in 2014 amounted to 36.7 billion PLN and industrial companies spent 24.6 billion PLN. As many as 18.5 million PLN was spent on fixed assets, among others, machinery, tools and technical equipment. Increasingly popular are the means of production automation as industrial robots, which is more than 8,500, or machining centers, the number of which has increased in Poland by over 20%.

In years 2010-2012, Poland was among the countries with the largest share of the innovation active enterprises that have benefited from the financial support of the European Union. In the mentioned period, the aid on innovation activity was used by 21.5% of the industrial enterprises in Poland. In years 2012 - 2014 the percentage of companies - beneficiaries of public support was higher (2.2%). Detailed expert analysis shows that the majority of investments in the industry took place in 2014. The latest report of the Statistical Office experts noted that the sector of industrial enterprises in 2012-2014 included about 18.6% of the innovative active enterprises compared to 18.4% of the innovative enterprises in 2011-2013. Expenditures on innovation activities in this group of companies in 2014 have been increased by 17.5%, reaching 24.6 billion PLN. The expenditure level per innovative activity on a scale of one company increased by 0.8 million PLN (it amounted 5.6 million PLN). Innovation in the industry is the basis of the company success and the economy

development. Companies that seek to improve the innovation of its products and manufacturing methods, have a chance to produce at the highest level, and thus free to compete even in the most difficult markets.

Despite the growing number of companies introducing innovations and relatively easy access to investment financing, the distance that separates Poland from the European innovations leaders in this field of automation and robotics is still large. Unfortunately, a similar situation is noted in the case of research - development field. Slowly growing expenditure on R & D in recent years make their present height in the amount of 90.3 Euro per 1 inhabitant places Poland in the 24th position among the 28 countries of the European Union, where the average value of the investment is 542 Euro.

In 2014, Polish industrial enterprises allocated 57.5% of the available funds for the purchase of machinery and technical equipment, means of transport, tools, instruments, movables and equipment that are necessary to conduct innovative activities. Growing needs and requirements of the production decided that about 3.5% of funds (more than in the previous year) was allocated to the technology field. The main source of the innovative activities investment funding were own funds of enterprises. In 2014, mentioned funds amounted 69.2% of all funds incurred for the investment purpose in industrial enterprises. The largest expenditure on innovation activities in terms of one industrial company in 2014 were noted in the following Polish regions: the Lodz region and the lowest expenditures were noted in the Opole province. There is a great chance that the investment process will be continued in the coming years. The latest technology in Poland is already readily available, as there are wide opportunities of financing its purchase. However, Polish entrepreneurs in contrast to other European countries prefer to invest their own money. This trend will be continued, even though force since this year, the Law on encouraging innovation, which allows spending on the innovation.

A recent analysis of Polish enterprises innovative activity shows that there are enterprises seek the automation advantages. In 2014 the percentage of industrial enterprises that have installed automation means

in the production processes increased by 1.8%. In 2014 Polish enterprises noted more than 43 000 of computers using in the control and regulation of the production processes, what means 5.3% more than in 2013. Number of automated and computer-controlled production lines increased over the year by 4.0% and 9.0%. The largest increase compared to 2013 amounted 20.5% concerned machining centers number.

Modern means of the production automation, in particular modern machining centers and numerically controlled, are characterized by a remarkable speed, a precision and an efficiency. Owing to the production of perfect quality parts mentioned modern means of automation are undeniably a source of competitive advantages of individual companies and the driving force of the innovation in sectors such as automotive industry, aerospace and even the health care. The most absorbent sector in terms of the technology is still manufacturing. The Polish Central Statistical Office report shows that companies from mentioned industries have noted the highest number of the automation means (82% of all computers for the control and the regulation of technological processes, 90% of automated or computer-controlled production lines, high-precision machine tools, lasers, and almost 100% of industrial robots and manipulators).

4.2. The characteristics of Polish enterprises automation

Recent statistics of Polish Central Statistical Office show that in Poland there are about 8513 of the working industrial robots, more than 4,500 manipulators, 15537 of the machining centers, 20098 of the automated production lines and 18696 of automatic computer-controlled lines and 43543 of computers used for the process control. Figure 4.1 presents installed means for automating production processes in 2014.

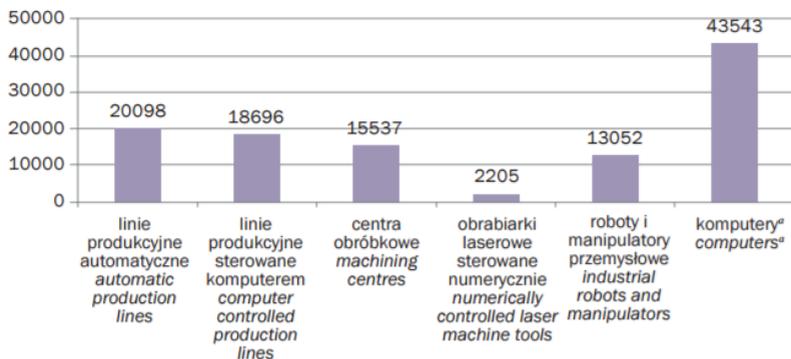


Fig. 4.1. Installed means for automating production processes in 2014.

Source: DZIDA L., GUMIŃSKI M., ORZECZOWSKA U., PIOTROWSKA J., ROZKRUT D., WEGNER M. 2015.

The largest groups are robots and industrial manipulators, which in 2014 accounted for one third of all the automation means in this section and 42.9% of the total number of devices installed in the industrial enterprises.

Figure 4.2 presents sum of installed means for automating production processes in 2014 by NACE divisions. In the list of the most automated industries (Fig. 4.2) in Poland there is unquestionably the motor vehicles, trailers and semi-trailers manufacturing (13.5% of the total industrial automation installed at the plants in Poland). In the group of highly automated industries high position still remains: manufacturing of rubber and plastics holds (12.4% of all the automation means in Poland), manufacturing of metal products (10.7% of all the automation means in Poland), manufacturing of food products (7% of all the automation means in Poland), production of computers, electronic and optical products (6.33% of all the automation means in Poland).

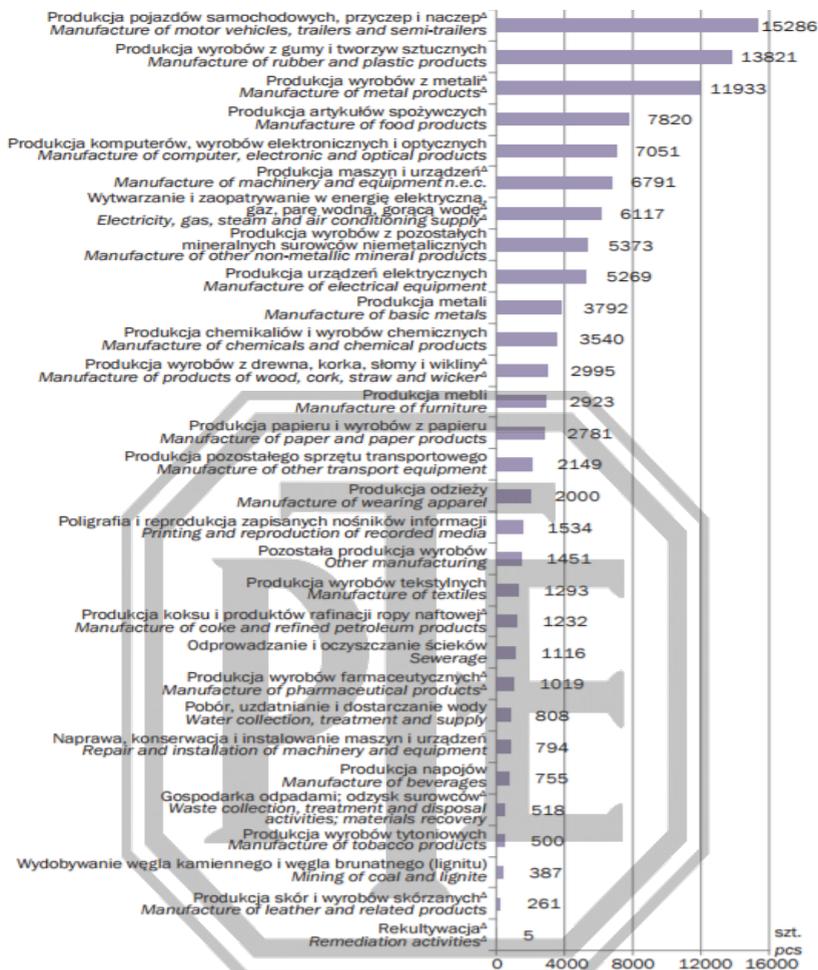


Fig. 4.2. Sum of installed means for automating production processes in 2014 by NACE divisions.

Source: DZIDA L., GUMIŃSKI M., ORZECZOWSKA U., PIOTROWSKA J., ROZKRUT D., WEGNER M. 2015.

Compared to 2013 when there were only 543, means an increase of nearly 370%. In the textile industry the number of machines has increased by approximately 20%.

Most industrial robotic industry in the Polish economy is the automotive industry, which is in line with global trends. The automotive sector in Poland presents 45% of operating industrial robots. In quantitative terms, the most important sector for the increase in the number of robots in the Polish industry is the automotive industry. The growing demand for labour in the industrial section is the main factor in growth in the number of robots in the Polish economy.

Slightly less spectacular result was noted in the tobacco industry automation, which also stands out in terms of the rate of new means installation in the production automation. At the end of 2014 companies from this section were installed 500 of the automation means (170% more than in the previous year). Companies that use a method for a rapid access to the information and its immediate treatment undergone or they are currently undergoing also another process automation. This action improves the effectiveness and efficiency of the plant, and thus the efficiency of the market.

Companies that invest in broadly defined automation can dynamically respond to the industry needs and develop its organization. Contrary to popular belief proclaiming that automation combats workplace is highly automated, automated enterprise employs more workers than regular one.

In automated factories the employer spend on the maintenance crew almost 6 times more money than the owners at all non-automated.

The average rate of growth companies investing in automation is 23%, and the leaders of the growth record over 140%. In the case of companies that are not at all automated, an average of investments is about 16% per year.

Table 4.1 presents types of enterprises with regard to a number of installed automated production lines and industrial robots in 2014. Research findings come from reports of the Central Statistical Office in Poland. Polish production companies, unfortunately, are still noted below the world average in terms of the automation.

Table 4.1. Enterprises which owned installed means for automating production processes in 2014 by number of persons employed

Wyszczególnienie Specification	Ogółem Grand total	W tym Of which						
		linie produkcyjne production lines		centra obróbkowe machining centres	obrabiałki laserowe sterowane numerycznie numerically controlled laser machine tools	roboty i manipulatory przemysłowe industrial robots and manipulators		komputery do sterowania i regulacji procesów computers controlling and regulating processes
		automatyczne automatic	sterowane komputerem computer controlled			razem total	w tym roboty przemysłowe of which industrial robots	
				w % in %				
OGÓŁEM TOTAL	26,9	12,9	12,2	8,8	3,2	4,2	3,1	10,6
10-49 osób persons	16,8	7,4	6,4	5,1	1,7	1,2	0,9	4,9
50-249	49,6	23,6	23,7	16,6	6,4	8,4	6,1	21,2
250 osób i więcej persons and more	77,0	47,0	47,7	29,0	11,0	29,7	23,2	48,6

Source: DZIDA L., GUMIŃSKI M., ORZECOWSKA U., PIOTROWSKA J., ROZKRUT D., WEGNER M. 2015.

According to the International Federation of Robotics (IFR) 10 000 of workers are supported by 18 industrial robots. In Germany the mentioned proportion is radically different. The same number of employees in Germany is supported by 273 industrial robots. The worldwide average is approximately 58 industrial robots. The process of the automation of Polish industry is progressing very slowly. The vast majority of companies declare only partial automation. Only 4% of companies with revenue of less than 300 million PLN declares full automation of production. Among enterprises whose annual income exceeds 300 million PLN there are approximately 20% of automated enterprises.

The research findings of the Central Statistical Office indicate that approximately three quarters of industrial and service enterprises, which

in 2012-2014 have not implemented innovation, stated a lack of cogent reason for their introduction as a cause of the automation lack. Quite surprising is the fact that companies explaining their passivity within the automation, pointed primarily to the lack of good ideas for innovation. Other players considered the implementation of innovation, but encountered barriers proved to be for them to pass. Every fourth industrial company as the most significant barrier indicated lack of innovation financing from internal sources of the company.

In the case of industrial companies, the lack of personnel with the appropriate skills in the company (11.7% of non-innovative entities) was the least frequently pointed. The results of this study coincide with the conclusions of another Polish Research Institute experts (IBnGR), who in the report revealed that the greatest barrier to implementation of new technologies is not only a lack of awareness of the benefits offered by the technology, but often their own prejudices entrepreneurs. Executive production managers in Poland are still thinking about automation implementing as a high cost, which is not worth paying because the long returns. They do not take into account the possibility of development or increase the scale of the company, quality and productivity improvement, which brings advanced technology. This approach effectively reduces the competitiveness of the company and in the long run causes the slow fall. The number of robots installed in the Polish industrial plants is steadily increasing (in 2006-2013 it was noted that it was increased two and a half).

4.3. The scope and size of the investment in automation

Wider use of ICT in business activities is an opportunity to improve the competitive position of particular enterprises with lower competitive and innovative potential, which are not able to engage e.g. to conduct their own research and development and deeper cooperation with the scientific community [Whitepaper A. 2015].

Innovative activity of Polish enterprises is hampered by a number of external factors. According to a study for the years 2002-2004, the implementation of 13.3% of innovation projects encountered difficulties. Approximately 4.5% of them have not even started (have been abandoned under development concept), 3.4% were discontinued in progress, and 5.1% were severely delayed. Polish company faced some of the barriers that stopped completing the innovation implementation project, and discouraged to invest in innovation activities.

Most entrepreneurs (36.4%) confirm the lack of their own funds as a factor limiting their investment activity. The other factors limiting investment within automation and robotics are following: high innovation costs (34.5%) and the absence of external sources of financing (28.5%). Only 5.5% of entrepreneurs indicated the lack of comprehensive information on technology and markets. Summing up all kinds of research, businesses face the following barriers to investing in modern solutions (NOWICKI M. et al 2014):

- financial - the high cost of credit, limited use of public funds, the lack of a developed market for venture capital (venture capital), the high cost of R&D,
- information - no precise and generally accessible information on emerging new technologies, partners and market research, available public support,
- poor research facilities result from a failure of new technological research institutions for practical use in the economy, poor cooperation between science and business, passive attitude of scientific,
- legal and administrative - the lack of clear and transparent regulations, limited legal protection of intellectual property, the lack of regulations to stimulate business innovation performance,
- internal competence - unqualified managers, employees resistance against the introduction of new technologies, the lack of strategic planning, lack of innovation culture, limited use of possibilities for employee training,

- demand - the reluctance of customers to new technological difficulties in entering foreign markets,
- risk - high economic risks associated with the implementation of new technologies to the production process.

The size of technological gap perceived by company is related to the type of strategy chosen by the company. More than half of companies (52%) declaring the delay in comparison to its competitors focused on minimizing costs and providing attractive products mainly on price, while only 16% seeks to provide its customers with products that distinguish themselves from the competition other than the price of items. The entrepreneurs of the SME sector asked about the main barriers limiting the ability to innovate and carry out investments in new technologies usually indicate the financial aspects. High costs of such actions, combined with the lack of an obstacle by 64% of respondents. Almost every third respondent pointed to the risk of failure and uncertain demand for new products, and another 28% of entrepreneurs fear competition. Every fourth entrepreneur complains about complicated legal regulations. Problems with identifying barriers to investment are indicated by 13% of respondents. Approximately 42% of entrepreneurs indicated high costs of automation as the one of the most important barrier in the investment within automation and robotics (NOWICKI M. et al. 2014).

Somewhat less frequently mentioned as a major obstacle to a high risk of failure and the lack of sufficient financial resources. These problems often indicated persons operating in the provinces of lower investment attractiveness, and the company is currently incurring lower capital investment. Overall (at any point) the high costs are pointed in another IBnGR research by 64% of respondents, another 38% indicated the lack of sufficient own financial resources. At the same time 12% of the representatives of the SME sector as a barrier to the development of their business recognizes the existing laws and tax regulations (NOWICKI M. et al 2014).

A survey of the Institute of Market Economy Research (IBnGR) shows that companies that have not invested in industrial robots, usually

indicate a profile of its production, as the main reason for the lack of robotics in the company. This usually means that the specificity of our products or the organization of production processes at the plant requires no installation just robots.

Another frequently indicated reason for the lack of robotics is the small scale of the production. The relatively small size, or a low reproducibility of the production at the plant can cause, that the implementation of industrial robots will have no economic justification. Another frequently mentioned reason of the little interest in robots is prevailing in enterprises believe that robotics production will not bring the company additional economic benefits.

Polish entrepreneurs often do not see the need for the production automation, which usually means that the current organization and the degree of technological sophistication of the production process at the plant are in their view appropriate from the point of view of the current situation of the company. The survey of IBnGR also shows that some companies do not invest in robots, because hindered by financial barriers. Some companies in Poland did not yet have considered their robotic production lines. This method of production automation was not the subject of any analysis in close to 7% of those surveyed by the Institute of enterprises. Robotics is not taken into account generally when the specifics of production processes at the plant preclude its application. The vast majority of companies surveyed said that robotics production leads to improved competitiveness. The increase in production capacity, lower manufacturing costs and improving product quality are the main factors that improve competitive position of companies that have implemented in their facilities industrial robots. It is worth noting that none of the companies do not believe that robotics could impair the competitiveness of the plant.

The survey IBnGR also shows that some companies do not invest in the automation and industrial robots, because it is hindered by financial barriers. Some companies in Poland did not yet have considered their robotic production lines. Robotics is not taken into account generally

when the specifics of production processes at the plant preclude its application. The vast majority of companies surveyed said that robotics production leads to improved competitiveness. The increase in production capacity, lower manufacturing costs and improving product quality are the main factors that improve the competitive position of companies that have implemented in their facilities industrial robots. It is worth noting that none of the companies do not believe that robotics could impair the competitiveness of the plant.

4.4. Conclusion

The intensity of the investment activity of Polish enterprises in the production automation and industrial robotics is increasing but it is a subject to significant fluctuations. One of the main reasons for the changes in the intensity of investment in the automation and robotics are changing economic conditions, conducive to the development of new technologies in Polish enterprises or inhibiting its development. The restrictive macroeconomic policies in the first half of the 90 inhibited the development of innovative companies contributing to a substantial reduction in the number of private companies interested in investing in new technologies. A breakthrough in this area occurred in the second half of the decade, when, amongst others greater supply of credit offered by the banking sector has encouraged entrepreneurs to implement them. It should be noted that there is increasing investment intensity of Polish entrepreneurs in the various components, which are objects of technology transfer.

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THE POTENTIAL OF WOODEN HOUSES ON THE SLOVAK MARKET

Abstract: Accepting the targets of 20/20/20 of the Europe 2020 strategy we obliged to cut down gradually energy consumption, CO₂ production and to increase the ratio of renewable energy sources. As 40% of energy is consumed by buildings, there is a significant change in requirements of energy efficiency. The construction of low energy houses as for masonry or timber constructions using renewable sources of energy for heating and water heating are becoming the favoured solution. The aim of the paper is to present potential of wooden houses on the Slovak market and also at the base of own survey, the basic preferences of Slovak customers dealing with certain aspects of own housing, with a focus on wooden houses.

Key words: wooden houses, preferences marketing, product value

5.1. Introduction

At present, we often talk about the advantages of wooden buildings and their technologies. Trends in the building lead to the exploitation of natural renewable materials, and so increased interest in wood used for thousands of years. Wood as a building material is used always. The use of wood for building structures went through its development. In Slovakia, we were met with wooden buildings in the past, especially in the form of wooden houses. It was the kind of massive wood building occurring especially in rural areas. (Kujanová, 2016) In the late 19th and 20th century construction has been affected by the emergence of new building materials such as steel and concrete. Allow to realize the construction of a new generation. Work has started to evaluate the use of wood as a construction material. The Czechoslovak Republic after World

War II it was forbidden to use wood in the construction industry as a structural building material, with few exceptions. In 1967 it ended this regulation, but despite the long period of construction until now prefers silicate construction methods.

In Western Europe, the building structures of wood-based successfully used for various types of objects much larger than in our country. The wood in these areas is considered to be equivalent to material not only others, but also luxurious and wooden buildings to buy mainly solvent people with higher incomes. Modern wooden houses are equal partners brick buildings and in some parameters even exceed them. Between selected and often preferred basic advantages of wooden houses by Ružičku (2006), including: reduced cost of heating (thermal insulation), dry construction technology, comfort indoor environment, healthy eco-friendly housing, possible use of heat gains, air tightness and sound insulation, environmental aspect. Of course with the wooden houses come some disadvantages. According to Ružičku (2006), including: lower thermal-storage capability, quickly falling temperatures, shorter life compared to a brick building,. On the grounds that the building currently produce 1/3 of world production of CO₂ and consumes 40% of global energy and the share of heating makes up 60% of the effort to reduce these levels enormous. The preferred solution would therefore become the construction of buildings with low energy and friendly environment based products.

5.2. Methodology

To address the issue were used more scientific methods to enable us to achieve your objectives. When analyzing the market shares of Wooden Slovakia and comparison with selected countries, we used basic descriptive statistics based on the statistical data that we used to evaluate the various indicators of development, then we used the synthesis of the data interpretation and comparative method, we compared the market share of wooden houses in countries surveyed. In a survey on selected

characteristics of private housing we used questionnaires answered by the survey of customer preferences in their future housing solutions. The survey was conducted by consulting the electronic time frame from January to April 2016 and personal contacts at the exhibition wood buildings and wood products in Nitra. By selecting the appropriate purpose and issues with emphasis on the issues examined.

The methodology for creating the questionnaire survey was based on the creation of questions pre-defined criteria, and we have similarly inspired compilation of a questionnaire survey in the Czech Republic (Lenoch, Hlaváčková, 2015). The first set of questions concerns demographic data such as age, sex, marital status, education, place of residence, as well as additional information about the respondent as his profession, monthly income, the question of localization and the type of building in which it currently resides. The second group of issues fell 4 issues which we questioned respondents on their awareness of the timber, the relevance of this method of construction, and the advantages of wooden constructions reach the customer. The last question was this filter question whether the respondent plans in the future construction of a house. If the respondent answered in the negative it questionnaire survey for him he was over, but if answered in the affirmative continues to the third group of questions. Those concerning selected preferences, characteristics of new housing, focusing on key issues and parameters.

5.3. Research object analysis – market share of wooden houses on the Slovak market

The market share of wooden houses in Slovakia is rather difficult to predict, as the Statistical Office does not have this type of statistics, so using a variety of sources, whether or magazine publications we will try to estimate this value. Relatively detailed statistics realized wooden buildings are performing in the Czech Republic, where the rising trend of construction and moving at 10%. According to relevant source, which is in our opinion the Slovak Association of Wood Producers, it can be

stated that before 10-12 years ago, the share of wooden houses minimum of 2% and at present this value is closer to 10%. The market share of choose countries is presented in Table 5.1.

Table 5.1. The market share of wooden houses in selected countries of the world

Country	Market share
USA	From 65 % to 80%
Canada	From 55% to 65 %
States of Scandinavium	70 %
Germany	50 %
Austria	45 %
Czech republic	From 15% to 20%
Slovakia	about 10 % (The Association of wood producers in Slovakia)

Source: own study based on <http://www.stavebnictvoabyvanie.sk/>

Notwithstanding the relevance of the complete accuracy of the data it can be concluded that the share of wooden houses in Slovakia compared to other developed European countries is low. However, the growth potential is high as evidenced by the steadily increasing proportion of producers of wooden houses in Slovakia, which is moved by its own findings at more than 50. The Association of Wood Processors section of wooden houses set himself the task by 2020, achieve at least a 20% share of wooden houses term and a 30% share in 2025. Whether they are refillable objectives can be considered. However, with environmental requirements time and energy intensity of the people's interest in this kind of housing. Timber, which is friendly to nature and yet it offers the economic recovery in the form of a return to lower energy consumption offers real future in this sector.

5.4. Results

In the survey, is due to content restrictions paper, we focus only on presentation of selected data about preferences of Slovak potential customers of wooden buildings.

Questionnaire survey was attended by over 621 respondents. We had represented 60% of men and 40% women. Age structure the respondents in Figure 1 were represented as follows: the largest age group was between 26 and 35 a year in the proportions of 37%, 30% under 25 and 24% of 36-50, 8% from 51-65 and 66+ been two respondents. As regards the structure it is important to be noted that 30% were singles, 21% awarded without a child and 49% of children given. This element of course preferences at new housing plays a very important weight, because the family is one of the motivators to purchase their own housing. Educational structure was represented at a ratio of 50 to 50%, the same number of university graduates than secondary education.

In public administration and 18% worked in the private sector 82% of respondents. Structure of respondents by and age and an income are presented in Figure 5.1 and Figure 5.2 and Figure 5.3 represents a current state of the housing.

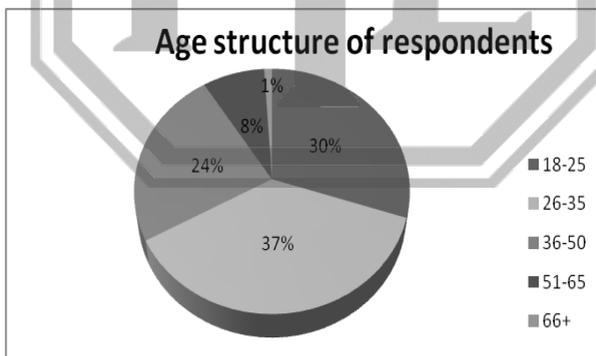


Fig. 5.1. Age structure of respondents.

Source: own study.

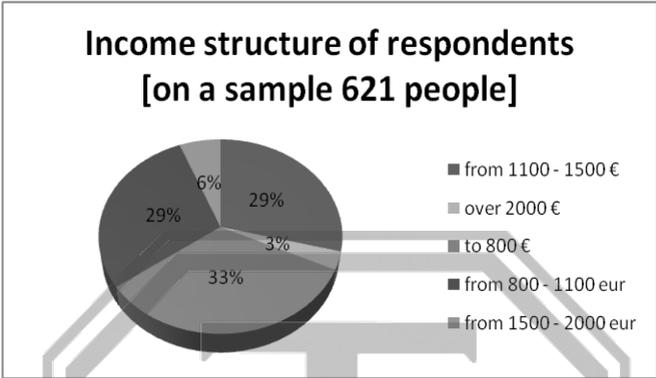


Fig.5.2. Respondents income structure.

Source: own study.

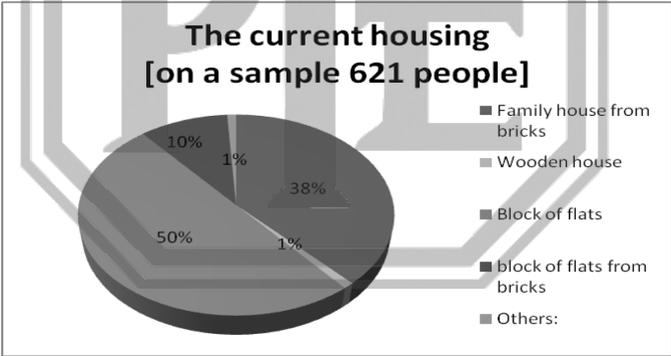
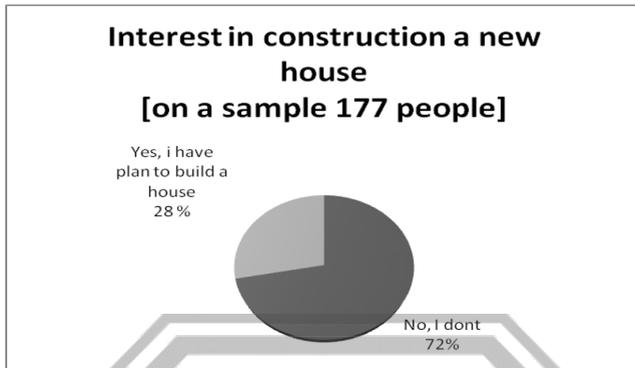


Fig. 5.3. The current housing of respondents

Source: own study.



5.4. Interest about the new house building.

Source: own study.

In the following section, we present a detailed preferences of potential customers who are planning to build a house and their preferences are important and valuable to the question whether they could wooden house as a solution to their future housing could reach out and meet the expectations of their preferences.

Figure 5.5 and Figure 5.6 show that, it is clear that more than three quarters of respondents would like to carry construction of a house in five years.

Most surveyed are willing to invest in the construction of new housing 75,000 to 100,000 €. 27% are willing to invest from 100,000 to 125,000, as compared to the prices of the available market for wooden houses is good news, as these prices are from the reality not that different even if each project should be considered separately.

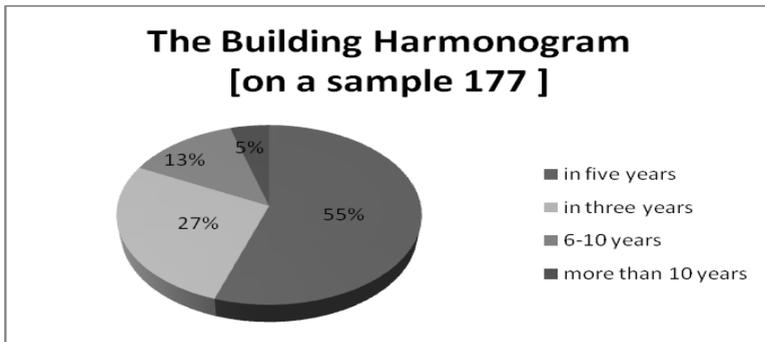


Fig. 5.5. Building harmonogram.

Source: own study.

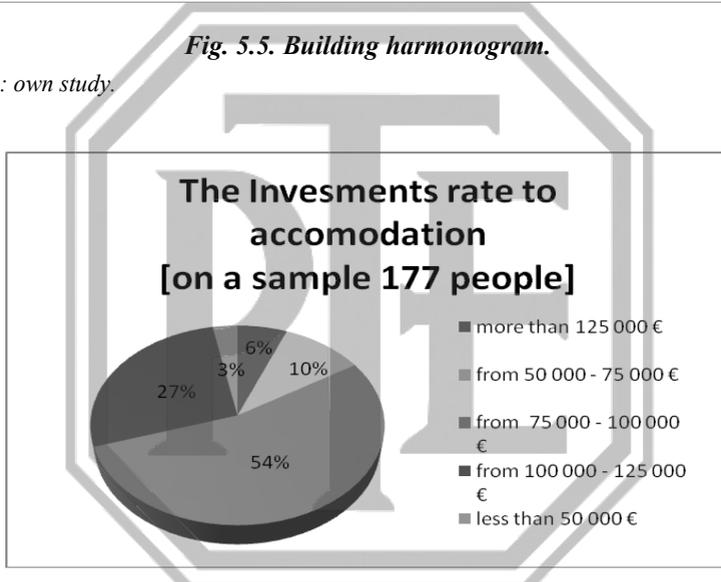


Fig. 5.6. The investment rate to accommodation.

Source: own study.

In Figures 5.7 and Figure 5.8, we can see that the potential customer prefers housing solution of 68% is suitable for him 4-bedroom house with a floor area of 121-150 square. 50% of respondents would choose to design the type of ground floor with one floor, 42% would be interested

in bungalow in Figure 5.9. A preferred type of realization was a system “on the key with the base plate” in Figure 5.10.

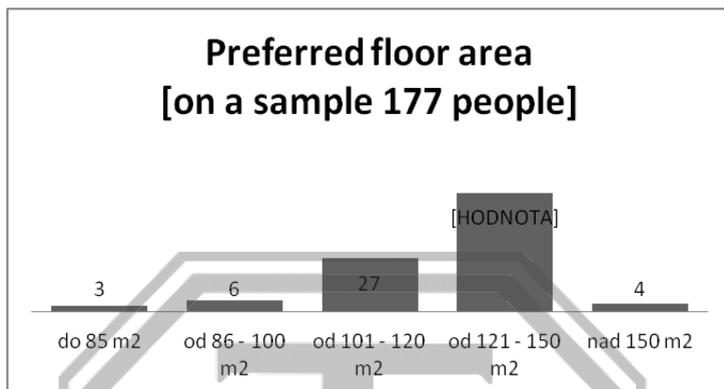


Fig 5. 7. Floor rea.

Source: own study.

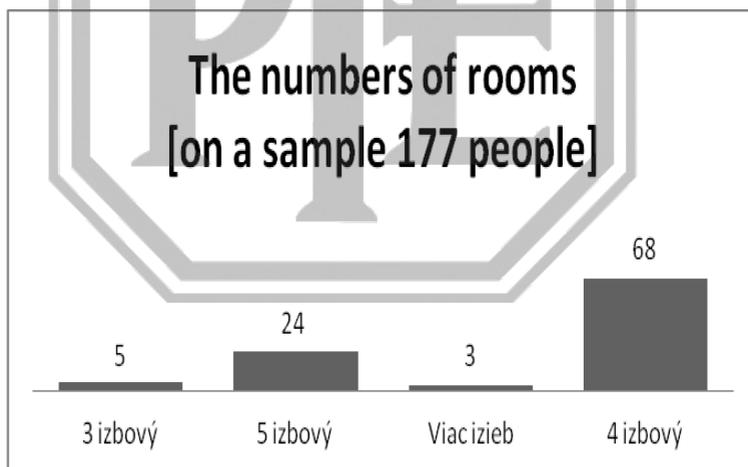


Fig. 5.8. The Numbers of rooms.

Source: own study.

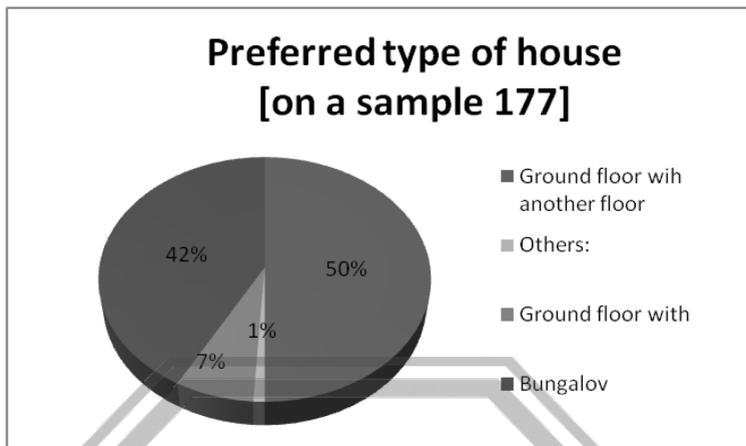


Fig. 5.9. Preferred type of house.

Source: own study.

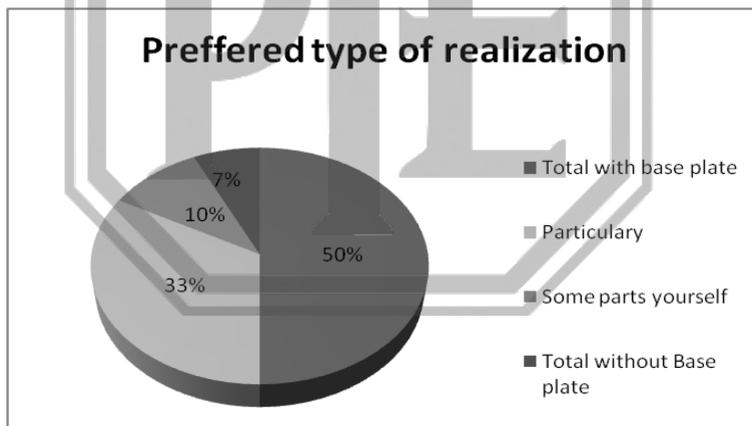


Fig. 5.10. Preferred type of realization.

Source: own study.

As for the type of construction was the most preferred panel 38%, then the part system with 26%, a pillar and log construction has reached 16 and 13% respectively. Preferred type of roof was 70% type saddle roof, over 13, 14% had hip and pent roof. To order the construction of a house materialized only 50% of respondents agreed to a third construction phase and certain parts would have made yourself.

In the last three preferential issues we found in addition to the level of knowledge producers wooden constructions in Slovakia and the type of buildings in terms of energy consumption and the potential means of financing. Type buildings in terms of energy savings has the most supporters to 70% of low-energy house, passive house 20% and 10% got a saving house. The method of financing, 75% of respondents chose the mixed form and 20% chose the real estate credit.

5.5. Conclusion

Importance of our research can be seen in a short summing up the advantages and disadvantages of wooden houses, market share of wooden houses, as well as the presentation of partial results of the questionnaire. Analysis of market share with Wooden Slovakia, we pointed to the level of wood construction in Slovakia, which unfortunately does not Slovak Republic accurate statistics. The trend is clearly growing for the last 10 years from 2 to 10%. The trend should be sustainable and market share growth should support and raising awareness only grow, and could reach 20% already in 2020. Among the specific threat to future growth is not all producers and meet the quality parameters. This phenomenon can affect the market negatively, whether negative references dissatisfied customers or loss of orientation in the market for a new customer, what it can deter interest. ZSDSR quality mark partially solves this problem. Certificate awarded skilled in the art should inspire confidence in the eyes of potential customers. This measure should ensure that the customer will be sure to ensure quality construction of wooden buildings from the performance to the actual operation.

The survey pointed out that the preferred potential customers, even though the sample was not statistically representative enough. Nevertheless, we managed to get the knowledge for a database of customer preferences. After the above facts it is clear that the wooden houses have great potential in the Slovak market by meeting and according to a survey carried out by consumer preferences such as low construction time, lower energy costs for operation and, last but not least it is a healthy and environmentally friendly form of housing, however this potential is unfulfilled.

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ECONOMIC ASPECTS OF SMALL ENTERPRISES ACTIVITY IN POLAND

Abstract: This chapter concerns issues of economic aspects of enterprises activity in the small business sector and the conditions of small businesses development. The aim of the research is to determine the economic aspects, which are one of the key factors of enterprise competitiveness. A chapter contains a brief summary of the research issues related with enterprise activity and its economic problems.

Key words: small enterprise, development, innovation, barriers

6.1. Introduction

Contemporary enterprises conduct their activity in the dynamically changing environment due to consumers' requirements, integration of markets and increase the competitiveness of other businesses.

The small business sector has become a major factor in the dynamic and stable economic development. Currently, small business, in order to fight the energetic and an unpredictable its existing technological capabilities, looking for new innovative solutions that often exceed its existing technological capabilities. Innovation in small enterprises are understood to be progressive in the field of techniques and methods modification in the creative processes concerning products and services and leading to increasing the efficiency of the resources available in the organization, fulfilling the wishes and criteria of the conscious consumer (NOWAK-FAR A. 2010).

There in the chapter it is hypothesized that the flow of information between business institutions and funding bodies, businesses and local entrepreneurs is very weak. Ignorance and lack of participation of small businesses in the local market entrepreneurship leads to blocking the small businesses development. Considering the fact that the strategy of any enterprise is based on maximizing its value and reaching the best position on the market there were presented economic aspects of the key factors in gaining qualitative and quantitative advantage in the free market economy.

6.2. Characteristics of SMEs

Activity of any enterprise is related with benefits for its environment and it is aimed at customers' requirements fulfilment. It is a process that involves the exchange of products or services with other entities or individuals on the basis of sale. It applies to both the supply processes of companies for the production and sales processes of products or services. Every company has certain capital resources, derived usually from the owner, in the form of tangible and intangible assets. As a unit focused on the profit, its objective is to generate a profit, seeks thus to maximize the income from invested capital. These attributes is characterized by any company, regardless of size (SUDOL S. 2002).

Small and medium-sized enterprises are characterized by the personal autonomy of the entrepreneur, which means that at the same time it is focused on the capital and the management functions and company management. The owner of such enterprise is also usually the manager who alone sets the rules of the enterprise, seeking to implement his own plans. Revenues from operations is essential for the entrepreneur, and often the only source of income. Responsibility for decisions belongs to the company owner, who bears entire risk. The owner usually works based on his own intuition or on the basis of information obtained from the closest environment (PIOCHA S., GABRYSZAK R.2008).

A characteristic feature of small and medium-sized enterprises is the economic and legal independence. Such companies are independent of large corporations operate on the basis of their own plans, striving to achieve their own goals, often taking a huge financial risk. They are characterized by great freedom of action, great flexibility in adapting to market conditions, fast and simplified decision-making and the persistence and consistency in achieving those objectives. The large self-reliance and independence in taking action allows the use of available resources and enriches the company that makes mobile business, creative, and creative. Unfortunately, the low financial resources, human and production limited growth opportunities, focus on a single product, which has no chance to enter the broader market (SIPA M. 2013).

Area of operation of small and medium-sized enterprises is usually relatively small. It is usually a local, sometimes regional, but rarely the SMEs activity area is extended beyond the region borders. These companies are mostly geared to meet the needs of the individual customer. A characteristic feature of small and medium-sized enterprises is a very good knowledge of their customers' requirements, the high flexibility and the ability to meet the needs of consumers. SME customers are not only the ultimate consumers, but also competitive firms located in the same area of operation. Success of SME depends on contacts with the environment. Personal contacts with business partners produce mutual trust and the exchange of information, which contributes to the ability to react quickly to changes in the market (DURAJ J. 2000).

The course of the work processes, that is determined by personal relations and relations, has a positive influence on improving the work atmosphere, employee motivation and loyalty. Personal relationships within the company constitute asset to the company on the market to fight competition, because the employee and the customer have a personal contact with the owner. The company is focused on one product or service and can address individual customer requests (SMOLAREK M. 2008).

Financing of small and medium-sized enterprises is usually carried out by means of own capital, that is, from the entrepreneur's own funds, often collected over the years, the savings from the funds of his family and personal loans entrepreneur. Enterprise activity also financed by foreign capital that comes mainly from the bank loans, which is not easy to obtain. The possibility of obtaining credit is limited or impossible, especially when a loan requires a lot of paperwork, fees and loan rates are higher, the procedures are lengthy and complex. These companies do not have direct access to the capital market, causing a lack of financial capacity (SMOLAREK M., DZIĘDZIORA J. 2011; OKRĘGLICKA M., LEMAŃSKA-MAJDIK A. 2015).

Small companies can implement innovations at a lower cost than large companies, and therefore they are characterized by a high innovation level. Due to the small scale of the production and individual customers small and medium-sized companies can seek new technical, organizational, technological solutions and methods for efficient use of labour and means of the production. Innovativeness of SME's affects their great diversity, each with its individual, specific innovative behaviour. Therefore, such enterprises may have a competitive advantage in the market, particularly in terms of rapid response to changing market requirements, without extensive management structure, use of business opportunities, quick to take risks, the rational flow of information, better use of specialists, rapid exploitation of innovation, easy-going in cooperation, quickly organize jobs, use the conditions to increase funds from institutions supporting local economic development (PACHURA A. 2014).

6.3. Determinants of small enterprises development

The activity of each enterprise is associated with its occurrence in the market and introduction of its products and services. The development of enterprise is significantly affected by macroeconomic and microeconomic factors related to changes in the environment. Recent years there is noted

an intense increase in the number of small and medium enterprises and a significant impact of this sector on GDP growth and employment in the national economy (SIUTKA-TOKARSKA B. 2008).

Microeconomic determinants that make up the rich list of growth factors, have been divided into two groups: factors associated with the person of the owner-manager and the factors associated with the company (system management, enterprise resources, local conditions, supplier and customer and competition). Among the factors of personal growth of the company reflects the personal success of entrepreneurs, thus its development is determined by personality traits model, expanding its operations manager (SIPA M. 2015).

According to research, factors determining entrepreneurial activity are related to gender, age, education, occupation, experience and education. The research shows that younger owners to engage in the development of the company with more energy, devote more time to the enterprise, but they have no experience and do not have borrowing powers. People have the ability to mature credit can benefit from the experience gained, but they are characterized by greater caution and less prone to take risks (SMOLAREK M. 2015).

Microeconomic factors determining the development of small and medium-sized enterprises are also entrepreneurial and management system as a process of creating a new product, assuming their financial risks. Own initiative and taken the risk of bearing result in the form of profit and personal satisfaction (SIUTKA-TOKARSKA B. 2008).

Funding with equity guarantees autonomy, independence, high reliability of the company enforces a strong motivation of the owner, and the gain is not distributed with external entities. The owners are reluctant to make use of external financing. The initial growth phase are financed mostly from own savings and money from family and friends (SMOLAREK M. 2015).

Another factor strongly affecting the development of companies is a competition, which is defined as companies compete for markets, labour, commodity markets and the implementation of innovations. The main

aim of the company is to gain competitive advantage and achieve the greatest benefits. Competition is a strong factor affecting the company and its development. It requires businesses make strategic and organizational decisions and the flexibility and speed of action. It also has a big impact for the operation and development of the company and on the market and its players (SIUTKA-TOKARSKA B. 2008).

In the literature there are criteria for the classification of the barriers of small and medium-sized companies development. One such classification (G. Garofoly) is the division of the barriers due to the time into barriers to entry and barriers to development. Barriers to entry occur at establishment and they are associated with the occurrence of the company on the market. These barriers include unclear regulations, incompetence and corruption of officials, bad economic situation, insufficient demand, patent rights, and the high investment costs. Whereas a barrier of development are related to the company, which already exists in the market and they are related to the different stages of the life cycle of the company.

These barriers appear at a critical point of survival, at the moment of transition from the phase of growth or its collapse. In various stages of development company meet barriers associated with the demand for financial capital, human capital, information resources and premises (SMOLAREK M. 2015).

Together with the development the enterprises financial needs and funding opportunities are growing, but not always the organization is sufficiently developed to be credible to the bank and get a loan. The barrier is limited demand resulting from a natural market economy. Its weakness is in the good times, and the gain during the economic recession.

6.4. Economic aspects – research results

The aim of the study was to present different diagnoses of the condition and prospects of small enterprises development and

fundamental problems. In this regard, it was hypothesized that ignorance and lack of participation of the SME sector enterprises in the local market entrepreneurship leads to blocking the development of small businesses.

In Poland in 2014 there were noted 1.77 million of non-financial companies known as the company active. Small and medium enterprises are approximately 99.8% of those entities. Data for the last 18 years are shown in Figure 6.1. The number of active enterprises is increasing (from approx. 1.58 million in 1997 to over 1.77 million in 2013), with the largest increase in the number of companies recorded in the years 1998-1999). In 2013, in comparison with 2012, a value of this indicator decreased by 1.3%.



Fig. 6.1. The number of companies in Poland in 1997-2013 (in thousands).

Source: own elaboration based on GUS *Działalność przedsiębiorstw niefinansowych (lata 2004–2013)* oraz danych GUS wykorzystanych w *Raportach o stanie sektora MSP (lata 1999–2003)*.

In comparison with other EU countries, Poland is on the sixth place in terms of the enterprises' number (according to Eurostat there are 1.5 million). In total, EU there are approximately 22 million of enterprises (majority of them are located in Italy what is approximately two and a half times more than in Poland). A similar number of companies as in Poland is noted in the United Kingdom (1.7 million). However, the only number of companies which is important, is not enough when the entrepreneurial potential of the country in the context of the number of

companies should be evaluated. A better indicator is the reference number of companies to the population in a given country. It turns out that the result of 40 companies per 1,000 inhabitants engaged 19 in the EU. The highest value of this indicator is indicated in: the Czech Republic (96), Portugal (75), Slovakia (74), Sweden (70) and Greece (66). The smallest businesses per 1000 inhabitants are noted in: Romania (21), Germany (27) and Britain (27) shown in Figure 6.2.

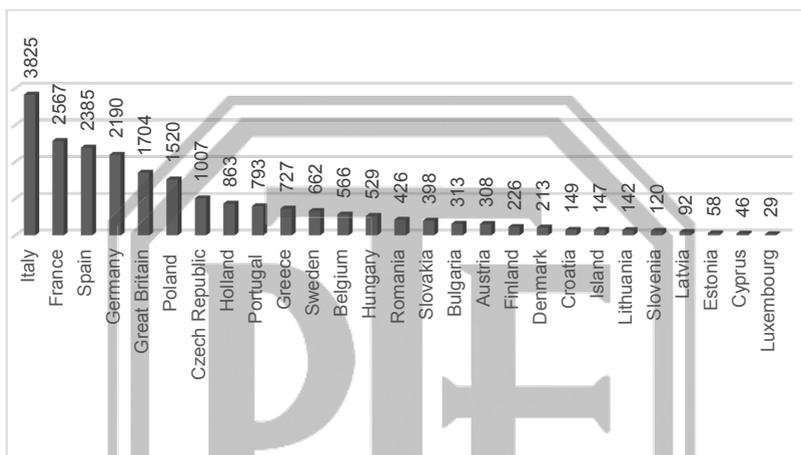


Fig. 6.2. Number of enterprises in Poland and selected EU countries in 2012 (in thousands).

Source: based on Raport o stanie sektora małych i średnich przedsiębiorstw w Polsce w latach 2013-2014.

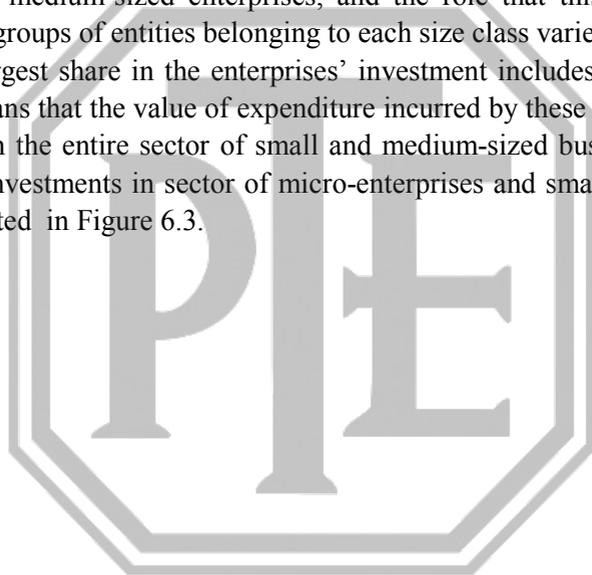
Small and medium-sized enterprises acting on the market today face significant risks and barriers that hinder the development of the SME sector, which negatively affects the development of the entire economy.

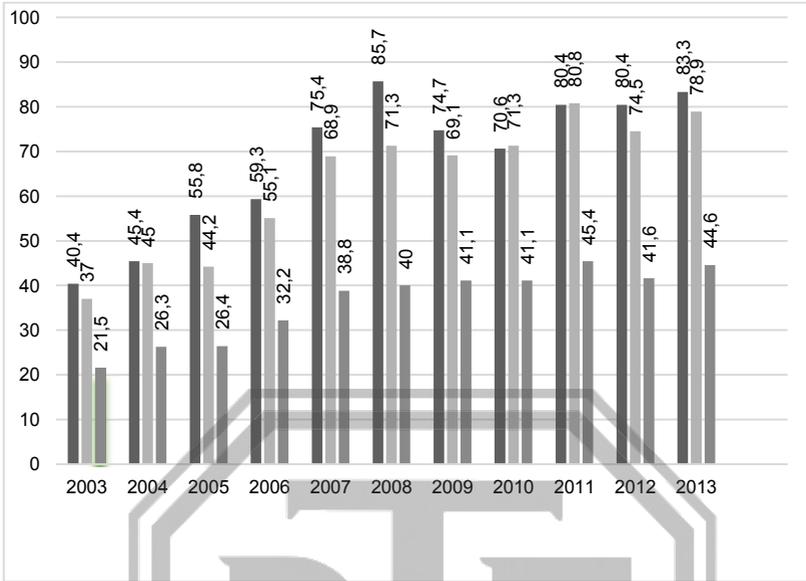
In 2013, the SME sector as a whole for the first time since 2004, recorded a slightly faster revenue growth than large companies. Small and micro enterprises recorded similarly low, but positive growth in revenues compared to the previous year, the decrease in revenues was seen in the group of medium-sized companies. As for the other indicators: profitability and liquidity - similar falls were observed in

SMEs and large enterprises. Prospects for next year were noted as a better. A strong correlation between GDP and revenues of companies indicate that 2014 noted an increase in financial performance both in the small and medium-sized businesses, and large enterprises.

The population of the enterprises, where a foreign capital was included, was admittedly small compared to the entire population of non-financial enterprises, but steadily to widen, and its participation in the labour market, income earned by the company or its business investment was already much larger. Growing involvement of foreign capital in Polish economy was also reflected in increasing its share in the sector of small and medium-sized enterprises, and the role that this capital has played in groups of entities belonging to each size class varied widely.

The largest share in the enterprises' investment includes big players, which means that the value of expenditure incurred by these companies is larger than the entire sector of small and medium-sized businesses. The smallest investments in sector of micro-enterprises and small enterprises are presented in Figure 6.3.





- Capital expenditures in large enterprises (billion PLN)
- Capital expenditures in SME enterprises in total (billion PLN)
- Capital expenditures for one company SME (in thousands PLN)

Fig. 6.3. Capital expenditures of the SME sector in total (billion zł) and one company (in thousands PLN) and capital expenditures in large enterprises (billion PLN) in Poland in 2003-2013.

Source: based on Raport o stanie sektora małych i średnich przedsiębiorstw w Polsce w latach 2013-2014.

Undoubtedly, one of the most important determinants of the formation of new economic activities is the desire to make a profit. This objective is not always achieved. According to Euler Hermes report, only in April 2013 in Poland 88 of enterprises' bankruptcy was noted which employing over 4 thousands of employees. Figure 6.4 shows the motives of enterprise establishment.

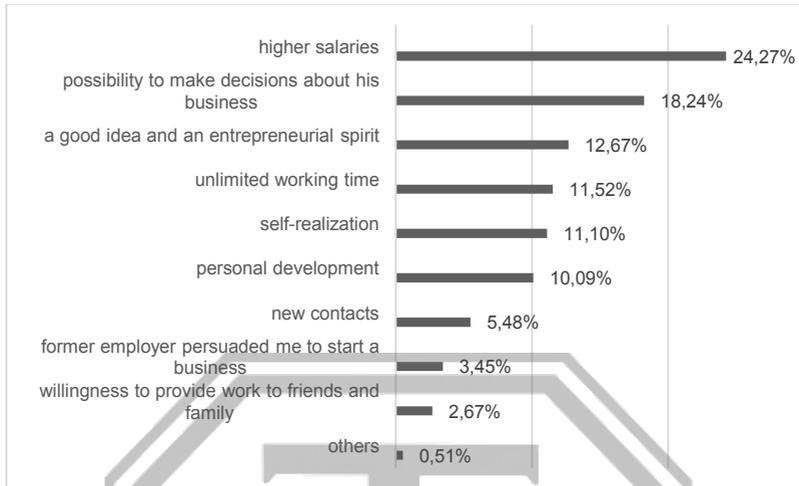


Fig. 6.4. The motives of setting up a business.

Source: Tex Care research including 1018 respondents who set up their business.

Another field of the business sector importance for Polish economy is the labour market. According to data from the Central Statistical Office in Poland, the number of people working in the national economy is 14.2 million (data for 2013), compared with the previous year it increased slightly (0.5%). In the private sector there was noted an increase in the number of employees by 1.2%, while there was noted decrease in the public sector (by 1.5%). Over the last five years (2009-2013) the number of people working in the national economy increased by 3.4%. The structure of employment in enterprises is shown in Figure 6.5 and Table 6.1.

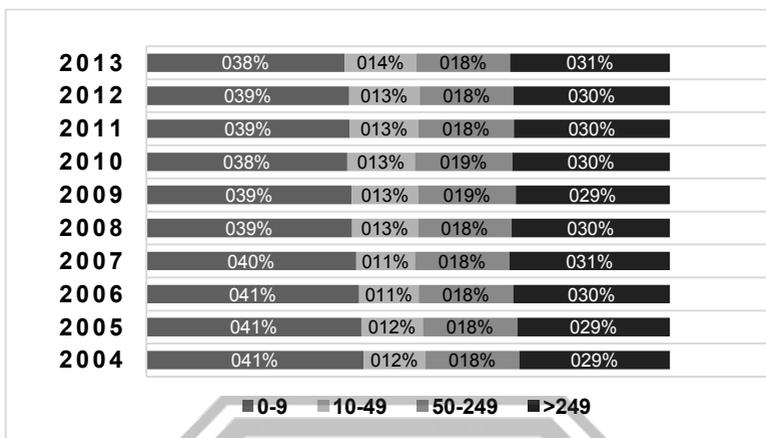


Fig. 6.5. Structure of the number of persons employed in enterprises in Poland in 2004-2013

Source: based on *Raport o stanie sektora małych i średnich przedsiębiorstw w Polsce w latach 2013-2014*.

Table 6.1. Employed in enterprises in Poland and in the EU according to size classes (share in total enterprises in%, data for 2012)

	Poland	UE-28 (average)	Difference between
Micro-enterprises	36,8%	29,5%	+ 7,3 p.p.
Small enterprises	13,4%	20,5%	-7,1 p.p.
Medium enterprises	18,8%	17,1%	+ 1,7 p.p.
Large enterprises	30,9%	32,8%	-1,9 p.p.
SME in total	69,0%	67,2%	+1,8 p.p.

Source: based on *Raport o stanie sektora małych i średnich przedsiębiorstw w Polsce w latach 2013-2014*.

Data presented in Figure 6.5 and Table 6.1 present relative dispersion of entrepreneurial potential in Poland in comparison with the EU. Note the relatively large number of companies per 1,000 inhabitants, while the

companies are small (average number of employees per company in Poland is 5.5 persons in the EU - 6.1 persons), with a fairly significant share of the employed, owning and helping family members , with a small share of full-time employees.

The following analysis shows the following phenomena. Firstly, the Polish labour market is to a greater extent than in the EU is dominated by micro-enterprises, which create most jobs of all the groups of companies. At the same time the labour market is unsatisfied with jobs created by small businesses in relation to the average situation in the EU. Secondly, the high share of micro enterprises in the number of employees in enterprises does not translate into the development of added value at the level of the EU average, reflecting the lower productivity of micro-entities in Poland. Perhaps this is due in part to the large share of self-employed in this group and generally lower than the EU average-sized enterprises in Poland. Thirdly, against this background there is noted growing role of large companies in Poland than in the EU.

6.5. Conclusions

Enterprises SMEs are exposed to a number of barriers to their development. Their source is in most cases the existing system of law. The Polish legislation does not set that would be addressed exclusively to SMEs. There are solutions, but they are hidden in various legal acts. Analysis of the SME sector shows that the upward trend over the nineties were stalled in 2000. The first time there was noted a reduced number of active small and medium-sized enterprises, decreased profitability of gross turnover and the number of people working in small and medium-sized enterprises. It should be underlined that the success of Polish economy, reduction of unemployment, increase competitiveness on EU markets and improving public sentiment are inseparably connected with development of small and medium-sized enterprises.

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GROWING NEURAL GAS FOR COMPARITIVE POLICY ANALYSIS. BUDGET COMPOSITION CASE STUDY

Abstract: This Since the sixties more empirical and inferential paradigm has been advocated for comparative policy analysis. However, data-driven evaluation of theoretical concepts and theories still gets less attention than deserved. Nowadays the abundance and availability of data is unprecedented in history and in an attempt to answer the need for evaluation tools we propose application of a Growing Neural Gas (GNG) clustering method for grouping economies. The method falls into the broad category of machine learning algorithms. GNG is applied to budget structure typology problem. We argue that the achieved results follow certain intuitively desired properties and the general method may be of use for testing and developing meaningful socio-economical classifications.

Key words: Growing Neural Gas, clustering, budget composition

7.1. Introduction

Good governance is a complex task and crafting and evaluating policies is in its core. It is performed all the time by politicians, councils and other governing bodies. Still, it is difficult to perform policy evaluation efficiently. There are many factors to take into account and a researcher has to be careful not to base the analysis on weak foundations. One of primary tools an analyst uses are comparisons and classifications. Then, there is a need for a way of setting right benchmarks.

The benchmarks can be set based on various principles, a natural one is to draw from some kind of classification. Social sciences thrive on classifications, groupings and typologies, that have often been created

based on expert knowledge gained over the years by researchers. Those typologies, such as Varieties of Capitalism classification (Hall & Soskice, 2001) spring out of theory and often establish some kind of an “ideal” type that real entities, such as countries or economies should resemble.

The recent outburst of quality and quantity of collected data is an incentive for taking a more data-driven approach. Social scientists are becoming more comfortable with analytical techniques and harness the power of data for validating theoretical classifications or developing them from scratch. There is also abundance of statistical and machine learning tools which enable such scientific activity.

In this paper we discuss the use of Growing Neural Gas (GNG) for clustering of economies. GNG is an algorithm which can perform unsupervised clustering without explicitly specifying the number of clusters prior to analysis. We consider this as an advantage, as we would like to obtain a clustering organically, without imposing too many constrains.

One of the relatively less studied problems in political economy and public policy domains is the one of budget structure, especially typology and similarities between budgets of particular countries. The main lines of research are concerned with either isolated parts of total expenditure or volumes of government income and spending. Some research has been done in analysing causes for structure of public expenditure, e.g. (Tridimas, 2001), but to authors knowledge there is no widely adopted budget structure typology. Such a classifications could be useful not only for academic purposes, but also to policy makers and analysts, especially now, when the world is troubled by recurring crises.

The aim of this paper is to apply the state-of-the art data analytic technique to budget composition problem. Obtained classification can be of use for comparative policy analysis and finding right benchmarks. The rest of the article is organised as follows: in the next two sections we discuss clustering methods used in economics to date and present Growing Neural Gas algorithm. A brief review of research in budget

structures follows. The last sections of this work describe the dataset used in the case study and present its results.

7.2. Clustering methodology in economics

In economics, as well as in other social sciences, observations are gathered on a massive scale. They have been grouped into clusters for decades, in order to explain interdependencies and events. Nowadays however, we observe a data-driven shift in methods of obtaining these groupings, clustering and classifications.

Until recently, groupings in economics have been heavily dependent on theoretical constructs. Famous classifications such as the “Three Worlds of Welfare Capitalism (Esping-Andersen, 1990) or “Varieties of Capitalism” (Hall & Soskice, 2001) can be considered examples of theory-driven classifications. They were usually created by coining a category (e.g. Liberal market economy) based on several theoretical properties with objects (real economies) assigned to these categories based on experience and expert judgement.

In the following research a number of problems inherent to this approach have been pinpointed. As the objects are classified by expert knowledge, there is an issue of differences of opinion between experts. This can be especially noticeable with objects that are not an obvious candidates to a particular class. Recently, more research has been directed towards testing these theoretical classification against data, see e.g. (Ahlquist & Breuning, 2012). These model-based clusterings assume some prior knowledge of the number and characteristic of classes and use probabilistic and statistical methods to fit the predefined model to data.

Another line of research, e.g. (Resta, 2009), (Koutsoukis, 2015) or (Chudziak, 2016) is to use some of the plethora of modern data science or machine learning techniques to economic data. This line is more exploratory in nature, which can be a drawback when discussing theory, but can be more beneficial considering applications, among others, to policy analysis. The use of so-called “black-box” methods comes handy,

when hypotheses are not known before experiments. The applications range from design of early warning systems, devising ad-hoc classifications to finding benchmarks. The Growing Neural Gas will fall to this category, as an unsupervised, self-organising algorithm.

7.3. Growing Neural Gas

There are various algorithms which perform clustering and many of them have been applied by social scientists. Among the most common ones there are such as k -means, hierarchical clustering or model based clusterings. Growing Neural Gas is an algorithm designed by (Fritzke, 1995) stemming from previous work on Neural Gas by (Martinetz & Schulten, 1991). It is a technique inspired by self-organising algorithms which enable dimension reduction at the same time as topology preservation. The result of a trained Growing Neural Gas is an undirected graph, which nodes are equipped with vectors (called weight vectors) in the feature space. The graph is to be considered as a discretization of the probability distribution of data and an approximation of its topology.

We will provide a gist of how the algorithm works. For a full description we refer the reader to (Fritzke, 1995). The GNG starts with two connected nodes, each one equipped with a weight vector in the feature space. The training data points are supplied to the algorithm in random order one by one. The nearest node together with all its topological neighbours are moved in the feature space towards the signal. Once every a certain number of steps a new node is added and edges of the graph are corrected on every step.

The Growing Neural Gas algorithm is implemented in many modern programming languages and environments, such as R, Python or Matlab. For this article we used the implementation for R statistical computing environment from the `gmum.r` package (GMUM).

7.4. Budget structure literature

For our case study we chose to analyse similarities in budget structures of countries. It has been noted before, that this subject is surprisingly underresearched (Tridimas, 2001) and in authors opinion much is still to do in this area. To authors knowledge there is no work attempting to classify budget types. Use of such classifications are twofold, on one hand it allows to quickly compare budget structures among countries which combined with other tools could help assess impact of some macroeconomic decisions on the general state of economy, on the other help creating a typology, which would structure our knowledge.

The current turbulent times for the global economy caused significant changes in income and expenditures of many countries. Some have seen dramatic spending cuts, while others decided that public spending has to be sustained on a significant level. The differences among countries expenditure policies are easily noticeable, which makes it a great occasion for examining budget structures and trying to develop classifications or make comparisons.

There has been of course previous literature on the subject, mainly focused on explaining budget structures (in particular the structure of national expenditure) in analogue to consumer theory. The usual setup is of politicians maximising voters utility or political influence function with respect to a budget constraint. This line of research is represented for example by (Tridimas, 2001). Another way of looking at the subject seen in the literature is to view it as a collective choice problem, e.g. (Creedy & Moslehi, 2009). This way the structure of budget is strictly connected to voting procedures. These models have great explanatory value, as they derive systems of demand equations which in return describe decisions made by politicians on expenditure. Another lines of research can be represented by (Lago-Peñas & Lago-Peñas, 2009) or (Potrafke, 2011), which investigate the influence of political systems characteristics and ideology on budget composition. None of the described approaches

however, provide a systemic way of looking at the entirety of types of expenditure and budget structures.

7.5. Data

Data for the case study comes from the World Development Indicators (WDI) dataset. It is a dataset collected and maintained by the World Bank, updated yearly. For our analysis we chose 25 indicators describing budget structure for 53 countries. Chosen variables can be observed in Table 6.1. We decided to pick data from year 2012, for their completeness. We perform a snapshot analysis not involving temporal components such as change of a parameter over the years etc.

Table 6.1. Used variables

Current account balance (% of GDP)	Final consumption expenditure, etc. (% of GDP)	Services, etc., value added (% of GDP)
Bank nonperforming loans to total gross loans (%)	Gross national expenditure (% of GDP)	Total natural resources rents (% of GDP)
Inflation, consumer prices (annual %)	Exports of goods and services (% of GDP)	Gross domestic savings (% of GDP)
Current account balance (% of GDP)	Final consumption expenditure, etc. (% of GDP)	Services, etc., value added (% of GDP)
Cash surplus/deficit (% of GDP)	Gross capital formation (% of GDP)	Health expenditure, total (% of GDP)
Social contributions (% of revenue)	Imports of goods and services (% of GDP)	
Tax revenue (% of GDP)	Trade (% of GDP)	
Expense (% of GDP)	Agriculture, value added (% of GDP)	

Subsidies and other transfers (% of expense)	Manufacturing, value added (% of GDP)	
Military expenditure (% of GDP)	Industry, value added (% of GDP)	

7.6. Case study results

We used the dataset described in the previous section to perform a budget composition clustering case study. We are interested whether classifications created by the Growing Neural Gas algorithm can be used for searching for benchmarks and creating typologies. This is an open-ended problem and its difficulty is that there are no objective measures of evaluating the quality of classification for objects for which the classes are not a priori known. Clustering is an exploratory technique and we can only compute some statistics about the clustering or compare it to others. However, there is no evident measure of success. Thus our results have to be treated as preliminary and not definitive.

We performed the experiments using the Growing Neural Gas algorithm implementation in the `gmum.r` package for R (GMUM). We used default algorithm parameters¹ and performed 5000 iterations of algorithm for each experiment. One parameter that was varied was the maximal number of nodes. As there is a limited amount of data points, the number of nodes plays an important role. In the Growing Neural Gas algorithm clustering is performed on the “closest-node” basis. That means nodes are defined as centres of clusters and objects (countries) are assigned to the node closest to it in the feature space. Because the number of observations is low, if the number of nodes was too high, most of the clusters would consist of only one country. We will present two experimental clustering, which come from different runs of algorithm with different maximal number of nodes in the GNG graph.

Table 6.2 presents a clustering obtained using Growing Neural Gas with a maximal number of nodes set to 9. The result is nine clusters,

¹ parameters $\alpha = 0.5$, $\beta = 0.99$ and the maximal edge age equal to 200

differing heavily by size. As there are 53 countries, using only nine nodes affected density of clustering and forced more compact classification. The question remains if this clustering stands to reason and if there are economic features which help explain the clustering.

We can observe some economic regularities in the clustering. First, note that more often than not countries of similar level of wealth are grouped together. Rich western countries tend to be clustered together, e.g. in clusters 3,7 or 9. On the other hand, lower income countries can be found in clusters such as 5 or 8. It is interesting, as in the data there is no direct indication of the level of income, only the budget structure (see Table 6.1). This reinforces a natural assumption that budget structures change with country wealth. Secondly, clearest outliers, such as the poorest countries Afghanistan and Mozambique are grouped together. On the other end of the scale is Luxembourg, which is the only country in cluster 2. Also, countries for which natural resources constitute a significant amount of exports, such as Chile (exporter of copper), Colombia, Norway or Russia (all are oil and gas exporters), can be seen clustered together in cluster 4. All this economic insights show sensibility of such classification and encourage further investigation.

*Table 6.2. Clusters obtained using GNG
with maximal number of nodes equal to 9*

Cluster	Countries
1	Afghanistan Mozambique
2	Luxembourg
3	Brazil Cyprus Denmark France United Kingdom Greece Croatia Iceland Italy Portugal South Africa
4	Chile Colombia Norway Peru Russia
5	India Kenya Tanzania
6	Armenia Guatemala Honduras Morocco Mauritius Paraguay El Salvador Thailand Tunisia Turkey Uruguay
7	Austria Germany Spain Finland Japan Latvia Netherlands Poland Sweden United States
8	Bosnia and Herzegovina Jordan Moldova Macedonia Serbia Ukraine
9	Belgium Czech Republic Estonia Hungary Ireland Lithuania Romania Slovak Republic Slovenia

**Table 6.3. Clusters obtained using GNG
with maximal number of nodes equal to 20**

Cluster	Countries
1	Brazil Colombia Japan United States
2	Luxembourg
3	Mozambique
4	Honduras Mauritius Thailand
5	Lithuania
6	Austria Germany Finland Poland Sweden
7	Ireland
8	Afghanistan
9	Bosnia and Herzegovina Macedonia Serbia Tunisia Ukraine
10	Chile India Norway Peru Russia
11	Cyprus Denmark Iceland Paraguay
12	Spain France Greece Italy Portugal
13	Czech Republic Latvia Netherlands Slovenia
14	Armenia Guatemala Kenya El Salvador Tanzania
15	Jordan Moldova
16	Croatia Morocco Romania
17	Belgium Estonia Hungary Slovak Republic
18	United Kingdom Turkey Uruguay South Africa

The natural question is how the results would change if we altered the maximal number of nodes in the GNG graph. For comparison we run the experiment with this parameter set to 20, see Table 6.3 for results. The algorithm returned 18 clusters. Note that the clustering obtained is not subordinate to the previous one. Clusters in Table 6.3 are similar, yet not entirely in accord with clusters from Table 6.2. This result is curious, but not entirely unexpected. The effect of using more nodes is that same cloud of points can be approximated by a bigger number of nodes. Thus countries previously assigned to different clusters may end now in the same class.

Let us however discuss briefly what is similar to previous case and what insights can we get from this take. Clearly, we have more clusters of

smaller size, especially of size one. However, a number of smaller yet meaningful clusters are to be observed. In cluster number 12 there are Spain, France, Greece, Italy and Portugal, southern European countries severely hit by the recent crisis. Also again, Chile, Norway and Russia are in the same cluster.

The exploratory character of clustering when classes are not clearly defined make these results difficult to evaluate. Also, the differences between clusterings dependent on parameters are to be expected. To get a full picture of similarities it may be necessary to conduct analyses using a number of different sizes of the GNG graph. Nonetheless, the economic features observed are encouraging for use of the method. We obtained some indication of similarities and hence indication for choosing benchmarks. In author's opinion classifications such as presented above, can serve as a good auxiliary tool for policy analysts.

7.7. Conclusions

We have performed a case study of usability of Growing Neural Gas algorithm to clustering budget structures. We used data from the World Bank Indicators database for 53 countries and 23 variables in 2012. The lack of theoretical typology in budget structure literature encourages research in this area. The other driver is the need for finding right benchmarks for policy analysis and in other cases, when such a benchmark is needed.

The results obtained followed certain patterns, such as grouping natural-resources economies together, or taking wealth of countries into account despite lack of direct wealth or income describing variable among chosen features. We treat our result as preliminary en route to two goals. Setting a budget structure typology and establishing clustering toolbox for policy analysts.

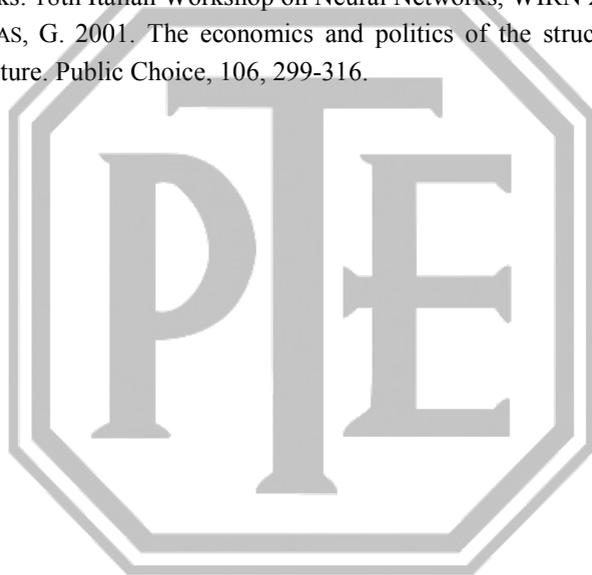
The directions for future research follow those two goals. The first would be to further explore possibilities that modern data science creates

for social scientists in terms of available tools and algorithms. The other to push further towards creating a typology of budget composition types.

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OUTSOURCING OF KNOWLEDGE MANAGEMENT

Abstract: The knowledge economy has a major impact on national prosperity, employment, business and personal success. This all depends on the ability of social groups or individuals who make use of existing knowledge and also apply new knowledge into decision-making processes. These abilities determine the business success in the global competition. This also affects the effectiveness of teams within the company's performance and chances of individuals to become leaders. Since the Industrial Revolution, we can talk about the exponential growth of science and practical knowledge. In recent years this process began to show an increasing trend, thanks to the media, information and communication technologies. These circumstances contributed to the creation of knowledge management, has been identified as a source of vital skills of the organization, leading to a successful competition policy and positions. One of the alternatives to improve the level of knowledge management is utilization the principle of outsourcing, thus services provision of external specialized company. The aim of this paper is to present the benefits and risks of the outsourcing of knowledge management.

Key words: outsourcing, knowledge management

8.1. Introduction

Knowledge management can be easily defined as a scheme of assembly steps required to achieve the greatest possible amount of knowledge. Knowledge management is perceived as an increasingly important discipline to promote creativity, knowledge sharing and grading trough the company. Peter Drucker (1994), regarded as the „father of knowledge management” defined its need and nature: „Knowledge has become a key resource to achieve efficiency in business. It is vastly different from traditional inputs (land, labor and capital), while

the quality and consequent productivity of knowledge requires a systematic approach throughout organization“.

According to Koenig (2012), Knowledge Management (KM) is a concept and a term that arose approximately two decades ago, roughly in 1990. Quite simply one might say that it means organizing an organization's information and knowledge holistically, but that sounds a bit wooly, and surprisingly enough, even though it sounds overbroad, it is not the whole picture. Very early on in the KM movement, Davenport (1994) offered the still widely quoted definition: "Knowledge management is the process of capturing, distributing, and effectively using knowledge." This definition has the virtue of being simple, stark, and to the point. A few years later, the Gartner Group created another second definition of KM, which is perhaps the most frequently cited one (DUHON, 1998): "Knowledge management is a discipline that promotes an integrated approach to identifying, capturing, evaluating, retrieving, and sharing all of an enterprise's information assets. These assets may include databases, documents, policies, procedures, and previously uncaptured expertise and experience in individual workers." Both definitions share a very organizational, a very corporate orientation. KM, historically at least, is primarily about managing the knowledge of and in organizations.

Frost (2010) writes that knowledge management is essentially about getting the right knowledge to the right person at the right time. This in itself may not seem so complex, but it implies a strong tie to corporate strategy, understanding of where and in what forms knowledge exists, creating processes that span organizational functions, and ensuring that initiatives are accepted and supported by organizational members. It is important to remember that knowledge management is not about managing knowledge for knowledge's sake.

8.2. Advantages of Knowledge Management

Craciun (2014) state that the advantages of a knowledge management system can be significant and rewarding when all the keys are in place. Here are some benefits that can help you understand how effective knowledge management systems can ensure quality and may even increase revenue:

- Every person in the company has access to management and business knowledge
- Makes it possible for you to support new technologies easily and capture new knowledge for future use
- Due to the existing knowledge base, the employees can quickly find all the information they need
- Create knowledge base articles using the real-time HTML editing tools
- Facilitates IT staff members stay up to date on various, ever-changing technologies
- Reduces IT costs without having to compromise quality service to internal and external customers
- Improves staff engagement and communication
- Helps in delivering better measurement and accountability.

The main benefits of knowledge management by Dias (2015) include:

- improving the quality of services towards customers,
- increase customer satisfaction,
- time reduction by problems and their solutions,
- reduced training time and costs,
- quick adoption of new or changed processes.

Jennex (2006) in his work also notes the sequence of steps and forms of knowledge management characterized on figure 8.1.

One of the alternatives to increase the level of knowledge management is using the principles of outsourcing services through external specialized company. The aim of this paper is to present the benefits and threats of knowledge management outsourcing.

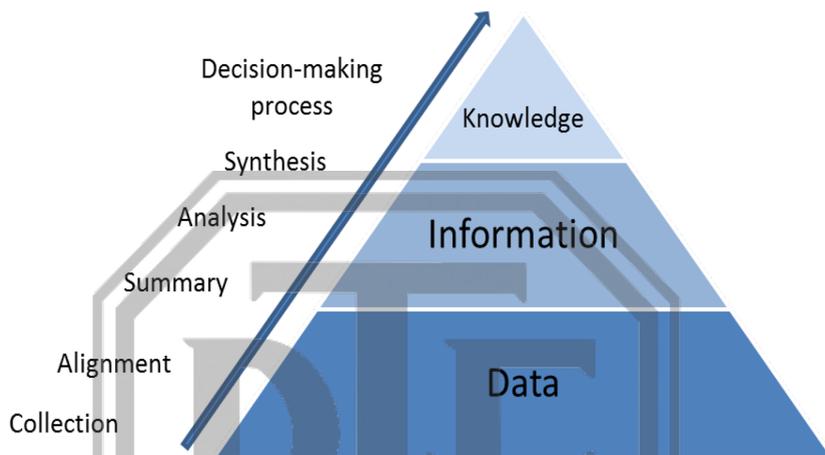


Fig. 8.1. Knowledge management pyramid.

Source: own reprocessing by Jennex, 2006.

8.3. The essence of knowledge management outsourcing

The primary motivation for using an outsourcing is certainly the ambition of reducing total cost level. The decision making process, whether ensure the processes “in house” or entrust them to the hands of external operators is already applied for several decades. The model “make or buy” is from the view of cost a useful tool and businesses actuate it routinely. On the other hands, as outsourcing is evolutionally developing, companies should review the impact of “make or buy” tools in question the decision of outsourcing. Make a decision for outsourcing solely based on costs is in modern environment wrong. Bharadwaj (2009)

notes that the outsourcing relationships became over time more complex and therefore companies need to rethink their “core” competency and the model “make or buy ignores the strategic dimension of outsourcing. Spotts (2006) and Potkány (2011) notes, that outsourcing can be into company established for following reasons:

- *economic reasons*: in this case is mainly about cost saving. However, the effectiveness of outsourcing remains questionable in some cases. The reason is the lack of detailed information about costs that would provide relevant information for decision making.
- *strategic reasons*: a release of own resources in enterprise, which can be used for other strategic interests.

Bragg (2006) in his work notes, that the main benefits of outsourcing include access to world-class knowledge, cost distribution, investment reduction, improved efficiency. The major disadvantages are irretrievability of decisions, need of relations management and risk of unfulfilled expectations of outsourcing relationship.

Bragg (2005) notes, that the main reasons to establishing outsourcing into a company can be summarized in following points:

- *increase or maintain of competitiveness*: outsourcing can increase the level of provided services.
- *experts acquisition*, the organization often does not have necessary experts, but the outsourcing can overcome this deficiency at lower costs than in case of recruiting staff into temporary employment.
- *reduction of costs*: outsourcing reduces operational and investment costs and the released resources can be used for other purposes.
- *efficient use of funds*
- *focus on „core business“*
- *simpler prediction of cost level*
- *reducing the risk associated with the technological change*
- *common activities with outsourcer*
- *synergic effect arising from collaboration.*

Companies, which successfully implemented outsourcing, managed to generate huge profits through cost saving. Processes such as

commitments or chooses evidence or personalistic are some of the processes, which are good candidates for outsourcing. In practice, we can talk about savings of 20 – 40 % of original cost produced by insource processes. Considering the success of BPO (Business Process Outsourcing) we meet with reflections about use of outsourcing services even in the key processes of companies, so called “core business” processes, where are expectations to acquire knowledge and approaches providing a competitive advantage. However, this approach is from the traditional view of the enterprise incorrect because of the sensitive information leakage.

The development of this trend can be attributed to the satisfaction of business executives with outsourcing business process services. The government interventions and enhance of outsourcing services contribute to consideration about outsourcing of key processes. There are processes, which require analytical thinking and judgment on the basis of inside information and competitive strategies. For example market research, financial planning, business intelligence and risk management. Outsourcing, which is working with these information and knowledge of company, is called knowledge process outsourcing – KPO. However, outsourcing also brings certain threats. There is a large percentage of organizations, which were unable to successfully implement outsourcing. There are many reasons, but the most common is a low service level, lower output quality, delayed delivery time, cultural differences and other economic or environmental factors.

Therefore KPO is experiences rapid growth in recent years. This growth is partly fueled by the adoption of international standards for professional qualifications, improved access to a large pool of skilled and experienced professionals abroad and better manageability of remote projects due the technical progress. KPO services are mostly used by legal, financial or consultant companies in the area of management or life sciences. Therefore, the subjects of outsourcing are data services, data integration, surveys, analyses, remote learning, research and development and many other services related to know-how.

8.4. Knowledge process outsourcing services – benefits and risks

Bambhania (2011) in his work deals with classification of most often used KPO services. This concerns the following services:

- investment surveys (assets, profitability, maturity)
- data analysis
- market research
- outsourcing of legal assets
- outsourcing of patents and licenses
- business process support, analytics and management
- publishing services

While the main advantages of support processes outsourcing are clearly in improving efficiency and reducing costs, KPO benefits are less tangible. In case of KPO is about gaining competitive advantage, which runs mainly from access to skilled professionals from different sectors. Certainly, the issue of cost is also an important contribution of KPO, especially for the use of cheaper skilled labor abroad. In addition, another advantage is the transformation of fixed costs to variable, which allows higher level of flexibility during economic cycles. An attractive benefit can be perceived the implementation of business processes in different time zones (for off-shore KPO). Due to the different time zones, there can be given tasks fulfilled by the next business day. KPO benefits can be summarized as follows (FERNANDEZ, 2014):

- Reduced costs: up to 40 % for off-shoring to countries with low wages
- Access to a skilled work labor power
- Increasing employment in underdeveloped regions
- Flexibility in human resources and time management.

The result of globalization and increasingly complex forms of business environments is the increasing interest in the use of outsourcing services. It should be emphasized that outsourcing is the way to implement the strategy. Thus business with the wrong strategy may have

problems in the future, despite the use of various forms of outsourcing. In practice, the organization with regard to KPO faces external and internal risks (Brown, 2005). External threats are related to factors operating outside the organization and therefore are less controllable:

- obtaining a suitable KPO provider: necessary skills, costs
- swings in the price of delivered services: e.g. increase of labor costs in the country of provider
- exchange rate risk
- risk of leakage of intellectual property, the main barrier to the full adoption of the KPO model. Laws and rules for compliance abroad may expose the intellectual property for significant risk with low control level.
- the physical location of KPO provider: risks associated with the economic, political and cultural environment in the provider country.

Internal threats arise from the direct interaction between the organization and the KPO provider. Most often risks are following:

- *communication risk*: results from the language barriers in countries where English is not the native language. Effective communication has a major impact on the success of KPO. In general, it is inappropriate to use off-shoring in case of direct customer interaction. As an example, the customer satisfaction in Delta Airlines has been reduced after the introduction of off-shoring. After this experience, the company decided to use services of domestic outsourcers.
- *risk of KPO provider management*: the lack of a formal process of documenting every decision on the basis of an analysis or specific parameters.
- *risk of deficiencies in the processes*: processes and technology should be optimized by the company to using the services of outsourcing. From optimized process then the company can expect higher cost savings.
- *risk of impact on employees*: KPO may have a negative impact on staff morale. It is a waste of talent within your own organization, as

- knowledge, skills and information are transferred to an external third party.
- *risk in decision-making*: the decision making process must take place at senior management level, linked to company strategy. Efforts to manage outsourcing at lower level offer a lot more risk and a higher probability of failure. An alternative solution may be a creation of centralized outsourcing group monitoring KPO.

8.5. The proposals to eliminate the risks of knowledge process outsourcing

In order to increase the chance of success, organizations should use a structured approach to managing KPO. This approach is illustrated in figure 8.2.

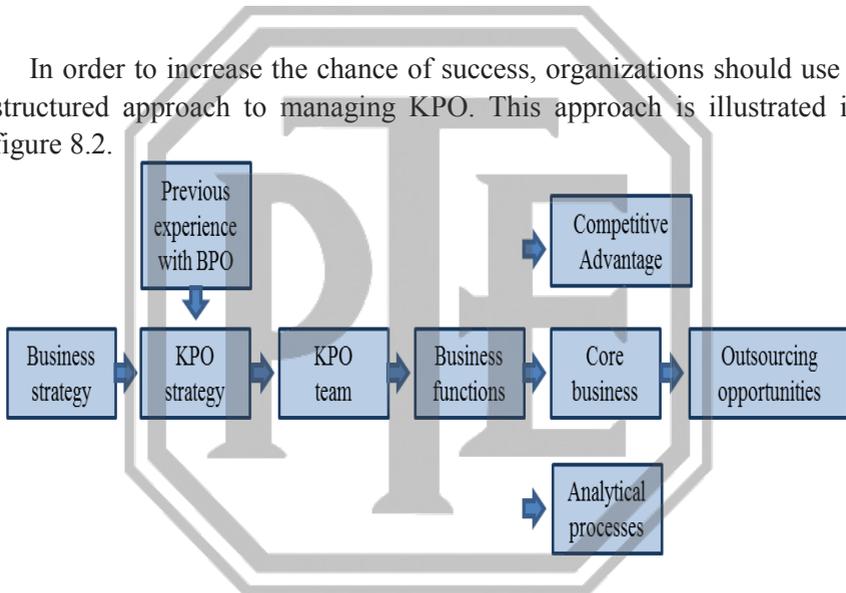


Fig. 8.2. KPO approach.

Source: Jennex, 2006.

Primarily, the organization should set its corporate strategy, which includes the operating model of KPO. It should be emphasized that the organization, which had previous experience with BPO (Business Process

Outsourcing), will have a shorter learning curve, lower risk and higher chance of success.

The organization should create a team responsible for identifying opportunities in context of the KPO model. This team should carry out a thorough analysis of organization to identify core competencies, competitive advantage, analytical processes and opportunities for outsourcing. It should present all relevant functions of the enterprise, make provision for strategic objectives of company and implement them into aims of outsourcing.

Project manager responsible for outsourcing should have previous experience in outsourcing projects and exhibits a high degree of empathy because the human aspect plays a most important role. KPO partner selection must be based on an assumption of providing a competitive advantage in terms of talents, skills and technologies. The choice of processes or functions to be outsourced should be done in stages, starting with process, that represent lower risk to processes that are critical for business.

8.6. Conclusion

Knowledge process outsourcing can ensure efficiency and cost savings to companies that want to focus on their continued growth. KPO provides a great opportunity to outsourcing analytical-intensive processes that contribute to the development of new products, analyze new markets and offer new services. Simultaneously provides a challenging and progressive position for employees who want to move into career positions, supervision and monitoring of KPO. However, knowledge process outsourcing should not be considered as the only option. Enterprises should primarily be focused on their internal resources and so find new, better and more innovative ways of doing business. The chance of failure by using KPO model is high and requires a structured approach of the organization. Therefore, KPO is an available alternative, but only if

the company is considering expanding their services and performance and not only to reduce the level of costs (JENNEX, 2006).

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BENEFITS AND RISKS OF THE UTILIZATION OF OUTSOURCING IN THE MARKETING ACTIVITIES

Abstract: Competitive contest caused a significant increase in consumer interest for the product value. Value is perceived as the value for money in today's context, which is certainly a critical determinant of purchasing decisions of many customers, but the value of the product is perceived also as the resulting benefit of buying process. Customers increasingly demand products with value added, but at ever lower costs level. Identifying of customer needs and ensuring all processes needed to meet customers' needs therefore have its critical value. At this stage, the concept of marketing is an irreplaceable element of corporate business structure and efficiency of the structure directly affects the company as a whole. One of the alternatives to improve the level of marketing is using the principle of outsourcing, thus services provision of external specialized company. The aim of this paper article is to present the advantages and disadvantages of the outsourcing utilization of marketing activities for the customers create value.

Key words: outsourcing, marketing, product value

9.1. Introduction

The continuous increase of operating costs and in competition caused in developed economies an effort to solve this problem through coordinated management of a wide range of supporting business processes. Most of these processes are linked to operating and auxiliary processes with traditional and innovative requirements, which have to be adapted to the needs of the enterprise. Numerous businesses are still verifying their options in terms of incurred overheads and considering whether it wouldn't be better for a part of cost to buy processes from outside by the principles of outsourcing. The decision, whether use or not this principle is often affected by several factors of complexity, like corporate culture, companies localization, residential structure, corporate know-how and experiences in scope. One of the business processes that can be ensured by the principles of outsourcing is the area of marketing

activities. The main aim of this paper is to present the advantages and disadvantages of outsourcing marketing activities.

9.2. Customer value

Michael Porter was one of the first experts, who highlighted the importance of the fact, that success can be achieved through cost leadership or through differentiated products or services which clearly distinguish individual companies (Figure 9.1).

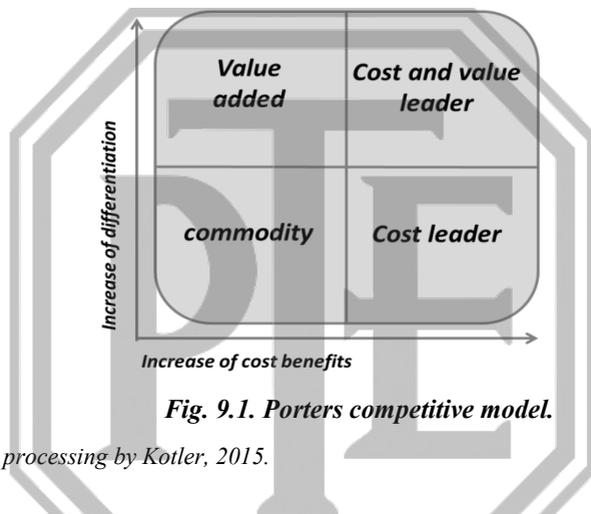


Fig. 9.1. Porters competitive model.

Source: own processing by Kotler, 2015.

According to him, a company with higher costs and a lack of product differentiation is perceived as a „commodity supplier“, and its chances to success are minimal in the long run. The organizations create a customer value either by increasing the level of „benefit“ or reducing costs, whereby according to Kotler (2015) we can set the customer value as follows:

$$Customer\ value = \frac{Perceived\ benefits}{Costs\ of\ ownership} \quad (9.1)$$

The benefits are perceived by customers differently. There may be benefits associated with the product use, benefits in connection with warranty, service, etc. The costs of ownership include all cost associated with the product. There are acquisition costs, purchase price, warranty and post warranty repairs and liquidation.

Marketing has an effect on both variables in previous relationship number 9.1, therefore it can affect a significant increase in product value, respectively services. Waters (2014) notes, that marketing is a „core activity“, which enables companies to achieve and maintain a competitive advantage. Companies are under competitive pressure forced to respond flexibly to changes in environment and customer requirements and must maintain the lowest level of costs. Businesses, which want to be still able to face to new challenges in competitive environment, but whose internal capacity is below the required level, may utilize the services of external process operators, i.e. use the principles of outsourcing.

9.3. Outsourcing of marketing activities – advantages and disadvantages

Marketing outsourcing has been traditionally limited to advertisements and promotional campaigns. On the present, we are witnessing a growing trend of using outsourcing in other marketing processes. The primary motivation for using an outsourcing is certainly the ambition of reducing total cost level. The decision making process, whether ensure the processes “in house” or entrust them to the hands of external operators is already applied for several decades. The model “make or buy” is from the view of cost a useful tool and businesses actuate it routinely. On the other hands, as outsourcing is evolutionally developing, companies should review the impact of “make or buy” tools in question the decision of outsourcing. Make a decision for outsourcing sorely based on costs is in modern environment wrong. Spotts (2006) notes that the outsourcing relationships became over time more complex

and therefore companies need to rethink their “core” competency and the model “make or buy ignores the strategic dimension of outsourcing. Outsourcing can be into company established for following reasons (Spotts, 2007):

- *economic reasons*: in this case is mainly about cost saving. However, the effectiveness of outsourcing remains questionable in some cases. The reason is the lack of detailed information about costs that would provide relevant information for decision making.
- *strategic reasons*: a release of own resources in enterprise, which can be used for other strategic interests.

Bragg (2006) in his work notes, that the main benefits of outsourcing include access to world-class knowledge, cost distribution, investment reduction, improved efficiency. The major disadvantages are irretrievability of decisions, need of relations management and risk of unfulfilled expectations of outsourcing relationship.

Brown (2005) notes, that the main reasons to establishing outsourcing into a company can be summarized in following points:

- *increase or maintain of competitiveness*: outsourcing can increase the level of provided services;
- *experts acquisition*, the organization often does not have necessary experts, but the outsourcing can overcome this deficiency at lower costs than in case of recruiting staff into temporary employment;
- *reduction of costs*: outsourcing reduces operational and investment costs and the released resources can be used for other purposes:
 - *efficient use of funds*
 - *focus on „core business“*
 - *simpler prediction of cost level*
 - *reducing the risk associated with the technological change*
 - *common activities with outsourcer and synergic effect arising from collaboration.*

9.4. The challenges of marketing activities outsourcing

According to Marketing outsource (2005), outsourcing of marketing activities includes processes as advertising, public relation, direct marketing, internal communication, sales and promotion, market research, competitive analysis, event planning as well as graphic design and product development. Companies decide for using of outsourcing, because their current system and factors are insufficient to meet the challenges in connection with business activities. By CMO (2012) these challenges can be summarized as follows:

Lack of own knowledge. Effective management of marketing knowledge requires a wide range of expert knowledge. A typical group of experts in larger enterprises includes strategists, analysts, auditors, product specialists, experts in area of communication, advertising, web masters, etc. For some companies are some parts of this professional team unavailable or under-staffed. Marketing analysis, databases creation, understanding customer needs their demographic and preferences are essential information for any company. For effective collection and processing of information is often needed a specialized help.

Lack of special technology. Backwardness or incompatibility of marketing departments in area of technologies is even known in modern and developed enterprises. Despite efforts to automatization of marketing tools, marketing is located at the bottom of IT priorities in company. To gain access to knowledge, integrated and technologically advanced solutions may cause a financial threat. Therefore is more acceptably to utilize the services of high-tech outsourcers.

Increasing the share of variable costs on total costs. The largest part of marketing budget contains fixed costs related to people, systems and devices. In modern environment is the rapid adaptation to unaware market changes necessary as well as an immediate response to newly emerging opportunities. Outsourcing of marketing activities, respectively marketing projects generally produces a higher level of flexibility. Costs of outsourcing may seem higher, but there are also hidden costs of

marketing activities carried out through internal capacities. There can include opportunity costs. Marketing activities can be delayed due the changes in priorities, respectively lack of support and related loss of opportunities as well as costs of the expansion or decline in the level of marketing function on monthly basis.

Need of understanding the fundamental, not technics. Each enterprise owns a combination of marketing skills. Within marketing development there are people whose job is to understand and control the positions and promotion of products. Other groups make consumer segmentation, consolidated transactions, management of distribution channels. There are also employees, whose task is to guide management processes, activities and events, ensure proper connection of X and Y to create Z according to plan. While the first group of employees is irreplaceable, the second one is candidate for outsourcing.

Need of increased growth. During the phase of intensive growth it is usually faster and often cheaper to outsource the required new employees or processes. Market entry with new product or building a new distribution channel is a very difficult process. The key factors must be previously identified, hired and trained. In this case is advisable to use a hybrid system of outsourcing and insourcing and reap the benefits of outsourcing while still develop and maintain internal capacities.

Stuck in the investment cycle: If the profit falls, the companies want to reduce costs. Investments in marketing are often the first under consideration. Later, when the company's financial situation gets better, the investment cycle resumes. Frequent changes between investment and emergency mode are expensive. Using outsourcing provides greater flexibility and the ability to use outsourcing on a project basis.

The reduction of legal risk. Marketing is changing worldwide. Legislation in the area of personal data protection have been harmonized within the European Union, on the other hand, there are inequalities with the law in the US. Legal compliance is a top priority for all sales organizations. However, most of companies do not have sufficient knowledge of relevant laws for ensuring compliance. Outsourcing in this

area helps to understand these problems and can also reduce legal risk in the case of a customer or government disaffection.

Launch of new distribution channels and expand into new markets. This process can be compared to acquisitions. Each added component brings new opportunities but also risks. The cultural elements represent the biggest threat. These cultural differences exist not only in different languages and geographic areas, but also in the communication channel. Implementation of new marketing channels requires a level of expertise that is often beyond the limits of companies. Outsourcing is the appropriate instrument to complement internal resources.

9.5. Possible threats of marketing outsourcing and their alleviation

The globalization and increasingly complex forms of business environment led to increasing interest in the use of outsourcing services. It should be emphasized that outsourcing is the way to implement the strategy. Therefore a company with a wrong strategy may have problems in the future, despite the use of various forms of outsourcing. In practice, companies often face to following types of threats (Figure 9.2):

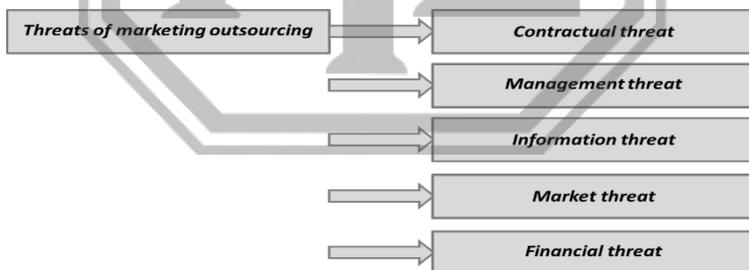


Fig. 9.2. Threats of outsourcing.

Source: own processing by Lilien, 2012.

Contractual threat results from compliance with the actual contract between the outsourcer and the enterprise. The problem may occur on both sides. For example, if the organization does not pay its obligations on time, respectively 3PL operator fails to comply with all obligations under the contract.

Management threat results in case, if there are differences between management of marketing provider and the enterprise. Using different practices and methods or cultural differences can cause considerable risks. These situations require professionalism on both sides.

In case of contractual relations, the enterprise and the provider of marketing services *share sensitive information* related to customers, products and management. After they cancel the cooperation, these information leaks may be dangerous; hence they are subjects of agreements and treaties.

Market threat is grounded in the unstable environment. The changes in the market of materials and services cause changes in the marketing sector. If the market is expanding, the prices of marketing services are rising too. If the current market price of services is higher than the price agreed in the contract, the enterprise exploits the benefits of outsourcing. The opposite situation causes losses for the company. However, in the long term, when the company becomes dependent on the outsourcer, an effort to reduce costs can result in passivity. It should be emphasized that even such a negative development may be more favorable for the company as marketing provided in-house.

Bharadwaj (2009) notes, that outsourcing does not guarantee the success and may not produce the desired return on investment. In addition, the company spends a considerable amount of financial resources to search and ensure the correct provider of marketing services. These transactions represent a *financial risk*.

Listed threats related to outsourcing can be through suitable strategies significantly reduced. Li-jun (2012) notes, that the threats can be eliminated as follows:

Identification of „core competencies” in enterprise. The basic prerequisite for the success of outsourcing is the comparison of cost and quality. Using outsourcing should ensure better outcomes at a lower cost than it would be “in-house”. Otherwise, outsourcing can cause a series of problems.

The principle of Win-win. Outsourcing is a bilateral relationship based on good cooperation with common interests. Therefore it should bring benefits on both sides, because poor performance of one of the partners can result in the loss of other part.

Choosing the right partner. The enterprise chooses the outsourcing company accordance to level of development, available resources and strategic needs in the future. Choice of future partners should be therefore preceded by serious analysis regarding the compatibility of enterprise and outsourcing company.

Improving the management responsible for contracts. Generally, there are two signed contracts in the outsourcing relationship. The first includes the standard provisions as insurance, trade secrets, discharge of contract, etc. The second is related to business. Its specific content avoids the ambiguity of contracting parties’ responsibility.

Setup the organizational structure in company. It is mainly about the solving following problems: how to adapt processes to be in harmony with corporate strategy, if the corporate culture stimulates innovations and transformations, how to present innovations to executives and employees at lower levels, etc.

Strict control of the outsourcer activities. Control of service provider activities ensures the successful implementation of outsourcing. There must be an effective channel between parties, which ensures the possibility of process control and compliance with the requirements imposing on the outsourcing company.

Establishment of performance measurement system. Standards of measurements have to be defined quantitatively, clear and obligatorily. The implementation of outsourcing and its assessment must be carried

out by a dedicated staff and the evaluation mechanism must be flexible and able to respond to changes in the environment.

9.6. Conclusion

The Dynamics of market changes occurs that almost every business today meets the question of effectiveness of their management in terms of search for potential cost savings and uncovering reserves. Precisely, the management of business support processes, using the principle of outsourcing, is an option and for several years a part of management system in developed market economies. Companies decide to use outsourcing because their current system and factors are insufficient to meet the challenges in connection with business activities. This method of ensuring this specific area holds out the potential of benefits but also threats and therefore need to be analyzed in detail. This article presents the basic benefits and risks of marketing activities outsourcing.

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EMPLOYEE VALUES AND DISHONEST BEHAVIOUR IN THE WORKPLACE

Abstract: The research was done about employees' values and dishonest behaviour in the workplace. The results of a pilot study, about employees' values and dishonesty, carried out in a manufacturing company. The goal of the study was to prove the influence of the values of certain employees on the dishonest behaviour. Analysed values were chosen according to their relation to the dishonest behaviour, i.e. they influence this behaviour in one way or the other.

Keywords: employee value, dishonest behavior, workplace

10.1. Introduction

The research was done about employees' values and dishonest behavior in the workplace. The results of a pilot study, about employees' values and dishonesty, carried out in a manufacturing company. The goal of the study was to prove the influence of the values of certain employees on the dishonest behavior. Analyzed values were chosen according to their relation to the dishonest behavior, i. e. they influence this behavior in one way or the other. When analyzing the influence of the values on the chance of the display of dishonest behavior, the goal was to evaluate the influence of the equality value, but this value was not chosen, because insufficient amount of employees gave it high importance; that is why from all the values, it was chosen to analyze the relation between the value of the self-esteem and dishonest behavior. The answers of the respondents are divided into two groups: in the first – self-esteem is important, in the second – less important.

According to the theory of personal characteristics, the influence of values to the chance of the display of dishonest behavior was evaluated. While there was a failure in analyzing equality value due to the insufficient amount of respondents' responses, the value of self-esteem was chosen for the analysis and its impact on dishonest behavior was analyzed. After evaluating results of the value part of the research it was determined that, on the individual level, this value, being of high importance, reduces, according to the opinion of employees, the chance of the dishonest behavior. When the staff of the organization attributed high importance of self-esteem, slight differences were noticed in comparison with the individual level.

10.2. Value conception

Values –basic beliefs, that a „specific behavior or a matter of existence is individually or socially more acceptable than the opposing set of behaviors or matter of existences“ (ROBBINS 2006). Values – the principles or fundamental beliefs, which are important guidelines and standards of a person's behavior. On the basis of these guidelines and standards it is decided what is desirable and positive. On the broad sense, values are called summarized graphic images about to what the priority is given, what matches the persons', or a group of people, needs, interests, intentions, goals, plans (VASILIAUSKAS 2005).

While describing values, specific definitions are usually being avoided, that is why more broad and abstract definitions are being searched. Trusting in a person and respect for individuality is considered a universal principle (VASILIAUSKAS 2005). A. Čiužas (2005) describes values as moral, social, esthetic regulations system, which has an important impact on a person's life. According to A. Čiužas (2005), these values determine essential human behavior directions, actions. Spiritual wiliness and social activity is said to depend on personal aspirations, based on values (VOSILIŪTĖ 2003).

Other authors associate the value notion with duty (NAVICKAS 1988). Based on this, it is believed that duty is created by real, important to self-aspects, which are mandatory and valuable. Such a conception is suggested to call a value (Navickas, 1988). Although, it should be noted that not every value has a moral and obligatory meaning. A value should not be considered as one if it only helps a person to achieve his or her set goal, as well as there are no values that are wicked, fake or negative (NAVICKAS 1988). Navickas (1988) also detaches the notion of value from being a good, claiming that the idea of a value is to be used only with special, independent things. There are authors who agree with the notion that values are separate from goods. Pruskus (2005) assigns values and goods to a person's goals reaches. It is claimed that values are specific and associated with life goals and the goods are considered a means to achieve these values (PRUSKUS 2005).

Another concept about values is that they are also considered as an aspect of one of the most important social action motivation. It is the criteria which social action choices and evaluations are based on (VOSIŪTĖ 2003). The author also believes that values are not always individual, especially when a person belongs to a group or an organization, which leads to the formation of collective value hierarchies (VOSIŪTĖ 2003).

Collectively we can state that values are a complex phenomenon, which includes a broad variety of personal goals and personal characteristics, meaning aspects which the person has priorities, compared to other things. Values are also a person's guidelines of behavior, since the values are always active and in motion, meaning the person, before choosing an action, will rely on his values and this states that each person, employers and employees have a set of criteria which controls their behavior in one way or another. If this is known then, in a way, the actions of these people can be, somewhat, guessed or controlled. Also, a thing to note is that values are not always an object, subject, relations with other people, but they can also be an idea itself.

10.3. Values in management

From the managerial aspect, one of the value research methodologies was created by a psychologist from the USA – Rokeach. The methodology consists of 2 value groups where each of them have 18 set of values. One group consists of terminal values, which depict human inner desires, common existential goals and results, the meaning of life, personal and social ideals (comfortable life, family, freedom, work, security and etc.) and instrumental values, which are considered human behavior, ambitions, love for another, patience, basically meaning various personal attributes, moral norms (ROKEACH 1973). Terminal values are determined by end goals, which a person wants to achieve. Instrumental values determine how, in what way or action these end goals are to be achieved. Both these sets of values are universal. Terminal values construct a personal basis for the value structure and from its evolution essential changes can be observed. Values are determined as criteria, by which people choose and justify their actions, evaluates others and oneself and etc. (VASILIAUSKAS 2005).

The function of any organization is to not only supply its members with knowledge, teach them new skills, but to also form their base values. The informational element in values is especially important, therefore it is said that values are taught (VASILIAUSKAS 2005). In that way, all organizations are considered of the elements, which transmits values from one generation to another and helps form them, or at least has impact on the formation. The relevance of value education is determined by the organizational values, goals and demands. The teaching of social values helps people become more effective elements of the society, as well as to help them decide between good and evil and how to prioritize one lifestyle over another.

While researching possible impact of individual and organizational values conflict, objective and subjective causes can be separated. Subjective causes come forth from individual organizational management

culture, management style, behavior standards evaluation. Objective personal and organizational conflict causes appear only when the individual and organization have both formed and expressed their values. Your own value purification and their compliance are the reason why organization and the individual can clash between each other. Value conflicts depend not only from the organizational sector, but from both parties involved (Individual and organization), their mutual interaction and the value occurrence source. If the value course is the people, then it is likely that value conflicts will be avoided. On the other hand, when values are artificially implanted in the organization or achieved only by the management level of the company, then colic arises from such values. Value conflicts are addressed in both ways: either the employee, who has clear formed values, feels insecure being inside a group of people, who have different values and choses a different job and atmosphere, or, while objective individual value and organizational value conflict exists, both parties resolve it in their own way, by choosing it themselves. Usually, a solution, which is acceptable by both parties, is chosen. The organization, more specifically, it's personnel decides what is valuable and what is not and hold compliance over it, then we can assume, that the organization has values and they appear from mutual reciprocity, not from the organizational managers and are not created as a means to control people for the sake of sole organizational benefit. Organizational values are a form of coexistence. Managerial theory, as one of the most important connection, puts the organizational values. Especially those values should be the guide and unifier, making the people coexistence unique and distinguishing from the masses.

Each organization has a vision – the basis of values, to which that organization is guided. In this way the organizational value system is formed. Each organizational values have a foundation and it should be the overall element for all of the member of the organization. The motivation of each member depends on whether those organizational values are at least, in their own notion, a part of the individual values of the employees. This should be one of the main goals of the company,

because only in such a way the success can be guaranteed. When a person believes in what he or she does, then the work becomes more productive and efficient and the the results are better. A person, before becoming an employee, has his or hers own values. Very rarely those values happen to be the same as the organizations values. Career, desire for honor, self-realization, increasing the size of contacts, good leisure time and other factors can motivate such person to join a certain organization. It is important, as time passes, that individual values do not contradict with the organizational values and eventually it is best for them to become as close as possible, which can be described as the ideal scenario. It does not necessarily have to be the case for the values to become the same, yet the fundamental and critical values, indeed, have to be one and the same in order for the company to function effectively and to achieve its purpose. Therefore, one of the organizational priorities should be associated with its members motivation and its own value system implementation and clarification. Although, values are not usually a constant, they change over time, which depends on a number of criteria, such as economic, political, social situations. One of more significant factor is the personal characteristics and values of the manager, head of the company. It can shape all of the organizational values, yet cannot change then cardinally. It is best that organizational values come out from those, who have the authority, such as high management or the employees who have spent a long and significant time inside the company. All of these members should try to achieve to make other members of the organization have a better understanding of the values.

K. Jaakson and M. Vadi (2013) researched the service sector employee personal values and their attitude towards organizational values, which were compared towards dishonest behavior, as well as researched the possible effect between values and dishonest behavior. The results have shown that a connection between values and dishonest behavior does exists. Respondents, who mentioned as being highly honest, evaluated the possibility of dishonest behavior in the workplace as having a slightly less chance to appear. Other half of the respondents,

who mentioned as being less honest, depicted that a dishonest behavior is more likely to happen in their workplace. These results show, that employees, who regard themselves as honest, considers dishonest behavior less likely, meaning a possibility to engage in dishonest behavior themselves less likely.

10.4. Value survey

In order to conduct the employee value survey, a manufacturing company in Lithuania was selected, which is a member of an international group. This organization produces aluminum components for various industry branches. The start of operations in Lithuania was in 1998. Respondents, chosen for this pilot study, were the employees of the company, who expressed their opinion about dishonest behavior in the workplace and the effect of values for their behavior, based on the survey scenarios and situations. Respondents includes 100 employees work in the target company. For the purpose of this survey, 100 questionnaires were handed out for the employees of the manufacturing company. Unfortunately, no contact could be made with 20 of the employees, since a part of them work in the night shift and others were not present in the company during the survey period, therefore the questionnaires were not handed out to them.

In the course of the pilot study, 66 completed questionnaires were collected. Reversibility was 82,5%, 14 of employees did not complete the questionnaire and refused to participate in the study. Unfilled questionnaire part makes 17,5% of the total amount of handed out questionnaires. From the 66 questioned respondents 38 were male (57,58%) and 28 were women (42,42%). The participants of the survey were divided into 5 age groups, based on Herzberg study and questionnaire example.

The majority of the respondents (31,82%) got into the 18-29 year old age group, which was 21 employee (Figure 10.1).

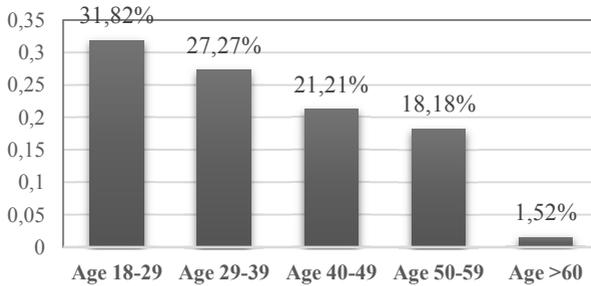


Fig. 10.1. Distribution of the respondents' age.

Source: own study.

The age of these employees were much higher than 18 years, yet slightly less than 29 years. 18 respondents got into the 30-39 age group, which was 27,27% (Figure 10.1). 40-49 age group consisted of 14 respondents (21,21%) and 50-59 age group had 12 respondents (18,18%) (Figure 10.1). Only one respondent was put into more than 60 age group.

Respondent work experience was varied and fluctuated from less than 1 year of having worked in the company to having worked 18 years. Less than 1 year of work experience in the company was selected by 7 respondents (10,60%). From 1 to 3 years of experience – 14 respondents (21,21%). The largest part consisted of 19 respondents (28,79%), where the work experience was from 4 to 6 years and a slightly less part consisted of 18 respondents (27,27%) who had work experience in the company from 7 to 9 years. From 10 to 12 years work experience were chosen by 6 respondents (9,10%) and more than 12 years of work experience were only picked by 2 respondents.

According to education, it was divided into 4 groups. The largest amount of respondents had higher education, which were 29 people (43,94%) (Figure 10.2). Higher vocational education had 15 respondents (22,73%) (Figure 10.2). 20 respondents had secondary education (30,30%) and incomplete secondary education 2 respondents (Figure 10.2).

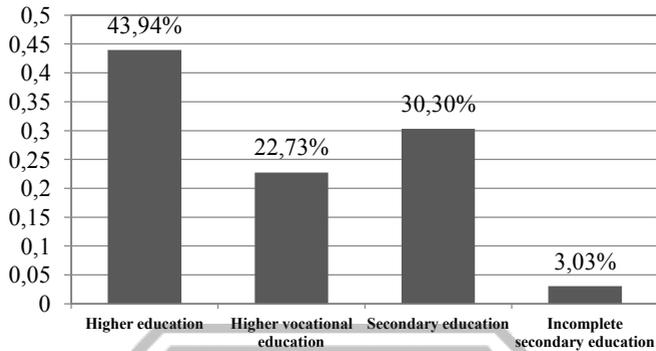


Fig. 10.2. Distribution of the respondents' education.

Source: own study.

10.5. Research methodology

Research methodology. In order to successfully carry out the survey, a methodology, which was made by K. Jaakson and M. Vadi of Taartu University (Estonia), was used. This methodology was adapted to fit the production enterprises, since it was originally made for the service industry. The collection of research data was conducted with the questionnaire method. The questionnaire consists of various situations, which the respondents have to evaluate using the Likert scale from 1 to 7, where 1 means that dishonest behavior in the workplace is very unlikely and 7 means that dishonest behavior in the workplace is highly likely. The purpose was to evaluate the connection between employee values and the probability of dishonest behavior in certain scenarios. Respondents were asked to rank the 18 terminal values: based on their personal importance, individual level, and to express their opinion about the collective values in the organization, based on what the employee thinks about his colleagues. Respondents, who ranked self-esteem from

1st to 7th places, are considered to be in the higher self-esteem group and respondents, who ranked self-esteem from 8th place to even lower, were considered in the lower self-esteem group.

Research methods:

- Questionnaire. For the purpose of the research the questionnaire, which was prepared in Taartu University, Estonia, was used. The questionnaire was originally in Russian language and in order to ensure the reliability of the collected data and their authenticity, a double translation was carried out: from Russian language to Lithuanian and from Lithuanian back to Russian again. In such a way the final version of the questionnaire in Lithuanian language was used to conduct the research. The questionnaire was translated from Russian to Lithuanian and back again in order that the translation was reliable. Although, the research is adapted to this production enterprise, the questionnaire is slightly reconstructed, while keeping its main points, structure and parameters intact. Terminal values are using in this research, mainly to determine the effect of quality on dishonest behavior. Unfortunately, too few respondents selected this value as of high significance to them, therefore another value was selected, which is self-esteem. The main structure of the questionnaire is left unchanged. In order to measure the effects of the self-esteem value, 9 dishonest behavior manifestation situations are selected, based on the Taartu University prepared methodology.
- Statistical data analysis. For the sake of data processing, Microsoft Excel program is used. The results are analyzed based on the averages of the overall points in the Likert scale, about dishonest behavior. The research sample is small, because it is a pilot study and a specific company is being research, in order to evaluate the employees in that particular organization. The purpose of the pilot study is also to determine whether this methodology can be applied to Lithuanian companies.

The research is conducted for 3 days using the questionnaire method, while taking into account the availability of possible respondents. The

first and second shift employees are being researched. Employees are asked to participate in this survey, as well as the purpose of this survey is revealed to them and how to answer the questionnaire. Due to large workloads, employees are allowed to take the questionnaires home, fill it there and bring them in the next day. During the third day questionnaires are being collected. Fourth day is used to check if there were any questionnaires left, or brought late.

The collected data is transferred to the Microsoft Excel program and are made ready for the analysis. While using the statistical data analysis method, the results are being grouped up, in order to determine the effects of dishonest behavior in the workplace under different scenarios. For the purpose of the analysis, averages are counted based on the total answers of the respondents, which depicts their overall evaluations. At the end of the research, a summary of the gathered data is delivered, stating the most important sightings about the dishonest behavior in the researched organization.

10.6. Research results

This research about dishonest behavior in the workplace and the correlation of employee values made it possible to determine the employee opinions about the probability of dishonest behavior, while evaluating specific scenarios according to the values. As well as individual and organizational differences were recorded.

From 66 respondents, 35 (53,03%) were classified to the high self-esteem group and 31 (46,97%) – lower self-esteem group. Overall, the group with the lower self-esteem value evaluated dishonest behavior as more probable, compared to the high self-esteem group. The largest difference is towards „damage of the company’s reputation“, where lower self-esteem increased the chance of dishonest behavior by 0,87 points, compared to high self-esteem group (Figure 10.3). Another larger leap was recorded in „hiding the truth from the customer“ scenario. Here dishonest behavior probability, under low self-esteem, increased 0,84 points (Figure 11.3). „Hiding the truth from the employer“ criteria was

also significant, which had an increase of 0,72 points with lower self-esteem (Figure 10.3). The fourth criteria can also be distinguished, where a smaller change was recorded (0,47) points with lower self-esteem – „impolite behavior with the customers“ (Figure 10.3).

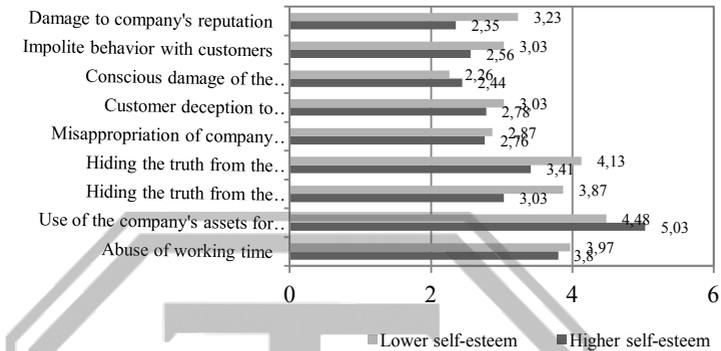


Fig. 10.3. Distribution of respondents' opinion about dishonest behaviour according to individuals self-esteem value.

Source: own study.

From the collected results it is possible to make a conclusion that people, who have higher self-esteem are less likely to exhibit dishonest behavior, since such behavior would contradict with their value system.

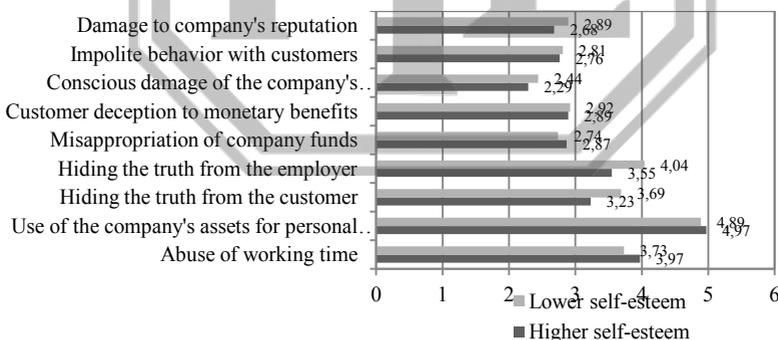


Fig. 10.4. Distribution of respondents' opinion about dishonest behaviour according to perceived organizational self-esteem values.

Source: own study.

On the other hand, comparing self-esteem value's significance to the organization collectively, the differences are smaller than analyzing this value on an individual employee level. The largest changes are in „hiding the truth from the employer“, where lower perceived self-esteem of colleagues increased the chance of such behavior by 0,48 points on the Likert scale, as well as increased the likelihood of dishonest behavior in „hiding the truth from the customer“ by 0,46 points (Figure 10.4). The probability of dishonest behavior in „Abuse of working time „criteria has reduced by 0,24 points and „damage to company's reputation“ increased by 0,20 points (Figure 10.4). Other changes in situations, organizational value level, were too little to be significant.

10. 7. Conclusions

While researching the effects of employee values towards dishonest behavior, the self-esteem value was chosen, because it was not possible to measure equality value, since too little respondents gave it enough significance. It has been noted, that on the individual level, employees who have a higher self-esteem value, described dishonest behavior as less probable, than those who had less significance on their self-esteem value. With lower self-esteem the probability of dishonest behavior increases in these areas:

- Damage to company's reputation;
- Impolite behavior with customers;
- Hiding the truth from the employer;
- Hiding the truth from the customer.

In the form of „customer deception to monetary benefits“, the dishonest behavior, while under lower self-esteem, increases very minimally.

Researching self-esteem value effects on dishonest behavior on the organizational value level, it was recorded, that changes are much smaller. The largest changes are found in „hiding the truth from employer and customers“. In this case, while having lower self-esteem on the

individual level is more significant on hiding the truth from both employer and customer, than under the effects of lower self-esteem on the organizational value level.

As well as, based on personal traits theory, it can be summarized, that a higher employee self-esteem value does decrease the probability of dishonest behavior in the workplace. In the organizational value level the changes are smaller compared to the individual level, so one can say that developing employee values can be one of effective ways to combat dishonesty in the workplace.

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CORPORATE SOCIAL RESPONSIBILITY IN CZECH ENTERPRISES

Abstract: Corporate Social Responsibility (CSR) concept is focused on understanding and managing the impacts a company has on the world around it, and doing so as a part of core business activities. CSR contains three parts: Profit (economical part), People (social aspects – employees and stakeholders) and Planet (environment). The papers deal with basic features, objectives and outputs of CSR concept in practical life of enterprises. The main aim of primary research was to identify the main barriers of CSR management system implementation according to organizations referred to themselves as socially responsible.

Key Words: Corporate Social Responsibility, Stakeholders, Profit – Planet - People, Triple Bottom Line

11.1. Introduction

According to World Business Council For Sustainable Development Corporate Social Responsibility (CSR) is “the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large.” The goal of the paper is to analyze whether Czech organizations adopting CSR know and are able to interpret required aspects in all three pillars of CSR management system in parallel according to ČSN 01 0391 standard and find out the barriers and whether it depends on size of company.

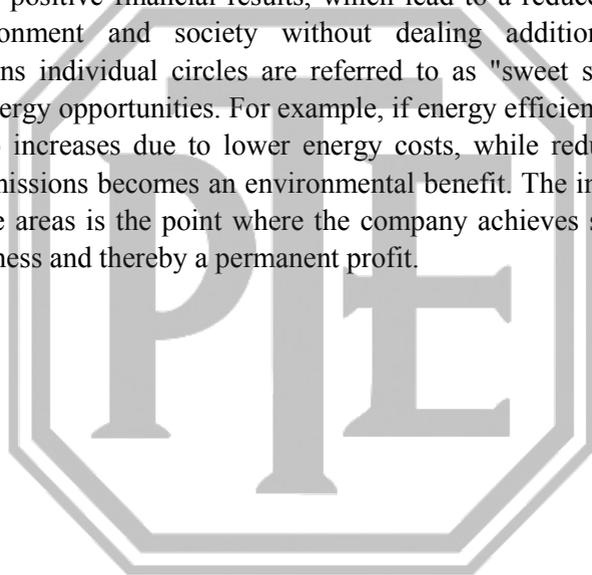
11.2. Corporate Social Responsibility

Corporate social responsibility is voluntary organization's initiative to assess and take responsibility for the company's effects on environmental management, economic growth and social progress. The term generally

applies to efforts that go beyond law requirements with respect to communication with stakeholders. The concept of social responsibility of organizations is built on three pillars, which are collectively referred to as the triple bottom line (TBL) or if the 3P strategy. They are (PETŘÍKOVÁ, R. et al. 2015):

- Profit - economic area,
- People - social area,
- Planet - environmental area.

The zones represent a threefold overall impact of business on the Planet, People and Profit. Figure 11.1 presents the idea that it is possible to achieve positive financial results, which lead to a reduced impact on the environment and society without dealing additional damage. Intersections individual circles are referred to as "sweet spots", which means synergy opportunities. For example, if energy efficiency improves, profit also increases due to lower energy costs, while reducing carbon dioxide emissions becomes an environmental benefit. The intersection of these three areas is the point where the company achieves sustainability of its business and thereby a permanent profit.



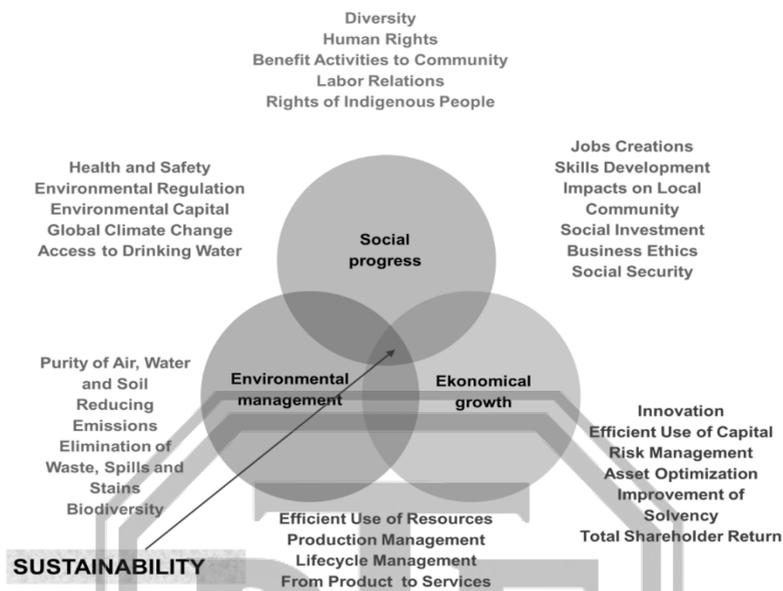


Fig. 11.1. Tripple-Bottom Line.

Source: Hofbruckerová. *Společenská odpovědnost organizací. Disertation thesis.*

There are a lot of benefits which the implementation of CSR can bring to organization:

- Increased employee loyalty and retention,
- increased quality of products and services,
- increased customer loyalty,
- increased reputation and brand image,
- greater productivity and quality,
- reduced regulatory oversight,
- access to capital and market,
- product safety and decreased liability,
- less volatile stock value.

However, many organizations state to be unable or unwilling to implement CSR for different reasons. Frequently mentioned barriers:

resistance from management part, resistance from employees, the inability of top management to argue persuasively for CSR implementation, limitation of profit maximization and higher costs, low tax benefits, CSR does not affect the customer's preference or does not distinguish the product from competitors.

11.3. Standards Usually Used for CSR Implementation

There are many standards and initiatives which are used for CSR implementation. Not all of them are suitable for Czech conditions. There are three most frequently used in praxis (MARKULIK Š. And KAMENICKÝ L. 2015):

- **ISO 26000:2010** provides guidance rather than requirements, so it cannot be certified to like some other well-known ISO standards. Instead, it helps clarify what social responsibility is, helps businesses and organizations to transfer principles into effective actions and shares best practices relating to social responsibility, globally. It is aimed at all types of organizations regardless of their activity, size or location.
- **SA8000** is an auditable certification standard that encourages organizations to develop, maintain, and apply socially acceptable practices only in the workplace.
- **GRI** is an international independent organization that helps businesses, governments and other organizations to understand and communicate the impact of business on critical sustainability issues such as climate change, human rights, corruption and many others via sustainability report. Report is document published by a company or organization about the economic, environmental and social impacts caused by its everyday activities. The sustainability report also presents the organization's values and governance model and demonstrates the link between its strategy and its commitment to a sustainable global economy.

- **ČSN 01 0391:2013** is a national Czech standard issued in 2013 which specifies requirements for the management system of social responsibility. The standard tries to offer the way how to integrate CSR management system requirements for the individual pillars (economic, environmental and social) and requirements for improvement (in accordance with the PDCA cycle). Standard can be used for certification on the national level. This standard is most suitable for organizations that have already implemented some management system (according to ISO 9001, 14001, OHSAS), as corresponds to various chapters of these international standards. Appropriate chapters and the similar structure can help organizations to transform requirements of CSR according to ČSN 01 0391 to existing integrated management system more easily.

11.4. Backgrounds

The issue of corporate social responsibility is now becoming an increasingly important part of strategic planning and business development. The cause is particularly increasing consumer pressure to take responsibility for the level of social, environmental and economic impacts of corporate activities and expectations towards producers, service providers as well as public administration organizations or educational institutions. Organizations often do not know the essence of the concept of CSR and for that reason it is not included in their strategic development plans. The main aim of the research is to define why organizations referring themselves as socially responsible do not implement activities of all the three pillars equally and make not efforts to gain a certification of CSR according to some international or national standards (HOFBRUCKEROVÁ Z. 2014).

The respondents were chosen from all organizations that participated in Social Responsibility Poll (promulgated by Institute for Social Responsibility) or applied in the evaluation for Award for CSR in Moravian-Silesian Region from 2010 to 2012. This target group was

chosen intentionally because the "Poll" participants are nominated by the public and employees and therefore it is likely that the CSR concept is part of their strategic focus. Companies that were awarded the „Prize of the Head of Moravian-Silesian Municipal district“ (rated by assessment body) demonstrably comply CSR requirements (or at least they try CSR).

Questionnaires were distributed electronically to the email addresses of organization heads. 114 respondents from 336 companies answered in the survey, which is a return of 34%.

For sorting of files according to organization size the number of employees was used. It differentiates firms by number of employees into small firms up to 50 employees, medium businesses with more than 50 and fewer than 250 employees and large companies with over 250 employees. As figure 11.2 shows, most (42.11%) of respondents were from large organizations, 36.84% of respondents ranked their company to midsize businesses, and the least (about one fifth) of research participants formed small businesses.

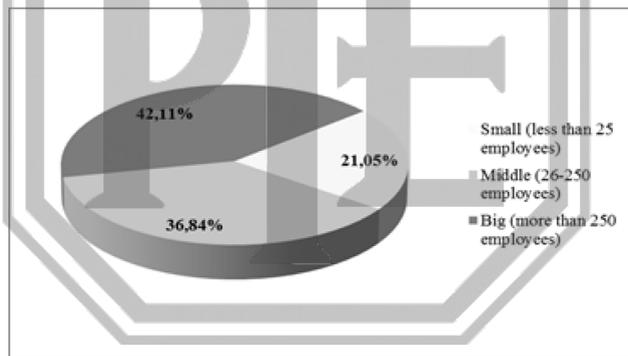


Fig. 11.2. Respondents according to size of company.

Source: own study.

More than half (51%) of organizations surveyed (figure 11.2) has implemented some of the management systems. Half of them are large companies, small firms confirmed only six certificated systems. Structure

of certified systems, depending on the size of the organization is illustrated in Figure 11.3. The certification according to the newly published standard CSN 01 0391 considered only eighteen companies, of which half with some already implemented the system.

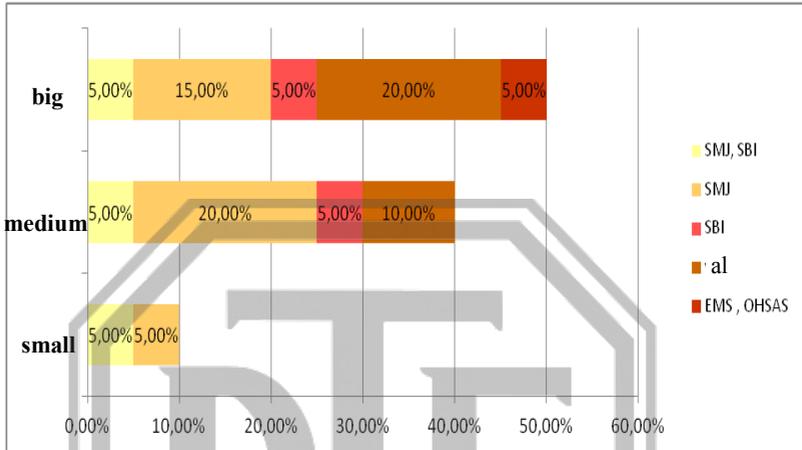


Fig. 11.3. Organizations with certificated management systems according to size.

Source: own study based on:

SMJ – Quality management system

SBI – Information management system

EMS – Environmental management system

OHSAS - Occupational health and safety management system

11.5. Research results

Initial consideration for this research was the fact that multinational organizations with foreign parent company are pushed into implementing of CSR elements only just by their headquarters. Therefore a hypothesis was settled that there is a link between the aspects considered to be barriers for introducing of CSR and the size of the company.

For evaluating of this hypothesis the Spearman rank correlation coefficient was used. The survey results were employed for assessment. The companies could assess each answer with ranking according to how they consider CSR implementing into practice to be problematic. Due to the form of the question it was necessary to transfer given answers into the sequence of importance of barriers in question according to the size of company (table 11.1).

Table 11.1. Order of perceived barriers to introducing CSR into practice

	Order of answers		
	Small company	Medium company	Big company
Resistance from management side	1	2	1
Resistance from employees, the inability of top management persuasively argue for CSR implementation	4	4	2
Limitation of profit maximization, higher costs	5	1	4
Low tax benefits	3	5	3
Does not affect the customer's preference, does not differ from competitors	2	3	5

Source: own study.

At small companies limitations of profit maximization and higher costs are perceived as the largest obstacle. Middle sized companies coincide on low tax advantages which can be utilized by the means of CSR implementation. Large organizations regard customer preferences or, more precisely, the fact that that the implementation of CSR does not affect the customer's preferences, to be the biggest barrier (figure 11.4).

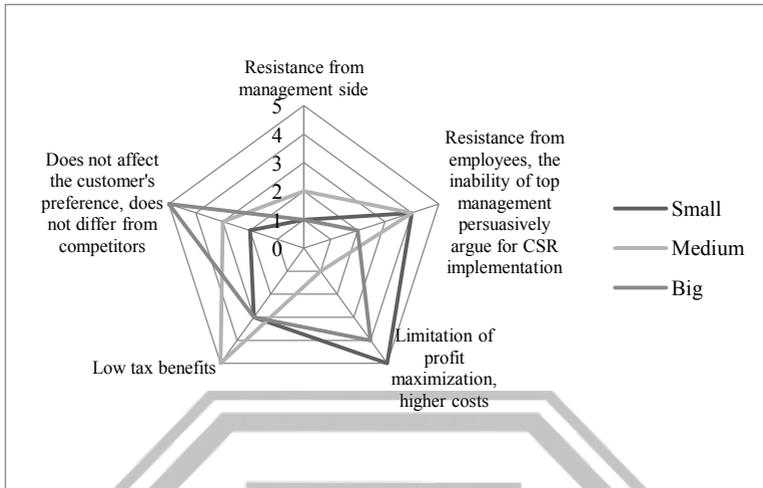


Fig. 11.4. Order of perceived barriers to introducing CSR into practice.

Source: own study.

Spearman correlation coefficients were quantified out of the chart data. Consequently the value of small and middle-sized companies, small and large-sized companies and finally middle and large-sized companies (for comparison purposes) were calculated. The correlation coefficient was calculated for each of that relations by means of MS Excel (table 11.2).

Table 11.2. Spearman correlation coefficient

Correlation between	r_s value
Small and medium companies	-0,1
Small and big companies	0,3
Medium and big companies	-0,1

Source: own study.

If we evaluate the individual values, it must be noted that there is no dependency between the order of individual barriers in introducing CSR into practice and sizes of companies. All these values are close to zero, thus indicating to noncorrelation relationship.

Therefore a necessary hypotheses about a possible relation between the size of the organization and what is seen as a barrier to the implementation of CSR principles arises. Based on those findings we can say that small businesses regard different issues to be barriers for introducing CSR into practice than middle sized and large companies. There is relatively close relation between the order of small and medium sized companies but here the value of Spearman coefficient is very low. If the values are to be correlated, correlation coefficients must be higher than 0.5.

Generally, on the base of the found data, those obstacles which are usually reported in the literature are significant for questioned companies too. Its relevance varies according to the size of the company though.

Therefore it is impossible to state that some of the mentioned obstacles is significant for all questioned subjects no matter what the size is.

11.6. Conclusion

The CSR concept is not an individual discipline or a project the company should opt for. It is an attitude affecting complex system management of the entire company both in positive and negative ways. CSR is based mainly on social maturity of managers. It is not just the knowledge and experience with conducting people and controlling the company but more and more often they are ethical leaders with high ability of empathy who are targeted on CSR, who are the holders of company's culture.

Nevertheless the knowledge of CSR concept as a complex system is a necessary condition for its implementation into company structures. Many organizations which have already implemented some of the

certified management systems (particularly ISO norms of series 9000, 14000 and 18000) begin to consider moving further. There are small and middle-sized companies which CSR requirements apply in accord with their needs and common sense just in order to keep long-term sustainable development. Those companies are usually neither aware of this three-pillar concept, nor use these activities for boosting their profile.

Significant circumstances leading to implementation of CSR management system are following facts:

According to the decision of the European Parliament (2014) companies with more than 500 employees are required to disclose how socially responsible they are. Certification according to ČSN 01 0391 is one of possible ways how Czech companies can meet this requirement.

However the companies that have already implemented some other management systems according to ISO (quality, health and safety, environment), have the opportunity to implement a CSR management system as an integrated part of ČSN 01 0391, which is suitable for CSR certification thanks its compatibility with other ISO standards.

CSR Certification is an opportunity and a competitive advantage for all organizations that want to participate in public procurement.

It is the way how to prove contracting entities that they are able to satisfy other than price criteria too.

These factors should motivate firms without distinction of size to overcome barriers and refer to the systematic implementation of CSR management system.

Acknowledgements

This paper was elaborated in the frame of the specific research project SP2016/91, which has been solved at the Faculty of Metallurgy and Materials Engineering, VŠB-TU Ostrava with the support of Ministry of Education, Youth and Sports, Czech Republic.

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ECONOMIC SCIENCE IN PROBLEMS OF GLOBALIZATION. FORECAST PROBLEMS OF MOTORISATION GLOBALISATION

Abstract: The speed of vehicle ownership expansion has important implications for transport and environmental policies, as well as the globalisation. The literature is divided whether the vehicle ownership rates drive economies or economic activity influences motorisation. This paper contributes to the debate by building a model that explicitly models the vehicle saturation level as a function of economic activity. Our model is estimated on the time-series of Hungary. Authors have overlooked the literature.

Keywords: Gompertz model, road transport, market penetration

12.1. Introduction

Economic development has historically been strongly associated with an increase in the demand for transport and particularly in the number of road vehicles. This relationship is also evident in the developing economies today, like in case of Hungary (SZENDRO, CSETE, TOROK, 2014). Surprisingly, very little research has been done on the determinants of vehicle ownership. Economic and social assumptions were made about maximum levels of vehicle ownership (vehicles per 1000 people). Because of this, forecasts of future vehicle ownership is key question (*Andrejszki, Torok, Molnar, 2014*). This paper empirically estimates the saturation rate, by mathematically formalizing the idea of vehicle saturation levels.

Section 2 - Methodology summarizes the data used for the analysis, and explores the historical patterns of vehicle ownership and used

mathematical models. Section 3 presents the result based on modified Gompertz model used in the econometric estimation. Section 4. summarizes the projections for vehicle ownership, based upon assumed growth rates of per-capita income.

12.2. Methodology

Having named after Benjamin Gompertz, there is a sigmoid function well known in econometrics. It is a type of mathematical model for a time series, where growth is slowest at the start and end of a time period for instance in market penetration of goods. The right-hand or future value asymptote of the function is approached much more gradually by the curve than the left-hand or lower valued asymptote, in contrast to the simple logistic function in which both asymptotes are approached by the curve symmetrically. In this case authors have investigate the usage of Gompertz function in road transport motorisation evolvement (Dargay, Gately, Sommer, 2007) (12.1):

$$MOT = A \cdot e^{-B \cdot e^{-C \cdot GDP}} \quad (12.1)$$

where (Wu, Zhao, Ou, 2014):

- GDP is the economic activity [USD/person]
- A is an asymptote [-],
- B, C are positive numbers [-]
 - B sets the displacement along the x -axis (translates the graph to the left or right)
 - C sets the growth rate (y scaling)
- e is Euler's Number [-].

Authors realised based on Andrejszki et. al. (2014) that the elasticity of GDP is very important and need to be incorporated to the model (12.2):

$$MOT = A \cdot e^{-B \cdot e^{-C \cdot GDP^D}} \quad (12.2)$$

where

- D is the elasticity of economic activity,

12.3. Results

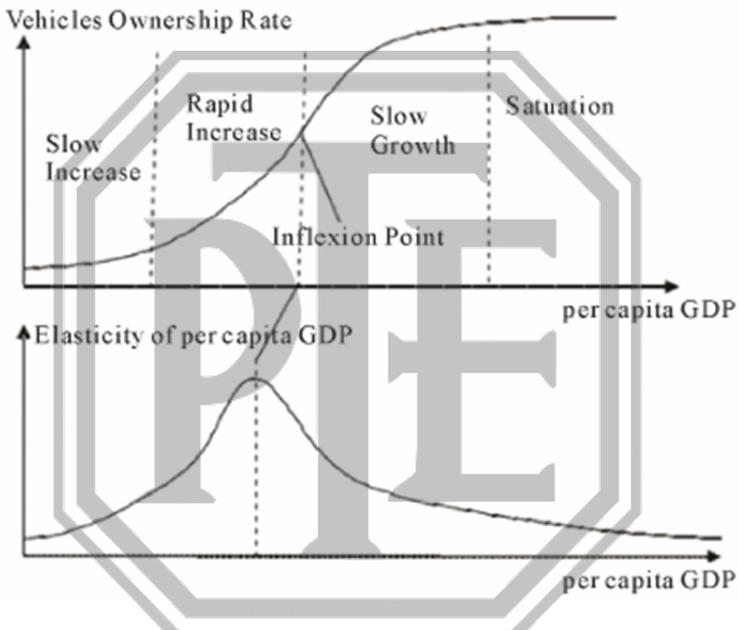


Fig. 12.1. Relation between mobility and economic growth

Source: Wang, et. al. 2012.

According to the ordinary least square mathematical statistical method the A, B, C, D parameter were calculated for Hungary based on the available dataset on 1970-2015.

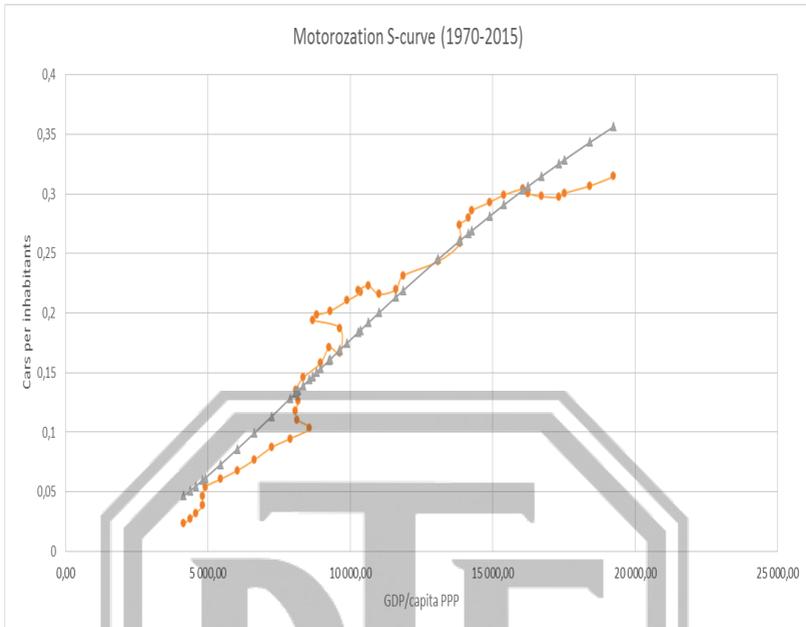


Fig. 12.2. Comparison of statistical data with estimation.

Source: own compilation.

Based on the estimation the maximal car ownership in Hungary will be 650 cars/1000 inhabitants. Authors have made sensitivity analysis on Gompertz model in case of investigated dataset.

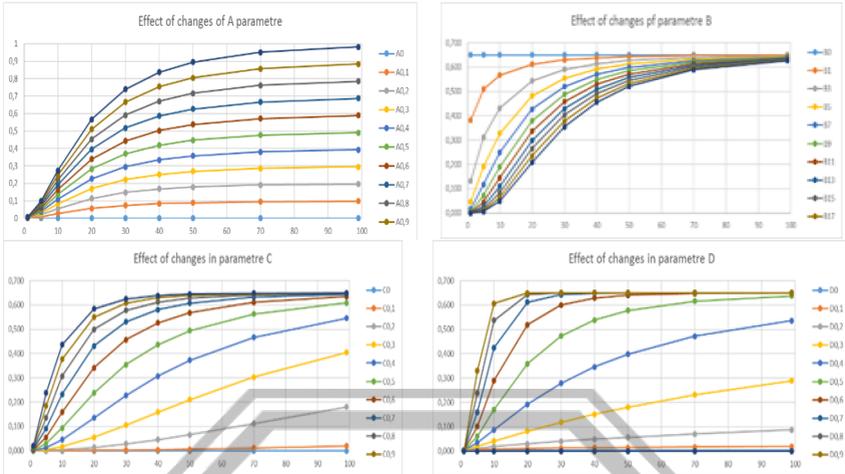


Fig. 12.3. Effect of sensitivity analysis.

Source: own elaboration.

12.4. Conclusion

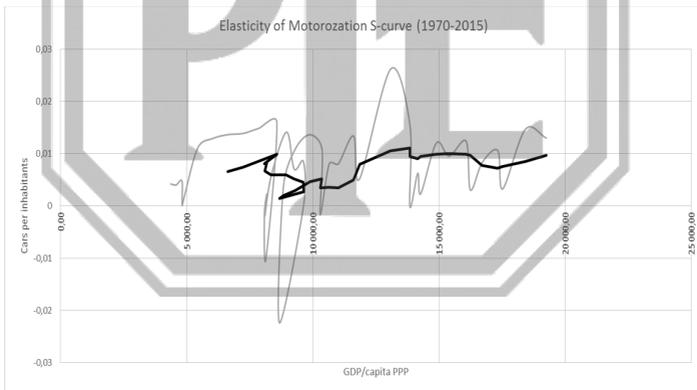


Fig. 12. 4. Elasticity of Motorisation S-curve.

Source: own research.

Authors having investigated the elasticity curve, have reached the conclusion, that the current 320 passengercar/1000 inhabitant motorisation has not reached the maximum saturation level. The inflection point is not yet reached where the saturation will start to slow down. Further investigation is needed. Further on authors also having realised during the analysis that Gompertz model can not only describe the penetration of passenger cars as a function of economic activity but the model also capable to investigate the market penetration of new fuels and drive trains.

Acknowledgement

Authors are gratefully acknowledge the support of János BÓLYAI Scholarship of Hungarian Academy of Sciences.

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DEA MODELS IN THE ANALYSIS OF COST EFFICIENCY AND INCOME OF SUPPORTED-EMPLOYMENT ENTERPRISES (ZPCHR)

Abstract: The obtainment of supported-employment enterprise status is connected with fulfilling a wide range of conditions, but it also enables to make the use of many financial supporting instruments aiming at the decrease of such activity risk. Lower efficiency of these bets is being compensated by public help for these subjects. So that the company was able to obtain the status of the bet of protected work has to fulfil a number of requirements. Obtaining of the status of the bet of protected work is involving with fulfilling a number of requirements, but is entitling too to use how many tools of financial support, of whom decrease in the risk is the chief objective of functioning of this type of companies.

The analysis of efficiency was the purpose of research carried out with the usage of DEA models.

Key words: Supported-employment enterprises, efficiency cost and profit, DEA models

13.1. The specificity of the functioning of supported-employment enterprises in Poland

The company, which employs disabled workers, may apply for the status of a protected work. This involves with a number of benefits, related primarily to the ability to take advantage of the preferential sources of financing this type of activity, reimbursements and tax exemptions. Obtaining these preferences, allowing for improvement in the competitive position of the company, however, it involves a duty to

fulfill certain conditions in the law, necessary for obtaining the status of a protected work.

If the employer is established for at least 12 months, employs no less than 25 employees converted into full-time work and achieve the employment rate of disabled persons of at least 50% (including at least 20% of all employees are the definitions a significant or moderate disability) can obtain the status of a protected work. In addition, facilities and premises used by a sheltered workshop must comply with the provisions and principles of occupational health and safety, and must take into account the needs of disabled people to adapt workplaces, in hygienic-sanitary and routes (USTAWA Z DNIA 27 SIERPNIA 1997). Another condition for receiving the status of a protected work is to provide emergency care and specialized medical care, counseling and rehabilitation services. Meeting the requirements of safety and health at work states at the request of the employer's State Labour Inspectorate.

Decisions on granting the status of a protected work seems indefinitely province governor. It may also by decision to release a specified period, but no longer than 6 months, the operator of sheltered employment to the requirement of achieving a 20% employment rate of disabled people, included a significant or moderate degree of disability, provided the total fulfillment of two criteria:

- employ at least 60% of people with disabilities,
- inability referral by the competent district labor office required number of disabled people, included a significant or moderate degree of disability, with appropriate professional qualifications.

In addition to the above-mentioned requirements that must be met to get the ability to function in the form of so-called. sheltered workshop, these companies also have beneficial powers. The main instrument of support are exemptions from certain charges, i.e. Exemption from property tax, agriculture and forestry in the subject of taxation reported palatine (USTAWA Z DNIA 27 SIERPNIA 1997). Application should be confirmed by a decision to grant the status of a protected work or certificate and the land used for the plant, with the exception of tax items

held by subsidiaries (rental, lease), entities which are not conducting sheltered workshops or betting activity. Exemption from tax on civil law transactions (PCC) is important when an entrepreneur takes action, such as the sale of goods, real estate, contract loans, etc. Preference fees also apply, with the exception of stamp duty and fees nature sanction (including fees for laboratory tests, fees for use of the environment, product fees and deposit). Tax exemptions do not apply however: taxation of gambling, tax on goods and services tax, excise duty, income tax and tax on means of transport.

The funds derived from tax exemptions cannot be spent by the entrepreneur for any purpose. They are transferred to the State Fund for Rehabilitation of Disabled Persons (PFRON) of 40% and a capital fund for rehabilitation of persons with disabilities - of 60% (MISZTAL M. 2007). Sheltered workshops are also provided funding for the costs of remuneration of the disabled.

13.2. Evaluation of the effectiveness of sheltered workshops in Poland, using the model of DEA

Evaluation of the effectiveness of using the method of nonparametric DEA is based on the concept of two-factor - technical efficiency (TE) (LANG G. and WELZEL P. 1996), indicating the company's ability to generate maximum production (effects) at a given level of effort and efficiency allocative (AE) (ROGOWSKI G. 2008) meaning in turn that the company can use the inputs in the optimum ratio for individual prices (input costs). It is often used to test for effectiveness (TAVARES G. 2002). The combination of TE and AE give the overall economic efficiency (EE) (SIKORA D., KULCZYCKI A. 2009).

In the case of the concept introduced by Farrell technical efficiency is taken into account the difference between an established level of production of the company and its overseas real production possibilities (WELZEL P, LANG G.1995). Derogation from the effective production plan means that the production effects of the combination of inputs

(derived effects) can be produced with less, there is therefore a waste of resources (WELZEL P. 1996). Due to the inefficiency of Technical increases proportionally to the distance from the efficient frontier of production (SHELDON G.1994). An important element in the study of the effectiveness of the company is to evaluate the effects of scale. Insufficient use of existing economies of scale affects the loss in enterprise efficiency.

Positive or negative effects of scale is an indication of how the size of the audited company is close to optimum (WIELGÓRKA D. 2008). From a general point of view of economies of scale reactions illustrate the level of effects on the proportional increase spending. In the case of economies of scale, the amount of produced effects increases relatively faster than the level of investment, which thus falling unit costs. In the opposite case, ie. Decreasing economies of scale (scale disadvantages), unit costs rise as rising production levels. In the case of solid economies of scale, despite the increasing number of effects, the cost of producing one unit of effects remain unchanged. DEA method allows to determine the presence or absence of economies of scale (NITKIEWICZ T. 2007).

Supporters of nonparametric methods, including the authors of the DEA method, based on the concept of productivity, defining measure of productivity as the ratio of the single result and a single effort (GOSPODAROWICZ M. 2000). With one effort (x), and one result (s), we get the curve of efficiency. This curve contains a collection of objects about the size of investment (x) and performance (s) that have reached the maximum, it is possible to achieve results at a given level of investment (CHARNES A., COOPER W.W, RHODES A. 1978). All combinations of inputs and outputs technologically possible are located between the x -axis and the curve of efficiency (production frontier), a curve between inputs and outputs (NIESZPORSKA S. 2005). DEA has been specially developed to overcome the shortcomings of parametric studies, by assessing the effectiveness of only the available data size of the costs and benefits without having to determine their functional dependencies as for the existence of a large number of factors is very difficult.

Objects are considered to be technically efficient if they are on the efficiency curve, while those that are below the efficiency curve is technically inefficient facilities. DMU - decision-making units, which are objects of analysis in the method of DEA. The main object of the analysis is the efficiency with which a given DMU transforms held expenditures for the results. As a measure of technical efficiency is assumed relationship between the efficiency of the object and the object maximum efficiency achievable in given technological conditions.

Depending on the orientation of the model calculated the effectiveness of technical-oriented investments (*input-oriented technical efficiency*) or the effectiveness of technical-oriented results (*output-oriented technical efficiency*) (SCHMID F.A. 2005). The first point in the evaluation of the effectiveness of the use of the DEA is to define the appropriate technology, which is the reference point for measurements made. For this purpose, it is taken into account a set of n decision making bodies that produce s effects using the m inputs. For each DMU vector inputs and results are denoted as $X_j = (x_{1j}, \dots, x_{ij}, \dots, x_{mj})$ and $Y_j = (y_{1j}, \dots, y_{ij}, \dots, y_{sj})$. Wherein $x > 0$ and $y > 0$, I mean, it is assumed that each decision unit has at least one effort and one effect. Defined in this way, production technology (GOSPODAROWICZ M. 2000):

$$T = \{(X, Y) : X \geq \sum_{j=1}^n \lambda_j X_j, Y \leq \sum_{j=1}^n \lambda_j Y_j, \lambda_j \geq 0\} \quad (13.1)$$

Subject to four fundamental assumptions (BANKER R.D., THRALL R.M. 1992):

1) bulge - the $(X_j, Y_j) \in T, j = 1, \dots, n, \lambda_j \geq 0$ nienegatywnymi are scalars, such that:

$$\sum_{j=1}^n \lambda_j = 1, \text{ then}$$

$$\left(\sum_{j=1}^n \lambda_j X_j, \sum_{j=1}^n \lambda_j Y_j \right) \in T \quad (13.2)$$

2) inefficiencies

- when $(X, Y) \in T$ and $\bar{X} \geq X$, then $(\bar{X}, Y) \in T$
- when $(X, Y) \in T$ and $\bar{Y} \leq Y$, then $(X, \bar{Y}) \in T$

3) constant economies of scale

- when $(X, Y) \in T$ then $(kX, kY) \in T$ for everyone $k > 0$

4) the minimum extrapolation, that is, the condition that the technology must contain all its combinations of inputs and results.

The development of alternative models DEA has transformed parts of assumptions. As part of the further development of the methodology has been challenged in particular the assumption of constant economies of scale (BANKER R.D CHARNES A., COOPER W.W. 1984). Original model of the DEA method is a form of non-linear (indicator), containing a weighted sum of inputs x and y results for the DMU. The purpose of the model is maximized this quotient assuming that for any other decision unit cannot be greater than 1 (LANG G., WELZEL P. 2005):

$$\max h_o = \frac{\sum_{r=1}^s u_r y_{ro}}{\sum_{i=1}^m v_i x_{io}} \quad ST : \frac{\sum_{r=1}^s u_r y_{rj}}{\sum_{i=1}^m v_i x_{ij}} \quad (13.3)$$

$$j = 1, \dots, n; u_r, v_i \geq 0, r = 1, \dots, s; i = 1, \dots, m$$

After transformations we get the normal linear form:

$$\max Z_o$$

$$ST : -\sum_{j=1}^n Y_{rj} \lambda_j + Y_{r0} Z_o \leq 0$$

$$\sum_{j=1}^n X_{ij} \lambda_j \leq X_{i0} \quad (13.4)$$

$$\lambda_j \geq 0$$

$$r = 1, \dots, s; i = 1, \dots, m; j = 1, \dots, n$$

Subsequent modifications cause that we get form the basic model CCR-oriented investments (LANG G., WELZEL P. 1996):

$$\begin{aligned}
 & \min \Theta_0 \\
 & ST : \sum_{j=1}^n x_{ij} \lambda_j \geq y_{r0} \\
 & X_{10} \Theta_0 - \sum_{j=1}^n x_{ij} \lambda_j \geq 0 \quad (13.5) \\
 & \lambda_j \geq 0, j = 1, \dots, n
 \end{aligned}$$

This model is designed to minimize the need for capital up to the limit of efficiency, so that the efficiency ratio is obtained expenditures Θ (SCHEFCZYK M. 2006). In the case of values $\Theta = 1$ DMU is tested fully effective, which is expressed 100% transformation of its expenditures the results. A proportional reduction of expenditures not included in this case in the game, because it would mean a simultaneous loss of efficiency. Result less than one suggests that the audited entity is inefficient because it wastes $(1 - \Theta) * 100\%$ expenditures.

Technical efficiency TE company, calculated by solving the model CCR, in economic terms refers to a situation of persistent effects of scale. This means that the proportional increase of expenditure entails a proportional increase in effect. Enterprises seek to determine the size of production, the cost of which will reach the lowest level possible, in terms of long-term effectiveness of the curve will be coming to the shape of the curve with fixed effects of scale.

Implementation of the DEA method requires the definition of costs and benefits, and then subjecting these factors analysis efficiency. After analyzing all the possible costs and benefits was assumed that the primary influence on the individual effectiveness of sheltered workshops have the following factors: sales revenue, relief and subsidies for sheltered workshops, net profit included the effects and fixed assets, operating expenses and number of employees including those with disabilities included in expenditures.

The main sources of data were the separate financial statements of 50 sheltered workshops operating in the Silesia region. For the analysis of the adopted 2006-2010.

Tested sheltered workshops cover an average of 73% of total assets of all “ZPChr” in the Silesian province in the period considered.

Table 13.1. Statistics measures the effectiveness of CSR TE surveyed sheltered workshops in 2011-2015

CRS TE	2011	2012	2013	2014	2015
Average	0,64	0,63	0,62	0,60	0,59
Standard deviation	0,21	0,22	0,21	0,23	0,20
The minimum value	0,39	0,34	0,28	0,26	0,25
Effective ZPChr	21	22	19	18	19
The number of inefficient ZPChr	29	28	31	32	31
% Effective ZPChr	42,0%	44,0%	38,0%	36,0%	38,0%

Source: own study based on the research.

The resulting measure of estimation models oriented expenditures will determine which is the ratio of actual production sheltered workshops to that which should be characterized by a sheltered workshop, if used effectively the same amount of effort. In the analyzed period decreases the number of effective sheltered workshops, which is a worrying phenomenon (table 13.1).

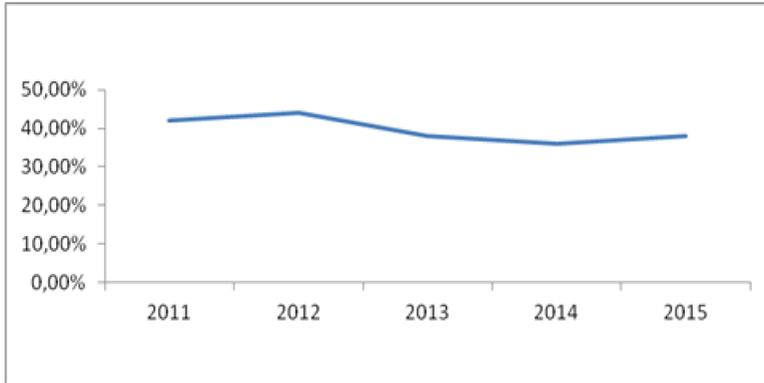


Fig. 13.1. Effective sheltered workshops in 2011-2015 (% of total).

Source: own study based on the research.

CCR estimating the model can calculate technical efficiency (TE) indicating the size of possible inputs, which can be used in a data process conditions to produce at least the same number effects. In 2011, 42% of sheltered workshops were effective unit (Fig. 13.1). Changes in the law on the mainly funding and the deteriorating economic situation led that in 2015 effectively sheltered employment accounted for only 38%.

13.3. Conclusion

Sheltered workshops are specific entities in which one side must operate on a normal competitive market and, on the other hand, employ people with disabilities. Because of the increased operating costs can benefit from financial assistance instruments. The results in the area of efficiency factors that could reach every sheltered workshop, contained in the range of 0-1. The index value of 1 means ZPChr effective, value and efficiency ratio of less than 1 indicates that the ZPChr has the opportunity to improve the relations of investments to results. In the analyzed period 2011-2015 should be pointed downward trend in the number of effective ZPChr. Reducing the number of ZPChr effective primarily due to the

decreasing number of financial instruments in support of sheltered workshops, as well as the common global crisis.

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Zbiór prac naukowych.

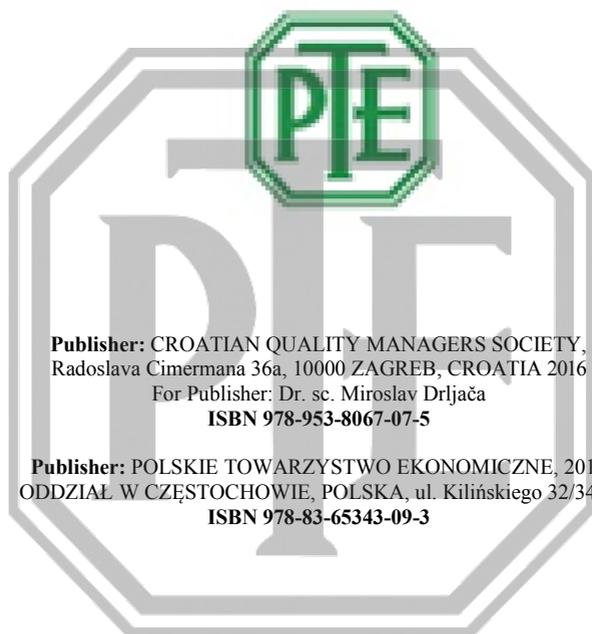
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ISBN 978-953-8067-07-5

Publisher: POLSKIE TOWARZYSTWO EKONOMICZNE, 2016
ODDZIAŁ W CZĘSTOCHOWIE, POLSKA, ul. Kilińskiego 32/34, Częstochowa
ISBN 978-83-65343-09-3

Printing: drukarnia Edytor360, Chorzów, Polska, was printed in December, 2016.

Format 29,7x42 1/4. Offset Paper.

Risograph printing. Conv. sheets 10,625,

200 copies.