Volume 8 • Issue 3 • 2016

Economics and Management

pages: 7-14

DE GRUYTER OPEN

ISMSME International Society for Manufacturing, Service and Management Engineering

received: 10 January, 2016
accepted: 15 July, 2016

Approaches to evaluating efficiency and quality of integrated health care: state of the evidence

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ABSTRACT

This paper investigates the outcomes of integrated health care model in terms of its economic efficiency and quality. The quality refers to subjective assessments of a patient, measured by a satisfaction indicator, as well as to the health benefits to a patient, measured by health status.

A systematic literature review has been applied to study the results of care coordination. The author performed the ordered analysis of existing research evidence, based on peer-reviewed literature available on health science and business databases.

The model of integrated health care delivery seemed to have positive effects on the quality of care. This encompasses mainly the quality of life, functional status, health outcomes, and process outcomes. The equal positive impact of integrated health programmes on economic efficiency has not been revealed. Only 15% of the effects reported in the reviews have been significant.

The work contributes to the worldwide debate dedicated to the impact of integrated health care programmes. The gathered research evidence concerning positive influence on costs remains unclear. It might require further investigations. The work also revealed some significant gaps that are prevalent in the field of standardized instruments of measurement referring to integration outcomes, including quality and efficiency over time at levels of the system, programme, provider, and patient.

KEY WORDS

integrated health care, performance measurement, quality improvement, cost containment

DOI: 10.1515/emj-2016-0019

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Introduction

Health care integration is a phenomenon, which apart from many enthusiasts, has also generated a sizeable group of sceptics or even critics. Their attention is drawn to the results of the application of care models based on Wagner's idea. Traditionally, the main areas of interest include quality and efficiency as well as the relationship between them in operating care.

It is worthwhile remembering the fundamental reason behind the increase in the interest in integrated health care, which was based on the desire to achieve higher efficiency in the management of available but limited resources as well as better results in their use. The relationship between efficiency and quality is clearly evident in integrated health care. It should be noted that ensuring quality increases therapy effectiveness, which results in better health outcomes

for a patient and at the same time affects care costs (Sobczak & Grudziąż-Sękowska, 2011, p. 156). The improvement in the quality of integrated health care has to contribute to generating direct savings both on the micro-scale (individual service providers) and the macro-scale (the entire system), chiefly resulting from reduced duplication of research and elimination of unnecessary procedures as well as inessential or inadequate resources. Improved quality additionally translates into long-term results, manifested through the holistic perspective, including avoidable or diminishable indirect costs of diseases, such as those emerging outside of the health care sector, in the social security system.

On the other hand, quality improvement requires substantial expenditure, which in integrated health care models is chiefly related to information and IT systems as well as organisational changes, such as the efficient location of medical equipment for the use by personnel. Under such circumstances, concerns are voiced regarding the implementation costs of integrated information and communication systems as well as their actual impact on achieved results. Typically, they are considered in respect of three dimensions:

- from the standpoint of health benefits to a patient, measured by health status, and in the long-term – by the quality of life,
- from the standpoint of economic efficiency, most often expressed through costs incurred,
- from the standpoint of subjective assessments of a patient, measured by a satisfaction indicator.

The three above-listed dimensions most frequently feature in research on the effects of integrated health care, although the extent of the use of detailed indicators may vary. As such, they have been used in the proposed study.

1. Literature review

Integrated health care is gaining more attention in all OECD countries. It is also on the top of the agenda of many international bodies such as the World Bank or the World Health Organization (WHO). The popularity of this idea has led to numerous studies that focused on the issue of co-ordination of the health care delivery process. The WHO European Office for Integrated Health Care Services conducts several projects devoted to this subject, for example, „Home Health Care", „Linking Levels of Care", „Primary Health Care", „Human Resource Development", „Hospital Management", or „Telemedicine" to mention but a few (Rudawska, 2013).

The phenomenon of integrated health care is associated with the provision of health care services through the coordination of different activities, such as diagnostics, therapy, rehabilitation, and health promotion, with the patient being the final beneficiary (Stranberg-Larsen & Krasnik, 2009). A coherent set of services is planned, managed and delivered to individual service users across a range of health care organisations and by a range of co-operating professionals (Hardy et al., 2003, p. 10). The authors indicate that, in practice, integrated care appears in a variety of forms, for example, „shared care", „transmural care", „integral care", „disease management", „intermediate care", „comprehensive care", or „continuing care", partly reflecting differences in the scope, approach and different countries of origin. In a similar vein but focusing on the system approach, another group of researchers proposes to define the term „integrated" as a coherent set of methods and models on the funding, and the administrative-, organisational-, service delivery- and clinical levels designed to create connectivity, alignment and collaboration within and between the cure and care sectors (Koder & Spreeuwenberg, 2002, p. 3). Furthermore, an element of integrated care is usually defined as an activity concerning realization, improvement, innovation or sustainability of integrated health care, based on the quality continuum of Feussner (Feussner et al., 2000).

It is generally believed, that integrated health care results in increased quality and effectiveness of care, at the same time being cost-effective or even cost-saving (Van Raak et al., 2003). Although many authors do agree that integrated care is a promising solution, they indicate the need for the dialogue and debate about the need for economic evaluation of such arrangements (Vondeling, 2004, p. 1). Some researchers warn against having expectations of this health care model as they may be unrealistic, and support a measurable approach (Berenson & Howell, 2009; Brown, 2009). This paper fits this trend. Its purpose is to summarise and discuss the outcomes of integrated health care in terms of quality and efficiency of this model.

2. Research method

A systematic literature review is a rigorous evaluation and synthesis of the research results reported in the literature. As a research method, it aims to provide managers and decision-makers with a synthesis of current evidence-based knowledge (Lavis et al., 2005, pp. 35-48; Lomas, 2005, pp. 55-71). Usually, a systematic literature review consists of several stages, with the intention to focus on ensuring the following (Bravata et al., 2005, pp. 1056-65; Brereton et al., 2007, pp. 571-83):

- the research is adequate to target users,
- the top quality studies are incorporated in the synthesis,
- diverse research is included, covering both qualitative and quantitative findings,
- the study includes peer-reviewed sciences and databases,
- analysis, interpretation, and synthesis of the evidence is valid,
- replicability principle of the scientific method is reflected.

A systematic literature review proves to have many advantages for planners and decision-makers. First of all, it lets them compare different findings and provides them with the synthesis of the challenges of the studied processes, models or strategies (Lavis et al., 2005, pp. 35-48). Secondly, it is time-saving and provides easier access to evidence-based information (Lavis et al., 2006, pp. 21-33).

The systematic literature review of peer-reviewed business science and health literature has been applied to meet the research purpose. High-quality databases, including Web of Science, Ebsco, Medline, and Cochrane Collaboration were used as a source of knowledge. The literature was searched in order to identify outcomes of integrated health care model, in terms of its efficiency, patient satisfaction, and clinical impact. Seven specific criteria have been applied: health results, quality of life, patient satisfaction, mortality rate, hospitalisation rate, process changes, and costs.

This paper summarizes the effects of integrated health care on the grounds of systematic literature review, which constitutes a method of ordered analysis of existing research results. Therefore, it is an attempt to collate research reports in such a manner so that an objective and representative image of the examined phenomenon is achieved. However, despite maintaining objective qualification criteria of the subjects analysed in the research, one needs to realize that the obtained results are strongly determined by the context, in which the analysed phenomena occurred.

The paper is based on a research conducted within the scope of a research project entitled: „The methodology of assessing patient care quality in integrated health care", financed by the National Science Centre of Poland (DEC-2012/05/B/HS4/02213).

3. Research results

The presented systematic literature review concerns the publications on integrated health care programmes. Databases were searched using the following keywords: disease management, patient care management, patient-centred care, health planning, and delivery of integrated health care. Out of 350 works selected on these grounds, 13 studies that were qualified for further analysis included meta-analyses, concerning integrated care programmes, addressed to populations of adult patients. Six of the selected studies regarded patients suffering from coronary vessel diseases, two – from diabetes, another three were patients with chronic conditions, and the remaining ones involved individual cases of sufferers from rheumatoid arthritis, heart attack, and chronic lung failure. All of the cited studies adopted the definition of integrated care as worded by Mur-Veeman (2008, p. 173), which is a process-based view as the interpretation guideline for their consideration.

The Table 1 demonstrates that the improvement of the functional health condition of patients covered by the programme is the most frequently reported beneficial effect of integrated care programmes (in the case of only one meta- analysis, the trend occurred to be statistically significant). It proves high clinical quality understood as a correct diagnosis, the adequacy of implemented medical procedures, or the efficiency of undertaken pharmacotherapy. Improvement in the quality of life of a patient corresponds to positive health effects. This was observed in six out of all of the conducted synthesizing studies, but the trend was not statistically significant in neither of them. Moreover, only one study concerning patients after a heart attack showed a statistically significant drop in the mortality rate. In the remaining cases, in which this dimension of results was analysed, the mortality rate did not lend itself to unambiguous evaluation, which means that

Tab. 1. Review of studies on the outcomes of integrated care programmes in terms of seven criteria

Author(s) of the meta-analysis	Health results	Quality of life	Patient satisfaction	Mortality rate	Hospitalisation rate	Process changes	Costs
Ferguson & Weinberger	+	+	+				?
Moser	+	+			-		-
Norris et al.	+					+	
Philbin	+	+	+		-		?
Renders & Wagner	+					+	
Rich	+	+	+	?	-*	+	-
Windham et al.	+	+		?	-	+	?
Badamgarav et al.	?						
McAlister et al. (a)	+	+		?	-*		-
McAlister et al. (b)	+*			?	-*		-
Sin et al.				?	?		
SUTC				-*			
Weingarten et al.						+*	

Legend: ? = ambiguous effect, - = downward trend (in over half of the analysed studies), + = upward trend (in over half of the analysed studies), * = the trend is statistically significant

Source: author's elaboration on the basis of (Windham et al., 2003; Ferguson & Weinberger, 1998; Moser, 2000; Norris et al., 2002; Philbin, 1999; Renders et al., 2001; Rich, 1999; Badamgarav et al., 2003; McAlister et al., 2001a; McAlister et al., 2001b; Sin et al., 2003; SUTC, 2007; Weingarten et al., 2002).

the percentage of results favouring integrated programmes was balanced by the percentage of results of the opposing tendency.

Patient satisfaction, despite being a subjective measure of the experienced service quality, is strongly linked to the achieved health results. In the meta-analyses of the effects of integrated care programmes, in which these issues were considered, a positive trend emerges. Therefore, the integration of health care has a beneficial impact on the degree of the satisfaction experienced by patients. Whereas, its measurement ought to be combined with the implementation of the idea of patient-centred care, in which the opinions of those patients constitute a significant element of system's quality evaluation.

Five out of all of the considered meta-analyses examined the issue of process quality understood as a provider's monitoring of, complying with and adapting to procedural guidelines and protocols. All of the systematic literature reviews indicate a positive trend in respect of integrated care programs, but only one of them evaluates the achieved effect as being significant.

Positive effects expected of health care integration, involving the more rational use of resources, constitute a material argument in debates on health care integration. Since hospital care is typically the most expensive, researchers focus their attention on the duration of hospitalization. In the group of investigated meta-analyses, six demonstrated a downward trend of the length of hospital stays as well as a decrease in rehospitalisation with regard to patients included in integrated care programs. In the case of three of those analyses, the trend was significant. In turn, the economic effects of implemented programmes were evaluated in terms of outlays incurred. Four out of seven meta-analyses reported beneficial cost effects, understood as a cost reduction achieved as a result of integrative processes.

4. Discussion of the results

Sceptics of health care integration claim that the savings made by integration are merely „vain hopes" (Leutz, 1999, p. 89). Some results of other synthetic literature reviews seem to be in favour of such conclusions. For example, the synthetic literature review conducted by Powell-Davies et al. (2008, pp. 65-68) comprised a total of 85 randomized experimental and evaluative studies, the subject of which was health care integration with the participation of primary level (between primary health care and specialist outpatient care, between primary health care and hospitals, between primary health care and long-term care, and within primary health care). Selected studies concerned the USA, Australia, the United Kingdom, the Netherlands,

New Zealand and Canada. In the majority of cases, the target group of integrated health care included patients with chronic conditions. The studies were selected using the following key words: „integration", „coordination", „primary health care" and „multidisciplinary care".

Positive cost-related effects were recorded with regard to the coordination of clinical activities in 1/5 of examined cases that analysed the same issues (Tab. 2). In the remaining types of strategies, cost-related effects were even less evident, while the overall percentage of studies reporting a positive impact of integration on costs was below 20% (Tab. 2).

of treated patients, yielding positive health effects, articulated in over half of the selected studies. This effect was most evident in the case of strategies oriented at the change of the relationship between providers (Tab. 2). Furthermore, the strategies occurred to have been the most effective in terms of improvement of patient satisfaction. In the remaining cases, the interventions appeared to have had a favourable influence on health results, but at the same time, they were less effective in building patient satisfaction and *vice versa*.

Ofman's team also conducted a meta-analysis of 102 papers, dedicated to the evaluation of effects

Tab. 2. Review of studies regarding the effects of integrated health care in the context of areas of intervention

Integration strategies (areas of intervention)	Percentage of studies reporting positive influence of integration on health results [%]	Percentage of studies reporting positive influence of integration on patients' satisfaction [%]	Percentage of studies reporting positive influence of integration on costs [%]
Change of relations between service providers - structural relations between providers, including co-location, case management, multidisciplinary teams	65.5	66.7	16.7
Coordination of clinical activities - structural solutions coordinating the delivery of health services between care providers, including joint consultations, patients' health evaluation, making priority appointments at subsequent care providers	61.3	33.3	20.0
Improvement of communication between care providers - case consultations, tele-conferences	55.3	54.5	14.3
Activities supporting and controlling personnel - joint training courses, the system of reminders	57.1	57.1	8.3
Implementation of IT and communication systems - treatment plans, availability of patients' records in service providers' network, electronic patients' register	60.5	36.8	15.4
Activities supporting patients - education, assistance in access to services, system of reminders	35.3	50.0	14.3
Total (all available papers and studies)	55.4	45.2	17.9

Source: own work on the basis of (Ling et al., 2010, p. 2; Powell-Davies et al., 2008, pp. 65-68).

In the study of Powell-Davies' team, better results were achieved with regard to patient satisfaction indicator: a percentage of randomized studies reporting positive influence on the indicator in respect of multiple strategies was at least 50%. Poorer results in this regard were obtained in the case of coordination of clinical activities and the implementation of IT and communication system (Tab. 2). Integrated care programmes have had relatively the widest impact on the health status

of integrated programmes of chronic disease management. That analysis indicated the improvement in patient satisfaction in 71% of studies, the improvement of patients' clinical condition in 45% of studies and the improvement of cost efficiency in 16% of studies (Ofman et al., 2004, pp. 182-192). The results obtained by other researchers are even more curious and thought-provoking, as the influence of integrated health care on cost effectiveness is ambiguous (McDonald, 2007, pp. 65-66). Therefore,

the issue of effectiveness of mechanisms coordinating and integrating health care in terms of effectiveness objectives needs to be approached with caution.

Apart from the three main directions of integrated health care evaluation referred to above, many more can be found in literature, including the ones evaluating „soft" elements, such as employees' satisfaction, or the quality of teamwork. However, as G. Armitage's team argues on the grounds of a systematic literature review, the majority of reports are based on perceived benefits of health care integration, and not on empirically verified data (Armitage et al., 2009, pp. 1-11). The systematic literature review of this case covered the total of 219 studies, which considered integrated methods of delivering health care. Selected studies concerned the United Kingdom, the USA, Australia, New Zealand and Canada. The studies were selected using the following keywords „delivery of health care, integrated", „organisational integration" and „integrated delivery systems, health care", using a number of databases, including ABI Global, MEDLINE, EMBASE, PsycInfo and Business Source Premier. The review concerned the literature of 1996-2006.

Below, only those works are presented, which constituted randomized empirical tests, reporting effects of the implementation of integrated systems of delivering health care, both with regard to financial and economic management of the studied institutions, as well as to „soft" elements, such as organisational culture or inter-organisational communication.

The above systematic literature review encompasses the multidisciplinary knowledge based on the research and thorough methodological approach. The concentration on the system-level integration could be treated as a limitation, as programme-level studies were not targeted.

Overall, the presented systematic literature reviews highlight some models, measurement instruments, and outcomes of integration which may be helpful for planners and decision-makers of integrated health systems.

Tab. 3. Effects of integrated health care according to systematic literature review conducted by Armitage's team

Methods of measurement	Subject of measurement	Obtained results
Questionnaires with managers	Degree of functional integration along with the management of finances	Better financial results in comparison to the competition
Questionnaires, interviews and focus groups with staff and managers	Experiences of the personnel involved in the system of integrated delivery of health care services	Positive effects regarding: employee satisfaction, teamwork, communication, inter-organisational cooperation, organisational culture
Data from annual surveys, uniform data system	Consumption of resources of hospitals and health centres in the network of cooperating entities	Reduction of unplanned admissions of chronically ill patients to „emergency" admission room. A decrease in the indicator of the average length of hospital stay
Interviews, questionnaires, non-participant observation of primary health care providers	Management and clinical practices used in a local network of service providers	Reduction of unit cost of appointment (per patient) within the network. More horizontal organisational structure
Data from annual surveys	Financial management of county hospitals (case of clinical structural integration)	Lack of explicit improvement of financial results, ambiguous result
Data from annual surveys and disclosure reports, health care financial administration, area resource file	Financial management of integrated network of short-term hospital	Positive influence on the financial indicator

Source: own work on the basis of (Armitage et al., 2009, p. 6).

Conclusions

The above empirical reports as well as descriptive studies provide us with the very interesting research material. They show the three main dimensions that allow us to evaluate the performance of integrated health care delivery systems. The applied dimensions for the evaluation of integrated health care refer mainly to the American health system. A few of these

instruments have been adapted to European conditions, including those of several European Union countries. The tools as well as their accompanying procedural methodologies feature several elements that constitute certain limitations for their direct adaptation to other health care systems, such as the Polish health care system.

Firstly, the available dimensions of evaluating quality and efficiency in integrated health care refer to the experiences of patients and managers with that type of health care service provision model. Therefore, they cannot be applied in systems that are at an early stage of its implementation, or which do not feature the model at all. An important reason for the need to create new measurement instruments is not merely organisational differences, but social and cultural ones as well.

Secondly, the dimensions discussed above refer to different systemic solutions, which mean that the organisation of healthcare systems providing the background for the afore-mentioned measurement instruments differs from the one that WHO proposes for the region of Europe, including Poland. Above all, it concerns the integration of health service financing and provision that operates in the USA and the integration of only the process of service provision proposed by WHO in Europe.

Thirdly, the methodology developed in the United States was built on the basis of scientific evidence gathered by American service providers. However, it does not mean that such achievements could be directly used in the European setting.

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Volume 8 • Issue 3 • 2016

Economics and Management

pages: 15-24

DE GRUYTER OPEN

ISMSME International Society for Manufacturing, Service and Management Engineering

received: 2 December, 2015
accepted: 30 May, 2016

Capital accumulation in a region. Cooperatives versus foreign direct investments

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ABSTRACT

The main aim of this article is to demonstrate the ability of cooperatives to create internal resources of a region through foreign direct investments and the creation of financial, physical, human, and social capital. It concerns the comparing and emphasizing of the stability of resources created in a region by these forms of action. In order to demonstrate the stability of internal resources of a region, generated through foreign direct investment, a research was conducted involving the analysis of the rankings of the largest foreign investors in Poland, statistical data from the Central Statistical Office and the NBP, showing the inflow and outflow of FDIs, the number of companies with foreign capital participation, and the number of people working in them. In addition, a case study was used for the regions where the investments have been withdrawn, showing the importance of cooperatives for the stabilization of the potential of the regions. The study shows that the transfer of FDIs is always guided by the maximization of profit, tax optimization of a location, and the native currency exchange rate fluctuations. The following consequences of withdrawal have no significance to foreign investors but affect the regions: the increase in the unemployment rate, the reduction in the income of local residents, the increase in debt, the acquisition of real estate purchased on credit. The case study shows that cooperative enterprises can replace foreign capital in the region, ensuring the stability and durability of its internal resources. The concepts and strategies for regional development should focus on cooperatives as a way to create the internal resources of a region, which are seen as the current development source. Co-operatives can prevent the leaching of resources and backwash effects. The economic policy must ensure the equal treatment of all of the entities investing in the region. Currently, Poland gives the priority to foreign investors over the domestic ones. Cooperative enterprises are particularly discriminated against through double taxation. It is worthwhile to examine the scale of the cooperative movement in the economy of the EU and the US and the policy instruments applied to this form of business in those areas.

KEY WORDS

resources of the region, foreign direct investments, cooperatives, stability of capital

DOI: 10.1515/emj-2016-0020

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Introduction

Foreign Direct Investment (FDI) is an issue from the area of the international flow of capital. From the point of view of economic development, macroeconomic theory and the practice of economic policy, it is seen as an external source of capital, financing economic activities carried out in a specific region or area of the national economy. The ruling politicians seek to improve the competitiveness of

a given economy or region, promoting the location of foreign capital through the use of the preferential treatment in the form of tax exemptions, formal, legal and organisational facilitation, particularly in Special Economic Zones.

In international economics, the theory discussing the foreign direct investment focuses primarily on the benefits of its launch in a given economy of a country or a region as well as the negative consequences, which mean the costs of FDIs. The benefits in the host country constitute costs for the investing country. On the other hand, the costs in the host country constitute the vice versa benefits for the country of origin. Rarely, however, there can be some consequences that result from the withdrawal of foreign investment. The article undertakes the problem of precisely those consequences, relevant to the internal resources of the regions. Foreign capital, through its withdrawal, destabilizes the economy of the region. The aim of the investors is profit, not the accumulation of resources in a given region. The pursuit of profit provides an incentive to invest capital where its productivity and, therefore, the rate and level of profit will be the highest.

Apart from the undoubted advantages and the importance of foreign direct investment for regional development, it is also necessary to show the negative consequences of the withdrawal of investors. For stable development, the internal resources are essential for the economy or a region. The regional development strategy can be based on internal resources, which is possible through their accumulation by cooperatives or cooperative enterprises. The local capital of cooperatives, also set for the implementation of social objectives, „will not escape" and will contribute to the accumulation of resources. This accumulation in the case of cooperatives concerns both financial and physical capital as well as human and social capital. More than 170 years of history of the cooperative movement shows that such accumulation of resources occurs.

1. Literature review

„Foreign Direct Investment is a term used to denote the acquisition abroad of physical assets, such as plant and equipment, with operational control ultimately residing with the parent company in the home country" (Buckley, 2004, p. 363). Foreign direct investments represent a specific type of investment, defined as the international transfer of capital in order to create a subsidiary in another country and maintain control over it (Krugman & Obstfeld, 2002). The definitions of foreign direct investments emphasize the fact that they are a specific transaction binding many planes: financial capital, knowledge, skills and know-how, technology, organisational and marketing patterns, management experience, and entrepreneurship (Dunning, 1981).

Key benefits of the countries receiving foreign direct investment are extensively described and documented in the literature on the subject (Buckley, 2009; Hill, 2013; Mosa, 2002). The research shows that foreign direct investments are a source of economic development. They provide opportunities for technology transfer, the creation of human capital, the integration of international trade. They foster the emergence of a more competitive business environment and the development of enterprises. Foreign direct investments can also bring social and environmental benefits. This happens when the so-called clean technologies and policies applying corporate social responsibility are used. For example, through the implementation of internationally agreed measures that prevent child labour, elimination of discrimination at the workplace and removing barriers for the conclusion of collective agreements.

Studies show that the condition for obtaining the maximum developmental benefits is the appropriate policy of the receiving country and the international investment structure. From the point of view of foreign investors (in most countries of the Organization for Economic Cooperation and Development – OECD) national policies should develop a transparent, broad, efficient and favourable investment environment and provide human and institutional potential for the realization of investments (Foreign Direct…, pp. 24-26). The investing companies have a choice of their allocation of resources, driven by profitability and it is obvious that the purpose of their transfer will be its highest level. According to the Eclectic theory of international production (Dunning paradigm OLI: Ownership – Location – Internalization), the definitive reasons for the decisions pertaining to the application of FDIs arise from the specific advantages of ownership, location, and internalization. International business activity and directions of the flow of FDIs depend on the difference in the level of economic development of individual countries (Dunning, 1981, p. 27).

Among the negative effects of foreign direct investments for the target countries, the economic and social costs are mentioned. The negative

economic consequences can include primarily the deterioration of the balance of payments of the receiving country due to the transfer of profits from the capital to its home country. There is also a negative impact of the increase in competition, leading to the focus on domestic markets, which may hinder the access to the market for smaller domestic entities having higher production costs. In addition, foreign investments especially in the heavy and mining industries can have a harmful impact on the environment. There may be social costs resulting from the lack of positive relationships with the local environment, the sense of loss of national sovereignty and dependence on international corporations (Hill, 2013).

From the point of view of the foreign investors themselves, many of these negative effects are a result of shortages of national policies of the receiving countries (Foreign Direct… pp. 28-30). However, many authors emphasize that the focus of foreign companies solely on profits may destabilize the economies of both: the host country and the country of origin. Through three main effects, namely, the transfer of resources, the impact on employment and the impact on the balance of payments, FDIs affect the changes in the economic structure of both parties to the transaction. If a company invests abroad, it means that the financial resources, technology, and managerial skills „will follow". In the receiving country, the opportunities for new jobs, the increase in labour productivity and wages will arise. In the balance of payments of the host country, in the current account, the turnover from exports may increase, but in the capital account, the liabilities will increase due to the outflow of foreign company profits to the country of origin.

The reversed effects of the transfer of assets will occur in the home country of the investor. The returning profit of a foreign company, by increasing its resources, provides opportunities for a further future increase of the market share. However, by utilizing their capital and technology for a given production abroad, the company can contribute to the reduction of this production within the country, and sometimes even to its closure and a total focus on the activities in the host country. It undoubtedly has a bad influence on the economy of the country of origin, particularly on the employment of native workers. Such an effect has been observed in the case of US economy, especially during the construction boom, when American builders had to import even the sheet metal and plasterboard from China. With time, the imported goods also included the machinery and equipment.

There is a gap in the knowledge relating to the actual course and development of the effects of foreign direct investment, especially on the mezzo-economic scale (Świerkocki, 2011). The literature rarely contains information relating to the effects of divestments or the withdrawal of foreign direct investments (Sadłakowski, 2015). The problem concerns the recognition of foreign direct investments as a transfer of resources – financial capital, human capital, and management practices. The transfer of resources means, however, both an inflow and outflow. Therefore, FDIs take the assumption of withdrawing in advance, once opportunities for a greater profit would appear in another location, for example in the form of a policy of tax exemptions in a host country. The impact of FDIs on economic development documented in the studies is conditioned by a long period of time. However, what remains in a given region if some years of functioning a foreign investor withdraws and transfers the resources to a different location? What resources remain in the region?

Economic development requires the pooling of resources as well as the accumulation of physical, financial, and human capital. An invaluable role it also played by social capital, particularly in regional development. In turn, the benefits and the costs of FDIs, analysed in the literature and shown in the studies, do not allow the claim that FDIs create resources in a host country. Divestments, which occur in the contemporary international investment structure, denote the outflow of financial capital. What leaves a „hole" in the form of unused human resources, destabilization of trade and organisational relations, especially at the mezzo-economic level? The negative effects of divestments can also be seen in the decline in the income and consumption in the region, the increase of debt, the decrease in tax revenues and the emigration of the population. The outflow of foreign capital from a given region is accompanied by the leaching of broadly defined resources from that region.

2. Research method

The theories of foreign trade argue that the international exchange and foreign trade bring benefits but are not fair. The benefits are therefore apparent at the macroeconomic level. It is emphasized

here that the benefits pertain to a country as a whole economy, as its production and exports increase, the consumption structure becomes more diversified, and the productivity and wages grows. Injustice becomes visible at both the meso- and microeconomic levels. It refers to the situation of individuals who must close their businesses because of foreign competition and those who lose their jobs as a result of these closures. In practice, the national policy exposes more localization incentives addressed to foreign investors through the foreign trade policy, and the politicians do not always see the need to improve the situation for entities and employees who experience losses as a result of the inflow and outflow of foreign direct investments.

In Poland, the institution acting on behalf of the government and dealing with the politics of foreign investment is the Polish Information and Foreign Investment Agency (PAIiIZ). It provides investors with comprehensive information about the economic and legal environment, about the potential partners and suppliers as well as the location. It helps investors in legal and administrative procedures. The mission of the PAIiIZ is the creation of a positive image of Poland in the world and the promotion of Polish products and services (http://www.paiz.gov.pl). The actions of this institution are therefore to a high degree aimed at foreign investors. For several years, PAIiIZ has been issuing an annual list of the largest foreign investors in Poland. On the other hand, it does not conduct the register of the foreign companies that have withdrawn their capital and activities from the territory of Poland.

In the article, the author used the method of comparative analysis of the contents of the lists of the largest foreign investors issued by the PAIiIZ. Also, the analysis encompassed the statistical data provided by the Central Statistical Office (GUS) and the National Polish Bank (NBP). The Central Statistical Office collects data on the activities of enterprises with foreign capital participation on the basis of the statistical reports submitted by them. NBP presents the annual inflow and outflow of foreign direct investments to the Polish economy also on the basis of reports of foreign companies. It shows the impact of these transfers, leaving a mark on the balance of payments, primarily in the form of increased liabilities. The summary and comparison of this data allowed assessing the level and stability of FDIs in Poland. To show the durability and the stability of the local capital created by cooperative enterprises, compared with FDIs, the analysis of case studies was used. The latter analysis shows a Polish cooperative enterprise taking over an establishment of a withdrawing foreign investor.

3. Research results

The transfer of foreign capital to a receiving country can be done through the establishment of a completely new company (Greenfield), mergers and acquisitions – the purchase of a part of stocks or shares of an already existing company (Brownfield), or creation of a new company together with a national partner (joint venture). The described benefits and costs of a national partner are formed depending on whether the investor will take action by relocating the departments that specialise in various stages of the production process, i.e. vertical investments, or the entire independent production plants, i.e. horizontal investments. In the case of vertical investments, there is an increase in both exports and imports, an increase in employment, and the rise in wages. However, such actions hinder the flow of technologies and organisational solutions to national companies. On the other hand, in the case of horizontal investments, the transfer of technologies and organisational experience is broader, but there occurs a decrease in foreign trade turnover, increase in competition, exclusion of national entities, and the decline in employment in local companies.

The conducted study indicates the high volatility of FDIs. Both the inflow and the outflow of foreign capital in individual years of the period 2006-2014 exhibit large fluctuations (Tab. 1). In Table 1, the second column included Total FDI inflows, thus taking into account the outflow of capital from Poland. In order to achieve the objectives of the research, it was necessary to also show the level of the withdrawal of foreign capital from the Polish economy. The highest level of FDI inflow occurred in 2007 and amounted to almost PLN 63 billion. However, in 2008, FDI inflow decreased to PLN 34.5 billion (45%).The period 2008 to 2012 is characterized by a relatively stable increase in capital inflows at the level of over fifty billion PLN. However, the year 2013 saw a big slump in net inflows of FDIs down to PLN 8.6 billion. In 2014, once again there was an increase to PLN 37.6 billion, even though, at the same time, there simultaneously occurred a significant outflow of capital from Poland of PLN 16.3 billion.

The instability of the net results of Total FDI inflows, among other things, arises from the volatility

of the withdrawal of capital from Poland. Foreign investors are guided by profitability and withdraw their resources from deposits where that profitability decreases or such decreased is predicted by forecasts. Likewise, they invest where growth occurs or is predicted. Often, the change of location results from financial institutions does not mean liquidation of Polish entities. Change in the ownership in the financial sector can also mean the reorganisation, cost reduction through the elimination of branches, and the decrease in employment.

The analysis of the number of enterprises with foreign capital participation operating in Poland shows a stable growth. In 2006, the number of such companies amounted to eighteen thousand and was steadily increasing to over twenty-six thousand in 2014. There was also a systematic increase in the number of employees working in these enterprises from 1.3 million people in 2006 to 1.7 million in 2014. It should be noted that the largest share (80%) in this group of companies were small enterprises employing up to 49 people, but the largest share (70%) was constituted by large companies employing more than 250 people. Their share in the capital also represents about 60% (NBP, 2014; PAIiIZ, 2015).

Tab. 1. FDIs in Poland in the years 2006-2014

Description	Total FDI inflows net (BN PLN)	Withdrawal of capital from Poland (BN PLN)	Number of entities with foreign capital	Number of working in entities with foreign capital (people)
2006	40.3	0.2	18015	1313359
2007	62.9	1.2	18515	1453733
2008	34.5	3.3	21092	1531668
2009	42.5	5.6	22176	1460650
2010	53.2	0.9	23078	1518398
2011	58.7	0.7	24910	1566533
2012	59.2	0.7	25914	1571235
2013	8.6	33.9	26128	1628516
2014	37.6	16.3	26464	1747811

Source: author's elaboration on the basis of (NBP, 2014; GUS, 2014).

assessments and forecasts of changes in politics and the economy, and even just the titles of articles reporting a threat to the free market from corruption and the nationalization of pension funds in Poland induce the changes in the decision-making process of foreign investors (Tyrmand, 2015). In the analysed period, the outflow of capital was in the range from PLN 0.2 billion to PLN 34 billion. The first moment of the outflow of FDIs occurred in the years 2008-2009 (PLN 3.3 and 5.6 billion). However, in 2013, there was a withdrawal of foreign capital at the level up to PLN 33.9 billion (Tab. 1).While for the period 2008-2009, the explanation is the beginning of the global financial crisis, in 2013, the record level of FDI outflow was mainly due to the withdrawal of companies from the financial and insurance sector (Section K in PKD). This was when the elimination of a number of special purpose entities with the involvement of transit capital occurred. It is the capital inflowing in a given year and increasing the equity of domestic companies, at the same time invested in the created branches abroad with the aim of financial optimization. This is done through special purpose entities and is not associated with the actual investment activities of entities from the investing country (NBP, 2013, pp. 33-37). The involvement of foreign investors in a special local financial institutions does not mean taking over of their business operations. Divestments made by foreign

The comparison of the investment in new fixed assets in Poland made by entities with foreign capital to domestic capital for one workplace in the reporting period reveals a narrowing of the gap between the two groups of entities. In 2006, entities with foreign capital invested PLN 43.5 thousand into one workplace, while all of the companies employing 10 or more people invested only PLN 18.3 thousand. This difference decreased to PLN 1.5 thousand in 2014 (Tab. 2). So, one can conclude there is no significant additional capital expenditures by companies with foreign capital.

Detailed information concerning the enterprises with foreign capital participation is included in the publications of the PAIiIZ. For the purposes of this article, the list of the biggest foreign investors in

Tab. 2. New fixed asset outlays in Poland in surveyed entities with 10 and more employees in years 2006-2014 (in PLN per job)

Description	In the entities preparing balance sheets	In the entities with foreign capital
2006	18.301	43.510
2007	22.030	33.995
2008	23.643	34.481
2009	22.089	29.787
2010	20.599	25.927
2011	23.636	29.983
2012	23.292	27.421
2013	24.005	27.156
2014	26.903	28.415

Source: author's elaboration on the basis of (GUS, 2014).

Poland for the years 2003-2014 was analysed (there is no such list yet for the year 2015). These lists represent investors who have committed at least USD 1 million in Poland and had at least a 10% share in a company. The number of companies in the ranking doubled from about 1000 companies in 2003 to nearly 2500 companies in 2014. The origin of that capital includes all the countries of the world. The analysed ranking indicates from 30 to 50 countries in individual years. However, most companies originate in Germany (in each year from 30 to 500), the Netherlands (150-200), the USA (150-300). In the years 2013-2014, the number of companies from France increased to 260 (more than from the Netherlands) and from Italy – to 180. The population of the companies included in the analysed ranking changes when comparing the lists from consecutive years. By 2011, dozens of companies „disappeared" from the list. In 2011, the list had 150 fewer companies than the list of the previous year, and about 200 companies were „missing" as compared to the previous one. The inability to account for the processes of mergers and acquisitions is one of the limitations of this study. However, for testing the stability and sustainability of the involvement of resources, it is important to change the structure of business entities having capital at their disposal, their number, and the sites of their activity.

As compared to the state as of the end of 2008, for example in 2009, the following companies left the PAIiIZ list: Polish Bakery Investment BV and it closed the plant Elite Confectionery Poland Sp. o.o. in Szczecin. Previously, the German Stollwerck withdrew and closed the chocolate factory in Jankowice, and the brewery Bitburger (later bought by the company Carlsberg-Okocim). The factory was bought by the Swiss-American company Kraft Jacobs Suchard and was afterwards transformed into Kraft Foods Poland, acting as Mondelēz Poland SA Cieszyn from 2013. One may also mention several banks that have disappeared from the list of the biggest investors: British HSBC, the Royal Bank of Scotland, and the networks; Centro (Russian) or the British Empik Media &Fashion and many others.

Foreign investors particularly focus on fiscal benefits offered by obtaining a permit to operate in a Special Economic Zone (SEZ). The tax exemption offered at SEZs is now a form of a regional state aid, the aim of which is to promote productive investment or job creation. State aid granted to undertakings constitutes an interference with free competition and, therefore, in principle, can be considered illegal from the point of view of the Community law.

Such aid is regarded as acceptable if it does not violate the principles of the common market. Placing a business in a SEZ, an investor can obtain individual relief or exemption from local taxes in addition to the income tax exemption. However, there is no bill of law, a government directive or a particular regulation, which would determine in advance the rules for granting the tax reductions or exemptions as this is done by way of individual negotiations. This means that foreign investors gain additional competitive advantage and inhibit the activities of domestic companies with a similar business field, which leads to job losses.

More than half of current zone investors declare not planning to implement new investment projects in their SEZ for until 2020. 81% of the respondents declared readiness to carry out new investments provided the zone continued to work longer. Continuation of the operation of SEZs is, therefore, a direct factor in the attractiveness of areas. As the main benefit of business in the zones, 96.7% of the respondents indicated an income tax exemption (according to the survey: Specjalne Strefy Ekonomiczne po 2020 roku).

To present the instability of foreign capital in developing the resources of the region, it is worth to present a case study of Colgate-Palmolive. Colgate-Palmolive America Inc. is an international company producing household items, soap, detergent, toothpaste, and toothbrushes. It was founded in 1806

in New York. The company entered Poland in 2001 with a 55% share in Colgate-Palmolive Poland Sp. z o.o. In Halinów, which is close to Warsaw, it constructed its first Polish factory. This plant employed 300 to 500 people through the years. Colgate, however, still carries out the strategy changing the locations of its activities. In 2005, they announced the closure of five factories: one in the UK and four in mainland Europe, including the one in Poland. The objective was to obtain funding for investments in new products in a new place. In the strategy announced in November 2012, the company clearly indicated the intention to liquidate its first plant in Poland in Halinów and the plan for the expansion of its second factory in Świdnica (opened on 1 July 2008), moving the production of toothpaste there and employing about 200 new employees. In 2013, they received a permit for a new investment in the Wałbrzych Special Economic Zone. At latest by the end 2015, Colgate was supposed to invest at least PLN 102.5 million in the expansion of the Colgate-Palmolive plant in Świdnica and employ at least 80 new employees. Thus, the Colgate-Palmolive factory in Świdnica was supposed to become a strategic factory for the company in Europe, and the company used all the perks offered by the activity in the special economic zone.

The factory in Halinów was closed in December 2015 (http://www.colgate.com). Already in May of that year, Colgate reported the largest number of people to be made redundant in the Mazowieckie voivodship (http://wupwarszawa.pl). At the end of 2015, the unemployment rate in the Minsk district was 8.8%; in January 2016 – 9.2%; in February – 9.7%; and in March – 9.3%. Most of the registered 359 people were from the rural-urban municipality of Halinów (http://www.praca.powiatminski.pl).

In January 2016, the Colgate-Palmolive company once again announced that by December 2017 it is going to sack 3.3 thousand to 3.8 thousand people as the company recorded a decline in sales in 2015. Especially from the European region from USD 3.4 billion in 2014 to USD 2.9 billion in the fourth quarter of 2015. The reason behind these plans was high exchange rates. More than 75% of the company's revenues come from outside the United States. In comparison to the European market, Colgate products were much more expensive in many regions, including Latin America, which is the largest market in terms of sales (http://www.statista.com).

In April 2016, the ownership of the Colgate-Palmolive company in Halinów went to the Cooperative of the Disabled Świt. Then, the transaction of sale of the organised part of the enterprise together with full infrastructure as well as production lines was finalized (http://www.swit.com.pl).

4. Discussion of the results

When describing the history of the Świt cooperative, it is possible to see a universal property of the cooperative movement. As in the case of most cooperatives, Świt was established to achieve the objectives of a group of people with a good will to cooperate, aware of its benefits and open towards others (Czternasty, 2013). A group of fifteen people, including veterans, created the Cooperative of Manufacturers Świt on 15 October 1944. In the ruined buildings after the Zylberman's soap factory, the production of soap, face powder, baby powder, and shoe and floor polish began, which in fact was packed in the boxes of canned products. Generally, the Polish co-operative movement was ruined and destroyed during the World War II by the German and Russian occupants. In the central and eastern Poland, the German occupants physically destroyed the Jewish merchants, who were predominant among the merchants before the war. Immediately after the war, work began on the Polish soil to rebuild the cooperative. Now, the cooperative had to respond to the local needs and the necessity to rebuild the country (Brodziński, 2014, p. 65).

The creation of the Świt cooperative was therefore not an act of the communist authorities but resulted from the needs of cooperative members and the needs of the local community. In 1949, the name was changed from the Cooperative of Manufacturers to the Cooperative of the Disabled Świt (SI Świt). The cooperative also became a member of the Headquarters of the Cooperative of the Disabled. In the years 1958-1961, with the use of the own resources of the Cooperative, at Taśmowa 1 Street, a modern industrial and office building was constructed with an area of over 11 thousand sq. meters, as well as blocks of flats for the members at Bogunki Street. The number of cooperative members systematically increased, but always more than 70% were the employees with disabilities, also the mentally disabled since 1960.

The Cooperative of the Disabled expanded the structure of production by the manufacture of components for television sets and tape recorders

in cooperation with M. Kasprzak Warszawskie Zakłady Telewizyjne and Zakłady Radiowe. In 1978, it also set up its own workshop in Myszyniec, in the region of Kurpie, which took over the production of welded plastic products (from 1982, the Cooperative of the Disabled). In the period of economic transformation, the collapse of the eastern market, and a massive influx of Western cosmetics, the cooperative survived the crisis of 1989-1991. The solution was to sign a contract with the German manufacturer of parapharmaceuticals – Sebapharma GmbH for the production of natural cosmetics, in line with the requirements of medicine of cosmetics from the series Sebamed. Then, the employment status was the highest in history with 1240 people, including 892 handicapped (http://www.swit.com.pl).

In 1994, SI Świt created Sp. z o.o. Świt in Kaliningrad for the operations in the eastern market. Its activity, however, was suspended in 1998 because of the crisis in Russia. However, in the same year, the company's Świt cooperative Pharma was founded in Malbork for the implementation of tasks relating to export to eastern markets. In 2001, the cooperative received the Quality System Certificate No. 8/QMS/2001, confirming the compliance with the requirements of the standard PN-ISO 9002: 1996 in the following areas: manufacturing of perfumes, cosmetics, and household chemicals, as well as plastics processing.

Since mid-2004, SI Świt suffered from a critical financial situation. The cooperative, however, began the process of restructuring, which was also associated with the necessity to lay-off workers. The restructuring lasted until December 2007. Then, the cooperative employed 212 people, including 126 handicapped. In the period of restructuring, SI Świt opened a flagship store at Taśmowa Street in Warsaw, launched online sales and an advertising campaign in trade magazines, women's magazines and the Internet. It participated in many international fairs (http://www.swit.com.pl). In 2008, the implementation of an innovative business project of the Outplacement Centre was launched, involving the direct sales of cosmetic products by consultants who were people with disabilities. In 2011, a branch in Radom was established (printing services), and in 2012, other two were started in Opole (production of protective clothing) and in Władysławowo (production of pallets).

In recent years, the participation in many prestigious international fairs and exhibitions has brought SI Świt the recognition of their products and numerous awards: Customer Laurel – Discovery of the Year 2013, the Excellence of the Year according to Twój Styl 2013, PEDI Award 2013, Art Of Packaging 2014, Customer Laurel – Discovery of the Year in 2015.

The cooperative conducts extensive educational and social activities. It organised workshops and co-organised the beauty pageant Miss Poland in a Wheelchair. A line of skin care products designed for fans and enthusiasts of the Polonia Club was started up in Świt Pharma. The profit from the sale of these cosmetics will be used to finance the Polonia Club (http://www.swit.com.pl).

On 15 October 2014, the SI Świt celebrated its seventieth birthday. Throughout the period of its activity, its products were appreciated by the consumers. There never was a situation as in the case of Colgate-Palmolive, which was brought to court for jeopardising consumer health due to the presence of hazardous substances in their products. Triclosan, which according to a recent research may cause cancer cells to grow and interfere with the normal development of animals, is one of the components of the popular toothpaste Colgate Total. The US office for regulating drugs and food market Food and Drug Administration (FDA) approved the sale of this paste as a non-prescription drug in 1997. After seventeen years, it turned out that the company concealed from the FDA a part of the documents containing test results. They were disclosed only as a result of a lawsuit (http://www.bloomberg.com).

The activities of the cooperative Świt are based on the Good Manufacturing Practice (GMP). The Good Manufacturing Practice is a system of procedures enforcing and guaranteeing the highest quality and purity of the products and ensuring complete control over the origin of raw materials.

For over 70 years, SI Świt has been a manufacturer of household chemicals and cosmetics for face and body, which are appreciated by consumers. Among the brands in the portfolio, the Abra brand should be mentioned, which has been continuously available for sale for several decades, almost since the inception of the company. The company also owns brands such as Exclusive Cosmetics, Days Cosmetics, and Clean Hands, which is anti-bacterial gel for hands (http://www.rp.pl/Biznes, 25.04.2016).

Within the development strategy of the Cooperative, the purchase of the Colgate production plant in Halinów was a key element. The deal allowed increasing the production capacity of the Cooperative from the existing 20 to over 110 million units per

year, which puts the company among the largest manufacturers of cosmetics in Poland. The plant in Halinów (23 km from the centre of Warsaw) is one of the most modern and automated facilities in Poland. The property, with the area of nearly 6 ha, is suitable for the production of lotions, shampoos, gels, pastes, and powders. In the production halls with the total area of 10 thousand sq. meters, there are modern, automated production lines designed for mixing, homogenizing, filtering, screening, as well as bottling of products. The factory is equipped with the automatic systems of measurement and control equipment, through which the entire production process may be continuously monitored in terms of the highest quality standards. On the premises, there is also a modern chemical and microbiological laboratory (http://www.swit.com.pl).

Among the main business objectives, the SI Świt is planning a significant expansion of the range of branded products, the expansion of the existing brands for the Polish into foreign retail chains, the development of contract manufacturing for current and new customers, and dynamic growth in exports. In connection with the first orders from the customers in Germany, Finland, France, Russia, Ukraine and Spain, the launch of the production lines will take place already in May. In the new factory, SI Świt will produce gels, liquid soaps, shampoos, dishwashing liquids, laundry liquids, rinse liquids, liquids for oral hygiene, etc. The offer will also be extended to include washing and cleaning powders, while in 2017, it is planned to launch the production of toothpaste. The Halinów plant of SI Świt will employ approx. 100 people, mainly machine operators and the production staff. From the end of April, approx. 30 people will begin working, most of them being the former employees of Colgate-Palmolive (http://www.swit.com.pl).

Conclusions

Comparing the activity and strategy of the multinational Colgate-Palmolive group with the objectives and strategy of the SI Świt, it is clear who participates in the achieved benefits. From the point of view of gathering resources in a particular economy or region, international capital flows do not provide a stable and sustainable growth. Moving towards greater profitability, FDIs are not concerned with the consequences of the withdrawal of their production from a particular region. As seen in the case of Colgate-Palmolive, closing factories and layoffs are caused by the fluctuations of the USD, the currency in which the capital owners ultimately count their profits. And although Colgate has been operating for over a century, SI Świt managed to accumulate non-monetary profits and benefits in the same field of activity during seventy years.

The accumulated physical and financial capital resources are the effects of the operation of Świt co-operative. Besides, we should not underestimate the importance of creating economic and social opportunities for people living with a disability. The use of modern technologies is possible having the necessary human capital. Undoubtedly, the effects of increasing the level of the social capital are also visible; not only the local community of Mazowieckie or Minsk Voivodships, but all Polish citizens and consumers can have greater confidence not only in the product quality, stability of employment but also in the opportunities and chances for success of joint action.

The development of the SI Świt for over seventy years is the proof that for the local community permanent indigenous entities are more important than the international companies relocating production from one place to another. You can ask how US consumers and citizens benefit from the activities of Colgate-Palmolive America Inc., if 75% of its revenues come from foreign markets. Does it provide them with jobs and ensures tax revenues to local budgets?

In conclusion, it is worth noting that:

- in the economies of the countries that are more developed than Poland, there are many cooperative enterprises; they operate successfully in various industries, and socio-economic policies of these countries support the cooperative movement,
- promotion of cooperatives also takes place in the activities of the European Union and the United Nations, for example, 2012 was declared the International Year of Cooperatives,
- unfortunately, the Polish policy of the political transformation period and also the later period has taken steps that were rather detrimental to the development of cooperatives,
- and even if, according to some people, the success of the SI Świt (is mainly due to the people with disabilities, whose jobs are subsidized by the State Fund for Rehabilitation of Disabled Persons (PFRON), these jobs exist and new will be created.

The case of the SI Świt is a good example of economic patriotism. This was evident in the comments of Internet users. They expressed joy about

the takeover of the western factory by the Polish cooperative. Therefore, with its very action, the Świt educates the Polish society, showing that cooperatives are not a relic of the communist collectivism. A cooperative company, which in addition to profit meets the objectives of its members, can surely be a way for people who are open, with good will to work together, to create a place in the economy and civil society.

Literature

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Volume 8 • Issue 3 • 2016

Economics and Management

pages: 25-34

DE GRUYTER OPEN

ISMSME International Society for Manufacturing, Service and Management Engineering

received: 30 October, 2015
accepted: 20 October, 2016

The concept for the development of a functional area illustrated by the case of the Functional Area of the Oder Communes

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ABSTRACT

The aim of this article is to present the essence of a functional area as a new tool of the EU regional policy and the course of designing an integrated approach to the development of the functional area. The study is a case study and relates to the methodical process of creating a development concept for the Functional Area of Oder Communes (FAOC). This article is based on the analysis of the domestic and foreign literature on regional development and own experiences and reflections of authors resulting from the work in the team for the development of a strategy for this area.
The analysis of domestic and foreign literature allowed for presenting a new paradigm of the local development. The current approach is characterized by a focus on the use of endogenous potentials and territorial targeting of the development, which promotes the creation of functional and spatial structures such as functional areas. Their development requires integrated development planning that provides benefits both in the social and economic dimension. The study presents the new paradigm of the local development in the context of the National Spatial Development Concept 2030. The study presents the theoretical and practical basis for creating a concept for integrated development of a functional area.

KEY WORDS

functional area, regional policy, spatial policy, local development, development concept

DOI: 10.1515/emj-2016-0021

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Introduction

The contemporary public administration should not be concentrated only on the issues related to the provision of public services but rather on the effective management, which can be reflected in the creation of new functional spatial structures and concepts of their integrated development aiming at building a sustainable competitive advantage.

The aim of this article is to present the essence of a functional area as a new tool of the EU regional policy and the course of designing an integrated approach to the development of the functional area. The study consists of two parts. The first presents a new approach to the regional policy in the European Union (EU) and the essence of a functional area, which is an instrument of this policy. The second

presents the role and the process of designing an integrated concept for the development of a functional area.

It was the Functional Area of Oder Communes that was used by the authors as the object of the study. The article is based on own experiences and reflections arising from the work in the team for the development of a strategy for this area. The work on the creation of the development concept was carried out within the scope of the project „The Socio-Economic Development of the Oder Communes" co-financed by the Programme of the Ministry of Regional Development „The development of towns by strengthening competences of local government units, the social dialog and cooperation with representatives of the civil society" and by the Financial Mechanism of the European Economic Area and/or the Norwegian Financial Mechanism.

1. Literature review

1.1. New approach to the EU regional policy

In the recent years, Europe has been discussing measures that should be considered to make the regional policy more effective. In addition, the measures had to target desired objectives, foster the socio-economic and territorial cohesion and simultaneously improve the competitiveness of regions as well as respond to current developmental challenges.

The regional policy conducted since the 1970s has been focused on redressing the interregional imbalances and the sectoral approach. The local development was defined as „actions for the social and economic development of a given territorial unit (a town, a commune) with the use of its resources, with respect to the needs of the population and with its involvement in actions taken" (Parysek, 1995, p. 12). The effectiveness limited in relation to the objectives of this policy provoked criticism in many different studies, e.g. the *Fourth progress report on cohesion* (COM (2006) 281 final), *Green Paper on Territorial Cohesion Turning territorial diversity into strength* (COM (2008) 616 final), *and An Agenda for a Reformed Cohesion Policy. A placed-based approach for meeting European Union challenges and expectations* (Barca, 2009). The criticism resulted in conclusions on the need to refocus the EU regional policy. The regional policy conducted in the EU in the recent years has been evolving from the model of the redistribution policy, focusing on transferring funds to the most disadvantaged regions, to the policy focused on the use of endogenous potentials and specifics of individual territories (Wasiluk & Daniluk, 2013).

The main document indicating the relevance of the territorial approach to the EU regional policy was a report drawn up by Barca, which on the one hand pointed out weaknesses of the cohesion policy, often associated with the sectoral thinking, and on the other hand described the so-called territorial approach to the regional policy (Barca, 2009). As a result of the studies, a new paradigm of the regional development and a new concept for the territorially-oriented regional policy in the EU were introduced since 2009.

According to Markowski, the territorial dimension of the development policy stems from the role, which is assigned to the dynamic functional spatial structures. It is by building such structures that the territorial capital is created and is understood as „specific external benefits generated and available as a result of multifunctional user interaction on a relatively isolated territory" (Markowski, 2011, pp. 25-44). It is closely related to the ability to cooperate with local government units in functional areas and with a high level of social trust. Temporary coalitions of local self-government units are created within the framework of functional connections formed and actions for executing development projects are integrated. The territorial capital is a set of elements, which constitute the competitive potential of the region. They include natural resources, public goods, private and mixed goods, human, social and relational capital, organisational resources, relational and cognitive abilities (Capello et al., 2011, pp. 144-145). The concept of building a territorial capital in functional areas requires integrated development planning, which is a prerequisite for the improvement of markets and implementation of the sustainable development paradigm based on the principle of the mutual, balanced relationship among economic, social and environmental subsystems.

Building the concept of the integrated development provides benefits in social and economic terms. It allows for the activation of a community through adoption of a more proactive attitude towards sustainable development by residents, which supports the development of the civil society. From the

economic point of view, the advantage of this approach is that it places the economic activity on the territory, and the undertaken economic activity depends on the specific economic conditions and comparative advantages of the territory. As a result of the involvement of local stakeholders and rooting of the economic activity in the given territory, it contributes to the overall improvement of the quality of work (Christopherson, 2008, pp. 241-242). The integrated development concept is, therefore, an instrument to overcome administrative barriers in order to use potentials arising from the new resource, which is the territorial capital, including the relational capital.

The EU regional policy is shaped under the influence of various theoretical concepts, which promote new solutions and mechanisms aimed at stimulating the growth and the development of regions. The new direction in the EU regional policy, i.e. the territorially-oriented development, is based on the achievements of the scientific thought in the field of the regional development focused on the analysis of the spatial dimension of the process of economic development in the recent years. The theoretical basis for programming and implementing the new approach to the EU regional policy consists of different theoretical concepts of regional development, including the concept of the network development (Castells, 2008), the concept of the learning region (Florida, 2000) or the new theory of endogenous growth (Szlachta & Zaleski, 2009).

In Poland, the new paradigm of the regional policy is reflected in the national strategic documents. They include: *The National Strategy of Regional Development: Regions, Towns, Rural Areas (NSRD),* (The Ministry of Regional Development, 2010), which was adopted by the Council of Ministers on 13 July 2010, and is the main document of the regional policy of the government as one of nine so-called integrated strategies and *The National Spatial Development Concept 2030* (NSDC 2030), (The Ministry of Regional Development, 2012), adopted by the Council of Ministers on 13 December 2011, which is the basis for spatial planning policy of the country.

It was in the NSDC 2030 that a new category of functional planning was introduced: „the separate sectional planning category due to the need to provide planning for the areas with specific characteristics, unrelated to administrative restrictions, regardless of the existence of national, provincial or local plans (plans for functional areas)", (The Ministry of Regional Development, 2012, p. 18). The principle of dynamic zoning and the designation of planning areas are indicated as a basis for functional planning in order to use local and regional potentials and minimize conflict situations (The Ministry of Regional Development, 2012, p. 68). According to the new paradigm, the local development is the result of joint actions of the public, private, and social sectors.

1.2. Functional Area of Oder Communes — a new category of the regional and spatial policy

The NSDC 2030 introduces the concept of the functional area, its types and specifies, who is responsible for their appointing and according to which criteria.

The definition of functional areas formulated in the NSDC 2030 is based on the definition of „the problem area" taken from the Law on Planning and Spatial Development (Dz. U. 2003 nr 80 poz. 717 z późn. zm., art. 2 pkt 7) which defines it as an „area of a particular phenomenon from the scope of spatial economy or appearing spatial conflicts" indicated in the spatial development plan for the province or referred to in the study of conditions and directions for spatial development. Due to the fact that this definition does not exhaust the concept of the functional area, the NSDC 2030 adds the following: „a compact spatial arrangement consisting of functionally related areas characterized by common conditions and expected, uniform development objectives" (The Ministry of Regional Development, 2012, p. 178).

It is in the NSDC 2030 that several types of functional areas were distinguished, which can be represented in three groups (Fig. 1).

Urban functional areas (UFA) are continuous settlement systems, composed of separate administrative units and covering closed areas of towns and functional urban zones associated with them. Administratively, these areas may include both town, rural and urban-rural communes. UFA can be divided into four categories: 1) provincial centres, including metropolitan ones, 2) regional, 3) sub-regional and 4) local (The Ministry of Regional Development, 2012, pp. 187-191).

Rural functional areas are divided into two groups: 1) participating in the development processes and 2) requiring support for development processes. The first group includes the areas situated in the zone

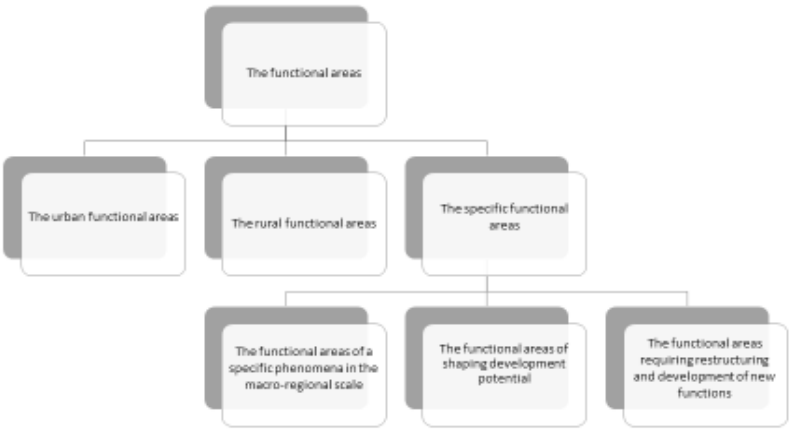

Fig. 1. Types of functional areas

Source: author's elaboration on the basis of (The Ministry of Regional Development, 2012, pp. 181-206).

of a strong impact or in the vicinity of main urban centres; they are characterized by a high share of non-agricultural functions or highly efficient agriculture, rather good access to public services and higher-order services. While the second group includes the areas with low availability of basic public services or situated in the vicinity of urban centres, which have lost their formerly important economic functions as a result of development processes and the dominant agricultural function does not provide sufficient revenue, and those, where commuting to work takes more than 90 minutes (The Ministry of Regional Development, 2012, pp. 191-193).

A specific functional area is a term proposed by the authors for the group of the other three types of functional areas (The Ministry of Regional Development, 2012, pp. 193-206):

- the functional areas of a specific phenomenon in the macro-regional scale (they are divided into seven groups: the coastal zone, Żuławy, mountain areas, closed areas, the Polish exclusive economic zone at sea, soil protection for purposes of agricultural production, areas exposed to the risk of flooding on a scale of river basins),
- the areas of shaping development potential requiring programming protective actions: these are areas of special cultural or natural value (divided into five groups: environmentally valuable areas, cultural landscape protection areas, areas of protection of water resources, areas of strategic mineral deposits),
- the functional areas requiring restructuring and development of new functions supported by the instruments of the appropriate regional policy are the areas with specific concentration of socio-economic problems, including towns, which may be important for the country (they are divided into 5 groups: The areas with the lowest development level and deteriorating development perspectives, towns and other areas losing existing socio-economic functions, the areas with the lowest access to services determining development opportunities, border areas, areas with the lowest availability of transport to centres of voivodships).

An example of an initiative, which is a new approach to the EU regional policy is the Functional Area of the Oder Communes (FAOC). The area is located in the Lubusz Voivodship; it is created by three communes: the urban and rural commune of Czerwieńsk, the urban and rural commune of Sulechów, and the rural commune of Dąbie. The FAOC is situated along the main navigable river of the country, Oder, in the natural environment unspoiled by human activity and entirely within the Zielona Góra agglomeration. Given the document that delineates the boundaries of the functional areas of the Lubusz Voivodship (Raport metodyczny…, pp. 13-78), the FAOC can be classified into the following functional areas:

- rural functional areas participating in development processes,
- the functional areas of a specific phenomenon on the macroeconomic scale: areas exposed to the risk of flooding in the scale of river basins,

- areas of shaping the development potential: environmentally valuable areas,
- areas of shaping the development potential: cultural areas,
- areas of shaping the development potential: protection areas and areas of shaping water resources,
- the functional areas requiring the development of new functions using the instruments of the competent regional policy: border areas.

However, it should be noted that the FAOC was defined even before drafting the document mentioned above within the framework of the project „Socio-economic development of the Oder communes". The purpose of the project was to develop a model for the Partnership of Oder Communes, which would make it possible to implement projects, which would contribute to the social and economic development of the defined functional area and to strengthening local social ties.

One of the first tasks was therefore to develop a concept for the FAOC development.

2. Research methods

The creation of the concept for the FAOC development required integrated planning understood as a holistic process of setting goals and finding ways to achieve the goals set in this process, taking into account the most important interdependencies (relationships) amongst the most important elements in the controlled system.

The model for the creation of the Integrated Strategy for the Development of the Functional Area of Oder Communes consisted of two main parts: strategic and management. The strategic part included the following stages: (1) the diagnosis of the Functional Area of Oder Communes, (2) the analysis of the conditions and the main development trends in the functional area (SWOT) and identification of strategic problems, (3) the definition of the mission and vision of the development, (4) the identification and prioritization of the development goals of the functional area, (5) the assessment of compliance with strategic documents, and (6) the definition of actions for implementation of the plan. The management part related to the management system for the implementation of the strategy and included monitoring and updating the strategy. This concept was created on the basis of the participatory-expert method, in which representatives of the public, social and business sectors participated.

In the first stage, the creation of the concept for development required a diagnosis of the current situation, which would contain the data showing the current demographic and socio-economic situation, the condition of the technical and social infrastructure, and the financial potential of the functional area. It was in the diagnosis that the internal conditions for development were also taken into account. At this stage, both the secondary and primary sources of information were used. The analysis of the source documentation of individual partners, public registers, administrative data and others was carried out. At this stage, the ratio analysis and benchmarking method were applied. Furthermore, such methods of obtaining primary data were used as: participatory observation, non-standardized interview with representatives of the regional and local authorities, subsidiary bodies and other stakeholders of the partnership as well as an online survey addressed to residents of the functional area aimed at evaluation of the quality of life.

The analysis of the functional relations within the scope of public and market services within the area and the existing relational relationships was carried out. The partnership cooperation in the Oder areas was established in order to improve the quality of life of the population living in the area as well as to stimulate the economy; nowadays, it brings together entities from three sectors (public, social and economic). The potential of a functional area consists of not only the potential of the participants in the partnership but also the value added, which is the result of a unique partnership. In the future, it should enable the integration within the scope of the provision of public services in order to use the economies of scale, while improving the quality and availability of services. The diagnostics measures should be repeated on a regular basis in the future, which should enable the verification of the implementation of the objectives and monitoring changes, which will occur on a given territory on the background of its surroundings. The development should not be perceived only in terms of the end result (desired in the static sense), but should be considered as a process of creating new conditions for development (desired in the dynamic sense). These conditions are crucial for changes needed for updating strategy (Kogut-Jaworska, 2011, p. 139).

An analysis of trends, phenomena and development processes was carried out in order to determine the strengths, weaknesses, opportunities, and threats, i.e.

the SWOT analysis, which allowed for the assessment of the current and future development situation of the functional area. It was in the integrated approach that the scope of the SWOT analysis was extended and supplemented by an analysis of the relationship amongst partners. Strong internal dependencies were taken into account, which occurred amongst the economic, social and spatial spheres as well as environmental one, which can be perceived as internal opportunities or internal threats to the development, strengthening or weakening the development processes in the area. It is at this stage that the problems, resources, competitive potential and the key features of the partners and the whole partnership were identified. The identification of positive and negative aspects of the current situation was carried out, and the main problems in terms of the strategic conclusions were identified.

Then, the mission and vision of the development of the functional area were determined. The vision and mission show the desired future partnership and living conditions of the residents. The vision of the functional area is the picture of its future and the target position in the surroundings. It contains a set of integrated aspirations associated with the future of activities of the partners, based on the analysis of the past and present situation. It is, therefore, a product of the historical heritage. The vision of the functional area presents states possible to achieve and creates a basis for determining the overarching objectives for future actions of the communes leading to the execution of the mission of the functional area. Each action of the partner communes should result from the vision of the communes and the functional area as well as it should serve the implementation of the mission of the functional area. The vision of the functional area is a target image of its functioning in the specified timeframe, which is desired to be achieved by authorities and residents of the commune in cooperation with other entities using current and future resources.

An important stage was also the identification and prioritization of the development goals for the functional area using the tool, which was the logical framework. While choosing the strategic goals and directions for the development, the principle of the sustainable development was applied, which requires providing the balance and sustainability of the development in the economic, social and environmental sphere. The resulting goals meet the SMART criteria.

The management system for strategy implementation includes monitoring and updating the strategy and the description of the scope of operational and implementation actions. Good management is strategically important since it allows local governments to anticipate changes in the environment and aims at using appropriate instruments to improve the effectiveness of local governments (Noworól, 2010, p. 57). It is in the territorial management understood integrally that the priority principle, as already mentioned, is understood as internal (amongst stakeholders of the same local self-government unit) and external (amongst units) partnership. There are three basic partnership postulates that result from this principle (Gawroński, 2014, p. 53):

- shared goals,
- mutual communication: full and the free flow of information amongst partners,
- mutual tolerance: acceptance, equality of the entities and transparency.

The integration must occur in the spatial, social, economic, environmental and management dimension. Such measures are intended to contribute to the creation of competitive advantage of the specific unit of the local self-government, which should result in its development and improvement of the living conditions of the residents by increasing access to public services and raising their quality.

3. Research results

The substantive activities related to the creation of the concept for the development of the Functional Area of Oder Communes were planned according to the intervention logic, which consists of three levels, which differ in the degree of detail of the issues under discussion.

- The first level: the Integrated Development Strategy for the Functional Area of Oder Communes, which sets development priorities, strategic, operational and general goals as well as general ways of their implementation by all partners.
- The second level: the integrated sectoral strategies in the areas identified by the analyses performed, which provide the best prospects for the development of the functional area or require an intervention:
  - *the Integrated Program for Activation and Social Participation in the Functional Area,*
  - *the Integrated Strategy for Development of Education and Labour Market in the*

Functional Area,

– *the Integrated Strategy for Development; Offers for Free Time in the Functional Area, with particular regard to the Recreational and Environmental Protection Offer.*

operational objectives were included.

Individual strategic goals will be achieved through the implementation of strategic actions, which are presented in the form of logical frameworks. They include not only actions but also planned effects.

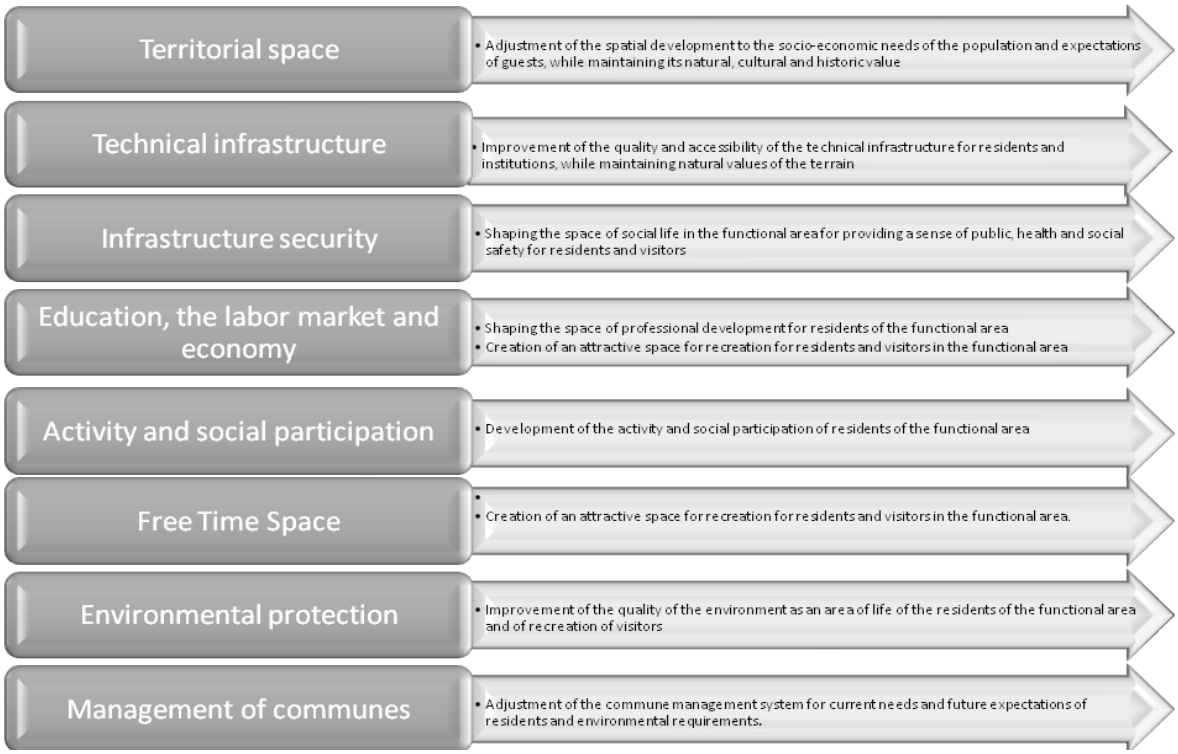

Fig. 2. The structure of priorities and strategic goals for the Functional Area of Oder Communes

Source: author's elaboration on the basis of (The Integrated..., 2015).

- The third level: the operational and implementation documentation for sectoral strategies, which contribute to the reduction of development barriers and substantial use of the endogenous potential of the functional area, including the preparation of the list of recommendations for economic policy, to achieve good growth rates.

The first level was the most important, within the scope of which the priorities and goals were set as a set of interrelated aspirations and the expected results with varying degrees of specificity taking into account the relational potential and resources created as a result of the creation of the functional area. The created set of the specific goals was arranged in a hierarchical structure to facilitate their systematic implementation. The set priorities and goals are a result of a compromise amongst goals of individual partners, opportunities, and limitations. Eight priority areas were found, which were the main areas of analysis and intervention and within the scope of which, nine strategic goals (Fig. 2) and 38 A sample matrix is presented in the Fig. 3.

It was on the second level that the focus was put on three plans, setting the most important problem areas, for which the leading projects and implementation documentation were created. At the same time, the space development plans for all places in the area, in which the priorities set in the concept for the development were taken into account, were prepared.

The socio-economic development of FAOC is impossible without adequate funding. An important role in the development of the area was played by the funds (Eur 365190) obtained for the implementation of the project The Socio-Economic *Development of the Oder Communes*, which were used to finance:

- preparation of local development plans for the towns located in the functional area,
- preparation of the technical documentation for construction of the water and sewage infrastructure in the area of the Dabie municipality (including cost estimates and environmental decisions),

Priority area
Free Time Space
Strategic goal
Creation of an attractive space for recreation for residents and visitors of the functional area
Operational goal
Refinement of the offer regarding recreational and leisure activities
Actions (selected)
among others: • creation of recreation and leisure centres on the Oder in the vicinity of towns with access roads, • creation of fishing spots on the Oder in the vicinity of recreation centres, • creation of recreation and leisure areas on the banks of rivers and lakes, • creation of recreation and leisure sites for residents of the municipality (parks, squares, green areas, walking paths).
Effects (selected)
among others: • improvement of the image of the functional area as a site, which is attractive in terms of recreation and tourism, • increase in the income from tourism of the residents and municipalities.

Fig. 3. Logical framework of the operating objective

Source: author's elaboration on the basis of (The Integrated..., 2015).

- preparation of the municipal register of monuments for the entire functional area along with proposals for touristic use of cultural objects.

The source of funding for strategic actions indicated in the FAOC development concept is created by public funds (JST own funds, funds of the national budget, EU funds), private funds (funds of entrepreneurs, residents, etc.) and public-private funds (a combination of public and private investment under Public-Private Partnerships, Licensing Agreements, etc.). The scope of financing of individual actions will depend on their nature. Due to the formal limitations imposed on the article (limited number of pages), the sources of financing of strategic actions of the FAOC development will be the subject of analysis and evaluation in subsequent publications.

The presented concept of the FAOC development was included in *The Integrated Development Strategy for the Functional Area of Oder Communes,* which was adopted by resolutions of the Municipal Councils of individual local government units in the fourth quarter of 2015. The actual evaluation of the impact of the activities planned in the strategy on the local and regional development will be possible in the near future during monitoring and the evaluation, which will be completed by the end of the first year of the implementation of the strategy. Also, due to the short time of operation of the Functional Area of the Oder Communes, it is difficult to evaluate it as a tool of regional policy, and it will become a subject of further publications in the future.

Conclusions

A functional area is a separated area characterized by common geographical and spatial conditions, a system of functional relationships and development objectives defined on the basis of the conditions mentioned above, which ensure the efficient use of the space.

An example of an area defined in this way is the Functional Area of Oder Communes (FAOC), which consists of three communes of the Lubusz Voivodship (Czerwieńsk, Sulechów, Dąbie) located along the main navigable river of the country, Oder.

The article demonstrates the essence of a functional area as a new tool of the EU regional policy and the course of designing an integrated approach to the development of the Functional Area of Oder Communes.

The substantive activities related to the creation of the concept for the development of the FAOC were planned according to the intervention logic, which consists of three levels, which differ in the degree of detail of the issues under discussion.

The first level is the *Integrated Development Strategy for the Functional Area of Oder Communes,* which sets the development priorities, strategic, operational and general goals as well as general ways of their implementation by all partners.

The second level are three integrated sectoral strategies *(The Integrated Program for Activation and*

Social Participation in the Functional Area, The Integrated Strategy for Development of Education and Labour Market in the Functional Area, The Integrated Strategy for Development; Offers for Free Time in the Functional Area, with particular regard to the Recreational and Environmental Protection Offer) in the areas identified by the analyses performed, which provide the best prospects for the development of the functional area or require an intervention.

The third level is the operational and implementation documentation for sectoral strategies, which shall contribute to the reduction of development barriers and substantial use of the endogenous potential of the functional area, including the preparation of the list of recommendations for economic policy, to achieve good growth rates.

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Volume 8 • Issue 3 • 2016

Economics and Management

pages: 35-42

DE GRUYTER OPEN

ISMSME International Society for Manufacturing, Service and Management Engineering

received: 25 November, 2015
accepted: 10 July, 2016

Empowerment in the open innovation concept

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ABSTRACT
The aim of this study is an attempt to interpret the concept of „empowerment" in the perspective of open innovation issues. The text consists of a brief introduction, four sections, and summary. The main background of the research is related to the importance of the social reality of the organisation to evolving paradigms of innovation. In the face of globalization challenges, the innovation management could be interpreted as a specific system based on interdisciplinary analysis of an organisation's social potential.
The methodology involves desk research and theoretical deliberations. As the results, this study distinguished attributes and role of empowerment in the social development process. The possibilities of an adoption of this concept to management in the open innovation context provide the theoretical contribution.

KEY WORDS
empowerment, management, open innovation, organisation

DOI: 10.1515/emj-2016-0022

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Introduction

The primary objective of this article is to make reflections on the significance of empowerment in the face of changing innovation paradigms based on the approach of open innovation systems. The first part takes the issue of social context in organisations up against the management process, the further second section focuses on epistemological foundations of empowerment, and the next part deals with the open innovation approach. The closing fourth section concentrates on propositions to implement empowerment in the range of open innovation environments.

In general, the theory of management studies and the dynamic network of social relationships reflect the picture of a modern organisation. The foundation of an organisational structure is a social network with the following attributes (Krannich & Sworowska, 2009, p. 53):

- increasing subjectivity of a human being,
- increasing awareness of cooperation in a network of relations of social links,
- awareness of co-creation, impact and agency in the area of network relations,
- high level of trust in knowledge teams and network structures,
- high ethical standards in knowledge teams and network structures.

Building a strong internal social potential in a system of complex network relations leads to the

search for new directions that could strengthen this potential. In this area, an interesting concept of strengthening social potential is „empowerment".

The methodology applied in this article is based on a systematic review of the existing knowledge in the field. Deductive reasoning was the basic logic of investigation presented in this paper. Theoretical frameworks have been determined, especially around the social context of an organisation and the open innovations as a binding model of organisational practice. This theoretical analysis is interdisciplinary in nature and leads to systematizations, generalizations, and syntheses.

evolution of the concept of a social human being gave rise to further intensification of the level of self-realisation and co-participation, shaping, thus, an „active" attitude in the work environment (Kożuch, 2011, p. 162).

Attention directed to a human being concentrates not only around recognising his/her subjectivity or primacy. Creation of favourable organisational climate and organisational awareness in the context of the development and use of social potential also refer to such issues as formalisation and bureaucratisation of structures, style of management, flow of information, knowledge, skills and experience, dynamics of the environment, etc. The holistic approach in the new paradigm of management studies allows looking for properties of the social potential of an organisation (Tab. 1).

Tab. 1. Place of a human being in the new management paradigm

Observation and decision-making perspectives	Social context in the new management paradigm – selected characteristics
Organisation	– fulfilment of responsibilities in the environment of friendly organisational relations, – respecting a human being in the environment of friendly organisational relations, – satisfaction of individual needs, etc. in the environment of friendly organisational relations, – cooperation, trust and freedom, – common values
Knowledge	– learning, improving qualifications, – improving skills, gaining experience, – creativity, entrepreneurship, – pro-innovativeness, – decision-making, responsibility, – activity and flexibility
Safety	– vigilance, assertiveness, – prevention, – dynamism, – defensiveness

Source: own study adjustment based on (Domański, Kotarba & Krupa, 2014, pp. 36-37, 39).

1. Organisation as an area for recognition of empowerment

The humanistic approach in management studies identifies the need to reorient the philosophy of an organisation in the direction of accepting the subjective role of a human being and creating a friendly organisational environment. Thus, a strong emphasis is placed on the issues of human experience and fate in organisations (Kociatkiewicz & Kostera, 2013, pp. 9-19). This perspective closely corresponds with the concept of a social human being in the light of the development of behavioural approach (Kożuch, 2011, p. 162). It is accepted that „interpersonal relations are a very strong source of motivation for the behaviour of humans, who strive for their value being recognised in their work environment, being guided not only by material considerations, but also feelings and emotions" (Kożuch, 2011, p. 162). The

The identified properties of social potential incite the reflection on the issues of managing people in an organisation. This issue seems particularly important especially in the context of managing people with high potential, talents, knowledge workers or trust strengthening. Given these properties, social potential often requires looking for an unconventional approach by building a free, flexible and dynamic organisational architecture. Moreover, it entails the need to improve the concept of leadership in the direction of strengthening an employee subjectivity and agency.

Analysis of selected interpretative bases of leadership leads to a view that this concept is most often associated with the issues of power, responsibility, dominance, abilities, selection of a leadership style, emergence of leadership and

shaping of leadership qualities, attitudes and behaviours (Mrówka, 2005, pp. 16-17). Thus, leadership can be perceived in terms of relations, process, abilities/skills, qualities or impact (Aftyka, 2014, p. 114). In this context, the concept of empowerment may represent a very interesting proposal of a detailed description of the issues of leadership in a modern organisation.

2. Epistemological foundations of empowerment

Leadership in an organisation in a broad sense can be examined at four levels: education, purposefulness, practical implementation of a strategy and achievement of efficiency/effectiveness of the leadership process (Aftyka, 2014, p. 115). Empowerment is a part of the multi-faceted perception of leadership, where knowledge, qualifications, abilities, innovativeness, good business practices as well as openness, activity and flexibility are regarded as key attributes of a modern organisation.

The idea of empowerment appeared in the 80s. Academic literature indicates that „empowerment is both a value orientation for working in the community and a theoretical model for understanding the process and consequences of efforts to exert control and influence over decisions that affect one's life, organisational functioning, and the quality of community life" (Zimmerman, 2000). Based on management studies, the fundament of the characterisation of social potential, organisational culture and system architecture of an organisation rests on the search for key properties of this concept (Tab. 2). Properties for the description of social potential focus in the first place on individual characteristics of an individual, presented attitude, as well as how an organisation operates. Thus, the following properties are named, among other things: creativity, unconventionality, involvement, responsibility, honesty, autonomy, freedom and discretion of action. The identified properties of social potential represent a valuable attribute of a modern organisation that determines its functioning in the space of social relations. However, the social potential in this dimension requires an organisational culture that is focused on acceptance of dissimilarity and diversity, development of cooperation, free exchange of knowledge, trust as well as the permission to make mistakes and the proactive use of information feeds. Meanwhile, in the light of the analysis of the foundations of empowerment, the system architecture of an organisation is mainly constituted by openness, the flexibility of structures and minimisation of bureaucracy.

The concept of empowerment is based on the subjectivity of an employee, his/her self-awareness,

Tab. 2. Empowerment – epistemological perspective

ITEM	AUTHOR	SELECTED CHARACTERISTICS OF EMPOWERMENT
1.	R. Zemke & D. Schaaf (1989)	– acceptance of involvement and initiation of activities – reinforcement of creative behaviours – inspiration for fantasy
2.	D. E. Bowen & E. E. Lawler (1992)	– flows of information and knowledge streams – power distribution – information, knowledge and power sharing as the basis for decision-making – rewarding bonuses for effectiveness
3.	S. H. Appelbaum & K. Honeggar (1998)	– freedom to initiate activities – the feeling of the need to get involved – the possibility of exceeding the standard scope of responsibilities
4.	M. Bratnicki (2000)	– complexity and multidimensionality – multi-subject scope – dynamism and continuity – integration of organisational and psychological spheres – cause and effect relationship between the effectiveness of activity and the level of an individual's empowerment – active communication – intensification of the level of autonomy and responsibility
5.	M. Bugdol (2006)	– integration of organisational, psychological, pedagogical and social spheres – dynamism and continuity – change of organisational roles – the capability of systemic thinking – identification with strategic objectives of an organisation

Source: own study adjustment based on (Brajer-Marczak, 2013, pp. 23-35; Bratnicki, 2000, pp. 22-25; Moczydłowska, 2014, pp. 71-78).

self-esteem and organisational agency. Academic literature defines empowerment as „a construct that links individual strengths and competencies, natural helping system, and proactive behaviours to social policy and social change" (Perkins & Zimmerman, 1995, pp. 569-579). It means that empowerment enriches the set of traditional managerial techniques. In simple terms, it is the expansion of the classical view of management from the perspective of a delegation of powers/ responsibilities and participation of employees. Some authors describe „empowerment" as a specific organisational strategy containing hierarchical goals such as: vision creation, communication channels, developing strong social relationships or building social networks (Erstad, 1997, p. 326; Nixon, 1994, pp. 14-24).

The strength of empowerment is based on the subjectivity of every employee and favourable organisational climate, understood in terms of organisational culture and system architecture of an organisation. It seems obvious that there should be a shift from authoritative and formal models towards the development of democracy and liberalism for increased participation and involvement. However, in the area of social relations, dynamic and open network environment is a prospect for effective leadership in an organisation and for exercising power. Moving around such an environment and taking advantage of its attributes requires organisational awareness of the need for unconventional behaviour and attitudes in the sphere of stimulating involvement, free cooperation, active exchange of information, processes of mutual learning, etc.

Academic literature proposes the description of the issues of leadership in the area of innovativeness using a detailed characterisation (Kruk, 2016, p. 412):

- of the profile of the leader, his/her characteristics, competencies and conditions,
- relations of the leader with the entities of an innovation environment (internal and external environment).

Most often it is assumed that leadership is a dynamic process and „leadership is not a function of level or position" (Prewitt, Weil & McClure, 2011, p. 13). As noted by Raišienė, „the modern conception of leadership emphasises not only the leader as an individual but also the group he influences and joint results" (Raišienė, 2014, p. 180). The issue of leadership is also considered not as an individual action but a collective social process (Bolden, 2011, p. 251). It seems that the proposed perspective of the analysis of leadership may also refer to the concept of empowerment. However, in the light of the interpretation of this concept, the subject structure is indicated, i.e. empowering subject and empowered subject, which is one of the necessary conditions for capturing the essence of empowerment (Kanafa-Chmielewska, 2012, p. 138). Meanwhile, from the perspective of the environment of the network of social relations, in which innovativeness is currently set, it seems highly valuable to conduct an analysis at the level of characterisation of all entities co-participating in the process of development and implementation of innovations.

An important part of the practical implementation of the idea of empowerment is the issue of the assessment of organisational empowerment. One approach to the assessment of organisational empowerment is a diagnosis on the following key criteria: dynamic structural framework, control of workplace decisions, and fluidity in information sharing (Moczydłowska, 2015, pp. 82-83). Generalizing, it can be assumed that the measurement of empowerment requires an analysis of many areas of an organisation related to knowledge of managerial staff and groups of employees, organisational culture, management style and trust, organisation's ability to change, access to the information, etc. It seems that the issue of the empowerment measurement methodology requires a complex approach and should be developed in terms of theoretical and practical activities.

3. Open innovation in the direction of a new view of the internal social potential of an organisation

In „Innovation paradigm shift from a closed to an open model" (Chesbrough & Crowther, 2006, p. 229) and as noted by Conger & Kanungo, empowerment is the „construct used by theorists to explain organisational effectiveness" (Conger & Kanungo, 1988, p. 471). The concept of open innovation reflects the holistic approach on the issues of development and implementation of innovations. Its essence is a new view on the

innovative potential, in particular with reference to possibilities of gaining it and using in an own innovation strategy (Odrobina, 2014, p. 461). The development and implementation of innovations in an open environment takes place in a network of relations. These relations reflect the interactions existing in the network that can take place at the level of cooperation, communication, conflict, etc. (Bogdanienko, 2016, p. 25). It is, however, worth bearing in mind that these interactions take place in the space of social relations. The space of social relations is very complex and dynamic. The foundation of its development is the need and willingness to communicate. Communication is regarded as a factor in the development and maintenance of relations, which determine coexistence of organisations (Janowska, 2016, p. 252).

The general theory of innovations emphasises knowledge, development of technology, research and development, information and communication technologies, participants of innovation process as well as institutional, technological, social and other factors (Sundbo, 2001, p. 72). As noted by Sisodiya et al., „an open innovation is the sustained and systematic practice of engaging in the search for and then integrating new product inputs from sources that cross firm boundaries and, often, technology boundaries" (Sisodiya et al., 2013, p. 2). In the approach open to innovation, various forms of cooperation and commercial transactions in the area of knowledge and technology are used (Odrobina, 2014, p. 462). In this respect, active and free cooperation between innovation entities is of particular importance. Moreover, in a mixed open innovation there is a two-way flow of knowledge and information, a network has a decentralised form, and „every participant has equal access to the effects of the cooperation" (Sopińska, 2013, p. 291). Thus, it seems that social potential, which is dynamic and open to cooperation, will significantly support innovation.

Academic literature shows that in open innovation, the power distance is shortened and cross-organisational task teams are formed (Olko, 2009, p. 164). Thus, open innovation not only expands the subject structure of innovations, creating the climate for active engagement of the external environment, or modifies the form of this engagement in the direction of cooperation, co-decision and co-responsibility.

At the basis of the interpretation of the importance of internal social potential for the development and implementation of innovation is the intellectual and creative potential of employees and knowledge resources (Rynkiewicz, 2014, p. 129). From the perspective of open innovation, the following attributes become highly desired: creativity, flexibility, freedom, dynamics, unconventionality, diversity and responsibility. In the light of these characteristics, the issues of managing, leading and participation go beyond the classical standards. They require an innovative approach to the internal social potential of an organisation, aimed at strengthening the potential of a human being. In this respect, the following needs are indicated, among other things, in the area of management (Olko, 2009, pp. 164-165):

- identification of networks, including social and informal networks, for processes of mutual diffusion of knowledge,
- allocation of knowledge employees in networks,
- the motivation of employees and coordination of their actions in knowledge processes,
- departure from classical prescriptive decisions and control measures,
- building authority on the ability to create and stimulate cross-organisational network relations,
- the increase in mutual trust between participants of the network as a result of knowledge sharing.

Thus, an employee's subjectivity and the organisational agency are regarded as the foundation of the development of a new philosophy of an organisation oriented towards open innovations.

4. Perspective on implementation of empowerment in the environment of open innovation

In open innovation, new knowledge is a highly valuable resource. The description of an organisational environment that is conducive to the creation of new knowledge includes creativity and originality. The development of these qualities more frequently results from recognition of autonomy, freedom, and discretion of activity at the level of social network relationships. Empowerment strongly highlights subjectivity of a human being. However, as a result

of the development of self-awareness, self-esteem, and agency, it complementarily strengthens the importance of an employee for an organisation. Empowerment in the direction of conscious and active co-participation in processes of knowledge creation, acquisition, and diffusion, results in increased involvement, responsibility, self-control and self-discipline. Often, it also leads to searching for new mechanisms of knowledge management. In this respect, one can point to the so-called communities of practice, which are characterised by such attributes as trust, factual knowledge, freedom of participation, mutual verification, cooperation, exchange of information, and experience (Mierzejewska, 2005, pp. 53-54).

The practical implication of the principles of empowerment will require a reorientation of the process of leadership in the direction of the democratic and liberal form. Leadership in this respect will mean in the first place a reasonable partnership, developed in structures of informal network relations based on mutual trust. Classical participation is replaced by the focus on cooperation, agency and co-responsibility.

In the environment of open innovation and network of social relations, the concept of empowerment strongly corresponds with the issues of talent management. Talent as a key attribute of an employee is subject to management processes in the context of creating an organisational climate that is conducive to self-development and self-realisation. It is, however, worth noting that strengthening individual social potential at the level of talent essentially refers to the sphere of organisational culture and system architecture of an organisation. Thus, it firstly requires the acceptance of otherness, diversity and feeling of trust as well as openness and flexibility of structures.

Undoubtedly, the issues of managing talents in the area of practical application of empowerment in open innovation strongly correspond with the issue of creativity and involvement. It is especially important in this respect to create an environment for individual involvement, perseverance and activity in work, motivation as well as new networks and structures of knowledge dissemination, formulation of hypotheses, etc. (Jabłoński, 2015, p. 38). It seems, thus, that the proposed complementary approach to the issues of talents that takes into account individual and organisational levels, is a chance for strengthening the force of social potential. However, it is worth stressing at this point that in the face of the development of innovation in an open system, it seems very important to support employees with higher than average talents and skills. An argument for this thesis can be the need of innovation and originality as well as the necessity of developing unique competencies. It is, however, increasingly stressed that „currently, talent development programmes do not mention only the best employees, but they are designed to ensure the development of all the employees of an organisation defined as its talents" (Kamińska, 2016, p. 308). The adopted cognitive context serves the implementation of empowerment for the development of the internal social potential of an organisation in open innovation.

Conclusions

Analysis of the issues of open innovation shows the need for a new view of the internal social potential of an organisation. In the environment of complex network relations, we observe interdisciplinarity and holistic approach to innovation, free flows of knowledge and experience, active cooperation of network participants as a result of free involvement, co-responsibility, and mutual trust. Moving around the space of open innovation increasingly requires a restructuring of classical organisational roles. Prescriptive and demanding leadership is replaced by the partnership. An employee's subjectivity and agency underlie discussions on the improvement of management of social potential.

The epistemological discussion presented in this paper about the possibility of practical application of empowerment in open innovation prompts the following thoughts:

- the network of social relations changes the perspective on the performance of management processes in the direction of open, free, and dynamic systems,
- the concept of empowerment matches the characterisation of social potential, organisational culture and system architecture of an organisation,
- empowerment leads to the strengthening of internal social potential in an environment of complex and dynamic network relations.

These suggest ideas for a further detailed research focused on empirical exploration. However, researchers need to be aware of many limitations in this area linked with the social dynamics in organisations and the society as well as the rapidly growing importance of technologies, especially ICT.

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Volume 8 • Issue 3 • 2016

ECONOMICS AND MANAGEMENT

pages: 43-56

DE GRUYTER OPEN

ISMSME International Society for Manufacturing, Service and Management Engineering

received: 15 November, 2015
accepted: 25 June, 2016

USE OF NEURAL NETWORKS IN RISK ASSESSMENT AND OPTIMIZATION OF INSURANCE COVER IN INNOVATIVE ENTERPRISES

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ABSTRACT

The scientific objective of the paper is to present the findings of a study into the use of artificial neural networks in quantifying activity related risks of an innovative enterprise and to optimize its insurance cover in order to minimize the probable financial losses whenever they materialize. The Kohonen network involving the activation of 51 input variables was applied in the study. The outcomes of the stimulation for the given set of variables made it possible to determine the probability of a threat occurring in the classes. The results of the analysis were used to prepare an optimal insurance cover for the activities of the innovative company. The research findings are suitable for use in risk theory as well as in issues relating to entrepreneurship and insurance. The analytical device employed can also be put to practical use as a support tool in corporate risk management.

KEY WORDS

innovative enterprise, risk, neural networks, Kohonen networks, business insurance

DOI: 10.1515/emj-2016-0023

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INTRODUCTION

The contemporary market economy has been subjected to constant changes due to processes of globalisation, the recurring crisis, the economic downturn of recent years, the tearing down of national frontiers as well as the intensifying competition. These factors are, in today's market realities, key external factors affecting the business activities of enterprises[1]. Hence it is expected of them to skilfully adapt tasks and functions including methods of work organisation and management to a radically changing business environment being the key players in a market economy. Their efficient adaptation to prevailing conditions (their complexity, structure, and dynamics) and the demands of a market economy determines the business outcomes and potentials for development in each case. Corporate adaptability can be observed, amongst other things, through the implementation of various innovative undertakings. It needs to be emphasized that the term „innovation" covers a very broad spectrum of concepts and refers to varied fields of life and business. The focus of this study, however, will be on economic and organisational aspects of the existence of an innovative enterprise. Contextually, therefore, it should be stressed that in the realities

1 The enterprise is understood to mean a „unit (entity), that undertakes business activity with aim of meeting the needs of other social entities (individual and /or institutions) by producing goods and /or offering services, with the motivation for such activity being the desire to gain material benefits and it is conducted independently at the risk of its owner(s)" (Sudoł, 2006).

of our modern world, where information flow is virtually uninhibited, any company wishing to elevate its competitiveness or at least maintain its standing position must continually undertake technical improvements. Thus, the isolation of a group of innovative enterprises is not always justified as in an enterprise, innovative activities are inherent parts of the general activity and guarantee its survival as well as effective response to market changes. Innovation is „a specific tool for entrepreneurs, with the help of which they create opportunities to develop new businesses or provide new services from existing changes" (Drucker, 1992, p. 29). Consequently, the introduction of changes only serves as a call to duty for every entrepreneur, as such, there is no need to isolate any specific category of innovative enterprises.

All companies, including the innovative ones, function in risky conditions. Risk is one of the primary economic phenomena. Every market participant is exposed to it and counteracting risk materialization is one of the elements of managerial efficiency, which is a relationship between making correct decisions that the management board bears responsibility for and information received (including, as regards risk), understood as an outlay. This applies particularly to business entities, where levels of savings and accumulated capital are generally insufficient to continue their business activities in the event of risks destabilizing their operations. Risk management and the eventual minimization of financial losses associated with its occurrence becomes hugely significant in such circumstances. Efficient risk management in corporate activities thus becomes an indispensable component of the business activity. It is also a process that is subject to continuous changes over time, which places on companies executives series of obligations aimed at risk limitation and optimum protection of companies against its negative consequences.

We need to emphasize that efficient corporate management, taking account of operating risk management, concerns the identification of various types of risk an innovative enterprise has to deal with as well as measuring and controlling risk levels. Risk management can, after all, only be talked about if it is measurable and quantifiable. Artificial neural networks, which are currently in use in many scientific fields can, amongst others, also be applied in this respect. Their primary benefits include „independent programmability" in the learning process, ability to generalize acquired knowledge and their relatively high resistance to errors of measurement. The biggest advantage of neural networks is that they allow the presentation of non-linear dependences and the solving of problems for which there are difficulties in defining the cause-effect relationships. These features allow for their application in processes of optimizing risk management in the activities of innovative enterprises. The results of optimization, on the other hand, serve as the basis for introducing mechanisms for risk transfer in the form of insurance.

The scientific objective of this paper is to present the findings of studies that illustrate the possibilities of applying artificial neural networks in the process of optimizing the business risks of an innovative enterprise and its further curtailment with the use of insurance instruments. The following research hypothesis were formulated for the purpose of the study:

1. Artificial neural networks are effective tools of optimization in quantifying risks in innovative enterprises.
2. Minimizing the effects of risks with the likelihood of occurrence improves the management process and enhances business activities of an innovative enterprise.

To verify the research hypotheses, identification was carried out of the business risks in key areas of activities of an innovative enterprise. Relying on expert assessment, a quantification of each was undertaken from the view-point of the potential threats of disruption they may cause. To carry out the optimization studies, the Kohonen networks were applied, thus activating 51 input variables. The results of the simulation conducted on the set of variables made it possible to determine the probability of a threat in each class. The risks identified in the optimization process served as a base material for developing hierarchical insurance instruments, whose aim was to minimize losses associated with the materialization of business risks in an innovative enterprise.

1. Literature review

Innovation as an issue in business has been the concern of research studies since the mid 20th century. It was then given a definition by Schumpeter (1960), who stated that it is:

- the introduction of a new product,
- the introduction of a new method of production (process innovation),

- the opening of new market outlets,
- the opening of a new supply market,
- the introduction of a new organisation.

The above-mentioned five types of innovation indicate that it was associated with novelties introduced in a company's life. Subsequent years witnessed innovative issues being studied on a wider scale by economists, thus paving the way for a broader definition of a corporate business that can be referred to as innovative. While Allen (1966) affirms that innovation is the introduction of new products, processes or procedures for a wider usage, Whitfield (1979) points out that innovation is any form of modification that is based on the assimilation of knowledge transfer. Another idea with a very broad significance is that of Rogers (2003), which states that innovation is the introduction of new products, processes or procedures for a wider usage. Barnett provided a different definition of innovation, based on the premise that it is any concept, idea, attitude, position or thing, whose quality distinguishes it from all others existing till date (Borowski, 2011). Innovation is also explained as a process of creative application of knowledge, transformation of knowledge owned by the company or secured externally into new products, services or processes (Cavagnoli, 2011).

Polish researchers have also devoted much time to the issue of innovativeness. Zastempowski (2010) focusses on the significance of innovation in corporate business in continuously transforming market situations. While Pichlak (2012) emphasizes the conditions that companies ought to meet to fulfil the criteria of innovativeness. Marciniak (2010) illustrates the links between innovativeness and acquisition of permanent competitive advantage in globalized markets. Wiśniewska's (Wiśniewska & Janasz, 2012) publication discusses the complex issues of innovation and corporate innovativeness in respect of challenges caused by smart strategies and sustainable development. Globalisation enhances the expansion of international economic ties and international co-operation. Common technical joint ventures and scientific research are also developed. This requires knowledge of existing regularities, mechanisms, innovative and development trends, re-evaluation of assessment criteria, identification of barriers to innovation as well as the functional principles of stimulators.

The concept of innovation has been the subject of analysis not only for individual scientists but also for institutions. One of the most important to be mentioned is the European Commission, which in its policy of support for businesses has been emphasising their innovativeness for years. According to the handbook issued by the European Commission, the Oslo Manual, an innovative enterprise is that which has introduced at least one technological innovation over the study period, which is usually three years. This could be a new or an improved product, a new or improved process, which from the said company's point of view is a novelty. Based on this definition a large group of companies can be classified as innovative. This will indeed serve as the leading definition in respect of analyses conducted for the purpose of this paper.

Enterprise development is an indispensable process for survival and continued existence in markets. This leads to changes in the level and structure of the company's component parts. Enterprise development depends on both external and internal factors that define companies' existence. The external factors, namely those, on which the enterprise has limited possible influence, constitute the widely understood environment, from whose resources the company benefits and satisfies its needs. The internal factors, on the other hand, namely factors on which the enterprise has direct influence and which determine the company's development. Both groups create, on a closer diagnosis, a broad spectrum of risks that could threaten businesses. Skilful risk identification and its efficient management undoubtedly improve companies' activities, allowing for the achievement of better financial results and very often a competitive edge.

Risk is defined as a state of uncertainty, during which a specific event, action or inaction could affect the capacity to achieve set objectives. The concept of risk is closely tied to the notion of change, uncertainty or decision. Risk, in the economic sphere, including corporate activities, is defined specifically from the view-point of achieving or non-achievement of expected economic and financial results, while its occurrence is a consequence of existence in the economic space of free markets. The concepts of risk and uncertainty exist and intertwine with each other both in everyday language and in theories of economics[2]. The author of basic distinctions in his fundamental studies on labour risks, risk, uncertainty and profit, is Knight (1921). Knight described risk and uncertainty as two distinctive phenomena, which

2 For example, the American Committee of Insurance Terminology defines risk as the uncertainty in achieving the results of an event, to which there exist two or more possible outcomes (Qutreville, 1998).

have continued to stir debates till date. Researches into risk have yielded several trends that relate to varied aspects of the theory. In their studies, representatives of the theory of the objective expected utility and game theory von Neumann and Morgenstern (1944), Markowitz (1959), and Baumol (2007) focused on the objectification of the assessment of situations in which the decision-maker has to make a choice of decision options, the form of the decision taken as well as its results. An example of the application of the objective components of risk theory could be the theory of games, which is used to analyse the behaviour of market players. Adherents of the theory of subjective expected utility are Ramsey (1926) and Aumann (1962), who drew prominent attention to the cognitive aspects of risk, had a different position on this matter. The next trend concerns a theory that was unrelated to the expected utility that was initiated by Schackle, Allais Wald. The theory of risk was also reflected in Tversky and Kahneman's (1979) experimental economics. Jajuga (2007), who precisely defined the process of risk management and demonstrated possibilities of its application in managerial processes in companies, banks, and insurance companies also contributed hugely to the development of the theory of risk.

All research trends into the theory of risk were concentrated on its theoretical aspects, but to a lesser extent referring to the practical applications of models or dependencies developed. In 1970s studies were undertaken that were aimed at practical using of risk as a state of uncertainty at making decisions. Another step was the development of an actuarial risk theory, formulated by the insurance sector, which undertook to control risk by means of elements of the probability theory (Sadowski, 1978). It was not until the actuarial theory of risk, developed by an insurance company, the first entrepreneurial field in which risk control was undertaken with the help of elements of probability theory, where attempts were made to develop a completely independent mainstream of researches (Borch, 1990). It is in the insurance business that risk issues are accorded an elaborate consideration. They are, on the one hand, business entities whose primary activity is to take over the risks of the insured and manage it in a way to facilitate the fulfilment of their commitments to customers. Insurance companies, on the other hand, are independent business entities that must take care of their economic accounting and make use of risk management mechanisms in this regard. Risk is, therefore, the subject of all economic endeavours, (Qutreville, 1998). Risk, from the objective perspective, means exposure to adversities (Vaugham, 1997). An important element, from the insurance view-point, is the reference made to the expected outcomes, as a result of which risk is defined as the spread of factual and expected results (Ronka-Chmielowiec, 1998), where the degree of deviation of results from the medium, or as the probability of achieving values other than that expected is determined. Contemporary research studies concentrate mainly on the practical aspects of risk management. Monkiewicz et al. (Monkiewicz & Hadyniak, 2010) indicate that insurance companies protect their resources and enhance the security level of market turnovers, thus impacting on their market values. The efficient use of insurance in risk management programs requires access to ever higher skills and competencies. The author highlights the effective use of insurance as an instrument of corporate management (Monkiewicz & Gąsiorkiewicz, 2011). A much wider approach to the use of insurance in business was presented by Kwiecień (2010), who brought to prominence the practical significance of insurance in risk management by business operators, i.e., clients of insurance companies.

It can, thus, be observed that the issue of risk management by companies and the limitation of its impacts through the use of insurance have been the subject of multilateral research over several decades. This, undoubtedly, indicates the significance of such issues in corporate business practices, including innovative enterprises.

The next area of concern of the elaborated research studies is artificial neural networks. As noted by Tadeusiewicz (2007), the sudden interest in neural networks is neither due to coincidence nor a fad. Neural networks are indeed convenient tools, successfully being put to use in an unexpectedly wide range of issues, in disciplines so different from each other like finance, medicine, engineering applications, geology, and physics. They can practically be applied wherever problems arise not only in data processing and analysis, but also in their prediction, classification, and control.

The start of developments in neural networks can be credited to McCulloch and Pitts (1943), who were the first to demonstrate mathematical descriptions of a nerve cell, linking it with the issue of data processing. The presented model had huge impacts on subsequent developments in this scientific discipline. Several years later, Hebb (1949) introduced

the concept of neuron teams and was the first to propose a method of learning networks, which involves exchanging connecting weights between neurons. The first networks with feedback units appeared in the 1980s but in 1982, Kohonen proposed a new algorithm for artificial neural networks, which were code-named Kohonen networks (Kohonen, 1982). It can be briefly characterized as a self-learning network with in-built competition and a neighbourhood mechanism (Lasek & Myzik, 2004). They are applicable in various fields of scientific studies and were involved, among other things, in geology (Chang et al., 2002), aviation (Czechowicz & Mikut, 2007), environmental protection (Licznar & Łomotowski, 2006) and in public administration (Muczyński, 2009). A very significant factor is the possibility to apply neural networks in economic studies, where they can be used, among other things, (Tadeusiewicz, 1998) for:

- predicting and forecasting of specific events based on data from the past (for example, a bear and bull market on the stock exchange, financial results),
- classification (for example, of companies based on the financial condition or degree of unemployment threat in the analysed regions),
- creating financial or production analysis as well as controlling business processes,
- searching for optimal solutions to economic issues (for example, the so-called the travelling salesman problem).

Utilization of Artificial Neural Networks in various areas of human activity has created new possibilities for analysing and forecasting the future. At the same

Tab. 1. Key business risks of innovative enterprises

Area (N)	Risk (X)		Range (W)
Technical (N_1)	lack of *know how* in practical application of technologies	x_1	0.60
	legislative changes that eliminate or restrict possible use of a technology	x_2	0.55
	...	...	...
	inability of use of technology in other alternative spheres	x_9	0.20
Economic (N_2)	lack of cash-flow/insolvency	x_{10}	0.60
	loss of influence over the company/company ownership in case of companies with foreign capital financing	x_{11}	0.55
	...	...	...
	inappropriate feasibility studies	x_{21}	0.05
Time (N_3)	exploiting the needs of customers	x_{22}	0.30
	improving the product	x_{23}	0.20
	time duration from product conception to its commercialisation	x_{24}	0.15
Absorbency (N_4)	incorrect definition of product features and its absorbency	x_{25}	0.40
	proper definition of the target market	x_{26}	0.35
	...	...	...
	supply of such products that generate further needs	x_{29}	0.15
Organisational (N_5)	qualifications of staff	x_{30}	0.50
	order management	x_{31}	0.45
	...	...	...
	strikes and labour unrest	x_{39}	0.05
Operational (N_6)	business interruptions	x_{40}	0.60
	inefficient plans of business restoration	x_{41}	0.55
	...	...	...
	liabilities and claims	x_{46}	0.30
Competition (N_7)	hostile takeovers	x_{47}	0.40
	theft of property rights	x_{48}	0.35
	...	...	...
	sabotage	x_{51}	0.15

time, risks that can falsify the results of analyses have emerged. The main factor that disorganises conducted studies is susceptibility of the network to over-learning (emergence of the fatigue phenomenon). In such case, initial data processing is required, e.g. normalisation of values of a learner-file size (Larose, 2006).

Alongside developments in researches into neural networks, publications linking various areas started emerging, including the use of the Kohonen networks for the division of provinces into regions of similar conditions for agricultural production (Zaród, 2012), in explorations concerning territorial units (Lasek & Myzik, 2004), to value contractual options at the WIG20 (Kraszewska, 2011) or in other areas. There is, however, a dearth of research studies in respect of the multi-dimensional analysis of innovative enterprises, risk, insurance and artificial networks. Hence an additional objective of the author is to undertake studies that are of interdisciplinary nature, linking all of the aspects analysed, thus creating a new added value in this field. The results obtained will be of theoretical analysis in nature, but the methodology thus developed can be of practical use in risk management process through the application of artificial neural networks in business activities.

2. Assumptions and research methods

In analysing the functioning of innovative enterprises, it should be emphasized that risk applies to every segment of their activities. The following stages, namely idea, incubation, growth, maturity, and decline, are identifiable in their case. Each of these stages is subjected to significant levels of risk. Innovative ventures come along with huge risks, especially at their early stages, hence not many of them go beyond the incubation stage to achieve success. It can rightly be said that skilful risk management results in innovative endeavours are transformed into innovative enterprises. Surmounting risk enables innovative enterprises to proceed to the incubation stage, and further growth is relatively quiet.

There are no innovative endeavours devoid of risks. Any entrepreneur that initiates an innovative project ought to have the fore-knowledge of what areas are risk prone, which constitute threats to his/her project and those that serve as opportunities for growth. Areas of risks in respect of innovative projects are much more extensive and complex than in other undertakings, hence, an innovative entrepreneur ought to pay specific attention to key areas of risk associated with current activities.

An optimal method of identification is to create a risk map based on risk analysis carried out by specialists employed at a company or outsourced to a specialist entity.

Table 1 is an illustration of risk types associated with the functioning of an innovative enterprise.

The risks were grouped into key areas of business activity *(N1 – N7)*. Each of the areas was divided into subcategories, which were, in accordance with the expert system, assigned a rank of significance reflecting the possible impact of a given subcategory on the entire activities of the enterprise.

Arranging particular risk categories can take place on the basis of an analysis of historical data concerning materialisation of particular risk types in the past and an individual assessment performed by specialists dealing with this area of corporate operations. An important source of information expedient at conducting the arrangement can comprise of reports of institutions specialising in corporate risk identification and assessment (e.g. „Corporate Risk and Insurance Management in Poland" report prepared by Aon Risk Solution). Beyond doubt, a dynamic process of changes related to the development of a company, entering new areas of operation and innovative activity itself, which can be performed with the use of ever more modern technologies, is hazardous for the process of risk identification and arrangement. Low level of knowledge among experts in the field of corporate risks can also constitute a problem.

The ranking range for a given area was between 0.00 and 1.00, with the minimum progressive step of 0.05. The aggregated data were used as input (vectors) data for further analysis, which involved the application of artificial neural networks.

Resolution of economic problems often requires the use of neural networks due to their complexity and nonlinear occurrences. Their application permits (Kasperski, 2003):

- a comprehensive unravelling of optimization issues, obtaining overt solutions to quantitative and qualitative problems in changing market conditions,
- a fast and efficient implementation of a number of variants based on different assumptions.

The self-organising Kohonen networks, in which

each learning vector from the input layer is connected to a neuron from the output layer, but avoiding any connections between components of the same layer was applied in optimization studies in this fore-going study. The connections were assigned weights with value ranges of [0, 1], (Larose, 2006). The weights were assigned initial values with the use of varied algorithms. Such values can be assigned randomly. The Kohonen learning network proceeds in an iterative manner. The so-called neural network learning stage ends after acquainting the network with cases of all learners, which consists of several individual steps. Each step involves the analysis of the case of a single learner, the rivalry of individual neurons, followed with the modification of the vector weight of the winning neuron, including its neighbouring neurons. The neuron for whom the signal is obtained, at its input stage, is the strongest and accepted as the winning neuron. The output value of this neuron is usually defined as the moment where the Euclidean distance between the weighted vector and the input vector attains its highest (usually the smallest in the case of the Euclidean distance) value. The weights of the winning neuron and its neighbours are modified in order to minimize the distance between the presented input vector and the weighted vector. We are dealing with competitive learning in this case of a network. This means that the user is in disposition only of input patterns, although there exist their corresponding expected values. The task of the network in the learning process is to produce such patterns. The network aims to isolate input date classes that will represent the dominant features from amongst the input vectors.

The applied neural network is a single directional feed-forward type of network, in which each neuron is connected to all components of the n-dimensional input vector x. The weights of neuron connections forms a vector *wi=[wi1, wi2, ..., win]T.* The vectors of the input signals x precedes the normalized learning process ||x||=1, which can be written as (http://iisi.pcz.pl/nn/samoorg.php?art=2),(1):

$$x_i = \frac{x_i}{\sqrt{\sum_{v-1}^{n}(x_v)^2}} \tag{1}$$

Having stimulated the network with the input vector x of the competition algorithm, the neuron whose weight differs from the corresponding components of the said vector and with the least value wins. The winning neuron w-ty should meet the following criteria (2):

$$d(x, w_w) = \min_{1<i<n} d(x, w_i) \tag{2}$$

where *d(x, w)* is the distance in terms of the selected metrics between vectors *n* and *w*.

A topological neighbourhood *Sw(n)*, whose radius decreases over time is acceptable in the proximity of the winning vector. Next, the winning neuron and other surrounding ones are subjected to adaptation in accordance with the Kohonen rule (Kohonen, 1995), (3):

$$w_i(n+1) = w_i(n) + \eta_i(n)[x - w_i(n)] \tag{3}$$

for i ∈ *Sw(n)*, where ∈ *i(n)* is a learning coefficient of the i neuron from the Sw(n) neighbourhood in an n moment. The value of ∈(n) decreases along with the distance of a neuron to the winner. Weights of neurons from outside the *Sw(n)* neighbourhood are not subject to changes.

$$w_i(n+1) = w_i(n) + \eta_i(n)[x - w_i(n)] \tag{4}$$

The basic learning algorithm in the Kohonen networks has the form (4):
where:
- *i* – element of a vector,
- *n* – number of learning stage.

The learning coefficient and each of the neurons have, in this formula, been separated from their distances in respect of the vector x, which was taken care of in the neighbourhood function G(i,x), (5).

$$G(i,x) = \exp\left(-\frac{d^2(i,w)}{2\lambda^2}\right) \tag{5}$$

The weights of the isolated winning neuron have been modified on the Kohonen maps (Kohonen, 1995) using the binary neighbourhood function (6):

$$G(i,x) = \begin{cases} 1 & dla \quad d(i,w) \le \lambda \\ 0 & dla \quad pozostalych \end{cases} \tag{6}$$

where:
- *d(i,w)* – distance between neurons in the network space,
- λ – neighbourhood radius decreasing to zero during learning.

In the Kohonen classical algorithm, the neighbourhood function usually assumes the form of Gaussian function *G(i,x)*, which is defined thus (7).
d(i,w) denotes the Euclidean distance between the winning neuron w and i-th neuron. The coefficient is the neighbourhood radius, with values decreasing

$$G(i,x) = \exp\left(-\frac{d^2(i,w)}{2\lambda^2}\right) \quad (7)$$

over time. This is a rectangular type of neighbourhood. The degree of adaptability of neighbourhood neurons to the winning one during the learning process determines both the Euclidean distance *d(i,w)* and the radius of the neighbourhood.

Simulations using the Kohonen network will be carried out in several stages. During the first stage, calculations will be carried out on 51 risks (x) in 7 classes (N) giving 567000 vectors in total. The simulation will result in isolating classes, within which the risks are most likely to occur. The probability of occurrence of certain risks within a group will also be calculated based on the number of vectors. The data obtained will serve as the base for establishing a group of risks, to which innovative enterprises are most vulnerable. The results of the simulation will be used to create a risk map, on which they will be classified as risks with the highest level of threat. The next stage of the simulation is to carry out calculations with the highest probability of occurrence, excluding those classes obtained at the first stage. The results obtained at this stage will be classified on the map as moderate risks. Subsequent stages will follow the same pattern, while the results will be marked on the risk map in areas with decreasing threat, based on their likelihood of occurrence.

The next stage will involve placing insurance products or other instruments of risk transfer that minimize the risks associated with activities of an innovative enterprise on the classes isolated as a result of the simulation.

3. Assessing the likelihood of risk occurrence in the activities of innovative companies in light of the author's studies

Every business activity has its inherent risk and is capable of destabilizing any endeavour should it occur. For an innovative enterprise, the identification and management of such risk could be crucial for the safety of its existence. An important factor is the „pre-emptive" approach to avoiding risk-related consequences through the use of tools that enable their skilful management and protection against such consequences. This can be achieved through the implementation of risk management mechanisms and, among other things (Kaszuba-Perz & Perz, 2010), through:

- integrating risk management with strategic planning, where the company specifies its „appetite" for risk at that stage of strategic planning,
- the inclusion of risk indicators in the company's internal evaluation system,
- taking into consideration the effects of diversification of various types of risks in the entire company,
- the conscious choice of varied forms of reaction to existing risks (acceptation, avoidance, sharing, and limitation).

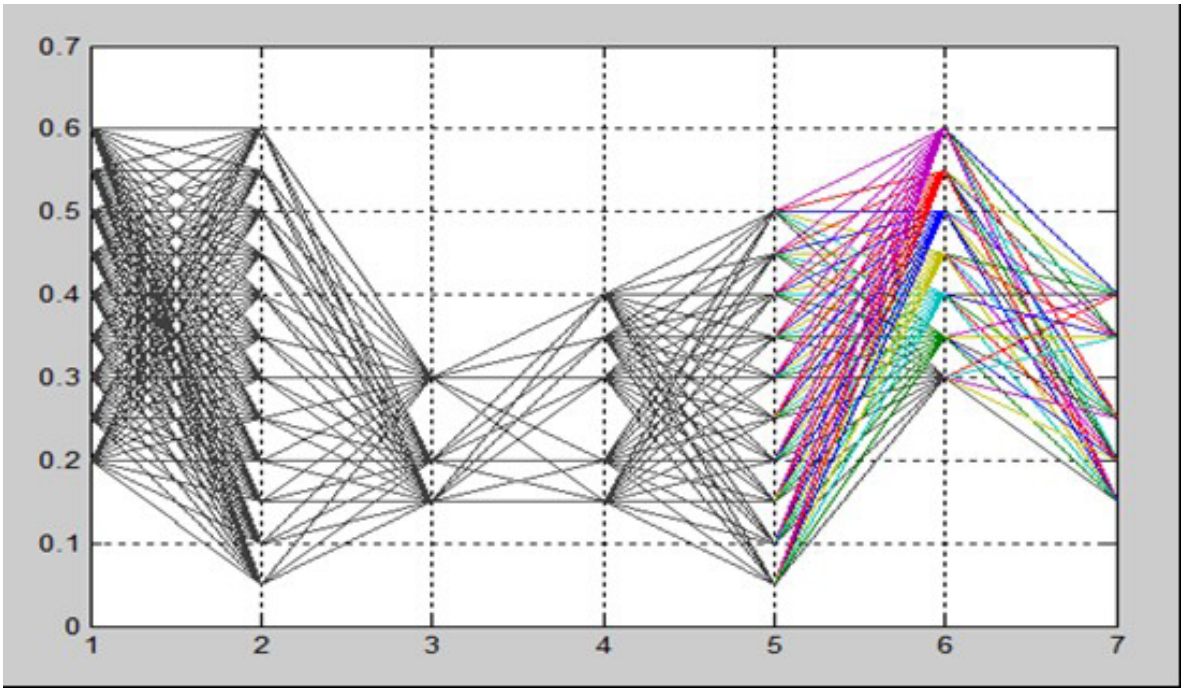
A key element in all the above-mentioned cases is the correct quantification of the risks and determination of their probability of occurrence. This enables the selection of an optimal means of counteracting the effects of risk. This was also the purpose of the simulation exercises undertaken using the Kohonen network.

An iterative algorithm is utilised in the learning process of the Kohonen network. Learning begins from a random weight of output neurons. Values of explanatory variables are introduced in the next stage to network inputs. In response to an input signal, network neurons begin rivalling one another, as a result of which an output neuron is found, whose weights are most similar to the vector of input values. Along with the winning neuron, weights of neigbouring neurons – assigned on the basis of an assumed network typology pattern – are modified in an analogous way. During the learning process the learning coefficient and neighbourhood size coefficient become gradually decreased. In consequence, the learning procedure leads not only to the allocation of cluster centres in a multi-dimensional input space, but also orders neurons in such a way that neurons that represent centres located close to one another in the input space are located close to one another in a model of two-dimensional topological map. In practice, this means that the more similar two objects are to each other, the closer the corresponding neutrons will be found on a topological map (Muczyński, 2009).

In the case analysed in this study, calculations were carried out in several stages with regard to a set of 567 thousand vectors that reflect risk classes and ranks presented in Table 1.

On the basis of obtained data, a knowledge map

Fig. 1. Distribution of Kohonen network vectors for key risks to innovative enterprise operations (for the set of 567000 vectors)



Source: own calculations using the MATLAB program.

was built, which defines probability of materialisation of key risks that determine the operation of an innovative enterprise. Another stage of analysis was to subject the data to a further, advanced analysis, aimed at identifying groups of risks that, if materialized, can contribute to the greatest losses suffered by an enterprise. Calculation results are presented in Figure 1. The conducted analyses have not found over-learning of neural networks, which means that results delivered are not burdened by irregularities.

Designations adopted in the abovementioned chart:

- Axis X – risk areas,
- Axis Y – ranks of identified risks.

On the basis of the simulations carried out at the first stage, the first group of risks was isolated, and among them, the risks with the highest probability of occurrence were identified. The results of the calculations are illustrated in Table 2.

The data obtained in the course of the simulations will enable the design of a map of risks in groups of the highest threat, with the probability of occurrence of the given risk being established (Fig. 2).

The risk with the most likely chance of occurrence ought to be, from the view-point of potential threats, „neutralized" at the first instance.

One of the most popular tools in this aspect is insurance, which is perceived by many entrepreneurs as an efficient instrument for the protection of corporate activities. Before undertaking a more detailed assessment, it is worth noting that two types of risks, from the security point of view, can be distinguished, namely:

- clean risks being the consequences of random events beyond our control or are unintended, whose effects can only cause, losses for example, fire, theft, car accident, etc.,
- speculative risks being the consequences of actions taken by us hoping that they would generate profits, for example, the purchase of shares on the stock exchange.

The objective of such classification is, first and foremost, to separate the insurable from the non-insurable risks and also to create groups of risks that can be legally regulated, which is a necessity and a general condition for drafting an insurance contract. It should be noted that insurance relies on the principle of risk sharing and in reference to future events, they are used to guarantee protection in case of clean risks[3]. Hence before the drafting of the final

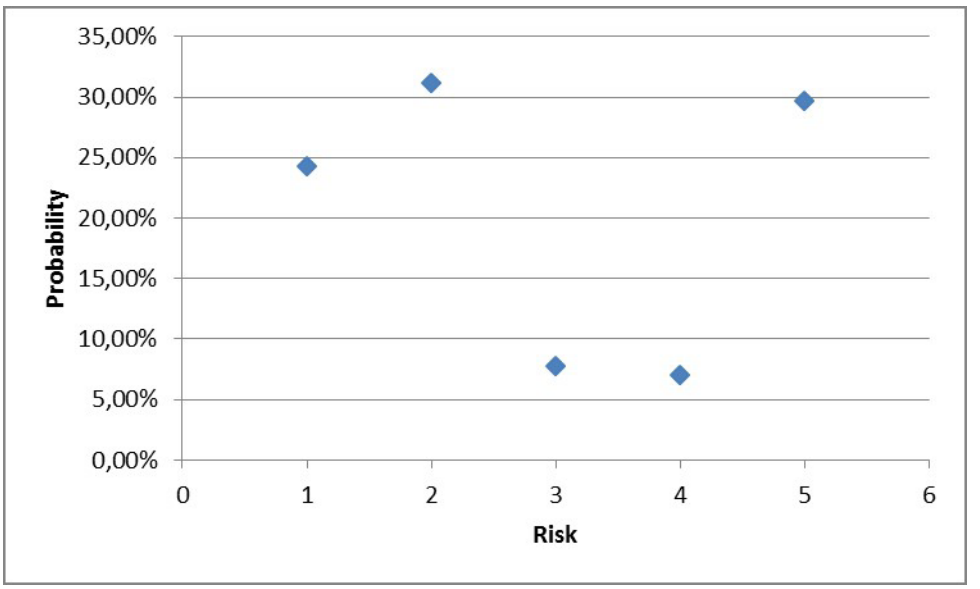
3 The market is also abound with insurance products that offer protection also in cases of speculative risks, they are, however, omitted in this study due to their specific nature.

Tab. 2. Risk classes with the highest probability of occurrence in the vector groups analysed

No	Number of isolated classes (N, X)	Number of vectors
1	N_1, x_2	137 585
2	N_4, x_4	176 643
3	N_5, x_2	44 095
4	N_6, x_5	40 061
5	N_7, x_2	168 616

Source: own calculations using the MATLAB program.

Fig. 2. Probability of occurrence of a risk in classes



Source: own calculations using the MATLAB program.

insurance offer, the risk category should be verified from the perspective of its insurability.

The next simulation stage is conducting calculations for the set of 390 357 vectors similarly to that previously described. The data obtained would allow the isolation of the next group of risks, whose impacts on the activities of an innovative enterprise is negligible.

It needs to be emphasized that each subsequent simulation is conducted on a smaller base of potential risks. During the simulation process, risks of the most likelihood of occurrence were firstly eliminated from the calculations to enable the adoption of the definite risk parameter. Each level of a given risk ought to be matched by actions from the company to minimize its impacts, thus enabling its efficient management. The relevant data is presented in Table 3.

It should be noted, however, that the level of risk transfer is assumed, as it depends on many factors attributable to the company. These include, among others:

- financial status,
- the level of indebtedness,
- the business sector the enterprise is in,
- dependence on the network of suppliers and subcontractors,
- implementation of risk management procedures,
- the range of instruments of risk transfer being put to use.

Hence, each company ought to decide, individually, about the degree and level of risk minimization making use of instruments of transfer available in the market.

4. Use of the research findings in corporate risk management by means of insurance

The studies unequivocally indicate that the proper

Tab. 3. Company activities relative to the level of risk

Simulation	Level of risk	Example of levels of risk transfer	Action
Level I	very high	100%	insure
Level II	high	80%	insure
Level III	moderate	60%	insure partly
Level IV	average	40%	retain
Level V	low	20%	don't insure

identification of risks in the activities of innovative enterprises could serve as a key factor in curbing business risks. The conscious and skilful transfer of risk to external entities, particularly those specializing in risk acceptance, such as insurance companies, becomes an important factor. It should be emphasised that insurance, from the view-point of entrepreneurs, is one of the optimal means of risk transfer. The competitive nature of insurance, compared to other methods of risk management, could be assessed from the angle of the relevance of criteria for evaluating and selecting risk management methods. The following criteria can be listed from the practical perspective (Pukała, 2013):

- effectiveness – insurance belongs to the group of compensatory methods, intended to compensate financially for losses incurred as a result of the risk that occurred,
- cost – insurance belongs to a financially attractive tool to ensure protection against the transfer of business-related risks. It is worth emphasizing that it facilitates the reduction of tax liabilities by writing off insurance premiums as deductibles,
- added benefits – the fact that insurance can, besides methods of risk transfer, ensure extra benefits for an entrepreneur, can be considered from two aspects:
  - additional (non-compensatory) services by the insurer that could be helpful in managing the company, for example, assistance,
  - benefits derivable from the insurance cover, other than the right to insurance claims or services, that give the entrepreneur the sense of security, thus encouraging them to take unconventional business decisions.

The risks identified in the course of the simulation exercise can be effectively handled through the use of insurance instruments. The scope (extent) of the resulting potential damage due to the materialization of events connected with the operations of the company is very wide, while the associated losses can lead to bankruptcy. Hence, the chief aim of an insurance policy is to minimize losses associated with turbulences in the company's activities and to provide support in areas of cost optimization in its operations. It should be noted that the current range of insurance cover offered business entities by insurers is elaborate, and the products on offer are becoming more sophisticated and „customized". This is facilitated by the growing competition, the development of modern risk management mechanisms, both from the client and insurance company's perspective as well as the global transfer of know-how that enables the offer of programs that fully meet the expected needs of the customer (Pukała, 2014).

The analysis of the possibility of using a neural network, by means of which a group of risks that threaten a company's activities were identified as well as their likelihood of occurrence, has led to the conclusion that it is a very effective tool. The algorithm designed applying the Kohonen network is characterized by high efficiency and flexibility in conducting all stages of the simulation. This confirms the research hypothesis that neural networks enable the control of complex multidimensional issues that would in the course of using other methods hamper attempts to model non-linear functions consisting of a large number of independent variables. Another important benefit is their ease of use. Neural networks practically design models needed by the user independently as they learn from examples fed to them automatically. Neural networks can thus be put to use wherever there are tasks related to prediction, classification, and control.

Conclusions

The issue of risk management in innovative enterprises is currently very attractive in the light of existing risks attributable not only to a company but also its external environment. It is in this context that one should view the research studies that concentrated on identifying a company's business-related risks and the mechanisms being put to use to

minimize their impacts.

In the light of the results obtained, the two research hypothesis adopted in preparation for the research study have been verified positively. The research methodology applied have yielded data, which unequivocally indicate that the methods are effective and can be efficiently applied in current business operations of innovative enterprises.

Here, it is worth emphasizing that analysis results delivered refer to three areas:

- risk assessment of innovative company, which:
  - identified operating areas and risks characteristic for the entity's operation,
  - arrange risks,
  - create a data matrix for a further analysis with the use of the Kohonen network,
- offering insurance protection aimed at optimizing business operations and leading to limiting losses that can arise in the case most probable risks materialise, as part of which:
  - identification and hierarchisation of the most probable risks has been carried out,
  - proposals for management activities of an enterprise in the scope of applying insurance tools to limit financial losses in the case of risk materialization, taking account of the risk level,
- using a self-organising Artificial Neural Network (ANN) to classify risk of an innovative company to determine priorities as regards optimisation of its operations.

When viewed from this perspective, there is a need to stress the practical applications of the methodology in the current activities of companies, not limited to innovative, though, since the algorithm is universal in nature. It should also be noted that it embodies several trends in the area of risk theory, entrepreneurship, insurance and neural networks, which in some respect attests to its innovativeness.

What is also worth mentioning is the theoretical aspect of the analysis. Both the literature analysis and the findings contained in them clearly indicate that while each of the aforementioned fields of science is adequately covered nationally and internationally, there is, however, the dearth of studies that link all these disciplines. Attempts were made in the research to cover all of these areas. The findings obtained indicate the possibility of combining various areas of research and arriving at conclusions that will be multidisciplinary in nature. This would enable the expansion of fields of research and sharing of solutions between them. Similar approaches undoubtedly contribute to the even deeper analysis of the phenomena, which have, hitherto, been studied superficially or within a narrow context.

The designed methodology can serve as a model, and an inspiration for further research in interdisciplinary dimension within the disciplines suggested as well as in others of different areas of interest. It can also be a source of information for developing own ideas, which will undoubtedly enable the efficient exploitation of available research instruments as well as the development of new, more innovative ones.

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Volume 8 • Issue 3 • 2016

Economics and Management

pages: 57-69

DE GRUYTER OPEN

ISMSME International Society for Manufacturing, Service and Management Engineering

received: 1 December, 2015
accepted: 5 July, 2016

Sustainable business development through leadership in SMEs

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ABSTRACT

The aim of this paper is to examine the role and scope of the influence of leadership on the sustainable development of SMEs. Research methods included the theoretical analysis of scientific literature and a direct survey. The quantitative sample for analysis contained 138 managers, the representatives of companies (SMEs) located in Poland. The data was collected in November and December 2015.

The obtained results show that leadership is one of the key aspects that enable sustainability. It is more important than employee approval, beliefs of employees from individual departments and teams, a long-term strategy for the sustainable development of the company, approval by external stakeholders, and substantial financial resources. There is a statistically significant relationship between taking action related to sustainable business in the company and manager's conviction (awareness) regarding the concept of sustainable business development as well as the influence of the manager on employees and the stimulation of their behaviour, including their development, decent treatment, communication with the manager, and the system of rewards and promotions. Managers undertake some action aimed at developing their employees. They also establish relationships with external stakeholders.

The paper presents theoretical reflections on the relationship between the sustainable business development of SMEs and leadership, also verified by the empirical study conducted among managers of private companies. The findings of the study contribute to the understanding of the connections between these constructs. The relationship between the creation of sustainable business development is analysed in depth with reference to SMEs. Entrepreneurs and managers of SMEs can benefit from the study in order to build an organisation capable of achieving effective and sustainable development.

KEY WORDS

sustainable development, sustainable business, corporate sustainability, small and medium-sized enterprises, leadership

DOI: 10.1515/emj-2016-0024

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Introduction

Together with increasing social, environmental and economic challenges, which have already become a constant component of the social and economic environment of every organisation, it is thought that companies (businesses) play a key role in shifting the society towards a more sustainable future (Baumann-Pauly et al., 2013; Hall et al., 2010). The economies of both developed and developing countries are largely based on the activities of small and medium-sized enterprises (SMEs). The SMEs also play a significant role as far as sustainable development is concerned. The European Commission policies emphasize the fundamental role that SMEs play in the shift towards a new and more sustainable models of production and consumption that can be obtained

by investments in human resources as well as social and environmental capital (Szczepańska-Woszczyna & Lis, 2015). Not only are SMEs a source of economic growth, but also innovation in all industries. Besides, they provide jobs for the citizens of the countries concerned. They also offset the negative economic trends and support the restructuring of industries. The sustainable development of the sector is vital to the economy and is a prerequisite to achieving economic growth for at least a few reasons. Firstly, small and medium-sized enterprises create six out of ten workplaces. Secondly, SMEs are leaders in the industry transformation from traditional forms of production to advanced technologies. Thirdly, SMEs play an important role in developing innovation, whose aim is to improve their competitiveness. Organisations in this sector also contribute to the development of the global market. Innovation plays a significant role in enhancing the competitiveness of SMEs, which is conditioned by competencies, in particular, that of managers (Szczepańska-Woszczyna, 2014).

It is simultaneously estimated that SMEs may be jointly accountable for up to 70% of industrial pollution (Entr, 2004). Financial obstacles followed by a lack of time and qualified personnel have been identified as the most significant in the development and implementation of sustainable innovations (Vasilenko & Arbačiauskas, 2012). SMEs have difficulties to integrate the environmental aspects into their activities (Bradford & Fraser, 2008; Drake et al., 2004; Revell & Blackburn, 2007) and environmental efforts made by SMEs are a matter of the owner's choice (De Gobbi, 2011; Nulkar, 2014). It seems that SMEs tend to be more reactive than pro-active in the environmental field (De Gobbi, 2011). Several factors contribute to SMEs' lack of interest in sustainable development. Previous studies (De Gobbi, 2011; Gadenne et al., 2009; Gerstenfeld & Roberts, 2000) indicate the major barriers, i.e. added costs and low awareness on the part of an owner, poor management skills and the lack of capacity to turn environmental improvements into business opportunities as well as the lack of skills to implement environmental improvements. Compliance itself comes at a cost and voluntary practices not resulting in direct business benefits may be ignored (Hobbs, 2000).

It is emphasized in the literature that the principles of sustainability are an indispensable part of the process of value creation: on the one hand, centralizing and combining ethical values and entrepreneurial values (Spence & Lozano, 2000; Vyakarnam et al., 1997), on the other hand, the significance of the ability to establish relationships through participation in networks (Jabłoński, 2015; Kurowska-Pysz & Gregor, 2014). The identification of instruments facilitating a sustainable business model in those companies represents a huge potential for the transfer towards a sustainable economy. As regards SMEs, the importance of interactions with society to the forefront is underlined. These interactions involve a company improving the relationships with actors of its value chain, with policy-makers, with researchers, with non-governmental organisations (NGOs), and with customers. For SMEs, success in sustainability depends on the extent of collaboration and the quality of these interactions (Cramer, 2006; Perrini & Tencati, 2006; Waddock & Bodwell, 2004). Companies fulfil a significant function in the society, not only as an entity that makes a profit but also as a provider of specific values anticipated by the society. These key values are most frequently defined in the company mission statement. It is a peculiar declaration of an organisation's identity, both for its employees and stakeholders outside the organisation. Managers are responsible for its effective enforcement by means of operating activities. Therefore, it is essential to translate the selected values into a set of competencies characterizing a given company (e.g. creativity, flexibility, customer orientation) as well as to inspire employees to follow the values. That is the leaders' task (Moszoro, 2012). Managers are especially responsible for integrating sustainability into company's strategy.

The literature on sustainability integrated into business practices has naturally focused on large, usually multinational companies, where impacts are significant (Bos-Brouwers, 2010; Epstein & Buhovac, 2014; Laurinkevičiūtė & Stasiškienė, 2010). Similarly, research on the sustainable value creation through leadership is conducted primarily in large organisations. Nevertheless, researchers claim that it is necessary to look at the development of SMEs in a different way than the development of large organisations (Hillary, 2000). The authors emphasize the gap and necessity to study sustainable behaviours in the SME sector, where unique approaches are required with specific leadership and understanding of the SME culture. Professionalization of management processes and the high level of competences are two of the most important requirements that modern organisations have to cope with (Drucker, 2004; Koźmiński, 2008; Nogalski

& Śniadecki, 2001), especially in the case of SMEs and their sustainable development. In SMEs, it varies in terms of a form and conditions (Jenkins, 2006; Stewart & Gapp, 2011). According to Hambrick and Mason, SME leaders influence organisational outcomes (Hambrick & Mason, 1984). This influence, as Hambrick and Mason claim, is mediated by the leaders' strategic choices that are driven by their values and cognitive bases. However, there has been little research on influence, and still little is known about the social practices of business related to the sustainability of SMEs. The literature on SMEs and their practices in a sustainability context is not extensive (Jansen, 2008) and the area requires further investigation. Due to this gap, the aim of the paper is to examine the role and scope of the influence of leadership on the sustainable development of SMEs. The study aimed to identify the key aspects of leadership that enable sustainability. It becomes increasingly important to understand what successful SME leaders do and how they behave to influence the sustainability of their companies. Therefore, three hypotheses were formulated for the purpose of research: Hypothesis 1. Leadership is one of the key factors that enable sustainability. Hypothesis 2. Own values of the managers are a key determinant of their activities and decisions taken related to sustainable development of a company. Hypothesis 3. Stimulation of employee awareness and development as well as their responsibility for the environment by owners/managers positively affect sustainable business development in SMEs.

The research was conducted in two stages. The first stage was a pilot study conducted in January and February 2015 on a group of 91 private sector organisations. The aim of the pilot study was to test the assumptions for real research. The paper presents the results of the real research (the second stage), conducted in November and December 2015 among 138 randomly selected companies (micro, small and medium-sized enterprises) implementing strategies for sustainable business development. The data for the research was collected on the basis of results of a questionnaire sent to the representatives of private organisations located in Poland.

1. Literature review

The United Nations Brundtland Commission defines sustainable development as „development that satisfies the economic, environmental and social needs of the current generation without compromising the development of future generations" (Lacy et al., 2010). As regards companies, the concept of sustainable development assumes that when some actions are taken, social and ecological problems are taken into account, both related to the company and the relationship with its stakeholders (internal stakeholders: shareholders, employees and managers and external ones: customers, business partners and society), (Jabłoński, 2010). In this context, the company focuses on a sustainable increase and development and integrates economic criteria as well as social and environmental goals while managing its activity. Thus, it can be concluded that development contributes to economic prosperity and the quality of environment and social capital (Vincenza Ciasullo & Troisi, 2013).

The concept of sustainability is understood as durability; sustainability is a relatively new concept, still not fully explored in the business world. Grudzewski et al. (2010) define sustainability as the company's ability to continuously learn, adapt and develop, revitalize, reconstruct, and reorient to maintain a lasting and distinctive position in the market by offering buyers above-average value today and in the future (consistent with the paradigm of innovative growth) through organic variation constituting business models, and arising from the creation of new opportunities, objectives and responses to them, while balancing the interests of different groups. Sustainable business development involves the application of sustainability principles to business operations. Sustainability in this sense may mean a variety of things – ecological sustainability, social sustainability or sustained economic growth. As such, the sustainable business movement is a component of the broader movement towards greater corporate social responsibility (Rainey, 2010). According to the Network for Business Sustainability, business sustainability is the inclusion of financial, environmental and social concerns in business decisions. Sustainable companies: 1) create a long-term financial value, 2) know how their actions affect the environment and actively work to reduce their impacts, 3) care about their employees, customers, and communities and work to make a positive social change, and 4) understand that these three elements are interconnected. Although there are several perspectives of defining „sustainability", the essence is related to the organic development of the company in a dynamic equilibrium with its external business environment and natural environment. Sustainability

implies vision and competitive advantage, which means strategic thinking and leadership (Bratianu, 2015).

The goal of a company is to create value together with society, the value which combines the development of society with the economic development (Porter & Kramer, 2007). Every company should take decisions considering the common value. Such an approach offers greater innovation and continuous development, which will bring more benefits to the whole society. There are four key sustainable categories of values which should be included in the company's mission statement: (1) business – related to business activity and making a profit, e.g. perseverance, effectiveness, professionalism, and performance orientation; (2) rational – values related to the quality of interpersonal relationships, e.g. communication, teamwork, and respect for people; (3) developmental, such as innovation, creativity, learning or continuous development; and (4) related to the contribution for the benefit of others (e.g. actions in the area of CSR), (Cardona & Rey, 2009). A company should be observed from the perspective of providing measurable benefits contributing to the creation of value for society (Martin et al., 2009). Hoag, Cooper (2006) highlight the multifaceted perception of values, which are the basis for interactive relationships between a company and its environment. One can thus talk about a group of values subject to the processes of exchange and that are the basis for considering reciprocal benefits for owners, customers, managers, employees, and other groups of stakeholders.

The long-term positive influence on the environment translates not only into image benefits for the company but also into financial ones. Companies are obliged to fulfil formal and legal requirements as well as to make an increased investment in human resources, environment, and relationships with stakeholders who can have a real impact on the efficiency of economic activities of these organisations and their innovation (expenditure of this kind should be regarded as an investment and a source of innovation rather than as an expense), (Szczepańska-Woszczyna et al., 2015). Strong leadership is of paramount importance for the sustainable development of a company, directly affecting the key areas of an organisation: the degree of the innovativeness of the company, its corporate reputation, its performance, financial stability and relationships with customers. The role of leadership responsible for the development and implementation of the company's brand strategy is crucial, although often underestimated. The awareness of managers as regards the fairness of activities is increasing (Sadecki, 2013). Doppelt argues that „for an organisation to make this kind of transformation to become truly sustainable, power and authority must be skilfully distributed amongst employees and stakeholders through effective information sharing, decision making and resource allocation mechanisms" (Doppelt, 2003). This is clearly an issue for the leaders of organisations. Supporting this view, Goehrig has emphasized the role of leadership in creating a sustainable and realistic business environment. He states that changing the business outcome requires changes to existing business structures. He highlights the need for executives, consultants, and management leaders to understand and implement new strategies (Goehrig, 2008). Also, in the research of SMEs conducted by Stewart and Gapp, a link between situational leadership and the successful uptake of CSR and sustainability has been found (Stewart & Gapp, 2011). According to Hind and Smit, there is considerable evidence that the leadership role is critical to the implementation of any sustainability development (Hind et al., 2013). In addition to leadership, Benmeriphi lists other factors such as: (1) access to skilled labour, (2) access to financial resources through the banking system, (3) the ability to respond to market demands, (4) a flexible institutional framework as the main factors that determine sustainable business development in SMEs.

The company creates value when managers are sustainability-oriented. In particular, this concerns SMEs where the owner-manager takes the responsibility for main decisions. Driving factors for SMEs to engage in at least parts of sustainable development are often personal and ethical values of the company's owners, managers, and employees. Companies where organisation members have a personal interest in involving in environmental and social issues are likely to pay attention to social and environmental issues ((EC), 2007). The owner-manager of an SME is both the author (creator) and performer (the one who enforces) of some values. Managers express their own personal values through their behaviour, the ways of taking decisions, and articulated values (Hemingway & Maclagan, 2004). The scale of business goals in the case of SMEs is linked with the owner-manager, for whom the relationship between personal and business success is

much closer than in the case of delegating managerial competencies to other people, and takes the form of ethical and responsible behaviour regardless of the outcome. In this context, the feeling of belonging from the perspective of an entrepreneur and their feeling of being part of a community becomes a unique „springboard" to create conditions for sustainable development. Research on sustainable entrepreneurship proves how sustainable entrepreneurs reveal personal competency and consider their professional life as a creative act. Differences between personal goals and perceived reality are regarded as a challenge rather than a problem. Moreover, sustainable entrepreneurs greatly influence the company with their personal goals and preferences in such a way that these are reflected in the company's goals. Employees are expected to have such personal skills as ethics and loyalty; responsibility and commitment; self-reliance; openness to learning and continuous development; the ability to work under time pressure; correct self-esteem; flexibility and the ability to adapt; and empathy. This is more common in small companies rather than in larger enterprises (Ciasullo & Troisi, 2011; Kurowska-Pysz, 2014).

Employees play an important role in the company's pursuit of sustainable business development policy and, therefore, the owner/manager should involve them in initiated sustainable activities. It is employees that are often the best and most effective channels of information. Employees should be aware of all the environmental and pro-social activities performed by the company because then they may contribute significantly to the effectiveness of these activities. Many companies have developed the ways of engaging employees in projects through joint actions and environmentally-friendly behaviour. Integrating corporate strategy, HR strategy and the strategy of sustainable development has a significant impact on the long-term financial performance of the company, the coherent development of employees and the organisation.

In the broader perspective, human capital, including the quality of managers (risk-taking tendency, entrepreneurship and commitment, the quality of marketing, technical and financial staff, and employees (qualifications, efficiency, and creativity) is listed as one of core components of the potential for company competitiveness, in addition to such components as: (2) physical and financial resources, (3) invisible resources – information, technologies, innovations, reputation, unique skills, informal liaisons, patents, licences, work atmosphere, organisational culture, experience, contacts, and (4) organisational resources (a decision-making system, distribution and logistics networks, organisational structure, connections with suppliers and consumers, etc.), (Skawińska, 2002). According to Subramaniam, Youndt (2005) and Ciasullo, Troisi (2011), the ability of an organisation to create sustainable value is directly related to the intellectual (human, structural, and relational) capital, and it makes it possible to analyse such factors as reliability, credibility, satisfaction, honesty, and relationships with stakeholders. Simultaneously, the analysis of separate components of intellectual capital explains the sources of creation of sustainable value at an individual level (person), the level of organisational structures, processes, systems, relationships, and networks. The competitive advantage of companies results from their characteristic management and organisational skills (the way of coordinating and using resources, developing products, creating alliances, etc.), and is shaped by positions of assets specific to the company (including know-how, the competitiveness of offered products and services, and delivering a measurable group of values to customers), as well as the development path(s) that the company has taken (Teece et al., 1997). To maintain the competitive advantage, an organisation must possess the ability („dynamic opportunity") to adapt, integrate and reconfigure its internal and external organisational skills, resources and functional competencies so as to meet the requirements of the changing environment. According to Teece (2007), this dynamic ability depends, to a large extent, on the top-level management. To be able to successfully manage an organisation, managers „must act entrepreneurially, think strategically, and execute flawlessly" (Augier & Teece, 2009), they must be leaders, articulate goals, help to assess opportunities, build trust and play a key role in taking decisions strategic for the organisation. It is estimated that companies may achieve much more profit (by 30%) if managers apply practices that stimulate an increase in employee commitment and competencies (Cardona & Rey, 2009).

It is the managers' role to promote the expected values, to specify the unacceptable behaviours and to enforce the appropriate attitudes of lower-level managers. Brand building and „healthy" corporate culture are the components of bilateral communication with all important partners as well as with employees. The image of the company and organisational culture

that identify the company in a business environment through CSR activities, advertising campaigns or employer branding, must be reliable and consistent with the elements that the staff perceive and declare (Szczepańska-Woszczyna, 2015).

The role of managers is to create such conditions for the company's operation that the mission and values become one whole underlying structure of the organisational culture of the company. If the mission is the goal that determines the direction of activities, values become the criteria and guidelines in the process of taking decisions in the most suitable manner of conduct in a particular situation. Values show how to pursue the mission. A proper selection of values that are consistent with the mission is an important part of what Cardona and Rey (2009) refer to as „intrategy", i.e. an increase in the employees' commitment to the company's affairs through managers' decisions, examining the environment of the company and internal processes occurring in it. The successful company will give its employees many opportunities to bear responsibility. It is increasingly necessary to decentralise decision making.

2. Research methods

Research methods were the theoretical analysis of scientific literature and a direct survey (questionnaires were the instrument of data collection). The quantitative sample for analysing contains the representatives of companies (SMEs) located in the Province of Silesia in Poland. The companies randomly selected in the sample are members of the regional chamber of commerce. The total of 300 enterprises was involved, including micro (up to 9 employees), small (10-50 employees) and medium-sized enterprises (51-250 employees). A total number of 138 correctly completed questionnaires were received (not all of the questionnaires were suitable for further analysis, the respondents who failed to answer at least 20 per cent of the questions were excluded). The survey was sample-based, and random sampling was applied. The data was collected in November and December 2015. The questionnaires were the instrument of data collection. The database contains 20 variables characterizing 138 managers/owners of SMEs. The variables were measured on the seven-point Likert scale, seven indicating „maximum agreement" and one meaning „no agreement". In addition to demographic data, the questionnaire contained questions on the key elements of company's business sustainability, the manager's role in the company's sustainable development, attention paid to employees, establishing relationships with employees and external stakeholders, and the promotion of activities aimed at the sustainable use of raw materials and energy. The analysis was conducted at two levels: the statistical description in the sample and statistical inference involving the generalization of the results obtained in the sample of the statistical population. Basic tables with descriptive statistics were used for the statistical description, giving the idea of the tested material structure, including matrix categorized histograms, and box-and-whisker plots. In terms of statistical inference, non-parametric statistical tests were applied: (1) a Spearman's linear rank correlation coefficient to examine the existence of a statistical relationship between the variables, (2) the chi-square test of independence in order to examine the existence of a statistically significant relationship between two variables. In order to determine the strength of the relationship between the qualitative variables, the measure of relationship strength based on the Cramer's V chi-square was used; (3) descriptive and exploratory factor analysis aimed at isolating the natural groups of variables. All hypotheses were verified at a significance level of 0.05. The analysis of the results also uses p-value, which is the smallest level of significance at which the null hypothesis can be rejected. Calculations were performed using Statistica 12.5.

Enterprises were of different size (employment criterion): micro-enterprises accounted for 31.2% of the respondents, small businesses – over 42.0%, and medium – 26.8%. The majority of respondents were male (63.3%), between 31 and 40 years of age (41.7%), with a mean of 12.73 years of experience as a manager.

3. Research results

3.1. Leadership as one of the key aspects that enable sustainability

In the research group, 65.2% of the respondents declared that a sustainable policy was fully pursued in their companies, and 55.0% of the respondents were personally involved in the company's sustainable policy. The factors determining the effective implementation of actions in the area of sustainable business that were rated highly include the

dependence of the effective implementation of actions for sustainable development on the owner/managers convinced of these activities. The box-and-whisker diagram shows the median and the diversity of the ratings of statements defining the effective action in the area of sustainable business (Fig. 1).

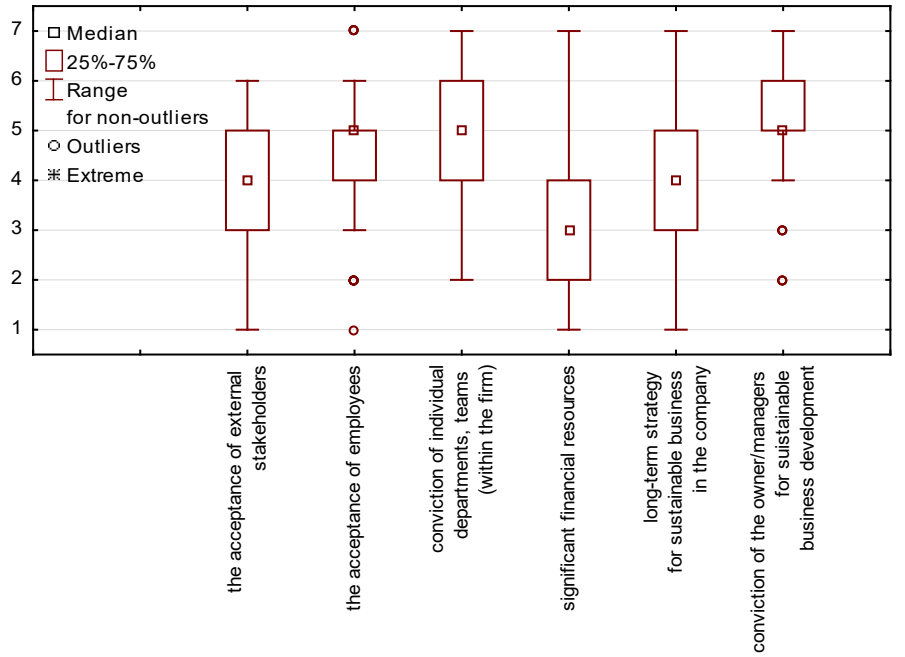

Fig. 1. Diversity of the ratings of statements defining the effective action in the area of sustainable business

Moreover, every second respondent rated this factor as a five (on a scale from one to seven). None of the respondents rated this factor as „I completely disagree". Next, the following factors were rated highly: employee approval, the beliefs of employees from individual departments and teams, having a long-term strategy for sustainable development in the company, external stakeholders' approval, and finally, having substantial financial resources. The highest convergence of ratings was for the dependence of the effective implementation of activities for sustainable development on the owner/managers convinced of these activities and employee approval. The greatest diversity of ratings was for having substantial financial resources and having a long-term strategy for sustainable development in the company. If leadership means dependence of actions on owners/managers, it indicates that the statement is true.

The size of the company (the analysis was conducted for two groups of companies: small, micro and medium-sized (75% of micro and small enterprises and 25% of medium-sized enterprises were studied) does not determine the factors that the effective implementation of activities for sustainable development may depend on (the chi-square test of independence was used; Tab. 1). There is a statistically significant relationship between the size of the company and external stakeholder approval of such measures. This relationship, however, is poor (Cramer's coefficient = 0.23662). Other relationships are statistically insignificant.

3.2. The areas where SME managers have an impact on sustainability business development

In order to test the influence that a manager has on business sustainability, the questions were selected from the survey expressing the opinions and position of managers in the field of sustainable development. Using the factor analysis, a group of determinants of the sustainable development of the company was identified based on the opinions of managers. The factor analysis allows the transformation of a mutually correlated set of variables into a new set of variables (so-called common factors) mutually uncorrelated, but comparable to the initial system. The advantage of factor analysis is an opportunity to discover the optimal number of hidden variables that explain the interrelationship between observed variables.

The basis for the contention that in the study there are groups of determinants of sustainable business

Tab. 1. Relationship between activities in the area of sustainable business and the size of the company (the chi-square test of independence (p-value))

Factor vs. size of the company (p-value)					
External stake-holders' approval	Employee approval	Beliefs of employees	Financial resources	A long-term strategy for sustainability	Dependence on owners / managers,
.01821*	.69680	.63223	.54169	.81035	.14198

* significance level of 0.05

development in the company is the correlation matrix, which proves the significant relationships between variables. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy was determined for 16 variables, and the Barlett's test was performed. Both tests (KMO is greater than 0.6 and Barlett's test p = 0.000) indicate the validity of applying the factor analysis. The data was analysed in terms of principal components. Based on the analysis of the Eigen values and variance explained, 16 input variables were reduced to seven dimensions, explaining a total of 73.88% of the total variation.

Thus, sustainable business is evaluated at seven levels. Factors were defined as:

- (a) the attitude of a manager to the sustainable development of the company: the ability to identify and analyse potential aspects of sustainable development in business situations, the correct understanding of the idea of sustainable business by managers and employees, and manager's decisions and solutions reflect their personal values,
- (b) an influence the manager has on employees and stimulating their behaviour: the awareness that decisions taken by the manager have a strong influence on the behaviour of others, the request for the opinion of others before taking a decision, encouraging subordinates to express their own opinion, the awareness that the improper structure of incentives may lead to the unethical behaviour of employees,
- (c) the development and decent treatment of employees: effectiveness in supporting the development of employees, care for the health and safety of employees, and the decent treatment of employees as a standard in the company,
- (d) the communication of the manager with employees/environment: both business and ethical reasons for their opinion/decision are regularly explained,
- (e) the system of rewards and promotions based on an ethical attitude: the ethical attitude of employees is a component in the system of rewards and promotions in the company,
- (f) the manager's own contribution to sustainable development of the company: promoting activities aimed at reducing the consumption of raw materials and energy among employees; the manager's personal involvement in the company's operations in the field of sustainable business, it is important that the company I run/where I work takes action in the field of sustainable business,
- (g) manager's activities for the benefit of the external environment: a belief that every company should hire employees from the region, in which it operates and buy from local suppliers.

For these groups, correlations with other questions that show the actual state of the company were calculated: taking action for the benefit of the community, in which it operates, supporting it financially and non-financially, the company has a clear policy for contacts with stakeholders, the company has talent management programmes, the company has a clear promotion path for employees, and the company takes action in the field of sustainable business. Simultaneously, correlations with the group regarding the presence of activities related to sustainable business in the company and convincing the manager of the concept of sustainable business development were calculated (GROUP A). Personal involvement of the manager in the company's operations in the field of sustainable business; it is important to me that the company I run/where I work takes action in the field of sustainable business, my company takes action in the field of sustainable business, the manager's ability to identify and analyse the potential aspects of sustainable development in business situations, the correct understanding of the idea of sustainable business by managers and employees). The results are presented in Table 2.

There is a statistically significant relationship between taking action related to sustainable business in the company and manager's conviction (awareness) of the concept of sustainable business development and the influence of the manager on employees and stimulating their behaviour (factors (b), (c), (d), and (e)). Simultaneously, there is a significant moderate correlation between the influence of the manager on

Tab. 2. Correlation of factors

	Variables vs ... (p value)						
	(a)	(b)	(c)	(d)	(e)	(f)	(g)
Q.1	-	0,255770*	0.075725	0.284942*	-0.017281	0.050422	-0.033537
Q.2	-	0.334401*	0.071562	0.178462*	0.038406	0.032889	0.014249
Q.3	0.146387	0.053935	0.334356*	0.150264	0.294706*	0.327640*	0.132659
Q.4	0.234979*	0.373838*	0.211594*	0.352888*	0.304695*	0.174648*	0.034196
Q.5	-0.018426	0.242307*	0.406066*	0.285513*	0.361544*	0.277581*	0.178168*
Q.6	-0.050178	0.082939	0.508204*	0.218394*	0.265816*	0.420346*	0.153937
Q.7	0.137810	0.279363*	0.359196*	0.053346	0.088777	0.160614	0.154224
Q.8	-0.085329	-0.060566	0.310791*	0.161568	0.339427*	-	0.168873*
Q.9	-0.121605	0.112893	0.259666*	0.094649	0.136710	-	0.228885*
Q.10	-0.083265	-0.090056	0.110791	-0.067367	0.018818	0.475802*	0.098125
GROUP A	-	0.367638*	0.279428*	0.300831*	0.203413*	-	0.127987
Q.11	0.010852	-0.160259	0.024740	-0.027328	-0.065386	0.109683	0.046868

* (1) I am able to identify and analyse the potential aspects of sustainable development in business situations; (2) In order for a company to be socially responsible, its executives and employees must properly understand the idea of sustainable business; (3) My company takes action for the benefit of community in which it operates, supports it financially and non-financially; (4) The company has a clear policy for contacts with stakeholders; (5) The company has talent management programmes; (6) The company has a clear promotion path for employees; (7) My company is operating in the field of sustainable business; (8) I involve personally in the company's operations in the field of sustainable business; (9) It is important to me that the company I run / where I work takes action in the field of sustainable business; (10) Leadership should be regarded as an element aimed at managing the value for stakeholders; (11) The size of the company (micro, small, medium)

employees and stimulating their behaviour (factors (b), (c), (d), and (e)) and having a clear company policy for contacts with stakeholders and the development of talent management programmes in the company. There is also a statistically significant correlation between the manager's attitude to the sustainable development of the company and a clear company policy for contacts with stakeholders.

The analysis of the issue of whether the action and decisions taken by a manager in the field of sustainable development are consistent with their own values indicates that the rating of at least half of the respondents in terms of individual variables (a, b, c, d) was 5 or 6. The most frequent value (the mode) was the rating of 5 (scale 1–7, where one is the lowest rating), (Tab. 3).

…81.2% of the respondents are definitely aware of the impact their decisions as managers have on the behaviour of others, and 10.9% to a moderate extent. It is important to the respondents to take decisions that are consistent with their own values; in the long term, they can be effective only if these two areas converge. 63.1% of the respondents state that their decisions and solutions as managers fully reflect their personal values (their business decisions over the last five years), 22.5% – moderately, low convergence is declared by 14.4% of the respondents (median: 5).

Tab. 3. Positional descriptive statistics for selected variables

Variable	Median	Mode	Number of modes	Minimum	Maximum	25 percentile	75 percentile
Q.1	5	5	39	2	7	4	6
Q.3	5	5	44	1	7	4	6
Q.4	6	5	43	1	7	5	6
Q.6	4	5	36	2	7	3	5

4. Discussion of the results

The paper presents theoretical reflections on the relationship between sustainable business

development of SMEs and leadership, also verified by the empirical study conducted among managers of private companies. The findings of the study contribute to understanding the connections between these theoretical constructs. The findings are consistent with research that indicates that relationship.

The research findings indicate that leadership is identified as one of the key factors that determine the implementation of sustainable development. This is consistent with the conclusions drawn by De Gobbi (2011), Stewart and Gapp (2011), and Hind et al. (2013). Among factors determining the sustainable development of SMEs are the awareness and motivation of the owner or manager. The majority of managers understand the concept of sustainable business development, can identify the activities related to this concept, and implement single solutions. The study indicates that according to managers, sustainable development can be the key to the company's future success. Similar results were obtained in the study conducted by the United Nations Global Compact (Lacy et al., 2010). Managers want to be aware of the actions undertaken, it is important to them that the decisions they make are consistent with their own values. This is favourable to the effectiveness of managers' activities. Not only does the law define the standard for what is considered acceptable in business, but also broader expectations of the society. Furthermore, with contemporary fast pace business climate and transparency, poor judgments are seen immediately across the world. Consequently, leaders must take decisions that reflect not only traditional economic but also ethical considerations. As the CGMA report shows, in many SMEs the finance function plays a critical role in formulating and implementing a sustainability strategy (Ten key…, 2013). The obtained results indicate that having significant financial resources for sustainable development in the studied companies was less important than leadership, employee approval, beliefs of employees from individual departments and teams, having a long-term strategy for sustainable development in the company, and external stakeholders' approval.

The sustainable business includes the understanding of values and the satisfaction of managers, employees and customers (Grönroos, 2007; Waddock & Bodwell, 2004). One should agree with the opinion of Hemingway and Maclagan (Hemingway & Maclagan, 2004) and De Gobbi (2011), that the effectiveness of the action taken by owners/managers in the field of sustainable development requires their personal commitment and conviction. It is important to the owners/managers to take decisions that are consistent with their own values. In the long term, they can be effective only if these two areas converge. The study shows that it is important for leaders to offer guidance to employees on behaviour-related expectations to make them responsible decision-makers. The challenge is to strike a balance between the needs of the organisation and the needs of its stakeholders and to establish the process of two-way communication with organisation stakeholders (Sroka & Gajdzik, 2015). This is evidenced by research that managers' activities are focused on building the relationships with both internal and external stakeholders.

Conclusions

In Poland, the breakthrough moment in the introduction of the concept of sustainable development into the national legislation was the recognition of the concept of sustainable development as a constitutional principle in 1997. Since the turn of the 20th and 21st centuries, there has been an increase in the interest in the concept of sustainable business development in the activities of enterprises. In contrast to countries with about 30 years of experience in the implementation of the concept of sustainability, its Polish history is rather short. Summarizing the research findings, it can be concluded that the idea of sustainable business development in Polish SMEs is still in the development phase.

The quality of human resources and their advantage in an organisation are increasingly becoming the crucial factors of the growth. Consequently, the human resources occur to be the main asset of an organisation and often determine the competitive advantage of the organisation in the market. In the process of current activities and during the implementation of the long-term strategies, organisations search for new methods of maximal benefiting from the staff competences. In the broadest sense, any activities of an organisation are always based on competences of employed staff. Practical implications result from literature studies, but first of all, they refer to empirical research analyses findings presented in the paper. They involve the identification of instruments facilitating a sustainable

business model in SMEs. Identification of factors influencing the growth of a sustainable business of SMEs has a crucial meaning because SMEs represent an enormous potential for the transfer towards a sustainable economy.

Managers of SMEs can become an important catalyst for changes in the way of thinking about the company's growth and development, and, consequently, the economic development. They play a special role in identifying the values of the company and in shaping its organisational culture, identifying key issues and creating the image of the company's future development. A significant condition of the practical implementation of the sustainable business development concept is, however, the managers' mental ability to perceive chances resulting from it and to persuade all the stakeholders to introduce necessary changes. In the processes of company's sustainable development, the leadership must be both competent and sincere. The behaviour and actions of a manager must include both personal and professional aspects. A manager needs to be authentic and reliable, and know how to positively balance various interests. Giving advice, they simultaneously include and inspire their colleagues to work well. They prevent situations in which employees have to deal with serious moral dilemmas by establishing clear ethical principles and in which employees are exposed to serious temptations. Not only does a real manager establish clear rules of conduct but they are also able to enforce them and solve problems that may arise.

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Volume 8 • Issue 3 • 2016
pages: 70-78

DE GRUYTER
OPEN

ISMSME
International Society for Manufacturing, Service and Management Engineering

received: 5 January, 2016
accepted: 1 August, 2016

Project management in behavioural perspective – cognitive biases in the formulation of the aim of the project

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ABSTRACT
The article contains a behavioural analysis of the aim-formulating stage of the project. The purpose of the article is to point out that in the process of formulating the aim of the project, it comes to such decision-making situations which favour heuristic thinking. The article presents the results of the secondary research. As a result of verified theory, according to which in the process of formulating the aim of the project, the interference in decision-making processes may occur on the part of the heuristics and the resulting cognitive biases.

KEY WORDS
project management, behavioural economics, cognitive bias, aim of the project

DOI: 10.1515/emj-2016-0025

Introduction

In the face of turbulent changes in the economic environment of an organisation, management practice focuses on the process of continuous improvement so as to continually improve efficiency (including the reduction in time consumption and capital intensity) and ensure the high quality of both our products and services and management processes. One of the responses to emerging challenges is the concept of a project-managed organisation and implementation of the project management principles. In the theory of this field, dynamic changes occur, which is associated with both a growing interest as well as the universality of the areas of project implementation. As a result, efforts are aimed at codifying good practices and indications in the project implementation. As a rule, these take the form of methodologies, representing the project management process and defining the scope of the tasks under each of its phases. Despite the undeniable advantages, they do not include behavioural analysis, which can provide a range of information on the regularity of decision-making, which in turn can translate into the improvement of economic efficiency of implemented projects.

The subject of the article is the aim-formulating stage of the project, which is crucial to its future success. The aim of the article is to point out that in the process of formulating the aim of the project, it

comes to such decision-making situations, which favour heuristic thinking. The authors of this article have attempted to assign corresponding categories of cognitive biases to the decision-making situations. The thesis of the article says that in the process of formulating the aim of the project, interference in decision-making processes may occur on the part of the heuristics and the resulting cognitive biases.

1. Purpose of the project

The main feature of projects is their purpose, orientation towards the implementation of specific and suitably-worded final result (Dąbrowski & Domagała, 2014, p. 4-5). The essence of a project is in fact to take the planned actions aimed at achieving the goal. This issue is raised in almost all definitions. For example, Kurzner defines a project as „aimed at achieving the target, requiring the use of resources and framed in time, cost and quality constraints" (Kerzner, 2005, p. 17). Similarly, the contribution of the project aim is emphasized by the definition contained in the standard for project management ISO 10006: 2005. According to the standard, a project is a „unique process consisting of a set of coordinated and supervised activities including the dates of the start and end, undertaken to achieve the purpose of meeting certain requirements within the time, cost and resource constraints" (PN-ISO 10006:2005, p. 13). On the other hand, according to the definition by the Project Management Institute (issuing the book on the good practice of project management PMBOK®) a project is understood as a temporary activity, the aim of which is to create an unusual product or service implemented having limited resources. Under the commonly used project management methodology of Prince2, developed by the Office of Government Commerce, a project is a temporary organisation established in order to manufacture products which support a specific business need (Dąbrowski & Domagała, 2014, p. 3).

Therefore, the definition of a project determines the way forward. Each activity within a project is focused on achieving the intended results. If, however, defining the intended purpose is not optimal, the achieved effects will not maximize the benefits flowing from the outlays either.

2. Introduction to the theory of heuristics and cognitive biases

The concept of heuristics and cognitive biases allows to look at the essence of an economic man through the prism of limited cognitive resources. The psychological analysis states that the human brain has a limited capacity of perception, collecting and processing information (Polowczyk, 2012, p. 60). According to Simon, management takes place in a kind of tunnel of restrictions. Hence, the freedom of action of an entity and its rationality can be shaped only within certain limits (Simon, 1995, p. 99). These restrictions affect almost all areas of human life, including the process of management, market, and managerial decision-making. They are reflected in the form of heuristic thinking, which in turn results in cognitive biases.

In the presented approach, heuristics is understood as a simplified rule of inference based on experience or the lore (Lewicka, 1993). On the one hand, it reduces the use of cognitive effort and the time that must be spent in the conclusion process. Hammond et al. indicate that in most situations, heuristics positively influences the decision-making process, because it provides instant suggestions in decisions taken under the pressure of time or the conditions of cognitive limitations (Hammond et al., 1998). On the other hand, the use of heuristics – especially in making key decisions, including strategic management decisions – can lead to non-compliance in inference with the rules of logic and lower the quality of decisions.

The consequence of heuristic processing is cognitive biases. Their essence is to ignore parts of the data and formulate assessments or decisions based on random information, characterized by a high adaptability (Falkowski & Zaleśkiewicz, 2012, p. 18).

The development of the concept of heuristics and cognitive biases is associated with key publications by Kahneman and Tversky (Kahneman & Tversky, 1979; Kahneman & Tversky, 1982), which pay special attention to issues of anomalies in decision-making processes of consumers, different from the classical theory of utility maximization. For this reason, the impact of heuristic thinking on purchasing decisions is a frequent subject of research. Today, attempts are being made to implement this area of knowledge to organisation management theory. The most common

problems discussed in this field are associated with the ability to stimulate the consumer market through the use of knowledge about the cognitive limitations of consumers. Less often, the subject of discussion is the impact of heuristic thinking on managers. In recent years, however, attempts of such analyses have been undertaken, mainly in the framework of strategic management (Narasimhen et al., 2005). This issue, however, is still poorly described in the Polish literature. Diagnosis of behavioural influence on the management process can bring positive effects in the form of increased efficiency as well as reduce the number of incorrect and sub-optimal decisions.

Camerer and Malmendier indicate the importance of the theory of heuristics and cognitive biases in the management of an organisation. In their opinion, it can be seen as both a threat and a challenge (Camerer & Malmendier, 2007, p. 235). This means that on this basis, one can identify both cognitive barriers resulting from an entity's behavioural anomalies, as well as the possibility of designing such management tools that allow you to maximize performance goals through the use of rules of heuristic thinking. This study focuses on the first of the identified problems.

3. Cognitive biases in the aim-formulation phase of the project

To formulate the purpose, towards which the project implementation will work, is to determine the expected results. On the basis of the behavioural analysis, it is considered that the choice of an aim is influenced by the decision-making context, including in this case a generated set of alternatives to choose from. Entities, making a decision, base it on a set of solutions, which take the form of a so-called set of known. In this group, a decision-maker selects the available ways of implementation creating a collection of considered solutions. It is important, therefore, that in the set of considered solutions are the best solutions. For this reason, the phase of generating alternatives significantly impacts the success of the entire project. In this phase, a decision-making situation occurs and is related to the recognition of a given aim as real and promising. Then, in the process of considering various options, they are the subject of valuation. The expected benefits are assigned to them, which is the basis for selection. Both, however, the process of generating alternatives and their assessment, due to their high complexity and the need to involve cognitive resources, are conducive to heuristic thinking.

3. 1. Cognitive biases in generating alternatives

When deciding on the implementation of a project, an organisation faces a choice between a completely new courses of action or the one used in previously completed projects. At this point, it may come to affecting the decision-making process of the effect of sunk costs and the effect of IKEA, which can unreasonably lead to continuing unprofitable projects. Effect of priming and anchoring also has an essential meaning.

According to the effect of sunk costs, wrong decisions generate costs and involve entities particularly strongly. Interruption of a project without achieved effects causes the sense of failure. Therefore, an entity seeks to justify the decision taken previously, revealing a tendency to continue inefficient investments, even when the costs substantially exceed the estimated budget (Hammond et al., 1998). This effect has a strong influence on the implementation phase of the project, when the test results indicate the need for modification of the aims. However, it can also manifest itself in the initiation phase and lead to the classification of previous, unsuccessful projects to the set of projects under consideration, which in turn means the risk of the continued growth in ineffective projects. Achieving even a small positive effect would allow rationalizing the incurred expenditure, which would be a source of psychological comfort.

The IKEA effect may enhance the effect of sunk costs, but it can also stand alone. This effect indicates a peculiarity described by Ariely, which occurs in the area of attachment to property. According to it, the more work a person puts into doing something, the bigger is the feeling of attachment to the object. The correctness is explained by the author in the example of furniture requiring assembly, which, according to the study, consumers value more (after assembling) than the one they purchase ready-made. Ariely shows that the strength of attachment is proportional to the put-in effort (Ariely, 2008, p. 90). A similar effect can be observed in terms of support for ideas on project implementation, which relate to specific contribution of work. If decision-makers have suffered certain expenditures to generate an idea, they are mentally attached to the given alternative. As a result, it is seen as more important compared to other ideas, regardless of the merit.

The priming effect also has an impact on the generation of alternatives. According to this effect, the appearance of a stimulus modifies the correct processing of next stimuli. It causes giving the priority while determining the context and searching the memory for elements that have been primed. Most often, these are the signals received by a decision-maker directly before the effects of the stimulus causing the reaction. The priming factor activates a way to associate, with the result that the response to another stimulus is associated with the priming stimulus (Matuszewski, 2001, pp. 168-170). Thus, in the phase of generating alternatives, the appearance of random stimuli can affect the priming of a specific way of thinking about the project implementation. This means that the range of generated alternatives is dependent on external signals, often unrelated to an organisation or a project. It causes a change in the range of generated alternatives in time, and it is particularly significant when a project is initiated and carried out under the pressure of time.

The anchoring effect strengthens the impact of the priming effect. In accordance with it, entities estimate the value on the basis of a suggested baseline, which makes a so-called anchor[1] or the reference point. So, decision-makers show a subconscious attachment to initial suggestions (Tversky & Kahneman, 1974). Thus, the first created alternative is an anchor for further ideas. This is the reason why the phase for generating alternatives may come to create only ideas similar to the base. It means that probably individual alternatives may be deviated due to specific properties; however, form the point of view of the reference point they will be similar.

Hammond et al. indicate that the error of anchoring in management decisions may also concern a strong base decisions on historical data and forecasts of future events built on this basis, including sales results. Historical data in this sense are the anchor, so the decision-makers assume that future results may differ from it, however slightly. They do not appreciate the same other factors that may condition the effects of decisions (Hammond et al., 1998).

1 Ariely presents an anchoring mechanism in the example of consumer choices, indicating that the role of an anchor is played by a suggested producer's price (e.g. regular, reduced) dependent on the producer of the good. Market prices affect the willingness of consumers to pay them. (Ariely, 2008, p. 67). In turn, Hammond et al. explain the effect on the example of the typical answers to questions "1. Do you think that the population of Turkey is higher than 35 million? 2. How would you estimate the population of Turkey?" The number in the first question is an anchor, while modifying the estimate declared in the second response (Hammond et al., 1998).

3. 2. Cognitive biases of alternatives assessment

The decision-making situation, which is conducive to heuristic thinking is alternatives evaluation. Decision-making processes in the evaluation of alternative targets have high complexity. The decision-maker must compare many features, which often differ in the way of presentation, including the quantitative and qualitative form. For this reason, the decision-maker operating in conditions of limited cognitive resources takes such mental stances that allow him/her to restore the clarity of a decision-making situation. Tyszka shows that in the assessment of choice alternatives, it often comes to errors associated with biased assessments prior to decisions. Decision-makers in particular are prone to widening gaps between an attractive alternative and alternatives perceived as less attractive (Tyszka, 2010, p. 6). Despite the apparent simplicity of the described mechanism, it comes, however, to some decision-making situations. Then, three key questions must be asked:

- What schemes in the assessment of attributes of alternatives do decision-makers adopt?
- How promising is one alternative?
- How possible is it for the alternative to become a solution?

In terms of assessment schemes used for attributes of alternatives adopted by the decision-makers, the impact of the concentration effect, the legend effect, the insulation effect, the effect of mere exposure can be seen.

The focusing effect indicates that decision-makers are willing to make assessments on the basis of obvious reasons for them or specific details, not appreciating others. In other words, they focus their attention on the selected evaluation indicators. Research suggests that focusing only on selected items can have a twofold cause. Firstly, it may be due to views or beliefs. Secondly, decision-makers tend to focus on those elements of the assessment, which are more understandable to them (Lehman et al., 1992, p. 691). For example, in the assessment of alternatives, specialists of the field of human resources management focus on the alternatives, which put the emphasis on this aspect of the project, minimizing the importance of used IT solutions.

The legend effect, also known as hyperreactivity to clear signals, says that people react more strongly to descriptive information signals and do not appreciate statistical information (Polowczyk, 2012, p. 65). Thus, in the evaluation phase of alternatives, decision-

makers are likely to pay more attention to qualitative rather than quantitative data. In other words, the alternatives described qualitatively gain a mental advantage over those described quantitatively.

At the stage of the assessment of preliminary attributes, the isolation effect may be revealed, also known as the von Restorff effect. According to this effect, decision-makers remember these qualities of alternatives better if they can be distinguished by them. The importance of the effect is usually considered in psychology. A study conducted by von Restorff related to memorization of specific words from the list when they are distinguished from other elements. Cohen and Carr conducted a study on the relationship between the ability to remember faces and the existence of details that distinguish them, pointing out in this regard a positive correlation (Cohen & Carr, 1975, pp. 383-384). Thus, alternatives different from the other, and the different characteristics are better stored. This can lead to the start of a mere exposure effect. According to this effect, under the influence of frequent contacts with a given object, affective attitude towards it is changed. This is the reason why individuals prefer better-known stimuli that are closer to them (Zajonc, 1968). Thus, better memorization may lead to distinguishing a given alternative.

3. 2. 1. Cognitive biases related to the assessment of alternatives

As indicated by Tyszka in the evaluation of alternative solutions, decision-makers evaluate an alternative as promising and then seek to sanction it (Tyszka, 2010, p. 6). The key question then is: what makes an alternative promising? The explanation may be the impact of primacy effect, the asymmetric dominance effect, authority effect, hedonism and the search for the domineering structure.

Due to the primacy effect, individuals are willing to build an opinion on the basis of characteristics of a given option, in the first place. As indicated by Tyszka, a certain selection option is quickly considered promising (Tyszka, 2010, p. 12). During the phase for the selection of alternatives, a particular option may be perceived differently if an individual presenting it starts their presentation with a strong argument for it, rather than the analysis indicating a possible risk or weakness. The first given argument influences the way of processing the remaining arguments. This mentally classifies a particular alternative as promising or rejected.

According to the asymmetric dominance effect, decision-makers seek for such an alternative, which in a given set has an option far worse that itself. This means that they perceive those alternatives as attractive which may be easily compared to others (Tyszka, 2010, p. 12). This is due to the fact that comparing the choice alternatives, individuals ignore the elements, which combine alternatives, and they focus on the points of difference (Czerwonka & Rzeszutek, 2011, p. 29). Thus, an alternative becomes more attractive if it is within the set with an alternative worse that itself in respect of at least one feature and not worse in other respects. The comparison of these two alternatives is a simple procedure for a decision-maker. He/she has confidence that one alternative is better than the other and marginalizes the fact that it may not be the best of all alternatives because the comparison of the entire collection is a difficult procedure that requires a significant commitment of cognitive resources. Therefore, decision-makers subconsciously perceive the alternatives that are dominant asymmetrically as promising.

In the selection of promising alternatives, the hedonistic approach may also be relevant. The term hedonism can be used in many contexts. In philosophy, it is the view that recognizes pleasure as the highest good and goal of life. In the narrower sense of the phenomenon of hedonism, it is understood as a desire to experience pleasure. Neuroscience indicates that this phenomenon is one of the main motivations of human behaviour and is related to the secretion of dopamine. Research conducted by Sharot (2009, pp. 2077-2080) indicates that at the time when a person is considering various options, dopamine signals are of the intensity of pleasure associated with the implementation of a given scenario. This chemical signal is then subconsciously taken into account in the decision. With regard to the selection from among alternative ways of project implementation, decision-makers are willing to evaluate scenarios not only on the basis of objective criteria, such as economic efficiency but also, on the subconscious level, taking into account hedonistic circumstances, as, for example, the amount of put-in work, the potential pleasure of the project or the need to take difficult decisions.

The perception of an alternative as promising is also influenced by the obedience to authority, distributed through research conducted by Milgram (1974). The effect is based on the manifestation of excessive trust and support in connection with the

assigned authority. Scientific studies provide a range of evidence for the effect of the obedience to authority in management systems, as well as on financial markets (e.g., Zaremba, 2010). With regard to the assessment of alternative project goals, this effect consists of supporting strategies assigned to a person, not its merits. This means that in assessing specific alternatives, a group tends to confirm those of them, which support or whose authors are people recognized as an authority.

3. 2. 2. How does a 'promising' alternative become a choice?

Another area, in which cognitive biases may become apparent, is the process of selecting an alternative subconsciously recognized as promising. The search for a dominant structure, the confirmation bias, and the herd instinct lead to confirmation of its superiority, which results in the selection of a promising alternative.

Tyszka indicates that in the process of assessing choice alternatives, decision-makers tend to seek for a so-called dominant structure. This process involves finding the structure of the problem, in which one alternative may be considered to be better, at least in selected respects and not worse in other respects. As a consequence, it makes it a given alternative the best, making it easier to make a choice. In the search for the dominant structure, decision-makers have a tendency to (Tyszka, 2010, pp. 7-8):

- reduce defects of the promising alternative (e.g., underestimation of the associated risks),
- deny drawbacks of this alternative by identifying them as advantages,
- combine two qualities of alternatives in order to justify its attractiveness (e.g., the realization of a goal requires a significant investment in the creation of research equipment, which is a disadvantage, however, the laboratory is better equipped, which in turn is an advantage),
- exaggerate defects and downgrade the advantages of a rejected alternative.

As a result, after determining a given alternative as promising, the decision-maker seeks to justify the subconscious choice. In this process, the decision-maker overestimates the importance of advantages, not appreciating defects. At the same time, he/she underestimates the importance of benefits of other alternatives, overestimating their weaknesses.

In the search for the dominant structure, confirmatory bias appears, which relies on the tendency to search for information confirming the hypothesis, while avoiding confrontation with the facts, which could disrupt the accepted way of thinking (Polowczyk, 2012, p. 65). This means that decision-makers are not able to objectively evaluate the new evidence or arguments. The effect manifests itself particularly in a situation where the decision-maker is at the disposal of the two conflicting pieces of information (or data, on the basis of which conclusions are formulated) regarding a planned result of the project. In such a situation, he/she is willing to entrust this information, which confirms the earlier formulated hypothesis (Hammond et al., 1998), or in the case of a choice of the project result – a promising alternative. Kosnik, conducting the research in the field of opinion on the acceptance of fiscal policy in the United States, has proved that confirmation bias occurs even at the absorption of relatively conclusive evidence and can affect whole groups of people (Kosnik, 2008, p. 193-214). At the same time, it can modify not only the choices of individuals, but also communities, which is especially important in project work.

Another effect, which influences the choice of a promising alternative is the herd instinct, also called the herd behaviour. It is associated with the conformism to the behaviour of the group. Primary research in this area conducted by Banerjee showed that in a sequence game when the first two players choose an option, the third player, in spite of personal beliefs and information, also chooses this option (Banerjee, 1992). This means that the attractiveness of a given alternative increases with the increasing support of the group. Thus, if individuals recognize an alternative as promising, the herd behaviour towards conformity will encourage other entities to support it.

Conclusions

To sum up, an appropriate formulation of the aim is one of the most important decision-making processes that occur in the field of project management. This process is difficult, time-consuming and requires the engagement of cognitive resources. In this respect, it promotes the start of heuristic processing, which makes decision-makers prone to cognitive biases.

In the aim-formulation process, cognitive biases may occur in some basic decision-making situations. Table 1 presents an attempt to organise specific cognitive biases, which can modify the behaviour

Decision-making situation		Cognitive bias		General meaning	Possible consequences
Generating alternatives		Sunk cost effect		tendency to continue unprofitable investments generating costs	willingness to continue the previous projects which do not generate effects
		IKEA effect		increase attachment to the object with the increasing workload associated with it	increased commitment to alternatives with increasing amount of work needed to generate it, supporting inefficient alternatives
		priming effect		a change in the processing of additional stimuli under the influence of the priming factor (often accidentally)	random stimuli appearing at the stage of generating alternatives affect the way we think about the project
		Anchoring heuristics		strong attachment to the initial suggestions, which constitute a reference point	In the phase for alternative generation, the first emerging alternative has the essential function
Alternatives' assessment	Biases connected with using simplified rules for comparing alternatives	Alternatives' assessment schemes	Focusing effect	evaluations based on obvious evidence or specific details, not appreciating others	attaching great importance to the qualities of alternatives, in which the decision-maker is a specialist and to obvious comparison criteria
			Legend effect	hyperresponsiveness to clear signals, a stronger response to descriptive signals and not valuing statistical information	giving more attention to the qualitative data than quantitative data during the evaluation of alternatives
			Isolation effect	remembering better the objects, which stand out in the environment	Decision-makers better remember the qualities of alternatives, which can be distinguish by them, marginalizing the importance of the common or similar elements
		Choice of promising alternative	Primacy effect	the tendency to build an opinion on the basis of the characteristics of the given options in the first place	the dependence of the overall assessment of alternatives on the order the arguments are presented
			the asymmetric dominance effect	preferring alternatives, which in the given set has an option far worse than them	a better evaluation of alternatives in the set of well-known with a worse alternative, underestimating the alternatives which are difficult to compare
			hedonism	the desire to experience pleasure	subconscious choice of alternatives associated with personal pleasure or minimal inconvenience
			Authority effect	The manifestation of excessive trust and encouraging individuals in connection with their authority	supporting the strategy assigned to the decision maker, not its merits
		Strengthening of promising alternatives	Searching for dominant structure	search for such a problem structure, in which one alternative may be considered to be better	overestimating the benefits and underestimating the disadvantages of promising alternatives, exaggerated defects and underestimation of the benefits of other alternatives
			Confirmation bias	the tendency to search for information confirming the hypothesis	the search for information confirming a promising alternative and undervaluing facts against it
			Herd instinct	the attractiveness of a given alternative increases with the support for it in the group	promotion of alternatives considered by the group as promising

of decision-makers.

In the phase of generating alternatives, the effect of sunk costs may lead to the continuation of unprofitable projects. The IKEA effect makes the alternative, the generation of which involves a certain amount of work, more attractive. The effect of priming and anchoring limit the number of generated alternatives.

Then, in the evaluation phase of alternatives, it comes to the adoption of simplified forms of inference. Decision-makers have a tendency to focus on selected aspects of the alternatives, they attach more importance to quality data and remember the distinctive elements of alternatives better. Then, on the basis of general methods of inference, a decision-maker starts to see a certain alternative as promising. In this respect, the process can be guided by the primacy effect, assessing a given target through the prism of the features associated with it. The asymmetric dominance makes those alternatives more attractive, which have far worse alternatives in their set of options. The authority effect strengthens the options that are supported by people recognized as an authority. Hedonism leads to the unconscious subjectification of alternatives' assessment. Then decision-makers seeking to preserve the clarity of the decision-making process have a tendency to overestimate the benefits and underestimate the drawbacks of alternatives subconsciously recognized as dominant. They tend to trust people confirming the accepted hypothesis. They attach greater importance to alternatives advocated by the group.

Knowledge of these regularities can help to improve the optimization of the aim of the project. Decision-makers aware of their own limitations are able to some extent, control the heuristic thinking, thus avoiding the cognitive biases. The manner and methods of control are of interest to behavioural engineering and should be subject to separate analysis.

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Volume 8 • Issue 3 • 2016

Economics and Management

pages: 79-88

DE GRUYTER OPEN

ISMSME International Society for Manufacturing, Service and Management Engineering

received: 15 November, 2015
accepted: 25 May, 2016

Taxonomic and econometric analysis of road transport development in Poland – the voivodship approach

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ABSTRACT

Transport is considered one of the basic aspects of the movement of people, raw materials as well as goods from the place of origin to the destination. Moreover, in the wider sense, transport includes economic bodies that aim to achieve goals similar to those of businesses that produce a wide range of goods required by customers. Hence, the efficient operations of basic branches of the transportation system determine the entire national economy. Furthermore, transport is considered a basic factor of development, both on the macro- and microeconomic scales.

The aim of the paper is to attempt the assessment of the road transport in Poland as an important element of macro logistics. Furthermore, one of the aims of the investigation was the explanation of its influence on the level of economic development in Poland.

As the source of information, the research used the data drawn from the Central Statistical Office of Poland. The main methods implemented in this study were both classic and order synthetic measure construction. Further, these measures were used in econometric models as well as for the prediction of their values.

The main result of the analysis indicates that the development level of the widely considered infrastructure is strictly correlated with the socio-economic development of particular voivodships.

The study on the level of road transport development can lead to a better understanding of the socio-economic development of particular areas of Poland as well as the more efficient use of the support funds.

KEY WORDS

road transport, synthetic measure, econometric model, prediction

DOI: 10.1515/emj-2016-0026

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Introduction

As a result of the accession of Poland to the European Union, Polish transportation policy must take into account the strategic aims of the EU in relation to transport. Transport is considered fundamental to the economy and society as mobility is especially important for the internal market and in the quality of life. Moreover, transport significantly affects the economic growth and job creation (White Paper, 2011).

In addition, there are relatively underdeveloped regions in the majority of the European Union countries. In this case, modern transportation infrastructure is created as one of the crucial elements of regional policy (Paprocki, 2013). Hence, in order to overcome differences in the development level, cohesion, and regional policies are implemented. Furthermore, financial tools have been developed in the form of support funds, including structural and cohesion ones (Witkowska, 2009).

Nevertheless, the financial resources received in the form of own funds and the funds of the European Union are limited. Therefore, the most important issue is to make a proper assessment of the current

and future condition of the transportation system, which ought to have a positive influence on the use of the support funds. It should be emphasized that this goal is very complicated, and the difficulties are compounded by the fact that the transportation system is sophisticated, and its users are diversified. Moreover, there are different interrelations between public authorities and its users (Liberadzki, 2013). The road transport is considered a special area and one of the most important issues of the Polish transportation system on the national and regional level. Thus, this branch of transport is the object of the research.

The aim of the study is to investigate the development level of road transport in Poland and to identify underdeveloped regions in the research field. Also, the article aims to forecast the development level of this transportation branch in particular voivodships.

1. Literature review

The transportation system as a part of the logistics area is considered a complex as well as a multidimensional phenomenon. Hence, the research in this field can be done using two different approaches.

The first approach is referred to as one-dimensional or a classical. The level of transport development is specified with the use of factors in the form of separate and particular variables. Generally, this kind of approach brings many difficulties in the clear-cut assessment of analysed research objects.

The literature review covered many scientific papers that deal with transport as a system and its particular branches in different countries or regions and introduced support policy.

In the case of Poland, the development level of the transport infrastructure as well as its adaptation to the European Union standards has already been presented (Wojewódzka-Król, 2015). In this paper, the author indicates that the road transport is a branch where the most noticeable effects of infrastructure are observed. Moreover, all types of transport may generate the external effects such as congestion, accidents, air pollution, noise, impact on climate change, etc. (Gratiela, 2013b). Nowadays, in order to alleviate all negative effects, investment in infrastructure is considered as part of planning policy (Marshal, 2012) or achieving the aims of sustainable transport (Gratiela & Viorela-Georgiana, 2013a) or sustainable consumption in this area (Gratiela, 2013a). Going further, the analysis of the Trans-European Network programme as well as its reforms and implications for spatial planning has been performed (Marshal, 2014). On the whole, the most important objectives were specified by the European Union institutions in the document Europe 2020 (Europe 2020, 2010). The implementation of all of the proposed improvements and programmes are impossible without the proper financial policy of European Union. Consequently, the area of transport and energy network has the funding of EUR 59 billion (Gratiela, 2014).

On the other hand, particular branches of the transportation system are considered sophisticated areas, which generate many external effects (Mężyk, 2014; Chruzik & Sitarz, 2014; Brach, 2014). However, the phenomena of transport and its scope play a significant role in the multifunctional development strategy for regions, especially the cross-border ones (Lewczuk & Ustinovichius, 2015).

The latter approach to transport analysis is considered the multidimensional data research. Implementation of taxonomic methods make it possible to support the logistic policy of the state by the specification of rules as well as procedures in the multidimensional ordering and classification process. Thus, it creates the possibility to work out a more cohesive and effective structure of information relationships. Moreover, it also makes it possible to increase the existing knowledge in this area, which provides tools for improvement as well as the way of conclusion construction. All in all, it is reflected in decision-making processes in the area of the state logistics policy (Figura, 2013, p. 159).

On the one hand, the empirical assessment with the implementation of taxonomic methods in Polish voivodships was implemented by Cheba (2011). On the other hand, multidimensional methods were introduced into the empirical assessment of transport development in the European Union countries (Tarka, 2012; Kauf & Tłuczuk, 2014). Generally, the analyses were based on no-pattern development methods of linear ordering. All analyses of the transportation development use classical statistical measures such as the arithmetic mean and the standard deviation. The study of the literature proved that these measures were implemented even in the case of strong distribution skewness of particular variables (Cheba, 2011). Moreover, the author presents the approach to prediction of road transport

development. However, only the classical synthetic measure was implemented in the process of construction of econometric models.

Apart from the presented ways of analysis and predictions in the transport area, there are other applicable future-oriented methods. For example, the foresight is one of those methods, which applies to the entire transportation system (Ejdys et al., 2015).

To sum up, there is a lack of taxonomic analysis in the literature, which takes into account the sophisticated character of the transportation system and mutual interactions among its particular elements. It should be emphasized that the research gap is also connected with econometric predictions of the road transport development, which are based on the construction of the order synthetic measure. Hence, this kin of a synthetic measure construction could have some influence on the correctness of taxonomic analysis and prediction process.

2. Research methods and selection of the data set

The literature study, both in the area of taxonomy and the type of implemented statistical measure, shows that there are two basic ways of synthetic measure construction depending on of implemented statistical measure. The former introduces the arithmetic mean and the standard deviation as the basis for the implemented algorithms (Hellwig, 1968). Thus, the normalization process of particular variables in their classical form, which is standardization, is expressed as follows:

$$z_{ij} = \frac{x_{ij} - \bar{x}_j}{S_j} \tag{1}$$

The latter attitude to synthetic measure construction replaces classical statistical measurers with order ones. This kind of taxonomic analysis was first implemented in the research by Poznań statisticians (Lira et al., 2002). Hence, the order version of standardization takes the following form:

$$z_{ij} = \frac{x_j - \theta_j}{1{,}4826 * mad(X_j)} \tag{2}$$

where θ_j is considered particular values of the multidimensional median vector, that is border median or Weber one, while the mad (median absolute deviation) of particular variables is expressed by the equation:

$$mad(X_j) = \underset{i=1,2,\ldots,n}{med} \left| x_j - \theta_j \right| \tag{3}$$

The implementation of Weber median, the history and construction of which is presented in literature (Młodak, 2009), allows taking into account interactions in the set of diagnostic variables. It should be emphasized that there are other forms of multidimensional median vector construction in the literature (Domański et al., 1998). Those methods take into account interactions in the set of diagnostic variables as well. Furthermore, there are other ways of the normalization process, i.e. the unitarization or ratio transformation, which has already been used in research (Dębkowska & Jarocka, 2013; Czech, 2014).

Further, the synthetic measure in its classical form is constructed according to the formulas:

$$MK_i = 1 - \frac{d_i}{\overline{D} + 2 * S_D} \tag{4}$$

where: D is the mean of distance vector, and
S_D is the standard deviation of the distance vector.

In the case of order form, the synthetic measure is constructed with the following formulas:

$$MP_i = 1 - \frac{d_i}{med(D) + 2{,}5 mad(D)} \tag{5}$$

where: *med(D)* is the median of distance vector,
mad(D) is the median absolute deviation of distance vector.

Furthermore, both synthetic measures can be implemented in the process of prediction of its future value. Going further, they are perceived as an endogenous variable in the econometric models. This kind of forecast construction is referred to as synthetic prediction in the literature (Zeliaś, 1991). On the one hand, the constructed model of the development trend in its classical version takes the following form:

$$MK_i = f(t, \varepsilon) \tag{6}$$

On the other hand, the presented method of prediction can be modified by replacing the endogenous variable in the classical form with the order one. Hence, the implementation of the order version of the synthetic measure construction leads to the econometric model expressed by the formulla:

$$MP_i = f(t, \varepsilon) \quad (7)$$

Every proper taxonomic analysis needs a set of diagnostic variables. Hence, the research is based on the data drawn from the Local Data Bank of the Polish Cent ral Statistical Office and relates to 2008-2014. It has been noticed, that the collected data is included in three mutual interrelated areas, which are presented in Fig. 1.

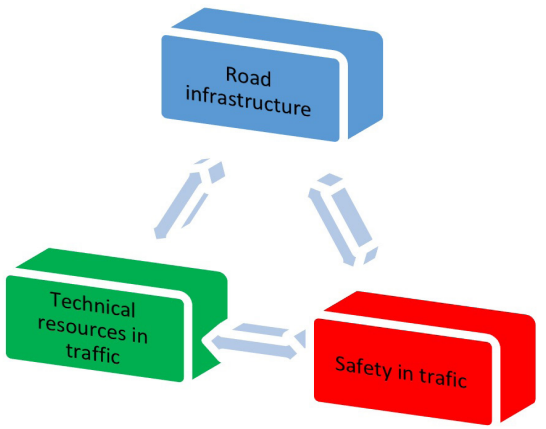


Fig 1. Relationships among particular areas in road transport

The first of the indicated areas in road transport is connected with road infrastructure and has been described by the following features: X_1 – hard surface roads per 100 km², X_2 – hard surface urban roads per 100 km², X_3 – the length of hard surface rural roads per 100 km², X_4 – the road of improved hard surface per 100 km², X_5 – urban roads of improved hard surface per 100 km², X_6 – rural roads of improved hard surface per 100 km², X_7 – expressways and motorways per 100 km², X_8 – state hard surface roads per 100 km², X_9 – the share of municipal and powiat roads in all roads (in %), X_{10} – the number of bridges and viaducts per 100 km², X_{11} – the number of tunnels and underpasses per 1000 km², X_{12} – the number of ferries per 10 000 km².

The second area is connected with technical resources used in traffic and includes the following variables: X_{13} – the number of passenger cars per 1000 citizens, X_{14} – the number of lorries per 1000 citizens, X_{15} – the number of motorbikes per 1000 citizens.

The third area presents the safety in road traffic and is followed by the variables: X_{16} – road accidents per 100 000 citizens, X_{17} – the number of casualties per 100 000 vehicles, X_{18} – the number of casualties per 100 000 citizens, X_{19} – the number of injured per 100 000 vehicles.

The potential set of diagnostic variables was investigated because of the variation and correlation analysis. Hence, the classical variation coefficient based on the arithmetic mean and the standard deviation was implemented as well as its order form. The latter, in its construction, uses the multidimensional median vector and the median absolute deviation (Młodak, 2006). The carried out analysis proves that in the majority of variables, the values of all three kinds of variation coefficients exceed the threshold value of 10%. All in all, the acceptations of the rules of that variation analysis were presented by variables X_{13} and X_{14}. The chosen statistical measures are presented in Table 1.

Making the analysis of the presented data in the table, it was observed that the variable X_{13} should be rejected. It was recognized that this variable significantly differs depending on the level of road transport development. In the scope of the variation analysis, the variable X_{14} appeared suspicious. The classical variation coefficient achieved high values because of strong skewness of empirical distribution

Tab. 1. Statistical measures of chosen diagnostic variables

Variable	Statistical Measure	2008	2009	2010	2011	2012	2013	2014
X_{13}	A_S	0.75	0.59	0.48	0.40	0.32	0.24	0.75
	V_S	8.84	7.97	7.95	7.85	7.86	7.85	8.84
	V_B	6.42	5.01	5.12	5.20	4.97	4.86	5.03
	V_W	9.97	5.01	4.92	5.16	4.97	5.22	5.50
X_{14}	A_S	1.40	1.27	1.37	1.29	1.27	1.17	1.40
	V_S	16.28	15.20	15.22	14.81	14.54	14.23	16.28
	V_B	8.21	8.67	8.79	8.64	8.95	8.42	7.98
	V_W	11.46	10.50	10.15	10.61	8.62	8.67	9.74

Explanations: A_S – skewness, V_S – the classic variation coefficient, V_B – the order variation coefficient with the border median, V_W – the order variation coefficient with the Weber median.

Tab. 2. Chosen statistical measures of the final set of diagnostic variables

Variable	Statistical Measure	2008	2009	2010	2011	2012	2013	2014
X_4	arithmetic mean	78.26	81.23	82.69	85.27	85.36	86.19	87.63
	border median	76.35	78.80	80.40	81.70	82.55	83.35	84.60
	Weber median	75.70	76.19	78.24	80.95	80.96	82.49	84.19
X_{12}	arithmetic mean	3.00	2.96	2.16	2.03	2.12	2.11	1.46
	border median	2.22	1.93	1.38	0.95	1.28	1.03	1.09
	Weber median	3.13	3.10	2.19	1.56	2.23	2.06	1.32
X_{14}	arithmetic mean	68.37	70.79	74.69	78.56	79.84	81.71	84.29
	border median	65.20	68.05	71.70	75.20	76.55	78.35	80.85
	Weber median	67.43	69.89	73.85	78.19	79.50	81.57	84.16
X_{15}	arithmetic mean	24.89	26.57	27.26	28.69	29.69	30.90	31.86
	border median	25.40	27.10	27.90	29.30	30.30	31.50	32.40
	Weber median	24.94	26.80	27.35	28.99	30.40	30.80	31.67
X_{16}	arithmetic mean	124.84	113.32	98.76	101.26	94.30	91.44	89.09
	border median	119.65	108.90	89.15	98.05	84.80	86.75	82.45
	Weber median	118.32	107.19	92.04	97.81	90.64	88.19	84.67

in particular years under investigation. On the other hand, the order form of variation coefficients with the border median caused a decrease in its value. Therefore, this situation excludes these variables from the further analysis. Nevertheless,the implementation of the multidimensional Weber median meant that the order variation coefficients increased significantly because of mutual interactions in the set of diagnostic variables. Moreover, the values increased by more than 10%. Therefore, this variable was included in the further taxonomic analysis.

Further, the potential set of diagnostic variables was put under the correlation analysis in order to eliminate variables that carry the same information. Hence, the parametric Hellwig's method based on the matrix of the Pearson correlation coefficients was introduced (Panek, 2009). The result of the analysis is the set of central, satellite and isolated variables. The satellite variables were excluded from the taxonomic analysis because they carry the same information.

To sum up, the final set of diagnostic variables includes both central features (X_4, X_{14}, X_{16}) as well as the isolated ones (X_{12}, X_{15}). Furthermore, all road transport areas which are presented in Fig. 1 have been taken into consideration.

3. Research results

Before the final set of diagnostic variables was used in the synthetic measure construction, it had been put through the normalization process. Additionally, these transformations were implemented with the use of both classical and order types of location measures as the dispersion ones. The former case was based on the arithmetic mean and the standard deviation. The latter introduces the equivalent of classical measures such as the Weber median and the median absolute deviation. All normalized formulas took the form of standardization and are considered a linear transformation. It should be emphasized that there are other forms of the normalization as unitization and ratio transformation, which were introduced, for example, to the research of regions innovation (Olszewska & Gudanowska, 2014) or indirect consumption analysis (Czech, 2014).

The chosen statistical measures, i.e. the arithmetic mean, the border median and the Weber median are presented in Table 2.

The data presented in the table shows that there are differences between the border and the Weber median values. It is caused by the fact that in the latter case, the mutual and indirectly observable relationships are taken into account. Hence, the Weber median takes both smaller and bigger values as compared to the border median.

In the scope of dealing with the road transport assessment with the implementation of mutual interaction in this area of the transportation system, it was crucial to make the empirical analysis resistant to the distribution skewness of particular variables. Both properties, interactions and skewness are taken

Tab. 3. Positions of voivodships in the ranking

Voivodship	2008		2009		2010		2011		2012		2013		2014	
	MK	*MP*	*MK*	*MP*	*MK*	*MP*	*MK*	*MP*	*MK*	*MP*	*MK*	*MP*	*MK*	*MP*
Dolnośląskie	8	7	8	7	9	10	12	9	14	14	14	13	13	13
Kujawsko-Pomorskie	2	5	2	2	3	3	3	3	3	3	1	2	2	2
Lubelskie	9	11	6	10	7	7	7	7	5	7	5	5	6	7
Lubuskie	3	8	5	8	6	8	6	8	7	9	7	8	8	9
Łódzkie	12	9	13	13	12	13	10	10	13	13	9	10	10	11
Małopolskie	10	3	11	6	13	9	8	6	11	8	11	9	12	12
Mazowieckie	1	2	1	1	2	2	2	2	1	1	2	1	4	3
Opolskie	13	13	12	12	11	11	13	13	12	11	13	11	11	10
Podkarpackie	5	6	4	5	5	6	5	5	6	6	6	7	3	4
Podlaskie	15	15	15	15	15	14	11	12	10	12	10	12	9	8
Pomorskie	14	14	14	14	14	15	15	15	15	15	15	15	15	15
Śląskie	6	1	7	3	8	4	16	16	8	5	8	6	7	6
Świętokrzyskie	4	4	3	4	4	5	4	4	4	4	4	4	5	5
Warmińsko-Mazurskie	16	16	16	16	16	16	14	14	16	16	16	16	16	16
Wielkopolskie	11	10	9	9	1	1	1	1	2	2	3	3	1	1
Zachodniopomorskie	7	12	10	11	10	12	9	11	9	10	12	14	14	14

Explanations: *MK* – the classical measure, *MP* – the order measure.

into account in the Weber case, while only the former one is presented by the border median. Furthermore, the synthetic measure construction with the border median was omitted in the research. The implementation of the presented linear ordering algorithms in both cases allowed for synthetic measure construction of the road transport development. Moreover, their monotonic order allowed for ranking the construction in both classical and order forms of the taxonomic measure. The results of this analysis are presented in Table 3.

These methods can be implemented in the process of indicating the areas of similar road transport development. An example of this kind of classification

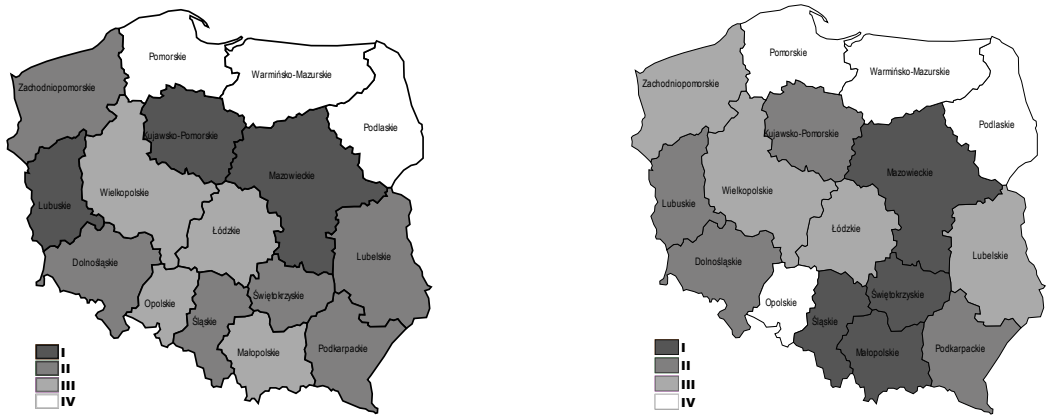


Fig. 2. Spatial diversification of road development level in Poland in 2008

Explanations: MK – classical measure, MP – order measure

Tab. 4. Prediction of spatial diversification of road transport development in 2015

Voivodship	Classical method		Order method	
	Measure	Rank	Measure	Rank
Dolnośląskie	0.113	14	0.166	11
Kujawsko-Pomorskie	0.494	2	0.485	2
Lubelskie	0.376	6	0.359	6
Lubuskie	0.278	8	0.254	8
Łódzkie	0.234	9	0.156	12
Małopolskie	0.194	12	0.236	10
Mazowieckie	0.424	3	0.459	3
Opolskie	0.229	10	0.154	13
Podkarpackie	0.406	5	0.389	5
Podlaskie	0.307	7	0.256	7
Pomorskie	0.102	15	0.068	15
Śląskie	0.218	11	0.240	9
Świętokrzyskie	0.422	4	0.402	4
Warmińsko-Mazurskie	0.049	16	0.005	16
Wielkopolskie	0.696	1	0.663	1
Zachodniopomorskie	0.192	13	0.142	14

with the use of three mean and three median method (Młodak, 2006) is presented in Figure 2.

Further, the constructed synthetic measures provide the possibility of prediction of future values. Thus, the predicted measures, with the implementation of both taxonomic approaches are presented in Table 4.

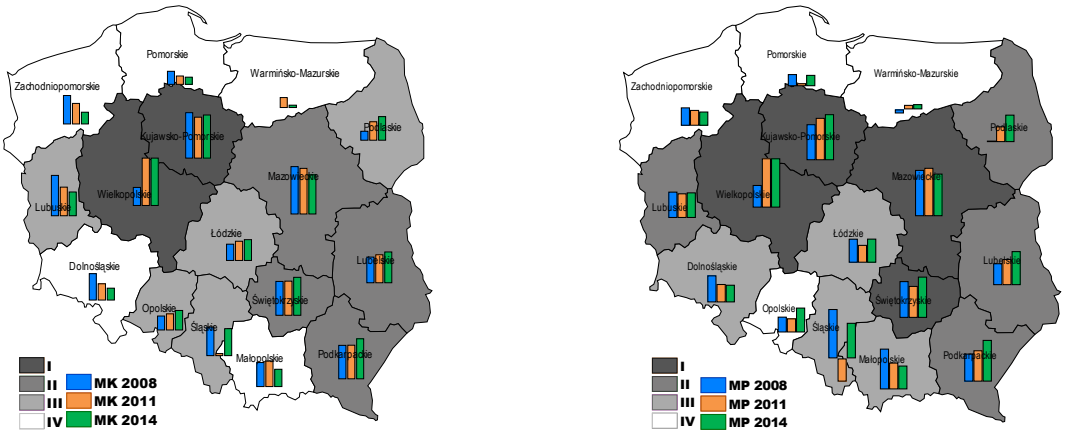
The colours of particular voivodships in Figure 3 presents the prediction of their position in the ranking.

It should be emphasized, that the height of bars in the figures represents the values of synthetic measures in the three chosen years.

It should be noted that the constructed predictions are short-term and do not take into account the effect of the technological progress. On the one hand, the presented approach seems to be pragmatic. On the other hand, this factor should be included in the case of long-term predictions. These important factors are reflected in the production of bituminous surfaces, which have an important impact on the quality of constructed road infrastructure. Furthermore, this kind of analysis has been carried out with the implementation of foresight methodology (Radziszewski et al., 2014).

4. Discussion of the results

The analysis of the road transportation development in Poland in particular voivodships



MK MP

Fig. 2. Prediction of the spatial diversification of road transport development

Explanations: background of a voivodship – the prediction in 2015, MK – the classical measure, MP – the order measure.

leads to some interesting findings in two main areas, i.e. logistics and statistics.

The former is strictly connected with the spatial objects included in the research. The analysis has been carried out between 2008 and 2014, as there is no data for 2015. Hence, the assessment of spatial transport development level in 2015 was predicted with the use of econometric models based on data time-series.

During the analysis of the ranking of particular voivodships between 2008 and 2014, it has been noticed that Mazowieckie and Wielkopolskie voivodships enjoy the best transport conditions. Moreover, this conclusion is true for both the classical synthetic measure and the order one.

In the scope of the conducted analysis, there is only one voivodship, where the beneficial trend of the road transportation development is observed. Between 2008 and 2013, Podlaskie voivodship was between the eleventh and fifteenth positions. Later, in 2014, it moved up to the eighth position. Moreover, the prediction for 2015 ranked this area seventh out of sixteen voivodships.

In the case of Podlasie voivodship, the observed situation in the area of road transport indicates that the unfavourable circumstances of the development have been reversed. Furthermore, the similar conclusion of this phenomenon can relate to Wielkoposkie voievodship.

The latter group of findings reflects the statistical observations in the area of implemented taxonomic as well as econometric methods.

The research was determined by the availability of data, which was drawn from the Central Statistical Office of Poland. It has been noticed that the expansion of the potential set of diagnostic variables resulted in the limitation of the analysis period.

Moreover, the potential set of nineteen diagnostic variables was strongly limited mainly at the stage of the correlation analysis. The statistical variation analysis shows that the variable connected with owning a passenger car differentiates research objects poorly. Hence, it has been concluded that this kind of the market is getting saturated, and the existing differences are levelling.

Furthermore, the research results show that such strong limitation of the potential set of diagnostic variables determines the use of the Weber median. The implementation of this kind of location measure allows to take into account the additional indirectly observed information. These relationships are called interactions and occur among specified variables implemented in the description process of three defined areas of road transport as one of the logistic phenomena.

Moreover, despite the road transport being a multidimensional phenomenon, there is a lack of spatial analysis that considers interactions.

Conclusions

The results obtained in this research show that there is an interdependence in the area of socio-economic development in particular voivodships and the level of their road development. The higher are the economic parameters of the related position of a voivodship in the ranking, the higher is the level of road transport development. This phenomenon is strictly connected with the regions such as Wilkopolskie, Mazowieckie and Kujawsko-Pomorskie. The research objects such as Podlaskie and Warmińsko-Mazurskie are perceived as outsiders in the constructed classification.

The analysis proves that the road network has a significant impact on the development of different logistic enterprises. Hence, the logistic centres, which fundamentally depend on the existing transport branches will be located in the areas with a relatively beneficial economic infrastructure and transport conditions. Furthermore, these factors determine effectively the efficiency of those logistic enterprises.

To sum up, these observations relate to the Polish regions that have a high ranking in the research carried out in the paper.

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Volume 8 • Issue 3 • 2016

Economics and Management

pages: 89-97

DE GRUYTER OPEN

ISMSME International Society for Manufacturing, Service and Management Engineering

received: 30 September, 2015
accepted: 5 May, 2016

The situation of bank lending in Ukraine: current problems and prospects of recovery

Svetlana Manzhos

ABSTRACT

The article investigates the state of bank lending in Ukraine, identifies the source of the severe banking crisis, that broke out in Ukraine in 2014-2015. Additionally, it suggests recommendations for the enhancement of the role of bank lending in the process of expanded incentives for investments in order to facilitate the exit from the economy crisis towards the economic growth. Using the general scientific methods of empirical and theoretical research, the dynamics of bank lending in Ukraine in 2003-2014 was analysed and the following periods were distinguished: 2003-2007, which is the period of the rise of a strong banking system and the increase of bank lending; 2008-2009, when the crisis and post-crisis recovery processes have been attempted, and 2014-2015, which is the period of an unprecedented crisis and a wave of bank failures.

The analysis revealed the following main factors constraining the lending to the economy of Ukraine in today's conditions: a slowdown in the economic growth, increasing economic and political risks of inflation and devaluation expectations, rapid fluctuations of exchange rate, a high cost and the lack of credit because of insufficient domestic resources and the mismatch of terms and conditions of bank loans with the aim to attract resources, a significant credit risk and imperfect methods of management, the lack of clear mechanisms for loan repayment applicable to insolvent borrowers, and inadequate protection of the rights of lenders and borrowers.

The article substantiates that the stimulation of the lending process should be based on the following: the improvement of the investment climate in Ukraine, using stricter lending criteria, ensuring effective mechanisms for provisioning for credit risks, and the improvement of measures for the protection of rights of lenders and borrowers. The state should focus on new projects stimulating – international investments by introducing the European standards on domestic enterprises, including joint investment projects in strategic sectors; the promotion of investment projects in support of small and medium enterprises; and intensified efforts to stimulate foreign banks to open credit lines for small and medium-sized businesses to implement energy efficiency projects under the state guarantee.

KEY WORDS

bank lending, real sector of economy, banking crisis, investment process

DOI: 10.1515/emj-2016-0027

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Introduction

The main condition for the economic development of any country is to ensure the stability of the banking system, which is the most important and integral part of a modern market economy. Transparency and predictable development of the banking system can facilitate the ability of investors to forecast its activities and improve its attractiveness to other economic subjects.

Banks that own substantial share of financial, investment, industrial and other sectors of the economy are the backbone of the banking system. The redistribution of temporarily free funds,

funnelling them into industries with a recurring need to mobilize additional capital can only be achieved by financially stable and reliable banks that are capable of withstanding the dynamic conditions of external and internal market environments. Banks must be reliable and ensure the safety of deposits held by legal entities and individuals as well as protect the interests of shareholders and provide timely customer service. Today, the banking system of Ukraine is in a severe recession that has already turned into a deep depression. In fact, one in three banks have been declared insolvent, no deposits are made, and lending has virtually stopped. A key precondition for overcoming an economic and the banking crisis a qualitatively new model for the monetary regulation, based on incentives for the recovery of monetary sovereignty and the enhancement of economic development primarily through credit support businesses in Ukraine as the foundation of a competitive market environment.

However, the problem of assessing the effectiveness of bank credit allocation in terms of coordination of its goals with strategic objectives of the state does not have sufficient coverage in the scientific literature, particularly the assessment of the real impact bank lending on the economic development of Ukraine.

1. Literature review

The issue of the formation and development of bank lending in Ukraine as well as the analysis of its impact on the economic development of the country have been explored in many scientific works, including those by (Dzyublyuk & Malakhov, 2008; Egorov, 2010; Lavrushina, 2013; Majewski & Zorin, 2011; Savluk, 2013; Semenoh, 2010; Shiyan, 2009) and others. Much attention in the works of foreign scholars (Werner, 2005; Lagarde, 2012 and others) has been given to lending and its role in the stimulation of the economy.

The particular features of bank lending have been studied by Lavrushin who focused on theoretical and methodological issues of planning and organising the process of lending. The researcher proved the need to strengthen the processes related to the lending role of the state, which should aim at ensuring the financial stability and the stability of domestic banks, in order to restore the confidence of people and businesses in the banking system. „The delay in economic reforms and the accumulation of macroeconomic imbalances in the real sector of the economy, mistakes in monetary policy and banking supervision policy drastically weakened the bank sector. Restoration work requires significant government support" (Lavrushin, 2012).

In his works, Dzyablyuk examined the effectiveness of the monetary influence on credit incentives of the central bank. The researcher pointed out that to overcome the consequences of the financial crisis, Ukraine must find the way to stop the decline of domestic production and enhance the development of the real economy. „It is necessary for the monetary policy to combat stagflation; on the one hand, to take measures to reduce inflation, and on the other – to create monetary conditions for structural support and stimulate economic growth" (Dzyublyuk & Malakhov, 2008).

In their works, Majewski and Zorin examined the mechanism of credit for entrepreneurial activity as a set of practical measures of the central bank and commercial banks focused on temporarily available cash resources in production activities of undertakings (Maevsky & Zorin, 2011).

Savluk studied the influence of banks on the real economy, and noted that Ukrainian banks are „not aimed to meet the investment needs neither legally nor practically" (Savluk, 2013). The researcher believes that the state of bank lending in Ukraine is largely dependent on the economy, especially the poor balance of the real sector and public finance.

Analysing the specific functioning of the banking and real sectors of the economy of Ukraine, Semenoh substantiated that „bank lending in Ukraine is diverged from the needs of the real sector and mainly focused on the fast high income" (Semenoh, 2010). The reforms initiated in the real economy are hindered by a low proportion of loans for the capital investment industry, high interest rates, and the lack of other than short-term loans.

Considering the particular features of the credit activity of banks, Shiyan noted that for the further development and improvement of the system of bank lending in Ukraine, a system of credit cooperation, mortgage and leasing should be developed (Shiyan, 2009). The author believes that the resumption of lending to the economy should take place through an increase in the volume of local sources and long-term financial resources as well as the promotion of local and syndicated agreements.

The works mentioned above provide detailed analyses of the methodological foundations and practical aspects of lending. However the unprecedented depth of the crisis, which may be

observed currently in Ukraine, requires the application of theoretical principles to new realities. The role of bank lending in overcoming the economic crisis and stimulating economic growth processes remains an unresolved issue.

2. Research methods

The aim of this article is to study the state of bank lending in Ukraine and give recommendations on how to defuse the crisis and increase the role of bank lending in the process of economic development. To achieve this goal, general scientific methods of empirical and theoretical research were used, including: analysis and synthesis for detail bank lending in Ukraine and the study of its impact on the real economy; methods of statistical analysis, comparison and evaluation of bank lending in Ukraine; methods of comparison, grouping and the graphical method for building tables and charts, generalization for justification of the need to resume lending in the process of the economic growth in Ukraine. Data processing was carried out using a modern computer technology.

3. Research results

Nowadays, banks have a powerful influence on the economy that manifests at least in three ways. They accumulate temporarily free funds and allocate them to market participants that need them. While funding market economy, banks perform a number of other important functions related to the support of economic entities. Accordingly, they increase the dependence of market operators on the state of the real economy and impact on the way the current needs of investment and economic operators are met. The more effective is the lending of investment banks, the more powerful is their role in promoting the economic growth and structural modernization of the economy.

The origins of the severe Ukrainian banking crisis of 2014-2015 lay in the relationship between the banking and real sectors of the domestic economy. This statement can be supported by the examination of the dynamics of bank lending in the years 2003-2014 (Tab. 1).

During the period the following intervals may be distinguished: 2003-2007, which is rise of a strong banking system and the increase in bank lending; 2008-2009, when the crisis and post-crisis recovery processes were attempted; and 2014-2015, which was the period of an unprecedented crisis and a wave of bank failures. Between 2003 and 2007, banks actively tried to lend money. Having the overall growth of the loan portfolio of 10.4 times the retail loans increased 47.7 times, and their share increased from 13.2 percent in 2003 to 24.3 in 2007. The exchange rate stability, as evinced by the lower interest rates on foreign currency loans, had made borrowing very attractive.

Thus, the structure of the share of retail loans in foreign currency loans increased from 40.7% in 2003 to 65% in 2007, and the share of consumer loans in the portfolio of private individuals was 71% in 2007 (The National…).

Priorities shifted towards retail lending, predominantly in foreign currency, during an active entry of foreign capital banks into the domestic financial market. Consumer-driven accelerated lending led to a decrease in shares of almost all key economic sectors in the overall loan portfolio: the processing industry from 25 to 15%, mining – from 2.6 to 1.3%, electricity – from 2.6 to 1.4%, agriculture – from 6.7 to 3.9%, and trade – from 36 to 24%. The construction industry was the only exception, which saw an increase from 4.3 to 7.2% (Tab. 2) during the period.

The lending in the trade sector increased almost 7 times, while in the mining industry – 4.5 times, manufacturing – by 5.5 times, and electricity – 4 times (The National…). Thus, one could argue that the Ukrainian crisis of 2008 in priority lending was driven by consumption. Therefore, the activity of the banking system did not have a sufficiently positive impact on the domestic production, but rather stimulated the influx of imports.

The crisis of 2008 had a negative impact on banking. After falling in 2009, positive dynamics of the credit indebtedness of residents (1.5%) had significantly lower rates compared to 2003 positive dynamics 2007. The total volume of loans for 2008-2013 increased to 24%. The structure of lending has changed. Falling incomes and problems with the servicing and repayment of foreign currency loans led to a sharp reduction in the demand for loans in the population. Therefore, loans to households for five years decreased by 31%, their share in the total portfolio of residents – from 38 to 21%, while loans to non-financial corporations' increased to 56% and their share – from 60.4 to 76% (The National…).

Tab. 1. Basic indicators of lending activity of Ukrainian banks in 2003-2015

Measure	Years												
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Number of operating banks with a banking license	158	160	165	170	175	184	182	176	176	176*	180*	163*	120*
With foreign capital	19	19	23	35	47	53	51	55	53	53	49	51	40
Bank assets UAH billion	100.2	134.3	213.9	340.2	518.8	926.1	880.3	942.1	1054.3	1127.2	1278.1	1316.9	1275.4
Loan portfolio, UAH billion	73.4	96.9	156.3	269.3	485.4	792.2	747.3	755.0	825.3	815.3	911.4	1006.4	954.0
Loans to economic entities, UAH billion	58.0	72.9	109.0	167.7	276.2	472.6	475.0	508.3	580.9	609.2	698.8	802.6	786.7
Loans to individuals, UAH billion	8.9	14.6	33.2	77.8	153.6	268.9	222.5	186.5	174.7	161.8	167.8	179.0	143.7
Total share of over-due loans, [%]	3.4	3.2	2.2	1.6	1.3	2.3	9.4	11.2	9.6	8.9	7.7	13.5	21.2
Provision for active operations of banks (including provisions for transactions that are accounted for off-balance sheet), UAH billion	4.6	7.3	9.4	13.3	20.2	48.4	122.4	148.9	157.9	141.3	131.3	204.9	294.4
Results, UAH billion	0.8	1.3	2.2	4.1	6.6	7.3	-38.5	-13.0	-7.7	4.9	1.4	-53.0	-57.3

* One of these banks has a valid bank license
Source: author's elaboration based on (The National...).

After the crisis, despite the drop in consumer credit, investment credit and loans showed a sluggish trend in the processing industry.

In Ukraine, a long-term investment loans (for the purchase, construction and reconstruction of real estate for more than one year) occupied a tiny part of the total volume of loans issued to non-financial corporations (1.9% at the end of 2014). This was influenced by the structure of bank lending and considerable structural imbalances in the national economy, which became the root of the reason for the loss of the industrial potential of Ukraine.

In 2014, Ukraine was hit by a serve structural socio-economic and political crisis. Under these conditions, the banking system has suffered from negative trends in the real economy, manifested in forms of the mass bankruptcy of banks, deposit flight, and stagnant lending. Indeed, the deeper the crisis in the real economy, the fewer opportunities to develop a stable banking system and promote lending.

It is worth noting that the credit activity of banks remained low during 2015 (there was a reduction of the gross loan portfolio by 5.2 percentage points in 2015, primarily due to the decline in lending to individuals by 19.7 percentage points (to UAH 35.3 billion)), which was due to the reduction in the resources, deteriorating creditworthiness of borrowers, and a high level of uncertainty about the further economic development under the conditions of political instability. This, in turn, made banks situation of potential borrowers more carefully or indeed put lending on hold, choosing to invest in

Tab. 2. Structure of loans given to entities in terms of economic activity in 2003-2012 [%]

Economic activity	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Agriculture, hunting and forestry	6.7	6.7	5.7	4.8	3.9	6.5	5.6	5.3	5.9	6.0
Fishing	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Mining industry	2.6	2.4	2.0	1.7	1.3	1.7	2.1	2.6	2.0	2.6
Manufacturing	25.2	26.3	21.3	18.1	15.1	23.9	22.7	24.3	21.6	20.8
Electricity, gas and water	2.6	1.6	1.7	1.3	1.4	1.9	2.0	2.5	3.3	3.5
Construction industry	4.3	3.0	8.1	7.9	7.2	8.9	9.0	8.6	7.7	6.1
Trade; repair of motor vehicles, household goods and personal consumption	36.3	34.5	30.6	25.9	23.6	35.1	35.8	34.8	36.3	36.4
Hotels and restaurants	0.9	0.4	0.5	0.4	0.9	0.9	1.0	1.0	0.8	0.7
Transport and communication	2.2	4.4	3.1	3.0	3.6	3.6	3.5	4.2	5.0	5.0
Real estate, renting and business activities	16.5	20.2	26.4	34.2	38.4	15.6	16.8	15.5	15.9	17.4
Education	6.4	5.1	4.5	5.4	6.5	0.1	0.05	0.03	0.02	0.02
Health care and social assistance	1.7	0.1	0.5	0.4	0.4	0.6	0.3	0.3	0.3	0.2
Provision of communal and individual services; culture and sport	1.2	1.3	1.2	0.8	1.5	1.0	1.0	0.9	1.1	1.1

Source: author's elaboration based on (The National...).

securities instead.

An important issue pointed out by many researchers is the need to reduce the volume and proportion of bad loans in the structure of banking assets. During 2014-2015, due to a systemic banking crisis, the share of bad loans in the total number of granted bank loans increased significantly and amounted to 21.2% (Tab. 1) as of 1 December 2015.

The current situation may be caused by the following:

- slower economic growth, increasing economic and political risks of inflation and devaluation expectations, rapid exchange rate fluctuations, hence the decline in profitability of business entities and reducing number of creditworthy borrowers, which, in turn, leads to cautious credit policies adopted by banks,
- the high cost and the lack of credit because of insufficient domestic resources and the mismatch of terms and conditions of bank loans aiming to attract resources. There is a tendency to steady the prevalence of short-term deposits: in absolute terms, at the end of the third quarter. In 2015, short-term deposits (on demand and up to one year) amounted to UAH 168.7 billion (68.11% of total deposits), the short-term loans (up to one year) amounted to UAH 376.2 billion. In the long-term, the number of loans exceeded deposits by UAH 102.0 billion,
- significant credit risk, inadequate management practices, and the lack of clear mechanisms for insolvent borrowers for repayment of loans. This leads to reduced quality of existing assets and the increase in problematic loans,
- the lack of protection of the rights of lenders and borrowers. During 2003-2015, the structure of loans in terms of entities. Loans issued to legal entities dominated (Fig. 1).

In recent years, their share was 80%, reflecting the corresponding trend of 2003-2005. Figure 1 clearly shows that in the pre-crisis, period banks have stepped up lending to individuals, which led to predominant consumer loans and mortgages, rather than the stimulation of the manufacturing sector. In 2008-2015, the portion of funds paid to legal entities amounted to the ranged of 60-82% and accounted for 2/3 of bank loans. However, it should be noted that most loans issued to legal entities were short-term rather than investments (not to rush to purchase or upgrade production facilities, fixed assets, proceed with constructions, development of innovative products), and are the primary source used to answer pressing needs. As a result, this measure was not an effective lever that could have stimulated economic growth in the domestic economy. Thus, the role of banks in the investment process could be considered as minimal efforts that did not comply with the greatest potential of banking institutions or the needs of the economy. This situation indicates a reduction in cash flows and deteriorating terms of bank lending in the country.

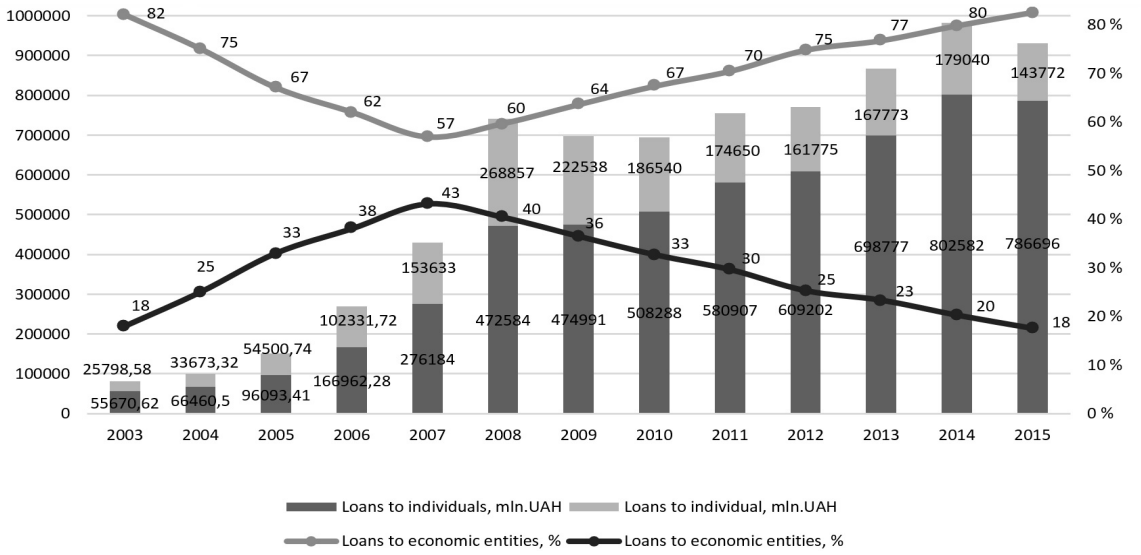

Fig. 1. Loans to depository corporations

Source: author's elaboration based on (The National...).

Analysis of the structure of bank loans in terms of economic activity (Tab. 3) shows that in 2008-2012, more than a half of all loans were used for trade, repair of motor vehicles, household goods, personal consumption and processing industry. In agriculture, construction, real estate, and energy sector, loans accounted for not more than 26%.

Since the introduction of the new Classification of Economic Activities in 2013, no major structural change in the distribution of credits was observed. For a more detailed analysis, the structure of loans was evaluated in terms of the most popular loans by economic activities in 2013-2015. Table 3 shows the domination of loans of up to one year in most industries of Ukraine, which confirms the consumer-driven, rather than, innovation- or investment-driven lending. The construction sector and the real estate industry were the only exceptions with the share of loans with the maturity of over 5 years amounting approx. 30%, which is due to the specific characteristics of these types of economic activities.

Almost 40% of the portfolio is aimed at lending to wholesale and retail, of which more than a half (60%) is short-term loans (up to one year). In industry has a predominant number of small and medium businesses, more than 50% of which have operated in the informal segment of the market in 2010. The predominance of short-term loans provides no evidence regarding the effectiveness of bank lending.

In fact, in Ukraine banks perform the role of intermediaries in servicing shady flows, which brings relatively high returns in the short term with a minimum risk and discourages economic development.

Tab. 3. Loans given to non-financial corporation's (2013-2015), [%]

Economic activity	In 2013			In 2014			Including terms 01.11.2015		
	Up to 1 year	From 1 to 5 years	More than 5 years	Up to 1 year	From 1 to 5 years	More than 5 years	Up to 1 year	From 1 to 5 years	More than 5 years
Agriculture, forestry and fishing	54.7	35.6	9.6	46.7	43.8	9.4	64.9	30.7	4.4
Manufacturing	45.3	40.4	14.3	38.4	49.3	12.3	39.6	39.1	21.3
Construction industry	39.2	35.0	25.8	35.2	35.1	29.6	52.7	32.4	14.8
Wholesale and retail trade; repair of vehicles and motorcycles	66.3	26.7	7.0	56.4	35.0	8.6	62.2	34.7	3.1
Real estate	32.5	35.9	31.6	30.0	38.1	31.9	27.1	40.2	32.8
Professional, scientific and technical activities	39.4	53.1	7.5	37.6	56.0	6.4	17.9	74.8	7.3

Source: author's elaboration based on: (The National...).

During the last ten years the preferred area of lending in Ukraine has been consumption, rather than production, which especially needs the banking support considering the total deficit of floating capital, not even to mention investments.

By all means, lending to the commercial sector and consumers is driven by the existing demand and seems to increase the gross domestic product. But the essential question in this process is weather to stimulate the consumption of own or imported goods? Following the seven-year period of positive net balance of the external accounts, the Ukrainian results of 2006 had a negative transformation. This trend data did not change in the last ten years. In 2008, 2011, 2012 and 2013 the value of the necessary net balance of the external accounts reached a dangerous amount (USD 12.8 billion, USD 10.2 billion, USD 14.3 billion, and USD 16.5 billion). The banking system had a role to play in the emergence of this trend, especially considering an intense growth of consumer-financed imports (Tab. 4).

The persistent and significant current account balance poses a threat to the economy of Ukraine. From the macroeconomic perspective, the negative value of this indicator arises from the following reasons:

- the country produces fewer goods and services compared to its consumption and investments,
- investments are not covered by domestic savings,
- the inflow of resources from abroad or a reduction in foreign holdings of Ukraine (confirmed by the significant reduction in international reserves) or growing responsibilities to non-residents, in other words, a foreign debt, which has a statistical confirmation.

The main factor of the significant reduction of the gross debt in 2014, was the decline in commercial loans amounting to USD 9.4 billion (because of the decline in imports) and bank debt of USD 3.8 billion (primarily due to the repayment of long-term loans by Ukrainian subsidiaries of parent banks).

Breaking trends particular to the current account balance and increasing foreign debt is one of the key challenges of the Ukrainian economy. Banks should understand that it is time to intensify the credit support to domestic exporters and import of replaceable industries, rather than just keep answering consumer needs.

The modern banking systems mainly adapt to the primary payment needs of economic subjects and the short-term floating capital needs. Needs of the real sector are not answered by Ukrainian banks either-structurally nor functionally, therefore, their impact on the material and technical fundament of the economy is extremely limited. Ukraine lacks specialized investment banks, yet opposes to the establishment of the National Bank for Reconstruction and Development with broader powers to finance of the investment needs of the economy, stimulate the growth of bank loans for manufacturing to reach the level of those for personal consumption and trade, and resolve the issue of small volumes of long-term deposits. Currently, all these factors hinder the development of long-term credit investment needs of manufacturing companies. In order to stimulate the economic growth, it is necessary to reform the structure of the modern banking system. Moreover, it is necessary to create conditions for the emergence of powerful regional banks, which would stimulate the economic development by their credit programs.

Tab. 4. Dynamics of the gross external debt, current account balance and international investment position at the end of the period [USD million]

Index	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
The gross external debt	30647	39619	54512	79955	101659	103396	117346	126236	134625	142079	126307
Including Government (no guarantees)	10068	10506	10924	11884	11959	17806	24982	25874	27333	29922	32884
National Bank of Ukraine	1690	1254	880	462	4725	6210	7509	7487	4853	1775	2176
Banks	2662	6112	14089	30949	39471	30861	28119	25198	21553	22555	18752
Other sectors	15678	20913	26676	33581	41255	43441	50843	59357	70441	76642	63252
Intercompany truss of direct investments	559	834	1943	3079	4249	5078	5893	8320	10445	11185	126307
International reserves of the National Bank of Ukraine	9715	19391	22358	32479	31543	26505	34576	31795	24546	20416	7533
The balance of current account (of the period)	6909	2531	-1617	-5272	-12763	-1732	-3018	-10245	-14315	-16478	-5273
The international investment position	-12119	-14158	-19919	-26699	-40199	-40247	-38785	-47948	-59447	-76848	-60016

Source: authors elaboration based on (The National...).

4. Discussion of results

Today, the overcoming of the credit crisis is one of the major preconditions for economic recovery and development of the real sector. In author's view, this process should be based on a system of measures for the monetary and fiscal policies, including the improvement of the regulation of the banking system, the strengthening the supervision and creating incentives for the development and sustainable operation of the private sector. In the area of fiscal policy, the key challenges for the banking sector in Ukraine are the reduction government deficits, domestic and foreign debt, and the expansion of incentives for the development of the real sector.

The greatest damage to the banking activity is caused by steep currency fluctuations resulting from the imbalances of payments. In terms of the current account deficit that is constantly growing – from USD 3.0 billion in 2010 to USD 16.5 billion in 2013 and USD 5.2 billion in 2014 (The National…) – the demand for currency always prevails over the apply that hampers currency interventions by the NBU. With the approach of the international reserves of the NBU to a critical level, interventions stop, leading to a sharp devaluation. This is the reason behind three episodes of devaluation. The first one took place in 1998-1999, the second – in 2008-2009 and the last one – in 2014-2015. Each of them had negative consequences for banks, but the latest one had the most negative outcomes of all.

The upsurge in inflation due to higher costs and the reduction in imports have a negative impact on the dynamics of savings and deposits of banks, on the one hand, and their confidence in the creditworthiness of customer borrowing on the other. Significantly complicated are the repayment of foreign currency loans and the servicing of foreign currency deposits. Rising unemployment and falling wages mean a sharp reduction of solvent borrowers and the high probability of default of already received loans. A significant portion of low-income households that do not own any savings and have no bank deposits can start their own business.

Among the negative factors that unfavourably affect the credit activity of banks are:

- shadow economy, which leads to the „loss" of substantial quantities of cash flow from the banking sector, the restriction of resources and revenues of banks, undermining the control of money circulation, and, ultimately, – weakens the stability of the national currency and banks,
- high level of monopolization of the economy due to the existence of large oligarchic structures that can influence the economic processes and also the banking sector, in their own interests, which is manifested through the withdrawal of capital abroad, massive speculation in the markets and also in the foreign exchange,
- chronic imbalances in public finances, leading to the financing budget, public debt growth, increasing inflation, rising market interest rates and other negative processes in the money and foreign exchange markets,
- war in Eastern Ukraine.

Conclusions

The analysis led to the conclusion that loans are largely dependent on problems, the solution of which is beyond the competence of the central bank. This is due to the general state of the economy, political situation, inflation and devaluation expectations, which lead to the emergence of certain economic and financial risks, and are ultimately reflected in a lower economic growth, the reduction in the number of solvent borrowers who fail to observe timely repayment conditions, as well as the increase in the share of problematic loans within bank portfolios.

Credit processes should be stimulated by improving the investment climate, the using more stringent lending criteria, ensuring effective mechanisms for provisioning for credit risks and the improvement of measures to protect the rights of lenders and borrowers. Also, it is necessary:

- focus state efforts on the implementation of new international investment projects on the introduction European standards for domestic enterprises, including joint investment projects in strategic sectors,
- promote investment projects in support of small and medium-sized businesses, especially implementation of new technologies, equipment, and advanced technological development, especially in the fields of energy and infrastructure development,
- intensify efforts to foreign banks to open credit lines for lending to small and medium-sized businesses to implement energy efficiency projects under the state guarantee.

The interdependence of the real and banking sectors requires the formation of such policy of the NBU and the regulation of the banking system, which

would consider the needs of the industry and would ensure its sustainable development. Small and medium businesses are the key sector able to provide the flexibility of the economy in the period of crisis and a source of income. Therefore, the support and development of such lending can increase the stability of the economy, which outlines our further scientific interests.

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