

FUNCTIONING AND DEVELOPMENT OF ENTERPRISES

CONTEMPORARY CHALLENGES

Edited by
Jerzy Duda and Iwona Skalna



WYDAWNICTWA AGH



KRAKOW 2019

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Contents

Preface.	5
Chapter 1. Entrepreneurial Orientation: is It Subjective Belief, or Objective Behaviour, or Both?	9
<i>Mateusz Codogni, Joanna Duda, Rafał Kusa</i>	
Chapter 2. Using the Concept of Open Innovation in Managing a Company's Core Competencies	19
<i>Zygmunt Waśkowski, Anna Jasiulewicz</i>	
Chapter 3. Use of Google's Ecosystem to Improve Efficiency of Selected Business Processes	29
<i>Katarzyna Ragin-Skorecka, Filip Nowak</i>	
Chapter 4. Beginning of Digital Transformation in Service Company Through Implementation of Lead Method – Case Study Analysis	37
<i>Mirosław Moroz, Konrad Piechota</i>	
Chapter 5. The Use of IT Systems in Processes of Knowledge Diffusion within an Organization	43
<i>Iwona Gawron, Sławomir Ziółkowski</i>	
Chapter 6. Adoption of Project Management Methodologies in Polish IT Companies. . .	49
<i>Jerzy Duda, Radosław Puka, Anna Puka</i>	
Chapter 7. Nonlinear Hicks Model with Cubic Investment Function	55
<i>Robert Kruszewski</i>	
Chapter 8. Impact of Fiscal Instruments on Investments of Industrial Enterprises in Poland.	63
<i>Robert Lisowski, Maciej Woźniak, Tomasz Wójtowicz</i>	
Chapter 9. Investments and Development of Polish SMEs	71
<i>Agnieszka Peszko</i>	

Chapter 10. Foreign Direct Investment in Innovative Sectors in Poland.	83
<i>Katarzyna Żak</i>	
Chapter 11. Competitiveness of New Member States of European Union in Foreign Trade in Agri-Food Products.	91
<i>Anna Budzyńska, Anna Nowak</i>	
Chapter 12. Opportunity Perception and Entrepreneurs' Motivation in SME Context	101
<i>Rafał Kusa</i>	
Chapter 13. Contemporary Trends in Motivating Employees	109
<i>Zofia Wyszowska</i>	
Chapter 14. Competitiveness Factors of Large Enterprises in Polish Economy	115
<i>Joanna Duda, Anna Wolak-Tuzimek</i>	
Chapter 15. Corporate Social Responsibility as Factor of Enterprise Competitiveness . . .	131
<i>Anna Wolak-Tuzimek, Weronika Tuzimek</i>	
Chapter 16. Approach to Development of Enterprise in Changeable Environment	141
<i>Henryk Dźwigoł</i>	

Preface

*Businesses that grow by development and improvement do not die.
But when a business ceases to be creative, when it believes it has reached perfection
and needs to do nothing but produce – it is done*

Henry Ford

The process of globalization and changes in the conditions of management and competition entailed the necessity to change the functioning of enterprises. The ability to adapt to the environment (e.g., suppliers, customers, competitors, cooperating companies, and business partners) and the requirements of market economy determine the effects of operational activities and development opportunities for each enterprise. The adaptation of companies to a changing environment manifests itself through the implementation of various innovative and restructuring projects. On the one hand, the market economy creates specific conditions for the enterprise, thanks to which it can achieve its goals, on the other hand, it sets requirements to ensure a relative stability of its existence and development opportunities.

Development in general is understood as a process of changes occurring over time. In the case of an enterprise, it may concern either part or the entire enterprise, and refer to all areas, i.e. goals, structure, technology, as well as the human resources. The essence of organizational development can be interpreted in two ways: as closing of the so-called development gap (developmental discrepancy) or as a process of improving the place that the organization occupies in the environment.

Enterprise development in general means coordinated changes in the company's systems, adapting them to an ever-changing environment. These adjustments are efficient if they ensure that the enterprise achieves and maintains a competitive advantage, which is a prerequisite for its duration on the market. Enterprise development in practice, therefore, means: introducing new elements into the enterprise system, improving the quality of existing elements in the systems and changing systems structures. Development is primarily a qualitative phenomenon of introducing innovations (product, process, structural ones as well as innovations in the organizational and management fields). The necessity of enterprise development results from constant changes in the environment and in order to adapt to them one should constantly make changes in the enterprise, i.e. develop it.

An enterprise wanting to define an effective strategy for its development must take into account many different factors coming from outside and inside the organization. Thus, this publication covers various issues related to the selected aspects of the functioning and development of enterprise, including: implementation of innovative activities, improvement of the efficiency of selected business processes, application of IT systems to knowledge dissemination processes, digital transformation, project management, corporate social responsibility (CSR), and finally contemporary employee motivation, with particular emphasis on employees of the SME sector.

The monograph consists of 16 chapters devoted to the above-mentioned issues. The first chapter deals with issues related to entrepreneurial orientation (EO). The authors investigate various subjective and objective measures, including self-descriptive scale, that can be used to assess entrepreneurial orientation. Their findings suggest that EO is correlated with tested objective indicators and, consequently, that EO fairly closely approximates behaviors. This implies, that EO can be assessed with both subjective and objective measures. Their study offers to practitioners some suggestions for diagnosing their organizations in terms of EO, which can lead to organizational development.

Chapter 2 is devoted to the core competences of companies. The authors point to the open innovation as the strategic chance for building and enhancing companies' core competences. They present the developed model that takes a form of a closed system, which includes the mechanism of a company's self-improvement and which is powered from the outside, through the conscious use of the concept of open innovation. Thanks to this concept, a company can improve its core competencies, as well as create higher value for its customers, which directly leads to strengthening its market position. The authors conclude that the exploration of the corporate concepts should rely on the two classic concepts of strategic management, i.e., the resource concept and the network of relationships concept.

Chapter 3 presents the phases of implementation of a prototypical web allocation that uses Google ecosystem to improve the efficiency of selected business processes. By using the simulation experiments conducted in iGrafx 2011 tool the authors compare various implementation scenarios with respect to adopted KPIs. The most effective scenario, that fits the management's expectations the best, is supported by a prototypical web application. The accuracy of use of Google ecosystem for supporting business processes is tested in three enterprises operating in various lines of business.

Chapter 4 shows the beginnings of the digital transformation in a service company, occurring thanks to the implementation of the Lead method. Additionally, the authors analyze the reasons of the failure of the implementation of the Lead method. The results of the conducted research indicate that, contrary to assumptions, the rooting of the digital transformation is not easy. The reasons for failures lie within the analyzed company and emerge from many areas: awareness of the needs of digital transformation, lack of appropriate competences, leaving front-line co-workers without relevant training, little support for the implementation of the Lead method by the top management.

Chapter 5 presents the application of IT systems in the processes of knowledge diffusion within an organization. The authors present effective IT systems and applications which can assist managers in overcoming one of the most significant impediments to proper diffusion of knowledge, namely technological barriers. The continuous development of the ICT sector results in an increasing number of executed projects and employees in IT companies, which, in turn, entails the necessity to use one of the project management methodologies.

That is why the next chapter (Chapter 6) presents the results of a survey conducted in IT companies operating in Małopolska (region of Poland), in which project managers were asked to point out project management methodologies and techniques they knew and they used in their daily practice.

Chapter 7 addresses an important issue related to the functioning and development of the organization, namely investment in industrial enterprises. The authors investigate the dynamics of the nonlinear Hicks-type model with cubic investment function. They determine the equilibria and investigate their local asymptotic stability. The authors present as well the bifurcation diagrams for two relevant parameters and localize those values, for which the system indicates cyclical or complex behavior.

The investments are dealt as well in Chapter 8, but this time the authors aim is to analyze the impact of the value growth of fiscal instruments and its delay on the increase in the level of investments of industrial enterprises in Poland in the years 2003–2016.

Chapter 9 also remains on the topic of investments, but implemented in the SME sector. The author compares the dynamics of SME investments with the dynamics of the number of these enterprises, the number of employees in SMEs, changes in gross value of fixed assets, revenues, gross profit and production value. It was shown that the development rate measured by these measures is correlated with the dynamics of investments.

The role of foreign direct investment (FDI) in stimulating innovation in the economy and enterprises is discussed in Chapter 10. In the studies and analyses carried out by the authors, particular attention is paid to the decisions made by foreign investors regarding their activity in innovative sectors. Theoretical aspects related to the transfer and diffusion of innovations via FDI are presented in the context of the synthetic analysis and the evaluation of the impact FDI had on innovative sectors in Poland in the years 2011–2016.

Continuing the topic of foreign markets, chapter 11 is devoted to evaluation of the competitiveness of new member states of the European Union (EU-13) in comparison to member states forming the so-called ‘old 15’ in terms of international trade in agri-food products. The study was based on data from ComExt – EUROSTAT databases from 2004, 2010 and 2016. The evaluation was performed using the following indicators: Revealed Comparative Advantage (RCA), Trade Coverage Ratio (TC) and Intra-Industry Trade Index (IIT).

Chapter 12 remains in the field of entrepreneurship. The author examines the opportunity perception and entrepreneurs’ motivation, as well as their association with entrepreneurial orientation (EO) and innovativeness in small and medium-sized enterprises. The research sample is 108 SMEs from Małopolska (region of Poland).

Chapter 13 presents the results of empirical research conducted in the form of a questionnaire. 126 correctly completed questionnaires were received and on this basis a system of motivating employees in manufacturing enterprises was developed.

Chapter 14 presents the results of research on the relationship between Corporate Social Responsibility and the competitiveness of enterprises. The authors verified two research hypotheses are proposed with regard to the impact of CSR and advertising and public relations on enterprise competitiveness. The hypotheses are verified by means of factor analysis.

The subject of CSR continues in Chapter 15. The authors examine how CSR implementation to enterprises impacts on the levels of their competitiveness, i.e., the ability of an enterprise to succeed at economic competition against other enterprises. The competitiveness is analyzed in three dimensions: competitive standing of enterprises, competitive potential

of enterprises, and instruments of competition. Results of the author's own research are presented into a group of 264 large enterprises in Poland, designed to evaluate significance of selected factors of enterprise competitiveness.

Last chapter is related to the functioning of a virtual organization. An attempt is made to answer research questions: What model or approach should be used in the process of building an optimal organization from the point of view of changes taking place in the environment? What valued tendencies in the economy should be taken into account to build a company in the new economic reality? What organizational structures will be optimal in the process of building a 21st century enterprise? How should individual and team work be organized in a modern organization?

Jerzy Duda
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CHAPTER 1

Entrepreneurial Orientation: is It Subjective Belief, or Objective Behaviour, or Both?

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1. Introduction

Entrepreneurship is an area of numerous new developments in practice and theory, and also of much interlocking of both. One of the examples is entrepreneurial orientation (EO) that reflects organizational behaviors and attitudes towards opportunities. This concept is widely recognized and utilized in entrepreneurial research, and offers possibility for organizational diagnosis and development. This is one of the examples of how managerial science can contribute to business practice.

There is ongoing discussion concerning the EO, that pertains to: its nature (multi- or unidimensional), a set of dimensions comprised in EO, and to measurement scale. Most EO scales are self-descriptive, based on subjective measures. This is represented by the scale proposed by Covin and Slevin [1] that dominates in the EO research and has proven its validity in numerous studies. However, this approach provokes the question: what is the relationship between attitudes declared by managers (reflected in such EO scales) and actual entrepreneurial behaviors of the company. This question is especially important in context of managerial implementation of EO scales and their practical relevance for organizational development. Since research shows the impact of EO on firm performance, the improvement of the EO methodology is important both for theory and practice. One of available ways of its enhancement is the implementation of objective measures that reflect entrepreneurial behaviors. The inclusion of objective measures can increase the researchers' and practitioners' ability to assess EO based on different types of data, depending on its availability.

This study refers to EO and its objective measures. The aim of the study is twofold. Firstly, it aims to examine whether EO measured with the subjective self-descriptive scale proposed by Covin and Slevin, is a valid predictor of entrepreneurial behaviors of a company. Its second goal is to test objective measures of EO in terms of their utility, association

with subjective measures and reliability of scales that use them. To this end, the declarations expressed in self-descriptive scales are confronted with behaviors observed within organizations and expressed in objective measures.

The structure of the chapter is as follows. Firstly, it describes EO concept and measurement tools, then introduces the methodology employed in the study. Next, it presents and discusses the results of the study and its limitations. And finally, it presents the implications of this study and proposes recommendations for the future research.

2. Conceptualization of entrepreneurial orientation

Entrepreneurship is a process by which “opportunities to create future goods and services are discovered, evaluated and exploited” [2: p. 218]. Hisrich, Peters, and Shepherd identify entrepreneurship with “behaviors that are related to the creation of value through the exploitation of opportunities in novel and innovative ways” ([3], quoted in: [4: p. 58]). Entrepreneurship is also perceived as a process that “involves all the functions, activities, and actions associated with the perceiving of opportunities and the creation of organizations to pursue them” [5: p. 14]. Entrepreneurship can also be perceived as a set of attitudes, such as the desire to achieve, the passion to create, the yearning for freedom, the drive for independence, and the embodiment of entrepreneurial visions and dreams through tireless hard work, calculated risk-taking, continuous innovation, and undying perseverance [6: p. 704].

Entrepreneurship is understood to be a trait of organizations. It reflects the entrepreneurial behaviors, “formal or informal activities aimed at creating new business in established companies through product and process innovations and market developments” ([7: p. 261] quoted in: [8: p. 31]). This concept shows that the entrepreneurial process does not end when the organization is founded, but it is continued within that organization.

Organizations vary in terms of entrepreneurship. Researchers and practitioners strive to measure the level of entrepreneurship in organizations. Morris states that “entrepreneurship occurs in varying degrees and amounts” and suggests the concept of “entrepreneurial intensity” [9: p. 18]. Lumpkin and Dess developed a concept of entrepreneurial orientation [10: p. 137]. This concept is based on the definition of an entrepreneurial firm, which was proposed by Miller. He stated, that “an entrepreneurial firm is one that engages in product-market innovation, undertakes somewhat risky ventures, and is the first to come up with ‘proactive’ innovations, beating competitors to the punch” [11: p. 771]. As Covin and Wales [12: p. 679] note,

the roots of EO research can be traced to the work of Mintzberg (1973). In his theorizing about decision-making, Mintzberg conceived of an entrepreneurial strategy-making mode as a managerial disposition characterized by the active search for new opportunities in uncertain environments through which dramatic growth might be realized. In a similarly pioneering work exploring managerial dispositions, Khandwalla (1976/1977) advanced the concept of management style as the operating set of beliefs and norms about management held by the organization’s key decision makers... [that] when translated into action constitute the organization’s strategy for survival and growth. According to Khandwalla, an entrepreneurial management style refers to a bold, risky, and aggressive approach to decision making, in contrast to more cautious, stability-oriented approach.

Freiling and Schelhowe, referencing Lumpkin and Dess, write: „the construct of EO captures the methods, practices, and decision-making styles that managers or owners use to act entrepreneurially. It reflects how a firm operates in value creation regardless of what entrepreneurial activities (such as new market entry) it undertakes” [13: p. 170]. A wider review of EO definitions is presented in Table 1.

Table 1. Selected definitions of EO

Autor(s)	Definition of EO
Khandwalla [14: p. 25]	“The entrepreneurial (management) style is characterized by bold, risky, aggressive decision-making”
Miller and Friesen [15: p. 5]	“The entrepreneurial model applies to firms that innovate boldly and regularly while taking considerable risks in their product-market strategies”
Miller [11: p. 771]	“An entrepreneurial firm is one that engages in product-market innovation, undertakes somewhat risky ventures, and is first to come up with ‘proactive’ innovations, beating competitors to the punch”
Morris and Paul [16: p. 249]	“An entrepreneurial firm is one with decision-making norms that emphasize proactive, innovative strategies that contain an element of risk”
Merz and Sauber [17: p. 554]	“[...] entrepreneurial orientation is defined as the firm’s degree of proactiveness (aggressiveness) in its chosen product-market unit (PMU) and its willingness to innovate and create new offerings”
Lumpkin and Dess [10: pp. 136–137]	“EO refers to the processes, practices, and decision-making activities that lead to new entry” as characterized by one, or more of the following dimensions: “a propensity to act autonomously, a willingness to innovate and take-risks, and a tendency to be aggressive toward competitors and proactive relative to marketplace opportunities”
Covin and Slevin [18: p. 218]	“Entrepreneurial firms are those in which the top managers have entrepreneurial management styles, as evidenced by the firms’ strategic decisions and operating management philosophies. Non-entrepreneurial or conservative firms are those in which the top management style is decidedly risk-averse, non-innovative, and passive or reactive”
Voss, Voss, and Moorman [19: p. 1134]	“[...] we define EO as a firm-level disposition to engage in behaviors [reflecting risk-taking, innovativeness, proactiveness, autonomy, and competitive aggressiveness] that lead to change in the organization or marketplace”
Pearce, Fritz, and Davis [20: p. 219]	“An EO is conceptualized as a set of distinct but related behaviors that have the qualities of innovativeness, proactiveness, competitive aggressiveness, risk taking, and autonomy”

Source: [12: p. 679]

Anderson et al., have posited that “(1) EO is a multidimensional construct consisting of two non-interchangeable dimensions – entrepreneurial behaviors and managerial attitude towards risk; (2) there is positive covariance between these two dimensions; and (3) both dimensions are fundamentally necessary for EO to exist” [21: p. 1583].

3. Measurement of entrepreneurial orientation

Numerous tools for EO measurement have been developed. Covin and Slevin have built a scale to measure the EO, which is comprised of three dimensions: risk-taking, innovativeness, and proactiveness [1: p. 75], and Lumpkin and Dees augmented it by adding two more dimensions: autonomy and competitive aggressiveness [10: p. 137]. Some modifications of this scale were proposed. One of them is the scale by Hughes and Morgan, who used 18 items to measure the dimensions of entrepreneurial orientation and 5 items to estimate the business performance of firms at the embryonic stage of development [22: pp. 657–658]. As Rauch et al. conclude, as the result of their meta-analysis based on 51 studies: “there is little doubt that the original studies of Miller [11] and Covin and Slevin [1] provided the foundations for the scales used in subsequent studies. [...]. Miller’s and Covin and Slevin’s original nine-item formulation of the three dimensions innovativeness, proactiveness, and risk taking dominated with a total of 28 studies” [23: p. 767]. Hence in this study Miller/Covin and Slevin scale has been used as EO measurement tool.

The Miller/Covin and Slevin EO scale consists of pairs of statements, and respondents assess their agreement with them on seven-point scale (see [12: p. 692]).

What is worth noting in the abovementioned definitions is the use of two distinct groups of words. On the one hand, EO is a disposition, set of beliefs, attitude. On the other hand, EO is a strategy, behavior, practice, activity, embarking on initiatives. It seems that EO refers both to the underlying belief structure and to its manifestation as set of behaviors. In a similar way, the EO scale asks the respondents questions concerning what top management favors, puts emphasis on, seeks to avoid, prefers, believes, what are its proclivities and what posture it adopts, but also the scale contains some questions about the number of new product lines and how often innovations are introduced. It seems, however, that while the definitions suggest mostly that EO is a behavioral trait (or rather a set of traits), the EO scale concentrates more on the underlying beliefs.

This seems to implicate that there is an underlying psychological model that posits that beliefs and behaviors form a strong sequence – if one believes something, one must always act it out. There also seems to be an implicit managerial model assuming that the top management fully controls the company – the management’s preferences, initiatives and decisions are not hindered by any resistance within the company nor by external forces. These assumptions are very plausible – to assume otherwise, that beliefs do not affect behaviors or that top management does not exert any control over their companies, would be at least counterintuitive. However, the exact strength of the link between the top management’s beliefs and the firm’s actions needs to be tested. There is an additional concern – if the scale that measures EO is a self-descriptive, seven-point Likert-like scale, the respondents might understand the questions inconsistently and different respondents might give different responses in situations where the objective situation is the same. For example, if two people, one very high and other very low on trait agreeableness, are asked to describe how aggressive a specific management team is on scale of 1 to 7, the first person might score it significantly higher than the second. Additionally, subjective scales can suffer from a number of flaws, like common-method bias caused by respondents’ tendency to respond similarly to separate questions [24, 25].

In this vein a hypothesis has been developed, that EO reflects the entrepreneurial behaviors of the company: H1. There is a monotonic relationship between EO and the entrepreneurial behaviors of the company measured with objective indicators.

The literature on the subject suggests that the nature of connection between behaviors and attitudes is such, that they measure the same construct, although the question whether EO is a unidimensional or multidimensional construct is still subject to debate [12]. Hence the second hypothesis has been developed, stating that the Miller/Covin and Slevin EO scale items, and objective variables describing company behaviors are statistically a single unidimensional construct, which will be tested using Cronbach alpha. Thus, **H2: Miller/Covin and Slevin EO Scale items and objective variables describing company behaviors are statistically a single construct.**

4. Research methods

In order to address the abovementioned considerations, a study has been carried out. The questionnaire consisted of demographic questions (size, main activity, date of establishment), a nine-question entrepreneurial orientation measurement tool developed by Miller [11] and Covin and Slevin [1] (and presented by Covin and Wales [12: p. 692], translated to Polish), and also of ten questions pertaining to specific entrepreneurial behaviors. Those questions were:

- [Q1] What is the number of employees, whose duties include seeking new market opportunities?
- [Q2] What is the number of employees that have submitted new ideas concerning market opportunities in the last year?
- [Q3] What is the number of ideas concerning market opportunities that have been submitted by employees in the last year?
- [Q4] What percentage of their work time can the employees spend on looking for new ideas and solutions and carrying out tasks that they set themselves?
- [Q5] What is the number of business plans and projects prepared in the last three years?
- [Q6] What is the number of business plans and projects implemented in the last three years?
- [Q7] What is the value of your biggest project/investment that the company has implemented in the last three years (as percentage of income in the year prior to its implementation)?
- [Q8] What is the number of innovations (new products, ways of production, management practices, ways of sales and distribution, that are new to the market or previously not used in the company) introduced in the last three years?
- [Q9] What percentage of the income is generated by products that are new to the market and introduced in the last year?
- [Q10] What percentage of the income is generated by products that are new to the company and introduced in the last year?

Results in Q1, Q2 and Q3 have been divided by number of employees, to convert them to fractions and make them more comparable. All the variables have been standardized. All calculations have been carried out in Statistica 13.1.

The surveyed population was defined as companies:

- whose primary activity is in the industry defined by PKD (Polska Klasyfikacja Działalności – Polish Classification of Economic Activities): code 26 – manufacture of computer, electronic, and optical products; code 27 – manufacture of electrical equipment; and code 31 – manufacture of furniture;
- that have their place of business in the Małopolska region;
- that are SMEs.

The sampling frame preparation, sample drawing, and collection of data was carried out by the Central Statistical Office of Poland (Kraków branch). A professional staff was hired to administer the survey during visits to company facilities. The sample size was 97 companies, but 7 questionnaires have been discarded due to failure to meet sample criteria or lack of answers for crucial questions. The final sample size is, therefore, 90 companies. If any data-points in other variables were missing, the company has been excluded from the calculation of the particular statistical correlation, but not discarded from the sample altogether.

5. Results and discussion

The results of calculations are presented in Table 2. There is low to moderate correlation between EO measured with the Miller/Covin and Slevin scale and entrepreneurial behaviors of a company. They are all statistically significant at p-values of 0.05 or less.

Table 2. Spearman correlations between EO index (and its subindexes) and company entrepreneurial behaviors

	EO index	Innovativeness subindex	Proactivity subindex	Risk-taking subindex
Q1	0.40***	0.33**	0.35***	0.34**
Q2	0.52***	0.49***	0.43***	0.36**
Q3	0.45***	0.42***	0.33**	0.32**
Q4	0.29**	0.27*	0.22*	0.23*
Q5	0.48***	0.44***	0.49***	0.33**
Q6	0.55***	0.49***	0.54***	0.43***
Q7	0.36*	0.31*	0.22	0.28
Q8	0.39***	0.32**	0.38***	0.32**
Q9	0.43***	0.41***	0.37***	0.31**
Q10	0.41***	0.45***	0.30*	0.32**

* $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$

Of the Q1–Q10, some of the questions are related more to innovative behaviors, while others are related to proactivity or risk-taking. Innovativeness subindex is associated with the number of employees submitting new ideas [Q2], the number of business plans and projects implemented [Q6] and prepared [Q5]. Surprisingly, the correlation with the number of innovations (new products, ways of production, management practices, ways of sales and distribution, that are new to the market or previously not used in the company) [Q8] is relatively weak. It suggests that the innovativeness index reflect involvement rather than results of innovative activity of the company. Proactiveness index is strongly correlated with the number of business plans and projects prepared [Q5] and implemented [Q6].

EO index is correlated with the number of employees that have submitted new ideas [Q2], the number of business plans and projects prepared [Q5] and implemented [Q6] in the last three years. What is worth noting that in 8 out of 10 cases EO index is a better predictor of entrepreneurial behaviors than any of its subindexes, even the ones that ostensibly refer to the same trait, so they intuitively should predict the specific type of behavior better. The values presented above show **a monotonic relationship between EO and the entrepreneurial behaviors of the company measured with objective indicators**. Consequently, hypothesis H1 is supported. Additionally, this confirms the position that EO is rather an unidimensional construct than multidimensional one.

Cronbach alpha for nineteen variables (nine from the Miller/Covin and Slevin EO Scale and ten described above as Q1–Q10) has been calculated. Cronbach alpha equals 0.867, which indicates good internal consistency of a measurement tool comprised of these 19 variables. This suggests that all the variables pertain to one latent construct. Removal of some items would increase the Cronbach alpha of the scale very slightly:

- Q2 – 0.867063;
- Q3 – 0.8701;
- Q4 – 0.873663;
- Q5 – 0.867203;
- Q7 – 0.873098.

Removal of any other items does not increase the Cronbach alpha. This supports our hypothesis H2 that **both subjective items of Covin and Slevin EO scale and objective variables describing company behaviors are statistically a single construct**.

In general, the results of this study imply, that EO can be measured in two ways: with subjective self-descriptive questions reflecting mainly managers' beliefs and attitudes, and with objective measures related to particular entrepreneurial behaviors and their results. As stated above, it is a valuable indication both for researchers and practitioners as they possess different types of data and sources. These results show that these different data can be employed alternatively to examine EO. This finding confirms recommendation from other fields, e.g. organizational performance [25, 26], to utilize both and objective and subjective measures in management research.

Our study has some limitations. Firstly, our sample was relatively small and consists solely of SMEs representing only two industries. Secondly, this study refers to only one operationalization of EO, i.e., the one proposed by Covin and Slevin. However, there are other scales that reflect more EO dimensions and consist of different questions. These limitations indicate further research possibilities.

6. Conclusions

Entrepreneurial orientation is a construct comprising of variables related to several dimensions. The majority of scales employ subjective measures that reflect mainly respondents' beliefs. In this study such measures have been confronted with several objective measures. The findings suggest that EO is correlated with tested objective indicators and, consequently, that EO fairly closely approximates behaviors. This implies, that EO can be assessed with both subjective and objective measures. Thus, these results contribute to the theory of entrepreneurship, particularly to methodology of EO research, by validating the Covin and Slevin EO scale as an acceptable approximation of actual entrepreneurial behavior as well as proposing alternative objective measures of EO. The further development of this approach is recommended, particularly the examination of other objective indicators of entrepreneurial behavior.

The study offers to practitioners some suggestions for diagnosing their organizations in terms of EO, which can lead to organizational development.

References

- [1] Covin J.G., Slevin D.P. (1989), *Strategic management of small firms in hostile and benign environments*, Strategic Management Journal, vol. 10, 1989, pp. 75–87.
- [2] Shane S., Venkatraman S. (2000), *The promise of entrepreneurship as a field of research*, Academy of Management Review, vol. 25, pp. 217–226.
- [3] Hisrich R.D., Peters M.P., Shepherd D.A. (2005), *Entrepreneurship*, 6th ed., McGraw-Hill Irwin, Boston.
- [4] Leutner F., Ahmetoglu G., Akhtar R., Chamorro-Premuzic T. (2014), *The relationship between the entrepreneurial personality and the Big Five personality traits*, Personality and Individual Differences, vol. 63, pp. 58–63.
- [5] Bygrave W.D., Hofer C.W. (1991), *Theorizing about entrepreneurship*, Entrepreneurship Theory and Practice, vol. 16(2), pp. 13–22.
- [6] Ma H., Tan J. (2006), *Key components and implications of entrepreneurship: A 4-P framework*, Journal of Business Venturing, vol. 21, pp. 704–725.
- [7] Zahra S.A. (1991), *Predictors and Financial Outcomes of Corporate Entrepreneurship: An Exploratory Study*, Journal of Business Venturing, vol. 6(4), pp. 259–286.
- [8] Morris M.H., Kuratko D.F. (2002), *Corporate Entrepreneurship*, Entrepreneurial Development within Organizations, Thomson South-Western.
- [9] Morris M.H. (1998), *Entrepreneurial Intensity: sustainable advantages for individuals, organizations and societies*, Quorum Books, Westport CT.
- [10] Lumpkin G.T., Dess G.G. (1996), *Clarifying the entrepreneurial orientation construct and linking it to performance*, Academy of Management Review, vol. 21, pp. 135–172.
- [11] Miller D. (1983), *The correlates of entrepreneurship in three types of firms*, Management Science, vol. 29, pp. 770–791.
- [12] Covin J.G., Wales W.J. (2012), *The Measurement of Entrepreneurial Orientation*, Entrepreneurship Theory and Practice, vol. 36(4), pp. 677–702.

- [13] Freiling J., Schelhowe C.L. (2014), *The Impact of Entrepreneurial Orientation on the Performance of Internationalization*, Journal of Entrepreneurship Management and Innovation, vol. 10(4), pp. 169–199.
- [14] Khandwalla P.N. (1976/1977), *Some top management styles, their context and performance*, Organization & Administrative Sciences, vol. 7, pp. 21–51
- [15] Miller D., Friesen P.H. (1982), *Innovation in conservative and entrepreneurial firms: Two models of strategic momentum*, Strategic Management Journal, vol. 3(1), pp. 1–25.
- [16] Morris M.H., Paul G.W. (1987), *The relationship between entrepreneurship and marketing in established firms*, Journal of Business Venturing, vol. 2(2), pp. 247–259.
- [17] Merz G.R., Sauber M.H. (1995), *Profiles of managerial activities in small firms*, Strategic Management Journal, vol. 16, pp. 551–564.
- [18] Covin J.G., Slevin D.P. (1998), *The influence of organization structure on the utility of an entrepreneurial top management style*, Journal of Management Studies, vol. 25(3), pp. 217–234.
- [19] Voss Z.G., Voss G.B., Moorman C. (2005), *An empirical examination of the complex relationships between entrepreneurial orientation and stakeholder support*, European Journal of Marketing, vol. 39(9/10), pp. 1132–1150.
- [20] Pearce J.A., II, Fritz P., Davi P.S. (2010), *Entrepreneurial orientation and the performance of religious congregations as predicted by rational choice theory*, Entrepreneurship Theory and Practice, vol. 34(1), pp. 219–248.
- [21] Anderson B.S., Kreiser P.M., Kuratko D.F., Hornsby J.S., Eshima Y. (2015), *Reconceptualizing entrepreneurial orientation*, Strategic Management Journal, vol. 36(10), pp. 1579–1596.
- [22] Hughes M., Morgan R.E. (2007), *Deconstructing the relationship between entrepreneurial orientation and business performance at the embryonic stage of firm growth*, Industrial Marketing Management, vol. 36, pp. 651–661.
- [23] Rauch A., Wiklund J., Lumpkin G.T., Frese M. (2009), *Entrepreneurial orientation and business performance: An assessment of past research and suggestions for the future*, Entrepreneurship Theory and Practice, vol. 33(3), pp. 761–787.
- [24] Wall T., Michie J., Patterson M., Wood S., Sheehan M., Clegg C., Fu X., Peixoto A., West M. (2004), *On the validity of subjective measures of company performance*, Personnel Psychology, vol. 5, pp. 95–118.
- [25] Andrews R., Boyne G., Walker R. (2006), *Subjective and objective measures of organizational performance: An empirical exploration*, in: G. Boyne, K. Meier, L. O'Toole, Jr., R. Walker (eds.), *Public Service Performance: Perspectives on Measurement and Management*, Cambridge University Press, Cambridge, pp. 14–34, <https://doi.org/10.1017/CBO9780511488511.002>.
- [26] Dess G.G., Robinson R.B. (1984), *Measuring organizational performance in the absence of objective measures: the case of the privately-held firm and conglomerate business unit*, Strategic Management Journal, vol. 5(3), pp. 265–273.

CHAPTER 2

Using the Concept of Open Innovation in Managing a Company's Core Competencies

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1. Introduction

In the long perspective, an organization's market position is to a large extent determined by its core competencies and the ability to use them in the competitive struggle. The complex nature of the core competencies, their volatility and limitations are the reasons why the final success will depend on the skillful management of these competencies, which will ensure the company an access to their sources. Even though a relatively vast amount of attention has been paid to the core competences of companies, their understanding, types and significance in the subject literature, there have not been enough attempts at the systematization of the sources of their origin. This chapter fills this gap, as on the basis on the existing literature and the research findings, its authors point to the open innovation as the strategic chance for building and enhancing companies' core competences. Therefore, the chapter aims to indicate the areas in which companies can develop their core competences, relying on the concept of open innovation. The proposed model is based on the qualitative research in the form of individual interviews with top executives of 21 Polish companies.

2. Company's core competencies

Regardless of the way in which the core competencies of a company are understood and defined, all the researchers dealing with this issue agree that they determine its competitive advantage. However, M. Bratnicki insists that a company's core competencies are only sign of its potential and until they are combined with resources and used for creating a measurable value for the customer, they do not give the company competitive advantage [1: p. 64].

The lack of agreement as to the definition of a company's core competencies, their complex and dynamic nature are the reasons why a variety of synonyms are used to refer to them,

e.g. abilities, skills and processes, or resources. A company's core competences are partly derived from the skills and intelligence of its managers, but also the involvement of other employees. Therefore, an in-depth literature study leads to a conclusion that a company's core competences are positively correlated with the unique resource of every organization, which is the knowledge of its employees. For instance, G. Gierszewska associates the concept of the core competencies with knowledge management, as she believes that they result from the organizational learning, entrepreneurship, innovation, obtaining and sharing knowledge by the company's staff [2: p. 29]. This approach to this issue implies the internal sources of the core competencies, however it does not fully reflect reality. The source of knowledge indispensable for creating and maintaining competitive advantage is increasingly frequently located outside the company. In the times of the knowledge-based economy, the external relations are more and more significant for the development of the core competencies.

Organizations are willing to acquire knowledge from many external sources at the same time, both from the closer and the farther environment, i.e. from outside their business sector. It is caused by the fact that internal sources are shortly depleted and do not ensure a long-lasting development of the company. It means that the sources of a company's core competencies, which determine its future market position, are to be sought primarily in cooperation with other entities, by forming networks of relationships [3: pp. 615–640]. An idea which might be a good response to this need is the concept of open innovation, which assumes searching for innovative solutions in an organization's environment, making contacts and inviting stakeholders to cooperate, as well reaping the benefits of the available resources, which the company could not access otherwise.

Regardless of their sources, a company's core competencies evolve, as they are dynamic by nature. Ignoring this fact may eventually reduce the company's potential for competitive struggle. Therefore, what is of the key significance here is the process of managing the core competencies, which consists of four elements:

- 1) identifying and reaching sources of competition,
- 2) creating, enhancing and developing competition,
- 3) using the core competencies for achieving the company's goals,
- 4) using the collected resources for renewing the core competencies or acquiring new ones, so as to ensure the continuity of competition.

In the light of the foregoing considerations, the following conclusions seem to be particularly noteworthy:

- The foundation of a scientific discussion about a company's core competencies is the resource theory, which, in the broad terms, sees the sources of these competencies inside the organization. However, this approach to the problem does not stand the test of time, as a growing number of researchers strongly stress the role of the environment in shaping a company's core competencies.
- The possession of the core competencies is not equivalent to the company's competitive advantage, as the competencies only indicate the organization's potential for achieving this advantage.
- The core competencies of a company can lead to the achievement or the enhancement of its competitive advantage only on condition that they are used with the view to creating value for customers.

- The phenomenon of the core competencies is indefinite, i.e. it is difficult to identify by the market competition, thereby it is hard to imitate.
- A company's core competencies, especially the key (strategic) ones, are of the extreme significance for the process of strategic management, creating new value for customers, implementing innovation and a skillful adaptation to the constantly changing environment.

In the view of all these facts, there appears to be a question of how to manage the core competencies, taking into account their uniqueness, precarious nature, complexity, but also their sources of origin and relations with other elements of the organization, as well as with the environment. The further part of the chapter is an attempt to offer a solution to this problem, by presenting a management model of the core competencies based on the concept of the open innovation.

3. Potential of open innovation for creating core competencies of company

The basis for innovation is the knowledge which is widespread in the global network society. Open innovation results from the purposeful inflow and outflow of knowledge, which accelerate the internal innovation in a company. The open approach means that companies should to a larger extent use external ideas and technologies in their business, as well as let other companies use their ideas which they do not presently need [4].

In the open innovation model, the role of external partners is not limited to the source of ideas at the stage of generating new solutions, but it also includes the other phases of the process, i.e. filtering and selection of ideas, their development into innovation, testing the created solutions, their commercialization, as well as the diffusion of innovation. A skillful integration of internal and external solutions in the open innovation model is the key to creating new, more advanced combinations of knowledge and giving a company the competitive edge over the competition, which is a chance for the market success. The *open innovation* approach means systematic stimulation of internal and external sources of innovation and analyzing them, which integrates research with a company's opportunities and resources [5: pp. 319–331]. The core of the open innovation model is sharing knowledge with the environment and obtaining innovation from outside [6: pp. 287–302]. According to Chiaromonte [7: pp. 111–114], mixed open innovation assumes building formal and informal networks, as well as undertaking cooperation with external stakeholders at various stages of the innovation process. The cooperation allows for the exchange of knowledge, mutual learning, as well as sharing the benefits from the jointly developed solutions [6: pp. 287–302].

The concept of open innovation emphasizes the role that external stakeholders play in creating the core competencies of a company and the success of its strategy on the market. Particularly traders, buyers and end-users have a significant function as an essential element of the demand side of innovation. It is important to know the stakeholders' opinions on innovation so as to, on the one hand, adapt the company's offer to their identified needs and desires and, on the other, deliberately shape them. Increasingly frequently, not only the stakeholders' so-called overt knowledge is used, i.e. their comments and remarks about products, but also the covert knowledge is obtained, e.g. through the observation of the way a product is used in practice and its adaptations inadvertently introduced by the users [8: pp. 135–147].

The key challenge for open innovation is creating synergy between the people from the inside and the outside of the organization, so implementing open innovation should begin with the identification of the open innovation network – i.e. a trusted network of external partners. However, the implementation of open innovation primarily depends on establishing the open mindset of internal and external participants. Therefore, companies must invest in activities which foster and stimulate the open, innovative mindset of their employees, through organizing workshops and training courses, building trust among the staff, offering them a space for discovering open innovation and taking autonomous decisions, as well as removing barriers to thinking processes, by showing that open innovation creates value for the customers and, by the same token, a new value for the company [9: pp. 45–48, 10: pp. 181–202]. A number of pioneer companies established organizational structures which support and systematize open innovation initiatives. Some companies have an integrating approach and introduce dedicated functions for coordinating incoming and outgoing innovation, whereas others created more specialized units for managing out-license activities, or strategic research and development alliances. Both of these organizational approaches help to reduce the staff's aversion to implementing open innovation [9: pp. 45–48]. On the other hand, the open approach to innovation should be also promoted outside the company, e.g. by means of free webinars, or good practice presentations for external partners [10: pp. 181–202]. Cooperation between companies should be considered a dynamic relationship, as it is a part of a broader picture of the partners' needs, so it is likely to change in time [11: pp. 171–186]. On the basis of research findings, Rangus claims that stimulating all types of open innovation practices strengthens the company's innovation performance [12: pp. 475–495].

4. Research method

With a view to verifying the assumption that seeking and using open innovation positively affects the development of the core competencies of a company, a series of in-depth interviews was conducted in 2018. The research tool was a partly structured interview script. The participants were top executives from large and medium-sized companies in Poland, representing the industrial, financial and trade sectors. On the whole, 21 interviews were conducted, some of which were divided into three rounds, so as to achieve a better insight into the issue. The starting point and the basis of the discussions was the model of a company's core competencies proposed by Prahalad and Hamel [13: pp. 79–91]. It was evaluated from the point of view of its potential for application, but it was also an inspiration for developing a new, original proposal for a model, which will take into account open innovation as the source of the core competencies of a company.

5. Model of developing company's core competencies based on open innovation

An inspiration for creating the model of developing core competencies on the basis of open innovation was the interpretation of the core competencies proposed by Prahalad and Hamel. These researchers defined the concept of the core competencies, which, in their

opinion, appear in the process of organizational learning and which can be enhanced and consolidated in the form of the implemented technological innovation. According to these authors, a company may gain competitive advantage in a short time, by means of low prices, or high quality of products, but these solutions can be easily imitated by the competition, which undermines the value of this advantage. However, in the long run, a company can ensure the competitive advantage through its core competencies, which enable the creation of new, innovative and hard to copy solutions and products, representing a high value for the customers, as well as the continuous improvement of the organizational performance. Moreover, Prahalad and Hamel see the managers' ability to create technologies and to implement them in the production processes as another source of advantage. These researchers explained the role of the core competencies for creating competitive advantage, by comparing a company to a tree, with three parts:

- 1) the roots, which reflect the company's core competencies and provide essential resources for the proper development of the organization;
- 2) the trunk and the limbs, representing the company's strategic products, which determine the structure of the business units in the organization;
- 3) the leaves, the flowers and the fruit are symbols of the finished products offered to the customers.

The empirical analysis and the interpretation of Prahalad's and Hamel's model reveal a few weaknesses and lead to the following conclusions:

The described concept of a company's core competencies focuses on the external sources of its origin.

- the presented model suggests a unidirectional process of creating value, from the possessed core competencies, through the implemented technological innovation, to the products manufactured and offered to the customers;
- the improvement of the core competencies results from a company's internal orientation, particularly on its resources and the ability of self-development;
- interactions with the environment usually take the form of *inside – outside*, are unidirectional and exclusively customer-oriented, disregarding the other company's stakeholders.

Seeing the chance for development inside the organization, the unidirectional nature of the processes, as well as the narrow perspective of the market, which takes into account only the competition and the customers are the biggest limitations of this model. In the 21st century, companies develop primarily thanks to the broad relationships with the environment, which provides them with ideas and resources indispensable for effective competition. They incorporate into their organizational processes not only their prosumers, but also other entities interested in cooperation, creating multiplane networks based on multidirectional exchange of information [11: pp. 171–186, 14: pp. 1235–1253, 15: pp. 21–29, 16, 17: p. 75]. The concept of open innovation has become a benchmark of success in the contemporary business, as in the times of the weakening ability of companies to single-handedly face challenges, it appears to create a new system of market forces, which, on the one hand, stimulates companies to be more active in their closer and farther environment and, on the other, opens new, previously unknown opportunities for development.

The proposed model of developing the core competencies of a company on the basis of the open innovation is a modified and improved version of Parahalad's and Hamel's proposal. A new, significant element of this model is the supply system, which – based on the analogy to a tree – is supposed to provide indispensable nutrients (chart 1). In order to grow and bear fruit, a tree must draw nutritious components, a large part of which comes from the environment. Likewise, companies must look for their 'supply sources' in their environment, if they want to develop and be competitive. One of such sources is the open innovation concept.

The aggregated opinions of the surveyed managers allowed for identifying a supply system, which consists of four subsystems, each of which is based on the relationship of the company with entities from its environment. These are the following subsystems (Fig. 1).

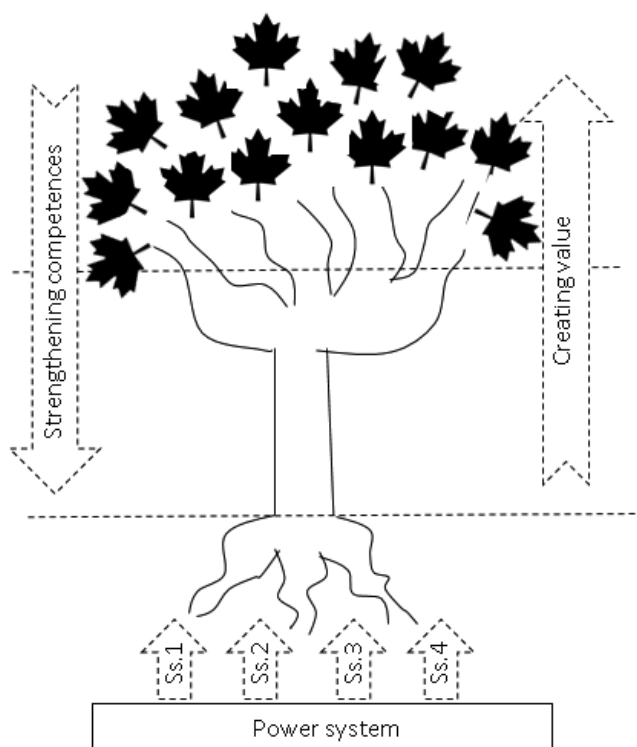


Fig. 1. Model of developing a company's core competences: Ss. 1 – subsystem of communication, Ss. 2 – subsystem of creating or co-creating value, Ss. 3 – subsystem of delivering value and exchange, Ss. 4. – subsystem of monitoring the environment

Subsystem of communication

Each company must communicate with its environment, by sending its own signals and receiving those sent by the entities from its environment. Today, market communication is more complex than ever before, as it is multi-channel, multiplane and multidirectional. These activities are referred to as the hypercommunication and they must be directly correlated to

the marketing strategy [18: p. 40]. Thanks to the feedback a company receives, it broadens its knowledge on new market trends, but also the needs and the expectations of its stakeholders. A part of them can contribute to implementing new innovation, which, as a mixture of new knowledge and actions, strengthens the competitive position of the company.

Subsystem of creating and co-creating value

It should be noted that today many consumers are increasingly active in the co-creation of value. Some researchers even maintain that a company cannot create value on its own – it can only make a proposal, but the real value comes into being only when this proposal is accepted by the customer. Many buyers, especially those representing the Y or Z generations, willingly share their needs and express opinions, which can inspire companies to introduce market innovation, engage in a dialogue, or build a relationship with the consumers [19]. Obviously, a great convenience for both sides is the common use of multimedia communication, both in the area of the mass communication and the individual one. The involvement of consumers in the co-creation of value can be initiated by a company, by encouraging consumers to make proposals for a product improvement, or ideas for a different application of a product – in the case of everyday products – or suggests a public consumption, which is relevant for offers such as artistic or sports event. No matter if in the process of exchange value is created by a company, or co-created with its customers, these are the organization's core competencies that determine the size of the value that can be created. That is why, their role seems to be of a strategic character.

Subsystem of delivering value and exchange

No matter if the value has been created by a company on its own, or in cooperation with the consumers, in compliance with the market principles, it must be delivered in the place and at the time which is most convenient for them. In the course of these processes, material goods, services, money and information are subject to an exchange, but to make that happen, both sides must engage their time and energy. Abundant research conducted into companies proves that trade contacts with the customers are one of the most valuable sources of ideas and innovative improvements and, at the same time, they allow for improving their organizational competencies [20: pp. 11–25, 21: pp. 930–938, 22: pp. 37–48, 23: pp. 198–209, 24: pp. 216–226, 25: pp. 313–324].

Subsystem of monitoring the environment

The intensifying turbulences of the environment are the reason why it requires more attention than before. Changes may be perceived as a threat if they undermine a company's competitive position, but they may also offer new opportunities and challenges. Therefore, the constant monitoring of the environment is an essential element of the strategic activity. For this purpose, companies can employ the method called environmental scanning, which consists in a complex observation of all the aspects of the economic and social life which are important from their point of view [26: pp. 413–432, 27: pp. 30–50].

The observations and the analyses carried out in both the macro and the micro scale serve as a basis for building scenarios of further events and forecasts for the future.

The relational character of the links between a company and its stakeholders opens new, rarely exposed in the literature so far, possibilities of strengthening and developing its core competencies. The greater opening to the customers and the dialogue on their expectations, as well as an immediate recognition of the market trends not only make it easier for a company to respond and adapt to the environment, but they also become a source of knowledge, which results in the development of the company's core competencies.

6. Conclusions

The identification of the external supply sources and confronting them with the organization's needs should become a foundation for creating a system ensuring a constant access to the nutrients that each tree (a company) needs for its development. The identified subsystems indicate the areas in which a company can obtain access to the external sources of competencies, by means of open innovation. This access is conditional on having an expanded network of relationships, both in the organization's sector and outside it. The model presented in the chapter takes a form of a closed system, which includes the mechanism of a company's self-improvement and which is powered from the outside, through the conscious use of the concept of open innovation. Thanks to this concept, a company can improve its core competencies, as well as create higher value for its customers, which directly leads to strengthening its market position.

The considerations presented in the chapter lead us to a conclusion that further research and the exploration of the corporate concepts should rely on the two classic concepts of strategic management, i.e. the resource concept and the network of relationships concept.

References

- [1] Bratnicki M. (2000), *Kompetencje przedsiębiorstwa. Od określenia kompetencji do zbudowania strategii*, Agencja Wydawnicza Placet, Warszawa.
- [2] Gierszewska G., Dąbrowski J. red. (2005), *Strategie przedsiębiorstw a zarządzanie wiedzą*, Wydawnictwo Wyższej Szkoły Przedsiębiorczości i Zarządzania im. Leona Koźmińskiego, Warszawa.
- [3] Lee C., Lee K., Pennings J.M. (2001), *Internal capabilities, external networks, and performance: A study on technology-based ventures*, Strategic Management Journal, vol. 22(6), pp. 615–640.
- [4] Chesbrough H. (2006), *Open Business Models: How to Thrive in the New Innovation Landscape*, Harvard Business School Press, Boston.
- [5] West J., Gallagher S. (2006), *Challenges of Open Innovation: The Paradox of Firm' Investment on Open Source Software*, R&D Management, vol. 36(3), pp. 319–331.
- [6] Sopińska A. (2013), *Otwarte innowacje bazujące na mądrości „tłumu” – podstawa sukcesu współczesnego przedsiębiorstwa*, Zarządzanie i Finanse, r. 11(4), cz. 1, pp. 287–302.

- [7] Chiaromonte F. (2006), *Open innovation through Alliances and Partnership: theory and practice*, International Journal of Technology Management, vol. 33(2–3), pp. 111–114.
- [8] Limański A. (2011), *Rola innowacyjności w budowaniu przewagi konkurencyjnej przedsiębiorstwa w gospodarce opartej na wiedzy*, Nierówności Społeczne a Wzrost Gospodarczy, nr 23, pp. 135–147.
- [9] Hoegl M., Lichtenthaler U., Muethel M. (2011), *Is your company ready for open innovation?* MIT Sloan Management Review, vol. 53(1), pp. 45–48.
- [10] Rangus K. (2017), *Does a firm's open innovation mode matter?* Economic and Business Review for Central and South – Eastern Europe, vol. 19(2), pp. 181–202.
- [11] Usman M., Vanhaverbeke W. (2017), *How start-ups successfully organize and manage open innovation with large companies*, European Journal of Innovation Management, vol. 20(1), pp. 171–186.
- [12] Rangus K. (2017), *The relation between different open innovation practices and firm's innovation performance*, Managing Global Transitions, vol. 15(1), pp. 61–79.
- [13] Prahalad C.K., Hamel G. (1990), *The core competence of the corporation*, Harvard Business Review, vol. 68(3), pp. 79–91.
- [14] Cheng C.C.J., Huizingh E.K.R.E. (2014), *When is open innovation beneficial? The role of strategic orientation*, The Journal of Product Innovation Management, vol. 31(6), pp. 1235–1253.
- [15] Hitchen E.L., Nylund P.A., Ferràs X., Mussons S. (2017), *Social media: Open innovation in SMEs finds new support*, The Journal of Business Strategy, vol. 38(3), pp. 21–29.
- [16] Huizingh E.K.R.E. (2011), *Open innovation: State of the art and future perspectives*, Technovation, vol. 31(1), pp. 2–9.
- [17] Lichtenthaler U. (2011), *Open innovation: Past research, current debates, and future directions*, The Academy of Management Perspectives, vol. 25(1), pp. 75–93.
- [18] Gadzinowski J. (2009), *Era hiperkomunikacji*, Marketing w Praktyce, nr 8, pp. 40–41.
- [19] Boguszewicz-Kreft M. red. (2013), *Trendy i wyzwania współczesnego marketingu*, Wyższa Szkoła Bankowa, Gdańsk; CeDeWu, Warszawa.
- [20] Baran G. (2011), *Potrzeba innowacji zarządzania: Czy współtworzenie wartości wraz z klientami oznacza początek „Zarządzania 2.0”?*, Zarządzanie Publiczne, nr 2(14), pp. 11–25.
- [21] Chesbrough H., Lettl C., Ritter T. (2018), *Value creation and value capture in open innovation*, The Journal of Product Innovation Management, vol. 35(6), pp. 930–938.
- [22] Repovienė R. (2017), *Role of content marketing in a value creation for customer context: Theoretical analysis*, International Journal on Global Business Management & Research, vol. 6(2), pp. 37–48.
- [23] Roberts Ch., Alpert F. (2010), *Total Customer Engagement: Designing and Aligning Key Strategic Elements to Achieve Growth*, Journal of Product & Brand Management, vol. 19(3), pp. 198–209.
- [24] Sobocińska M. (2018), *Perspektywa marketingowa w procesach kreowania innowacji*, Handel Wewnętrzny, 4 (375), t. II, pp. 216–226.

- [25] Światowiec-Szczepańska J. (2016), *Tworzenie i zawłaszczanie wartości na rynku B2B*, *Handel Wewnętrzny*, 4 (363), pp. 313–324.
- [26] Ngamkroekjoti C., Speece M. (2008), *Technology turbulence and environmental scanning in Thai food new product development*, *Asia Pacific of Marketing and Logistics*, vol. 20(4), pp. 413–432.
- [27] Wong H., Hung J. (2012), *Environmental scanning literature – past, present and future research propositions*, *International Journal of Business Environment*, vol. 5(1), pp. 30–50.

CHAPTER 3

Use of Google's Ecosystem to Improve Efficiency of Selected Business Processes

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1. Introduction

Performing an analysis is necessary before implementing any changes in organizations. One of the methods of searching for changing points – improvements and preparing for their implementation, is process analysis [1–3]. It helps to understand the key activities of the organization. It helps to define their terms and their characteristics and also gives opportunity to evaluate their responsibilities for realization of each process.

In the literature, one can find many attempts to define the concept of a process. In the classical approach, Hammer [4: pp. 15–19] defines a process as a set of activities that when they take place in groups, produce a result with value for a customer. Grajewski [5: pp. 106–107] adds that it must be value that the customer is willing to pay for. Davenport [6: p. 5] states that a process is a set of measurable actions that are characterized by structure and were designed for providing a given customer with a specific result or, alternatively, for a specific market. The authors assume that a process is a sequence of chronologically arranged actions initiated by one or several different input events that once implemented generate value added for the client.

The key elements which need to be examined while defining the business processes are [5, 7, 8]:

- the beginning and the end of the process,
- process structure,
- process inputs and outputs,
- suppliers and customers (internal and external clients),
- process owners,
- measurement and assessment tools,
- available resources,
- Key Performance Indicators (KPI),
- process documentation and its course.

When modelling processed in an organization, one should choose a specific standard. In the subject literature, three are most often [5: p. 35–45, 8: pp. 35–45]:

- SIPOC (Suppliers, Inputs, Process, Outputs, Customers – modelling of a customer-oriented process in accordance with the value chain concept;
- ARIS (*Architektur Integrierter Informationssysteme* – architecture of integrated information systems) – focused on building an integrated design and process course data processing system in an organization;
- BPMN (Business Process Model and Notation) – describing business and production processes, most commonly used in Poland and worldwide.

The applied notation allows one to unequivocally represent processes that take place in an organization in a manner that is clear both to individuals who directly carry out the processes, those who manage these processes and IT specialists who implement process changes. The processes illustrated by means of maps constitute a starting point for further analyses. Hence, new process models are formed whose simulation allows one to find areas eligible for a change or indicating quality of the proposed changes [9].

The aim of this chapter is to indicate the possible application of Google ecosystem in testing assumptions adopted in the result of the process simulation. The below-presented approach elaborated on the process analysis methodology proposed in previous studies [9].

2. Methodology of business processes analysis

In the research and during their cooperation with the economy, the authors adopted a process analysis method based on the bottom-up approach. The selected standard was BPMN 2.0 due to its more common usage. This standard is described in ISO/IEC/19510:2013 Information technology – Object Management Group Business Process Model and Notation [10–13].

The conducted studies allowed the authors to create a methodology for improving efficiency of business processes (Fig. 1), which allows for a process analysis of an entire organization or its selected areas to be performed. Each of the presented steps is detailed on a separate map.

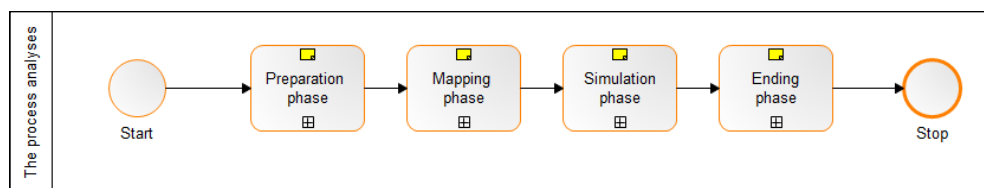


Fig. 1. Methodology of business processes analysis

Source: [9]

The aim of the preparation phase is to gather basic information and prepare guidelines based on which the study is carried out. We build a scenario according to which we will explore the current running process. The AS IS scenario includes, among others, information on the number of people supporting the test process, time resource availability (uptime),

information determining the transaction processes in terms of the amount and time they are supposed to generated.

The mapping phase is divided into two parts: AS IS mapping and TO BE mapping. The aim of AS IS mapping is to reflect the current process flow according to practice of their use and to prepare conclusions which are showing the discrepancies from arrangements with process owner. The aim of TO BE mapping is to show the planned changes and then verifying them in terms of business process correctness and logic.

Simulation phase is also divided into two parts: creating and simulating the AS IS model and creating and simulating the TO BE model. The aim of AS IS simulation is to verify if the map prepared during modeling reflects the real state of the transportation process. Verification with the customer is the AS IS conclusion which leads to further work on the project – target state (TO BE) simulation based on changed scenario of business processes.

The ending phase allows to merge all the elaborations, analysis and simulations into one report. Only after approval of this phase the results are handed to the customer.

Seeking potential changes that will allow the process efficiency to be improved takes place in the mapping and simulation phase. Once a map of the current state of the process is made (AS IS), it should be parametrized and calibrated based on historical data. KPI is determined and measured for the current process. Already at this stage subprocesses emerge, which can be then improved. When creating a map of the desired state of a given process (TO BE) it is worth to consider how many changes can be introduced. When simulating the TO BE process one should introduce changes one by one while monitoring their efficiency (by referring to the previously determined KPI and their base values). Once the effect obtained for the simulated introduction of an individual change is positive, the total efficiency of the proposed changes can be examined. It might be the case that the positive effect is absent for two or more changes (no synergy takes place). The solution that is best for given conditions is obtained iteratively, when the client decides that he has obtained a proper efficiency of the process given the assumed usage of resources.

By collaborating with enterprises, the authors could notice a new application gap. The said gap stems from managers' uncertainty regarding the possibility to implement and obtain the intended effects as a result of the proposed change. The solution to thus defined problem is to prepare a prototype of a change related to information flow, which allows the potential of a given scenario to be verified. This was the reason for expanding the methodology to include another prototyping phase (Fig. 2).

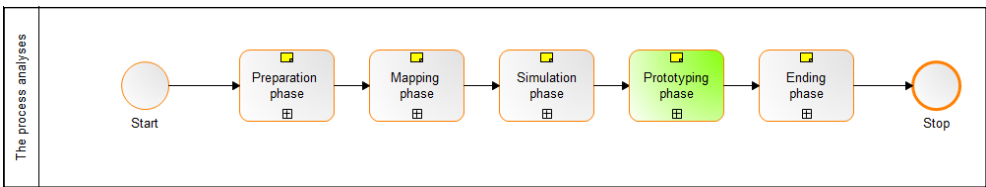


Fig. 2. Expanded methodology of business processes analysis

The prototyping phase was subjected to experimental studies in three selected enterprises. This allowed the authors to create a general model described below.

3. Study results

3.1. Research methodology

The process analyses conducted by the authors in selected organizations allowed them to identify an application gap indicated above. Moreover, no methods or tools were found in the subject literature that would allow this problem to be solved in line with the expectations of business entities (short duration and low costs). Therefore, the research objective was to find a way for quick interception, collection and processing of information on the way to process translations in business processes with due account of cost and temporal limitations they indicated.

For implementing this objective, the methodology specified in Figure 1 was used along with a simulation experiment and the case study method that allowed the authors to verify the efficiency of the indicated tool due to the adoption of Key Process Indicators (KPI).

The research was conducted in 2018. The subject of the research was selected processes from three production company for which a prototype was made using the below-indicated tool. The assumption, and at the same time, the limitation that was adopted is the absence of implementation of the integrated management system in in the analyzed organization.

3.2. Results

The prototypical phase was introduced to the business process analysis methodology before the end phase (cf. Fig. 2). Its aim is to verify the enforceability of implementation of the change proposed in the scenario indicated in the simulation phase and assessment of its potential, which is linked primarily to improving the information flow.

The following indicators (KPI) were determined for process efficiency assessment: process operating time, work time in the process and use of resources. Their choice results from the expert knowledge of the authors of this chapter.

Figure 3 shows the universal process of collecting and processing information in the studied enterprises (the AS IS map).

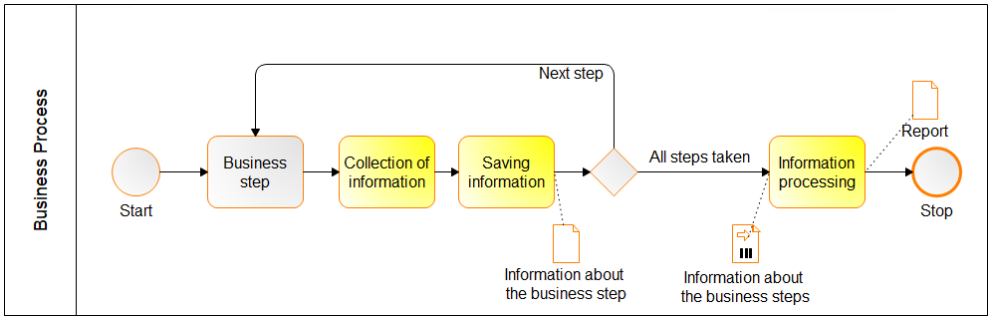


Fig. 3. Universal process of collecting and processing information – AS IS map

The above process map presents the universal business process composed of a sequence of steps (business actions), with each step recorded. In the case of the AS IS process, this is performed in a conventional way.

The tool that allows the preset research objective to be implemented with the indicated limitations on the side of the enterprises is Google ecosystem. It enables quick prototyping of changes related to improving business information processing, since it is generally available, integrated with commonly accessible devices that collect data (smartphones, tablets), easy to adapt and implement owing to the available creators and templates.

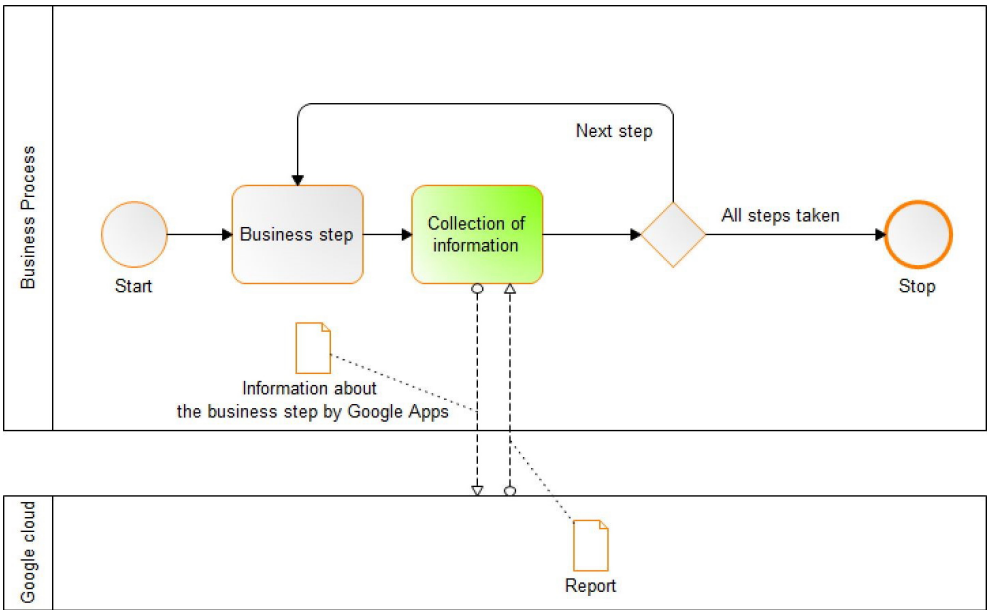


Fig. 4. Target process – TO BE map

The process of target information processing using Google Apps (TO BE map) is presented in Figure 4. Here, an original methodology of comparing business process efficiency using the BPMN 2.0 standard and the simulation experiment conducted in iGrafx 2011 tool was applied. As a result, both processes were compared in accordance with the adopted KPI. The obtained results are presented in Figure 5.

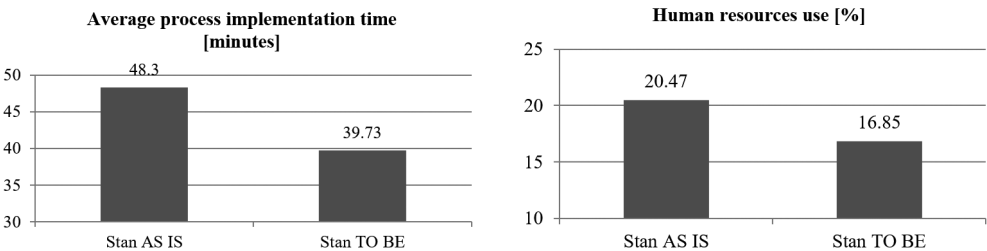


Fig. 5. KPI values in the AS IS and TO BE models

The analysis of the obtained results shows that the target process relieves human resources owing to automatic information processing. Devices used for interception and digitalization of data on the state of individual process transactions. Other KPI show that better results were obtained using Google ecosystem.

4. Conclusions

The proposed solution gap is the use of Google ecosystem. The obtained results positively verified the proposed manner of prototyping a change. The following benefits of the presented approach can be indicated:

- better preparation for the target implementation,
- testing the TO BE model in practice,
- limiting the costs of implementation of changes that satisfy the needs of a given enterprise,
- discovering limitations inaccessible during previous phases of the methodology (e.g. in the simulation phase).

References

- [1] Gabryelczyk R., Rakowska E. (2015), *Pomiar procesów jako element oceny wdrożeń systemów IT w administracji publicznej*, Roczniki Kolegium Analiz Ekonomicznych SGH, nr 36, pp. 205–220.
- [2] Drejewicz S. (2012), *Zrozumieć BPMN. Modelowanie procesów biznesowych*, Wydawnictwo Helion, Gliwice.
- [3] Gawin B., Marcinkowski B. (2013), *Symulacja procesów biznesowych*, Wydawnictwo Helion, Gliwice.
- [4] Hammer M. (1999), *Reinżynieria i jej następstwa*, Wydawnictwo Naukowe PWN, Warszawa.
- [5] Grajewski P. (2007), *Organizacja procesowa*, Polskie Wydawnictwo Ekonomiczne, Warszawa.
- [6] Davenport T.H. (1993), *Process Innovation: Reengineering Work Through Information Technology*. Harvard Business School Press, Boston.
- [7] Stajniak M. (2015), *Mapowanie, modelowanie i symulacja wg teorii BPMN jako doskonalenie procesów transportowych*. Gospodarka Materiałowa i Logistyka, nr 5 (CD), pp. 687–698.
- [8] Trzecieliński S., Adamczyk M., Pawłowski E. (2013), *Procesowa orientacja przedsiębiorstwa*, Wydawnictwo Politechniki Poznańskiej, Poznań.
- [9] Ragin-Skorecka K., Nowak F. (2017), *Analiza procesowa jako narzędzie do usprawnienia działalności organizacji*, Studia i Prace WNEiZ US, nr 48, t. 2. Zarządzanie, pp. 77–88.

- [10] Shapiro R., White S., Bock C. (2011), *BPMN 2.0 Handbook Second Edition: Methods, Concepts, Case Studies and Standards in Business Process Modeling Notation*, Future Strategies Inc., USA.
- [11] Silver B. (2011), *BPMN Method and Style with BPMN Implementer's Guide*. Cody-Cassidy Press, USA.
- [12] White S., Miers D. (2008), *BPMN Modeling and Reference Guide. Understanding and using BPMN*, Future Strategies Inc., USA.
- [13] Briol P. (2010), *BPMN 2.0 Distilled*, Lulu Enterprises, USA.

CHAPTER 4

Beginning of Digital Transformation in Service Company Through Implementation of Lead Method – Case Study Analysis

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1. Introduction

The focus of every company is on customer acquisition. Along with the development of the economic use of the Internet, companies have received a new sales channel (e-commerce). However, a typical Internet sales model is not suitable for every company. That is why the Lead method was used. This method consists in initiating contact with the enterprise by a person interested in purchasing a given good or service, by sending contact details, sales data, etc. In turn, in order to respond professionally to the demand, the company has to implement appropriate technological, organizational, marketing solutions.

The Lead method was known before the Internet era. However, ICT technologies have given new opportunities to use the mentioned method, which results from the ease of establishing and maintaining contact, the possibility of multi-criteria, extended in time digital data processing and virtually no costs on the part of the potential customer.

The use of the Lead method is in line with the wider trend of digital transformation that organizations are currently undergoing. This trend generally speaking consists in transferring professional and private activities to virtual space. Due to its multidisciplinary nature, the discussed method is a good example of digital transformation.

2. Digital transformation

The World Economic Forum defines the digital transformation as a change in the way of life, work and functioning of the society in the conditions of continuous access to Internet resources [1]. The quoted definition seems a bit vague and too wide. However, it reflects the entry of information and communication technologies (ICT) into virtually every aspect of modern life: both in professional and personal; at the same time in private as well as

institutional level; through various types of organizations (administration, enterprises, and non-profit organizations). Nevertheless, it is worth noting that the most comprehensive digital transformation is examined in the area of companies [2].

Advances in digital digitalization are related to the advantages of ICT: ease of searching, obtaining and processing information and its integration (useful results), universal and cheap communication, compression of time to reach information and its utilization, automation of specific routine activities (algorithms) and non-routine (artificial intelligence), creating new business models and new sources of income.

On the other hand, the digitization trend encounters numerous barriers, such as: legacy technologies, lack of talent, lack of collaboration on data and analytics, lack of entrepreneurial spirit, willingness to take risks [3].

3. Lead method

The Lead method consists in initiating contact with the enterprise by a person interested in purchasing a given good or service, by sending contact details, sales data, etc. In turn, in order to respond professionally to the demand, the company has to implement appropriate system (integrated technological, organizational, marketing solutions).

The Lead method was known before the Internet era. However, ICT technologies have given new opportunities to use the mentioned method, which results from the ease of establishing and maintaining contact, the possibility of multi-criteria, extended in time digital data processing and virtually no costs on the part of the potential customer.

The Lead method based on a sales lead, which is qualified data of a potential client, who [4]:

- is interested in buying a given product or service,
- for which the functions and parameters of a given product (even if initially known only) are satisfactory,
- can afford to buy a good or service,
- expressed interest in receiving feedback from the company.

Looking through the prism of the sales process, the lead is generated by a client who is almost determined to finalize the purchase, in accordance with the sales funnel framework [5]:

1. Suspect – the potential buyer that seller is aware of,
2. Prospect – suspect who meet the predefined criteria,
3. Lead – prospect who is qualified to be contacted,
4. Client – lead who bought a good or service.

From the point of view of the company using the Lead method, the whole process includes lead generation, lead capture, lead allocation, lead cracking and trading, lead utilization [6].

4. Research design

For the purpose of this chapter, the research problem was formulated as follows: evaluation of difficulties in the digital transformation process manifested in the implementation of the Lead method. The aim of the study is twofold. Firstly: show of beginnings of the

digital transformation in the service company, occurring thanks to the implementation of Lead method. Secondly, an analysis of the reasons for the failure to implement the Lead method.

The research method used in the chapter is a case study. A case study is a reasonable method of conducting research when the purpose of the research is to find answers to questions “how” or “why”, as well as analyzing current events [7]. A case study is a particularly desirable method of research in the situation of searching for failures [8].

Interview with the managers of the surveyed company as well as participant observation were applied research techniques. The study took place in 2018.

No permission was received to disclose the name of the company under investigation. The company has been operating since 2005. Currently, it is a large enterprise. The field of the commercial activity is to receive the full amount of compensation from the insurer on behalf of aggrieved person. The company operates in the success fee model – it earns only when compensation is obtained from the insurance company. The company has an agency sales model – the external network of agents deals with searching for potential customers and signing contracts with them. The company has not yet acquired customers via the Internet, nor has it had experience with the Lead method. The effectiveness of core business is declining, which has become an incentive to look for new ways of acquiring a client (ROE: 39.9% in 2016 vs. 12.4% in 2017; ROS: 12.9% in 2016 vs. 3.45% in 2017).

5. Pilot implementation of Lead method in surveyed service company

The company in question is not the only one in the sector to claim the full amount of compensation. Although it is one of the largest compensation companies in Poland, since 2017 it has started to feel a decrease in demand. As a result of competition, the market has saturated. At that moment an external firm specializing in gaining customers in accord with the Lead method appeared. The management of the surveyed company decided to launch a pilot implementation of the Lead method.

The objectives of the implementation were as follows:

- increase in sales – leads are treated as a potential source of inflow of new customers,
- having an additional customer acquisition channel for the agency sales network,
- sales support in the difficult process of searching for new customers in an increasingly saturated and competitive market.

The quantitative dimension of success was determined. It was assumed that thanks to the implementation of the Lead method, after a 6-month implementation period, the number of contracts signed with customers will increase by 15%.

Three organizational units took part in the implementation: IT department, sales department (to be more precise, the section dealing with field agents) and marketing department. Each of the above-mentioned cells had a specific task to do, which in total was to contribute to the full implementation of the objectives.

The IT department was given the task of analyzing, preparing the process and then building or purchasing an IT tool (system) that would provide support for the entire lead flow process in the company.

Task set for the IT department:

- taking lead from a partner (an external company specializing in getting a lead),
- handing it over to the relevant agent who is closest to the place where the customer is located,
- notifying the agent about sending the lead,
- enabling the agent to report on the effectiveness of customer acquisition.

Tasks set for the marketing department:

- training of the partner on the company's products,
- preparing questions with the scope of answers in the needs forms and forwarding them to the partner,
- supervision of the budget to be spent on lead system,
- comparison of the costs of acquiring customers through the Lead method in relation to the previous costs of acquiring a customer.

Tasks set for the sales department:

- supervision over the process of transferring leads to field agents,
- defining the rules for assigning leads to agent and adherence to the developed rules,
- ensuring that agents handle lead as quickly as possible (contact the customer within 24 hours),
- collecting information from agents on the effectiveness of lead.

The IT department of the analyzed company during the pilot implementation based the distribution of data collected in the lead in the form of a classic e-mail (exchange data between the partner and the agent, as well as sales department and agents). The IT department roughly verified the needs related to the lead processing process, i.e. did not do a thorough analysis of the amount of data that is contained in one lead. Meanwhile, the scope of information was quite significant (contact details, sales preferences, description of the event). The IT department also did not verify that the lead must have a very fast circulation. Lead must reach the agent within 24 hours, otherwise the potential customer will most likely take advantage of the competition offer and will no longer be interested in the company's offer.

During the pilot implementation, the marketing department stated that it could not control the budget related to lead acquisition expenses, and even less compare it with the hitherto cost of acquiring a potential customer, because it never counted what are the customer acquired costs. This was a consequence of the fact that the marketing department has been dealing with PR in general rather than acquiring new clients. During the implementation of the Lead method, the mentioned department did not develop competencies related to customer acquisition on the Internet.

The sales department at the company's headquarters was not able to quickly distribute leads to agents, nor was it able to match the customer's location to the appropriate agent in a geographically correct manner. It also failed to collect reasonably complete feedback from agents. On the other hand, agents in the field were not trained in the use of leads method and did not know how quickly they should contact the customer. The agents also did not know

that the company pays for data set contained in leads and that it is a cost-creating component for company. As a result, they did not handle leads with due diligence, nor did they attach any importance to quick contact, many of them did not handle lead at all, not believing in their effectiveness.

The pilot implementation of the Lead method did not reach its intended objectives. The planned efficiency of acquiring new customers was to amount to 15%, and in fact it reached 3.33%. The idea of supporting the agency network was also unsuccessful.

The company's management drew conclusions from the unsuccessful implementation. In the organizational layer:

- Marketing department was liquidated and all persons employed in it were fired.
- IT department was moved away from support of leads flow. IT support for the acquisition, processing and distribution of leads has completely passed into the hands of the partner.
- A dedicated sales group was created to service leads, with customer service standards other than before and with another sales process (direct sales). The agents' access to leads was also completely cut off.

6. Conclusions

The presented implementation of the Lead method failed. However, the results were encouraging enough that the management board approved the continuation of implementation, based on a specialized external company. The presented example indicates that only cooperation with an external agency can make decision-makers aware of the need for organizational and business changes triggered by digital transformation [9].

The following causes of failure can be indicated:

- lack of awareness of the complexity of implementation of the Lead method, resulting from the need to engage in several areas of the company's operations;
- lack of adequate management, coordination and organizational competences;
- believing in the ability to act in accordance with existing patterns (especially the IT department);
- misunderstanding the essence and conditions of the Lead method among agents (lack of proper training and motivators before and during the pilot);
- little involvement of top management in promoting the Lead method across organization.

This requires more extensive research, but based on this case the key to the success of the Lead method implementation is the determination of the management board, the willingness to develop appropriate competences among employees and the identification and involvement of a company specializing in the use of the Lead method.

The case study also proves that the digital transition is a complex process that requires commitment and resources. As well as it requires the development of appropriate competences, and this means that the barriers to the implementation of digital transformation are more embedded in human resources than technical (IT) resources.

References

- [1] World Economic Forum (2018), *Digital Transformation Initiative*, World Economic Forum White Paper.
- [2] Nadeem A., Abedin B., Cerpa N., Chew E. (2018), *Digital transformation & digital business strategy in electronic commerce-the role of organizational capabilities*, Journal of Theoretical and Applied Electronic Commerce Research, vol. 13(2), pp. I–VIII.
- [3] Eggers W. D., Bellman J. (2015), *The journey to government's digital transformation*, Deloitte University Press.
- [4] Jolson M.A. (1988), *Qualifying sales leads: the tight and loose approaches*, Industrial Marketing Management, vol. 17(3), pp. 189–196.
- [5] Järvinen J., Taiminen H. (2016), *Harnessing marketing automation for B2B content marketing*, Industrial Marketing Management, vol. 54, pp. 164–175.
- [6] Saxena H., Sarda E. (2016), *An Agent Based Approach for Lead Management System in Banking Sector*, International Journal on Recent and Innovation Trends in Computing and Communication, vol. 4(6), pp. 653–658.
- [7] Yin R.K. (2009), *Case study research: Design and methods (applied social research methods)*, Sage, London and Singapore.
- [8] Boodhoo R., Purmessur R.D. (2009), *Justifications for qualitative research in organisations: a step forward*, The Journal of Online Education (New York), January 2009, available at SSRN: <https://ssrn.com/abstract=1325607> [access: 29.12.2018].
- [9] Kuruzovich J. (2013), *Sales technologies, sales force management, and online intermediaries*, Journal of Personal Selling & Sales Management, vol. 33(2), pp. 211–224.

CHAPTER 5

The Use of IT Systems in Processes of Knowledge Diffusion within an Organization

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1. Knowledge management and technology

The review of the available studies and theories discussing key barriers in sharing knowledge, has shown that most of their authors pointed out among others barriers of a technical nature or problems at the point of contact between the man and technology. The aspect of the used technologies is an inherent element of the definition of knowledge management. Ahmed describes it as „merging of organizational processes, information processing technologies, organizational strategies and culture for the enhanced management and leverage of human knowledge and learning to the benefit of the company” and at the same time he points to the need for synergy of technology and human creativity, aligned with the organizations strategy in order for business benefits to occur [1]. On the other hand, in the context of knowledge management – it is technology that is considered as one of the most significant barriers in knowledge sharing. Anderas Riege outlines three main types of barriers to effective knowledge management: individual, organizational and technological. Among technological barriers to knowledge sharing, Riege lists the following ones:

- lack of integration of IT systems and processes impedes on the way people do things;
- lack of technical support (internal and external) and immediate maintenance of integrated IT systems obstructs work routines and communication flows;
- unrealistic expectations of employees as to what technology can do and cannot do;
- lack of compatibility between diverse IT systems and processes;
- mismatch between individuals’ need requirements and integrated IT systems and processes restrict sharing practices;
- reluctance to use IT systems due to lack of familiarity and experience with them;
- lack of training regarding employee familiarization of new IT systems and processes;
- lack of communication and demonstration of all advantages of any new system over existing ones [2].

In turn, B.P. Sharma and M.D. Singh [3] distinguished the lack or poor infrastructure facilitating knowledge sharing and lack of integration of IT systems among technological barriers restricting or preventing knowledge sharing within an organization.

The same problem is also pointed out by practitioners (dealing with project management, for example), who imply that the solutions applied by organizations may „impose technological barriers when they obstruct work routines and communication flows because: they don’t integrate with other systems or because they are not compatible; there is a lack of immediate technical support and maintenance; they don’t respond to the expectations of the employees; or people don’t know how, when, and why they should use each of them” [4].

Technological barriers seen as one of crucial obstacles in the process of knowledge management were also mentioned by the respondents in the study conducted by one of the authors of the present chapter [5]. The variety of solutions, which are at the disposal of practically every organization, does not automatically mean that they are going to be used in an appropriate way [6–9]. One of the purposes of the analysis, therefore, was to provide recommendations based on the experience of middle managers employed by knowledge-based organizations:

- establishing what objectives are in fact going to be achieved thanks to new solutions;
- accurate analysis of needed tools- which of them are going to be relevant to the planned objectives (in terms of technology, costs and usage);
- making sure that the present infrastructure allows for the implementation, maintenance and development (compatibility, possibilities concerning systems integration);
- suitable (user friendly, user experience) adaptation of the functions (excessive number of often useless functions, which may even distract users or cause fear and reluctance), and indication of real capabilities of the system application (including upgrades) to eliminate unrealistic expectations;
- training (on-the-job, functional, procedural) and making users believe (motivation) they can effectively apply the applications;
- ensuring full support by IT specialists (helpdesk, support) [5].

2. IT systems and knowledge management

A. Jashapara [7] identified five most important functions, which should be secured by IT systems managing knowledge: **organization, identification, valuation, sharing as well as storage and presentation of knowledge** (Tab. 1).

Table 1. Selected IT tools in knowledge management

Category	Characteristics
Knowledge organization tools	<p>Ontologies – formalized description of a fragment of reality used to structure corporate knowledge of higher level. In a simplified form they may take a form of a Category tree tool (catalogue).</p> <p>Knowledge maps – result of cataloguing logical elements presented in a visual form.</p> <p>Taxonomies – classification of certain field of knowledge into logical elements in the hierarchical form</p>

Table 1. cont.

Knowledge identification tools	<p>Text data processing tools – search the databases desired by the user for documents and include automatic indexation and prioritization.</p> <p>ERM Systems (Employee Relationships Management) – elements of a corporate platform (nowadays seen as a general tool for knowledge management, which integrates available systems and applications and provides an access to a range of information and data). A particular feature of ERM is a personalized access to technological infrastructure and knowledge resources that is necessary (or just useful) for their work.</p> <p>Agent software/systems – a function of up-to-date recording and analysis of all available data, which then will be used by the user to make the optimal choice.</p> <p>AI – Artificial intelligence – independent and self-learning systems used in much more broader extent, replacing humans even in the decision-making process through the use of many parallel and distributed applications</p>
Knowledge valuation tools	<p>Data mining – a process based on statistical analysis or elements of probabilistic reasoning that allows to explore data warehouses and databases in order to access the most valuable knowledge.</p> <p>ES (Expert Systems) – systems based on relevant expertise and algorithms exploring databases which are automatically interpreted</p>
Knowledge sharing tools	<p>Network – the term refers both to the Internet but also local internal networks (intranet); it is the most important system used by enterprises (in the process of knowledge management) to share knowledge.</p> <p>E-mail and instant messengers – allow ongoing exchange of information, transfer of files to one person or whole group of people with the possibility to view history of messages. Programs offer a much wider range of functions such as calendar management, planning and labelling tasks, etc.</p> <p>Forums as well as newsgroups – allow people to exchange information and ideas and are public but may also be restricted to the selected user group.</p> <p>Tele and video-conferences – allow two-way (or more) communication in real time.</p> <p>Bulletins, subscriptions and newsletters – their role is to provide the user with dedicated knowledge.</p> <p>Functionalities of the following programs are used to share knowledge ERM (system for employees), Workflow (circulation of documents and work) and systems for customer relations management CRM/KCRM (Customer Relationships Management/Knowledge base Customer Relationships Management).</p> <p>Knowledge Network – knowledge bases co-created by its users. It is a platform for exchanging experiences, inquires and proposals for solutions to the problems.</p> <p>E-learning/distance learning (LMS Learning Management System) – the so-called distance education, which is of great importance for dissemination of knowledge through the use of IT solutions</p>

Table 1. cont.

Category	Characteristics
Knowledge storage and presentation tools	<p>Public folders – used for files sharing.</p> <p>Repositories and databases – used to storage of enterprise related data including numerical, graphical and text data.</p> <p>Data warehouses – (usually in read-only mode), is a system used for storing current and historical enterprise data/knowledge.</p> <p>Document Management System – allow us to archive, present (edition), organize and search for electronic documents.</p> <p>Best Practices Base – a set of standards and rules for proceedings formulated based on good practices and solutions.</p> <p>Case Base – refer to certain problematic situations experienced in specific projects.</p> <p>Bussines Intelligence (BI) Tools, generate reports from available data, present most important indicators of the company’s current activity in graphical form, provide best solutions</p>

Source: own elaboration based on [8–10]

3. Conclusions

Nowadays it is difficult to imagine in practice that one can manage organizational knowledge effectively without using modern IT systems. However, in order to fully benefit from all the capabilities offered by various applications, we should first focus on the most significant barrier to knowledge diffusion – workers’ unwillingness and resistance to share knowledge. It is also worth remembering that precise procedures and advanced technologies indeed effectively support and ensure the transfer of only one component of knowledge – the one known as *explicit knowledge*. A greater challenge, however, is to capture *tacit knowledge*, which constitutes a far broader and more valuable field that an organization potentially has at its disposal [11].

References

- [1] Ahmed K.P., Lim K.K., Loh A.Y.E. (2002), *Learning through Knowledge Management*, Butterworth-Heinemann, Oxford.
- [2] Riege A. (2005), *Three-dozen knowledge-sharing barriers managers must consider*, Journal of Knowledge Management, vol. 9(3), pp. 18–35.
- [3] Sharma B.P., Singh M.D. (2015), *Modeling the Knowledge Sharing Barriers: An ISM Approach*, International Journal of Knowledge-Based Organizations, vol. 5(1), pp. 16–33.
- [4] Martínez Sanz M. (2016), *Overcoming knowledge-sharing barriers*, paper presented at PMI® Global Congress 2016 – EMEA, Barcelona, Spain. Newtown Square, PA: Project Management Institute.

- [5] Ziółkowski S. (2017), *Bariery dla transferu wiedzy wewnątrz organizacji*, Studia Ekonomiczne – Zeszyty Naukowe Wydziałowe Uniwersytetu Ekonomicznego w Katowicach, nr 322, pp. 243–255.
- [6] Benbya H., Passiante G., Belbaly N.A. (2004), *Corporate portal: a tool for knowledge management synchronization*, International Journal of Information Management, vol. 24 (3), pp. 201–220.
- [7] Jashapara A. (2006), *Zarządzanie wiedzą – zintegrowane podejście*, Polskie Wydawnictwo Ekonomiczne, Warszawa.
- [8] Solska H. (2010), *Zarządzanie wiedzą*, in: S. Wrycza (red.), *Informatyka ekonomiczna: podręcznik akademicki*, Polskie Wydawnictwo Ekonomiczne, Warszawa, pp. 457–469.
- [9] Kłak M. (2010), *Zarządzanie wiedzą we współczesnym przedsiębiorstwie*, Kieleckie Towarzystwo Edukacji Ekonomicznej, Kielce.
- [10] Michalik K. (2012), *Inżynieria wiedzy i systemy ekspertowe w zarządzaniu wiedzą i wspomaganiu decyzji biznesowych*, Zarządzanie i Finanse, r. 10(1), cz. 3, pp. 569–579.
- [11] Nonaka I., Takeuchi H. (2000), *Kreowanie wiedzy w organizacji*, Poltext, Warszawa.

CHAPTER 6

Adoption of Project Management Methodologies in Polish IT Companies

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1. Introduction

Polish enterprises working in the ICT sector account for 7.6% of the total EU market. In the years 2009–2014, the Polish ICT sector recorded an 8.64% average annual growth, which is one the best results in Europe. At the same time the number of the companies working in the sector increased by 10.1%, the majority of whom are the companies providing IT services and applications [1]. Continuous development of the sector leads to an increase in the number of projects and employees in IT companies, which entails the necessity of adopting project management methodologies, or at least some techniques to their daily operational practice.

Despite the importance of this issue, which is one of the major determinants of the further, intensive development of the sector, there is virtually no research on project management methodologies and techniques used in Polish IT companies. Single research examples can be found, for example, in some industrial reports. One of them [2], on a sample of 50 companies, shows that 76% of the surveyed companies use agile and techniques (such as Scrum or Extreme Programming), and 57% use traditional methodologies and techniques (waterfall approach). Simultaneously, according to the survey, in 70% of the companies have employees who hold the Project Management Professional certificate, while not much fewer employ some people with Scrum Master certificate. This seemingly could be a sign of the company's high awareness of the approach to project management.

The presented chapter, based on a broader and more detailed questionnaire survey, presents how it looks in small and medium enterprises located in Małopolska (region of Poland) – one of the most important regions in terms of the number of companies and the number of employees for the Polish IT sector.

2. Traditional and agile IT project methodologies

Traditionally, the IT sector used a so-called waterfall approach for managing projects related to software development. This approach was firstly described by Winston W. Royce in 1970 [3] and is not a methodology per se, still, it defines the technique of creating an IT project step by step, which means starting from system requirements and analysis, through software design and coding, to its testing and maintenance. In 1975, one of the first software development methodologies called PROMPT (Project Resource Organisation Management Planning Technique) has been developed by a private company called Simpact Systems Ltd in UK for IT projects. On the basis of its successor (PROMPT II) UK government, in 1989 a new technology was derived: it was called PRINCE (PProjects IN Controlled Environments) firstly for IT projects and then, especially the extended PRINCE2 version introduced in 1996, it has become a universal project management methodology for all types of projects. In the same year the first addition of Project Management Body of Knowledge (PMBOK) was published by the Project Management Institute (PMI). Contrary to the PRINCE2, it's not a complete methodology; it is a set of best code of conduct. Nevertheless, it became a widely accepted project management standard all over the world.

The traditional approach to software development has been criticized by Royce himself for the lack of feedback between consecutive stages, and later by many other authors, mostly emphasizing that customers usually do not know precisely what they want, so they cannot specify their exact needs to the software company. Even when the analysts were eventually able to collect all the requirements, we could not avoid human error [4].

In the mid '90s, different lightweight methods have been proposed for software development in order to overcome the disadvantages of the waterfall approach. They were – for instance – Dynamic systems development method (DSDM) by DSDM Consortium (1994), Scrum by Jeff Sutherland and Ken Schwaber (1995), Crystal Clear by Alistair Cockburn and eXtreme Programming (XP) by Ken Beck (1996) and Feature Driven Development (FDD) by Jeff De Luca (1997). All those methods and many others, such as Lean Software Development (LSD) or Test-Driven Development (TDD) are referred to as agile methodologies.

Since then, agile methodologies are implemented to many IT companies around the world. According to the newest State of Agile report [5] 97% of the organizations asked practice some agile development methods. However, only 25% of them indicated that the agile approach is used by all of their teams, while 46% of them use agile only for less than half of their software development teams. Among all the agile methodologies, Scrum is by far most popular and was used by 56% organizations, and including hybrids like Scrumban and Scrum/XP this number grows to 70%. Similar values are presented in the State of Scrum 2017–2018 report [6] based on the survey conducted among 2000 active Scrum and Agile practitioners. 94% of the questioned companies use Scrum in their agile practice: 76% together with other approaches, and 18% as the only software development methodology.

Regarding the knowledge of agile methods, an interesting survey was conducted online in 2012 [6]. Among 377 responders, 19% of them indicated a very extensive knowledge of agile methods, 38% indicated an extensive knowledge, while 30% an average knowledge. The remaining responders indicated only a limited (9%) or a very limited knowledge (4%). The majority of agile organizations reported an extensive knowledge (32%) of agile methods,

while companies using only traditional software development methods reported usually an average knowledge on agile (13%).

There are no similar data for Polish companies, except for some reports concerning the whole IT industry, mentioned in the Introduction. In [7] authors surveyed 27 companies for the level of adoption of all Scrum methods and techniques, while in [8] authors basing on 60 questionnaires discussed determinants of using agile methodologies in Polish IT companies.

3. Project management in Polish IT sector – survey study

The described research covers the knowledge and use of various methodologies (with a particular emphasis on agile methodologies) in enterprises operating in the IT sector. It is based on the data collected in the survey carried out for the purposes of the diploma thesis at the Faculty of Management of the AGH University of Science and Technology in Kraków, Poland [9]. The companies, with their headquarters or branch in Kraków (Małopolska – region of Poland), were selected for research. The study was conducted using the computer-assisted personal interview (CAPI) method in 2018. The survey, which was the key part of the study, included questions such as:

- basic information about the company in which the respondents are employed,
- subjective opinions of respondents about the degree of their use of a given methodology or technique in the project management process.

61 people employed as project managers took part in the survey. Almost half of the respondents (30 people) worked in large enterprises (more than 250 people). Other respondents worked in medium, small or micro enterprises.

The respondents were asked to assess the degree of their use of a given project methodology or technique (including Kanban and Critical Path Method – CPM) in ongoing projects. To assess the degree of use of the methodologies or techniques, an interval scale with values from 1 (no use of any methods from a given methodology) to 5 (using the methodology in all activities related to the project) was used. An additional possibility of an answer was introduced, in which the respondent could indicate that they did not know the given methodology or technique (in this case they could not assess the degree of use of the given methodology).

In the further part of the study, the adopted scale of the use assessments of a given methodology has been scaled up on a three-priced scale:

- low – for grades 1 and 2,
- medium – for rating 3,
- high – for grades 4 and 5.

The described rescaling was aimed at reducing the degree of uncertainty of the results obtained, related to the ability of the respondents to perceive the values 1 and 2 as well as 4 and 5 as very similar to each other. The proposed rescaling was based on the center point (value 3), which in the authors' opinion is a good reference point for the remaining results.

In the Figure 1 the percentage of respondents declaring a given degree of use for each methodology is presented. It should be noted that only the people who did not declare that they do not know the methodology were able to mark the degree of its use. The percentage of people who did not declare a lack of knowledge of a given methodology was marked with a continuous line.

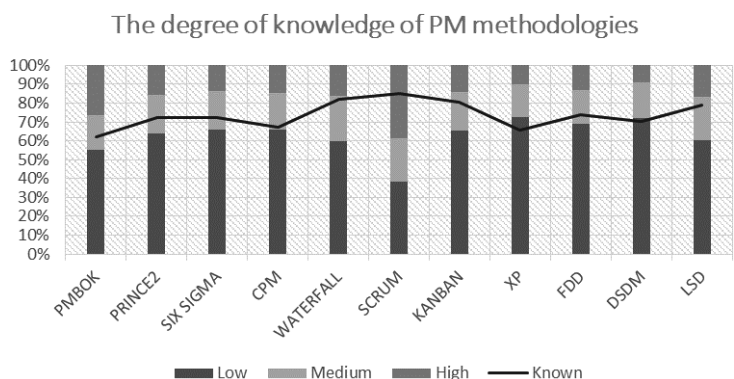


Fig. 1. Assessment of the usage degree of a given methodology by project managers

Source of data: [9]

Basing on the presented results, it can be concluded that the fewest people declare knowledge of the PMBOK methodology, while the most people know Scrum. It is worth noting that nearly two in five people declaring knowledge of Scrum believe that they use Scrum in a high degree to manage projects. However, the PMBOK methodology, the knowledge of which it is declared by the smallest number of respondents, is in the second place in terms of the percentage of people using PMBOK to a high degree. Every fourth person declaring the knowledge of PMBOK uses this methodology to a high degree. Comparing the traditional methodologies (the first five methodologies in Figure 1) with agile methodologies, a small difference in the declared knowledge of the methodologies will be obtained in favor of agile methodologies (71% to 76% for agile). In terms of the usage degree of methodologies, the average percentage of people using the methodology from a given group (traditional or agile) to a high degree is similar for both groups and amounts to approximately 17%.

In Figures 2 and 3 the assessment of the use of methodologies in micro, small and medium (Fig. 2) and in large enterprises (Fig. 3) has been compared.

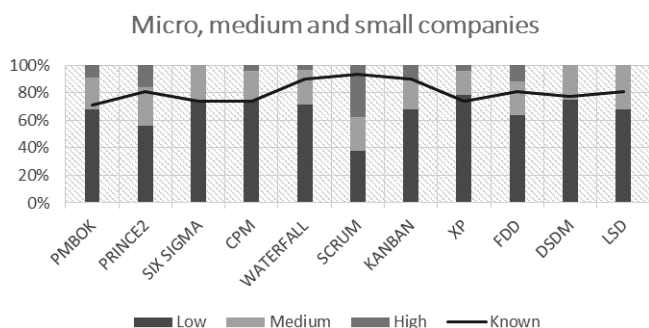


Fig. 2. Evaluation of usage degree of a given methodology by project managers in micro, small and medium-sized enterprises

Source of data: [9]

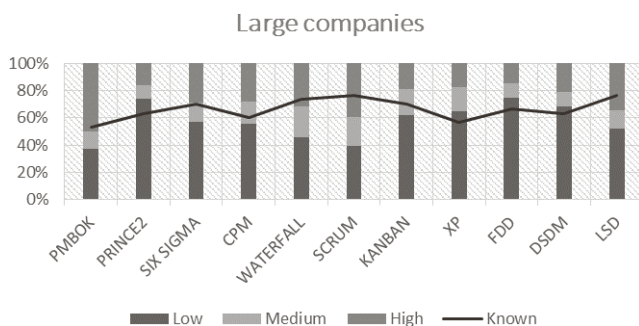


Fig. 3. Evaluation of usage degree of a given methodology by project managers in large enterprises

Source of data: [9]

In the presented chart, in terms of the size of the enterprise in which the PM researcher works, a significant difference in the results is visible. In large enterprises, project managers much more often decided to say that they do not know a given methodology than among PMs from smaller enterprises. On the other hand, managers working in smaller enterprises less frequently declared on average a high usage degree of a given methodology. In the case of as many as 6 methodologies, only a maximum of one PM from smaller enterprises indicated a high degree of use of a given methodology. In the case of three methodologies (PRINCE2, Scrum and FDD), the percentage of people using a given methodology to a high degree (among people declaring knowledge of them) is similar. In other cases, the percentage of PMs in large enterprises is significantly higher. An extreme example here is the PMBOK methodology, which in large enterprises is used to a large extent by half of project managers who declare knowledge of this methodology.

4. Conclusions

On the basis of the presented research, it can be concluded that Scrum is the best-known project management methodology among PMs working in IT companies located in Małopolska (region of Poland). In enterprises employing over 250 people, only PMBOK is characterized by a higher percentage of high-level utilization. It is also worth noting that in large enterprises much more people have decided to admit that they do not know a given methodology (on average, every third respondent did not know a given methodology) than in the case of smaller enterprises (on average, every fifth respondent did not know a given methodology). In both considered groups of enterprises, the use of Scrum in the high degree is almost equal – nearly 2 out of 5 PM declares using Scrum in a high degree.

Among smaller enterprises, declarations of a high degree usage of other methodologies should be treated as isolated exceptions. Definitely more people declaring the high-level usage of methodologies can be found in large companies. The traditional methodology (PMBOK, PRINCE2) is more often used in large enterprises than the agile methodologies. Interestingly, in the medium level traditional methodologies are on average just as often used as agile methodologies. This proportion is maintained irrespective of the size of the company in question.

References

- [1] *Growth Perspectives for Polish ICT Sector by 2025* (2017), Polish Agency for Enterprise Development (PARP).
- [2] *IT Services Market 2015 in Poland* (2015), ABSL.
- [3] Winston R. (1970), *Managing the Development of Large Software Systems*, in: *Proceedings of IEEE WESCON, 26 August 1970*, Los Angeles, pp. 1–9.
- [4] Parnas D.L., Clements P.C. (1986), *A rational design process: How and why to fake it*, *Software Engineering*, IEEE Transactions, vol. SE-12 (2), pp. 251–257.
- [5] *12th Annual State of Agile report* (2018), VersionOne.
- [6] Papatheocharouse E., Andreou A.S. (2013), *Evidence of Agile Adoption in Software Organizations: An Empirical Survey*, in: F. McCaffery, R.V. O'Connor, R. Messnarz (eds.), *Systems, Software and Services Process Improvement: 20th European Conference, EuroSPI 2013, Dundalk, Ireland, June 25–27, 2013. Proceedings*, Communications in Computer and Information Science, vol. 364, Springer, pp. 237–246.
- [7] Ćwiklicki M., Włodarek T. (2010), *Metodyka Scrum w Polsce w świetle badań*, *Nauka i Gospodarka*, nr 3(6), pp. 6–11.
- [8] Wirkus M., Zejer P. (2017), *Uwarunkowania zastosowania metodyk zwinnych w przedsiębiorstwie*, *Zeszyty Naukowe. Organizacja i Zarządzanie. Politechnika Śląska*, z. 114, pp. 569–582.
- [9] Korżyk J. (2018), *Analiza wykorzystania metodyk zarządzania projektami w firmach IT działających na terenie Krakowa* (ang. *Analysis of the use of project management methodologies in IT companies operating in Kraków*), Akademia Górniczo-Hutnicza, Kraków [unpublished diploma thesis].

CHAPTER 7

Nonlinear Hicks Model with Cubic Investment Function

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1. Introduction

In economics, there is a great interest in the use of nonlinear deterministic models. The main reason is that a nonlinear deterministic model may exhibit stable periodic, aperiodic and chaotic behavior, and hence may provide an endogenous explanation of the periodicity and irregularity observed in economic data.

The original model proposed by Paul Samuelson [1] in 1939 is a linear one and can generate cyclical change. Due to the linearity, it can only produce exponentially explosive or damped amplitudes. According to Hicks, only the explosive case is interesting. Hicks [2] in 1950 modified the Samuelson model through introducing two constraints and modelled investment function as piecewise linear function with upper and lower bounds. As an alternative Richard Goodwin suggested that the upper bound and the lower bound could be approached asymptotically by a hyperbolic tangent type investment function. Both modifications of the investment function can be approximated by linear-cubic Taylor series expansion. Investment function of this type was proposed by Tõnu Puu in [3]. This cubic investment function is a symmetric function with respect to the origin, to break this symmetry and get a more generic model Sushko, Puu and Gardini [4] added an even order quadratic term. Such cubic non-symmetric investment function will be used in this chapter. This form of the investment function is a generalization of the model described in [5].

In this chapter, it was introduced a new (nonlinear) rule for consumption. This modification extends the model described in [4]. After this modification we are able to answer the following question: What happens if (due to statistical, observational, or expectational influences) the actual realization of a standard behavioral assumption slightly diverges from theoretical ideal? The proposed model is represented by a two dimensional, nonlinear first order dynamical system.

The equilibria was determined and investigate their local asymptotic stability. Either simple or complex dynamics can occur around an equilibrium. In addition to an asymptotically stable equilibrium, unstable fluctuations can occur. Violation of stability conditions lead to the pitchfork or flip bifurcation. The global behavior of the economy is analyzed numerically. The bifurcation diagrams and localize those values were presented, for which the system indicates chaotic or complex behavior, and analytical results whenever it is possible and numerical simulations of the more interesting occurrences.

2. Model

Proposed model is built on multiplier and accelerator. Current consumption C_t is a non-linear increasing function of previous period's income Y_{t-1} :

$$C_t = C_a + (1-s)Y_{t-1}^\alpha, \quad 0 < s < 1 \quad (1)$$

with C_a an autonomous consumption and s proportion of income which is saved. Parameter $\alpha > 0$ is close to one. Such modification of the consumption function allows us to analyze what happens if (due to statistical, observational, or expectational influences) the actual realization of a standard behavioral assumption slightly diverges from theoretical ideal. Investments are partly autonomous and independent of the business cycle, denoted I_a , and partly induced with acceleration coefficient v :

$$I_t = I_a + v\left((Y_{t-1} - Y_{t-2}) + b(Y_{t-1} - Y_{t-2})^2 - (Y_{t-1} - Y_{t-2})^3\right), \quad v > 0 \quad (2)$$

National income identity is given by:

$$Y_t = C_t + I_t + G_t \quad (3)$$

where $G_t = G_a > 0$ represents constant autonomous government spending.

Equations (1)–(3) form a complete nonlinear version of the Hicksian model. Eliminating C_t and I_t we get the single second order nonlinear difference equation:

$$Y_t = (1-s)Y_{t-1}^\alpha + v\left((Y_{t-1} - Y_{t-2}) + b(Y_{t-1} - Y_{t-2})^2 - (Y_{t-1} - Y_{t-2})^3\right) + I_a + C_a + G_a \quad (4)$$

For the analysis, an auxiliary variable $X_t = Y_{t-1}$ is introduced and a first-order system in (Y_t, X_t) is derived:

$$\begin{cases} Y_t = (1-s)Y_{t-1}^\alpha + v\left((Y_{t-1} - Y_{t-2}) + b(Y_{t-1} - Y_{t-2})^2 - (Y_{t-1} - Y_{t-2})^3\right) + I_a + C_a + G_a \\ X_t = Y_{t-1} \end{cases} \quad (5)$$

To describe the dynamics of the model introduced above it is necessary to study the behavior of trajectories of a two-dimensional map $F: R^2 \rightarrow R^2$ given by:

$$F(y, x) = \begin{cases} (1-s)y^\alpha + v\left((y-x) + b(y-x)^2 - (y-x)^3\right) + I_a + C_a + G_a \\ y \end{cases} \quad (6)$$

3. Equilibria

The dynamical system (6) is nonlinear and at the beginning of the analysis it necessary to determine the number of equilibria for this system. Equilibria, sometimes called critical points, are fixed points of the map F . Fixed points satisfy the equation:

$$F(y_*, x_*) = (y_*, x_*)$$

which is equivalent to the following system of algebraic equations:

$$\begin{cases} (1-s)y_*^\alpha = y_* - (I_a + C_a + G_a) \\ x_* = y_* \end{cases} \quad (7)$$

Finally, to determine equilibrium points of the F map, it is necessary to find all real roots of the following equation:

$$(1-s)y_*^\alpha = y_* - (I_a + C_a + G_a) \quad (8)$$

Number of equilibria depends on total autonomous expenditure, proportion of income which is saved and parameter alpha. The above equation will be analyzed graphically. Figure 1 shows graphs of both sides of the above equation, assuming that $0 < \alpha < 1$. Left-hand side of (8) is a concave increasing function starting at the origin and right-hand side of (8) is linear function with positive slope. In this case there is only one and positive solution, for all admissible values of s and total autonomous expenditures.

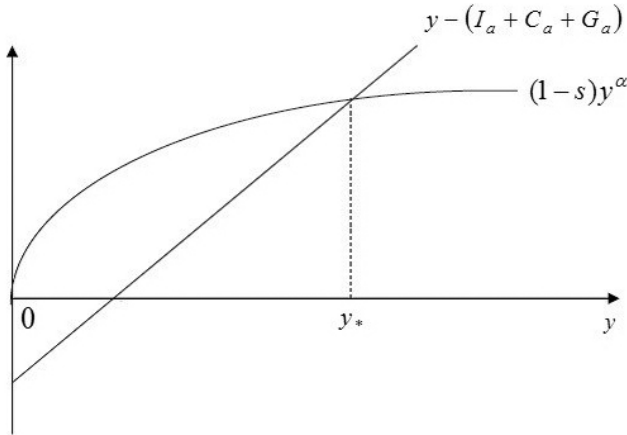


Fig. 1. Existence of the equilibrium for $0 < \alpha < 1$

Figure 2 shows graphs of both sides of the above equation, assuming that $1 < \alpha$. Left hand side of (8) is a convex increasing function starting at the origin and right-hand side of (8) is linear function with positive slope. In this case equation (8) can have zero, one or two solutions, it means that the straight line is disjoint, tangent or intersects the graph of $(1-s)y^\alpha$.

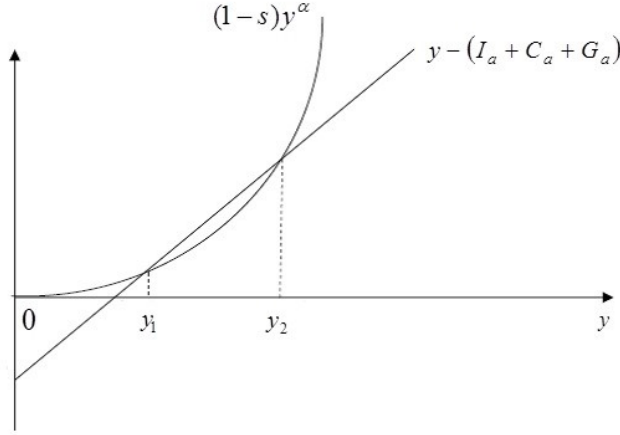


Fig. 2. Existence of the equilibria for $1 < \alpha$

Corollary 1

Proposed model has unique positive equilibrium $E(y, y)$ such that $y > (1 - s)^{1/(1-\alpha)}$ for $0 < \alpha < 1$, $0 < s < 1$, $0 < v$, I_a, C_a, G_a and $b \in \mathbb{R}$.

Corollary 2

Let us assume that $\alpha > 1$. Proposed model has no equilibrium for $I_a + C_a + G_a > [1/(1-s)\alpha]^{1/(\alpha-1)}(1-1/\alpha)$, one positive equilibrium $E(y, y)$, such that $y = [1/(1-s)\alpha]^{1/(\alpha-1)}$, if $I_a + C_a + G_a = [1/(1-s)\alpha]^{1/(\alpha-1)}(1-1/\alpha)$ and two equilibria $E_1(y_1, y_1)$, $E_1(y_2, y_2)$, such that $y_1 < [1/(1-s)\alpha]^{1/(\alpha-1)} < y_2$, when $0 < I_a + C_a + G_a < [1/(1-s)\alpha]^{1/(\alpha-1)}(1-1/\alpha)$.

4. Local dynamics. Stability

The next step in the qualitative analysis of the proposed model is to determine the conditions that exogenous variables must meet to make the equilibrium locally asymptotically stable. The stability of the equilibrium depends on the eigenvalues of the Jacobian matrix of the map F . Jacobian of (6) is given by:

$$J(y, x) = \begin{bmatrix} (1-s)\alpha y^{\alpha-1} + v + 2vb(y-x) - 3v(y-x)^2 & -v - 2vb(y-x) + 3(y-x)^2 \\ 1 & 0 \end{bmatrix} \quad (9)$$

Let us now consider local stability of the unique positive equilibrium E when $0 < \alpha < 1$. Evaluating the Jacobian matrix at $E(y, y)$ with $y > (1 - s)^{1/(1-\alpha)}$, we get:

$$J(E) = \begin{bmatrix} (1-s)\alpha y^{\alpha-1} + v & -v \\ 1 & 0 \end{bmatrix},$$

Therefore, we get:

$$Tr J(E) = (1-s)\alpha y^{\alpha-1} + v,$$

$$Det J(E) = v.$$

Keeping in mind that stability of equilibrium requires that the following conditions be met:

$$\begin{aligned} (i) \quad & 1 + Tr J(E) + Det J(E) > 0 \\ (ii) \quad & 1 - Tr J(E) + Det J(E) > 0 \\ (iii) \quad & 1 - Det J(E) > 0 \end{aligned} \tag{10}$$

it is possible now to define the so-called stability region, that is, the set of values of all parameters for which equilibrium is locally asymptotically stable. Trace and determinant of the Jacobian matrix $J(E)$ are positive, so the first condition (i) in (10) is satisfied trivially. Second condition (ii) is equivalent to, which is satisfied because $0 < \alpha < 1$ and $y > (1-s)^{1/(1-\alpha)}$. The last stability condition (iii) is fulfilled if $0 < v < 1$.

Corollary 3

If $0 < \alpha < 1$ and $0 < v < 1$ then unique positive equilibrium E of the proposed model is stable.

Let us now consider stability properties of the two equilibria $E_1(y_1, y_1)$, $E_1(y_2, y_2)$ of the model when $\alpha > 1$ and $0 < I_a + C_a + G_a < [1/(1-s)\alpha]^{1/(\alpha-1)}(1-1/\alpha)$. Evaluating the Jacobian matrix at $E(y_i, y_i)$ with $y_1 < [1/(1-s)\alpha]^{1/(\alpha-1)} < y_2$, we get:

$$J(E_i) = \begin{bmatrix} (1-s)\alpha y_i^{\alpha-1} + v & -v \\ 1 & 0 \end{bmatrix}.$$

Trace and determinant are given by:

$$Tr J(E_i) = (1-s)\alpha y_i^{\alpha-1} + v,$$

$$Det J(E_i) = v.$$

Trace and determinant of the Jacobian matrix $J(E_i)$ are positive, so the first condition (i) in (10) is satisfied trivially. Additionally, trace satisfies $Tr J(E_1) < 1 + v < Tr J(E_2)$ and condition (ii) is fulfilled for E_1 and not satisfied for E_2 ($1 - Tr J(E_2) + \det J(E_2) = 1 + v - Tr J(E_2) < 0$). Third stability condition in (10) is satisfied if $0 < v < 1$.

Corollary 4

If $\alpha > 1$ and $0 < I_a + C_a + G_a < [1/(1-s)\alpha]^{1/(\alpha-1)}(1-1/\alpha)$ then equilibrium E_2 is unstable and E_1 is stable for $0 < v < 1$.

5. Global dynamics and bifurcations

One fundamental characteristics of a complex dynamical system is the possibility of order and chaos, which can exist either separately or simultaneously. In an ordered dynamical system, for arbitrary initial conditions, after going through a transient period the system approaches a periodic behavior with a predictable periodicity. In contrast, a chaotic dynamical system exhibits behavior that depends sensitively on the initial conditions, and long-term prediction is impossible. Chaotic motion is sensitive to initial conditions. Its measure is the largest Lyapunov exponent, which is the exponential rate of divergence of nearby orbits in phase space. Theoretically, the Lyapunov exponent is negative for systems with stable fixed points or stable cycles and positive for chaos.

Before discussing loss of stability and local bifurcation, we need to recapitulate some elementary notions in bifurcation theory necessary in the remainder of this chapter. The term bifurcation describes a quantitative change in the orbit structure of a dynamical system, as one of the parameters on which it depends is changed slightly.

For the map F , a stable fixed point loses its stability through a saddle-node bifurcation when, changing the bifurcation parameter (chosen exogeneous variable), an eigenvalue of the Jacobian matrix goes through plus one and additional transversality conditions are satisfied. The bifurcation leads to the appearance of a pair of stable fixed points.

For the map F , a stable fixed point loses its stability through a Neimark–Sacker bifurcation when, changing the bifurcation parameter, the modulus of a pair of complex conjugate eigenvalues of the Jacobian matrix crosses the unit circle, all of the other eigenvalues remaining inside the circle. Under certain, non-resonance conditions, which we assume to hold here, loss of stability of the fixed-point leads to the emergence of an invariant circle on which the dynamics can be periodic or quasi-periodic.

The discussion of numerical simulations is concentrated on the effects of changing two parameters α and b which are used to extend models in [5] and [1] respectively. Figure 3 shows bifurcation diagrams w.r.t α and b , with other parameters fixed at $s = 0.3$, $v = 1.4$, $I_a + C_a + G_a = 2$, $b = 0.5$ for α bifurcation diagram and for b bifurcation diagram at $s = 0.3$, $v = 1.6$, $\alpha = 1.03$, $I_a + C_a + G_a = 2$. When $\alpha = 1$ the proposed model is the same as in [4] and behaves chaotically, the largest Lyapunov exponent is positive (Fig. 4). Erratic or chaotic solutions in the sense of Li and Yorke are highly unstable and prediction horizon is limited. This complex and irregular behavior disappears when linear consumption function is slightly perturbed. For $\alpha < 0.997$ and $\alpha > 1.004$ the proposed model has stable periodic trajectories and is predictable in the long-run. When $b = 0$ the proposed model is the same as in [5] and behaves quasi-periodically. This quasi-periodic behavior is resistant to perturbation of parameter b , this type of dynamics is for b from -0.1 to 0.1 . To get stable periodic trajectories parameter b must be chosen from the following set $(-0.29, -0.1) \cup (0.1, 0.25)$. It is possible to use these two parameters to control dynamics of the model and avoid erratic or chaotic behavior of national income.

Figure 5 shows the development of the national income, the time path for the initial condition, for 250 observations for two different values of parameter b . Fluctuations in economic activity are quite complicated in both cases. We can find almost no regularity in the timing and duration of booms ($b = 0.7$) and recessions ($b = -0.77$). National income may remain below its long-run equilibrium value for some time ($b = -0.77$), and then suddenly switches

and remain above its long-run equilibrium for certain period. When $b = 0.7$ national income oscillates above its long-run equilibrium with variable amplitude and period, and from time to time national income turns back to the lower value below long-run equilibrium. We observe irregularly occurring downturns and upturns. During recessions and booms erratic movements are observed. Thus, the proposed model is able to model endogenous business cycles with some limitations. It is necessary to change parameter b to model the behavior of national income during recessions and booms and this is a weakness of the proposed model and a suggestion for future work, to build a model which will be able to model dynamics of the national income for a one value of parameter b .

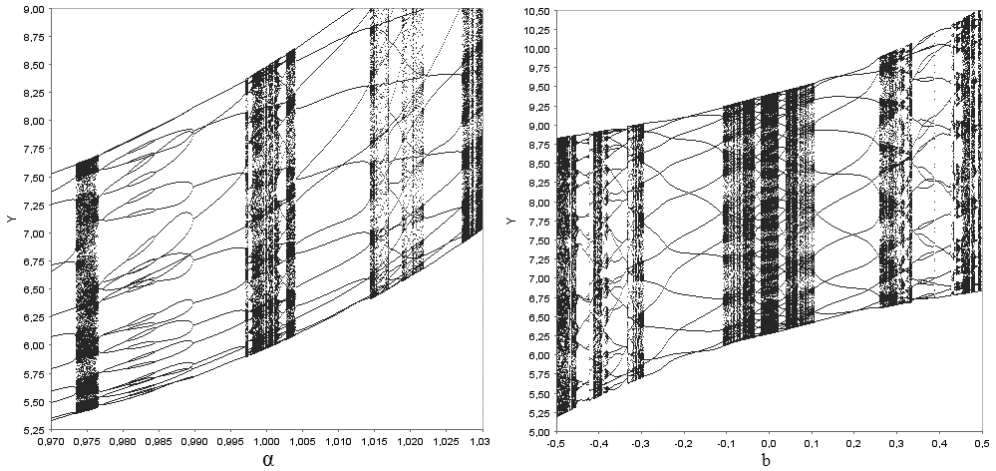


Fig. 3. Bifurcation diagrams

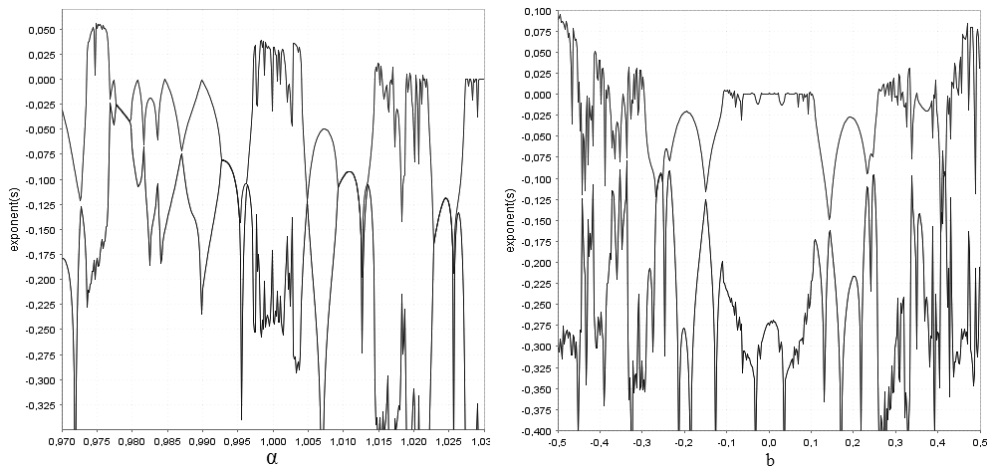


Fig. 4. Lyapunov exponents

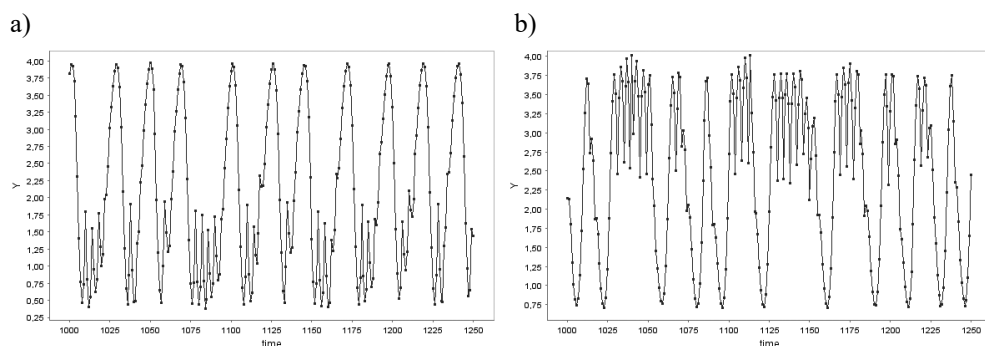


Fig. 5. National income trajectories: a) $b = -0.77$; b) $b = 0.7$

6. Conclusions

Proposed nonlinear model of the business cycle has none, one or two equilibrium points. With the proposed nonlinear model local stability of a fixed point may be lost while global stability continues in the form of convergence to periodic, quasi-periodic or chaotic attractors. Introducing a non-linear rule for consumption into the Goodwin-type model proposed by Gardini, Puu and Sushko [4] enormously increases the potential complexity of its dynamics. The effect of variations of parameters on stability as well as on the degree of complexity of the dynamics of the system need not be monotonic. Moreover, proposed model produces sustained and intricate fluctuations in economic activity for realistic values of the propensity to save comparing to the model in [4].

References

- [1] Hicks J.R. (1950), *A contribution to the theory of the trade cycle*, Oxford University Press.
- [2] Goodwin R.M. (1951), *The nonlinear accelerator and the persistence of business cycles*, *Econometrica*, vol. 19, pp. 1–17.
- [3] Puu T. (2003), *Attractors, bifurcations, & chaos*. Springer-Verlag Berlin Heidelberg.
- [4] Sushko I., Puu T., Gardini L. (2006), *A Goodwin-Type Model with Cubic Investment Function*, in: T. Puu, I. Sushko (eds.), *Business Cycle Dynamics: Models and Tools*, Springer Science & Business Media, pp. 299–316.
- [5] Kruszewski R. (2016), *Atraktory okresowe, quasi-okresowe i chaotyczne w nieliniowym modelu Hicksa*. *Studia i Prace WNEiZ US*, nr 44, t. 2, pp. 191–208.

CHAPTER 8

Impact of Fiscal Instruments on Investments of Industrial Enterprises in Poland

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1. Introduction

The concept of market failures is well known in the literature. On the basis, many governments, also in Poland, implement various support programs for companies, particularly small and medium-sized enterprises (SMEs). Fiscal instruments are among them. However, their impact on is not clear. Moreover, there is a question of the delay between implementing of an instrument and the adjustment of companies.

There are some researches which seek to assess the impact of fiscal instruments on enterprises. Most of them were done, however, for other than Poland countries. In case of Polish research, the methods of analysis were usually quite simple, so the results need to be verified by more advanced statistical tools. Only few authors decided to focus on the delay which is inevitable in public policy. They suggest that it could be even up to one year but this should be tested, too. Therefore, there are some research gaps in the literature. Their explanation is of great importance not only for researchers but also for politicians responsible for public policy. However, the industrial enterprises need more investments than companies which offer services. In connection to this, the aim of the chapter is to analyze the impact of the value growth of fiscal instruments and its delay on the increase in the level of investments of industrial enterprises in Poland in the years 2003–2016.

The chapter is organized as follows. First the literature review was done and hypotheses was presented. In the third section the process of statistical analyses was shown. The conclusions were presented in the end of the chapter.

2. Literature review and hypotheses

First, the pros and cons for fiscal instruments were discussed. Then, research which encompass the assessment of their impact were analyzed. The research gaps and hypotheses were shown in the end of the section.

The fiscal instruments are criticized by some authors. M. Sosnowski states that the delay between the diagnosis of economy and preparing the appropriate tools of public policy is too long. When the incentives¹ are ready to implement, the economic circumstances could change so dramatically that these instruments are no longer necessary. Moreover, tax breaks and allowances for one group of companies means that the other group of enterprises, which are not beneficiaries, have to pay more taxes. This could discourage them to invest in new projects [1]. Moreover, R. Barczyk finds that the effectiveness of fiscal instruments can be connected with the phase of the economic development. Implementing new tax breaks during depression may not convince companies to invest more. However, such instruments could be effective during recovery of economy [2]. Another problem is the issue of targeting. There are some companies which do not intend to grow and create new jobs. Such enterprises decrease the effectiveness of tax reliefs [3]. Moreover, the companies which are on early stages of development usually do not have enough profit to utilize tax breaks [4]. Some authors state also that too many tax allowances or breaks can complicate the fiscal system [3, 5]. In connection to this, some countries of the European Union decided to eliminate such instruments in order to simplify the tax system and make it neutral. E. Pohulak-Żołędowska believes that it could be more beneficial to enterprises than offer of many tax instruments [5]. The International Monetary Fund also recommends to lower taxes and implement more beneficial depreciation than using various fiscal breaks [1].

Other authors are but the advocates of tax incentives, particularly for research and development (R&D) investments. They argue that it is quite simple to implement these instruments through the existing fiscal system. Moreover, it implies low costs both for companies and authorities. The treasury does not have to gather funds for spending like for grants because the fiscal instruments only lower the revenues to budget [4, 6]. Such instruments are also more accessible for companies and do not require the decision of the appropriate authorities [6]. J. Freeman argues that these incentives are particularly justified for SMEs because of the regressive nature of burdens on these companies, including tax ones. Moreover, losses bear more heavily on SMEs than on large enterprises. The most important reason could be, however, that SMEs create many benefits to economy and, therefore, they should be supported by government [3].

Some authors try to assess the impact of fiscal instruments on R&D investments. First of all, as Ortega et al. states, fiscal instruments are tools of research and development policy so it should be complemented with other kind of policies [7]. However, M. Stepień finds that in Poland the value of tax breaks for R&D activities have decreased in the last years, what constraints the benefits for enterprises. Moreover, the accounting regulations are not clear what makes more difficult to use such incentives [8]. A. Żabiński states also that only few types of R&D investments are the subject of tax breaks what discourage many companies to use them [9]. As the result, as P. Nowak states, the fiscal instruments in Poland do not particularly motivate enterprises to such investments. The problem is connected also with the fact that for many years tax incentives were intended only for acquiring new technologies instead investing in R&D activities [4].

However, there are also research that encompass the impact of fiscal instruments on various kind of investments. Banghan and Mohnen research enterprises in Quebec. They argue

¹ The terms: instruments and incentives are used in the chapter as synonymous.

that there was a deadweight loss but rather for large companies than SMEs [10]. Therefore, Hamid et al. determine the key factors of successful utilization of tax instruments for manufacturing sector in Malesia with logistic approach. They also state that governance of companies has a significant impact of the ability of SMEs to effectively utilize fiscal incentives [11]. Manzo researches companies in Italy. He finds that productivity is more sensitive to changes of the corporate tax, particularly in small and young enterprises. The findings suggest also that accelerator models of tax-policy do not have significant impact on the value of investments of incorporated enterprises [12]. There are also some researches in Poland. Woźniak and Lisowski suggest that there is a significant relationship between most of the fiscal instruments and the value of investments in industrial SMEs. However, the correlations could be random [13]. This could be associated with other problems – Polish tax regulations have been quite often changed and, moreover, they are sometimes not transparent [14]. T. Grabia states also that there are two type of delay in realization of support instruments, including fiscal incentives. The first one is connected with administrative and legal issues and could be even more than one year. The second one is associated with the adjustment of companies themselves and may be up to 12 months [15].

Although there are rationale for and against fiscal instruments, the authors do not intend to solve this question. However, they believe that if many governments offer various tax incentives for enterprises, it is important to assess their impact. The findings of research are inconclusive. Moreover, there is dearth of results based on advanced statistical methods for Poland. There is also a question of the delay from implementing of fiscal incentives to adjustments of companies. Such research gaps make that the authors decided to set and verify the following hypotheses:

The growth of the value of the fiscal instruments the previous year have a positive impact on the increase in the level of the investments of micro, small, medium and large-sized industrial companies.

3. Statistical analysis

In order to make analysis, the following data for the years 2003–2016 were collected:

- the levels of investment in industry [16] – 3 explanatory variables – for:
 - IM – investments in micro and small enterprises (up to 49 employees),
 - IS – investments in medium-sized enterprises (50–249 employees),
 - ID – investments in large enterprises (250 and more employees);
- the values of utilized tax instruments [17] – 11 potential explanatory variables – for:
 - a. Personal Income Tax (PIT):
 - SSE-PIT – special economic zones,
 - WNT-PIT – expenses for acquisitions of new technology,
 - SLU-PIT – settlement of losses from previous years according to the general tax scale,
 - SLU-PIT19 – settlement of losses from previous years according to the flat tax;
 - b. Corporate Income Tax (CIT):
 - ZUZ-CIT – exemptions for companies with foreign shareholders,
 - SSE-CIT – special economic zones,

- SSEOLD-CIT – special economic zones, previous regulations,
- SSESUM-CIT – the sum of SSE-CIT and SSEOLD-CIT,
- SLU-CIT – settlement of losses from previous years,
- WNT-CIT – expenses for acquisitions of new technology,
- OWI-CIT – for investment expenditures.

Data presented in this chapter concern the industrial companies from the following sections: mining and quarrying; manufacturing; electricity, gas, steam and air conditioning supply as well as water supply, sewerage, waste management and remediation activities [16]. The investments are defined as financial or tangible outlays for the creation of new fixed assets or the improvement (rebuilding, enlargement, reconstruction or modernization) of existing capital asset items, as well as outlays on so-called initial investments [16]. The data selected for the study cover the years 2003–2016, however, due to their availability and changes in tax law, some of the time series are shorter. For example, data from WNT-PIT cover only the years 2007–2015. Therefore, the used tests are characterized by low power. The results of the conducted research should be treated only as information. The calculations were carried out using the *Gretl* program.

The first step of the study was the verification of the stationarity of the time series. Therefore, we did both the trend analysis and the ADF test. On this basis, we can state that all data should be considered as non-stationary except for SSE-PIT and OWI-CIT. Therefore, in the further study OWI-CIT and SSE-PIT were used as well as the growth of the following variables: IM, IS, ID, WNT-PIT, SLU-PIT, SLU-PIT19, ZUZ-CIT, SSE-CIT, SSEOLD-CIT, SSESUM-CIT, SLU-CIT, WNT-CIT (now designated with the prefix “d_”).

The preliminary assessment of the causal relationship was calculated by using cross-correlations between past values of potential explanatory variables delayed by 1 year and the level of investment in industry. In case of data which have the maximum length of 13 observations, the correlation coefficients with the absolute value higher than 0.55 can be considered as significant. This value only exists between d_WNT-CIT₋₁ (where “-1” means a delayed variable by 1 year) and d_ID. When testing such relationships between variables from two years ago, none of them can be considered as significant.

In order to finally verify the causal relationship between the amounts of used tax instruments and the level of investments in industry we used Granger causality. These dependencies were only examined for the pairs of analyzed variables, taking 2 as the maximum order of delay due to the small number of data. The number of lags in VAR model was selected on the basis of information criteria AIC and BIC.

Table 1 presents the results of the causal relationships between the considered variables. However, it presents only pairs where Granger causality is significant at least at the 10% level. In line with the aim of the chapter we considered only causality from fiscal instruments. They are listed in the first column. If a causal relationship is found, information on the selected delay in the used VAR model and the *p*-value in the non-causality test were provided.

The causal impact on the level growth of investment can only be found in SSE-CIT, SSEOLD-CIT, SSESUM-CIT and SLU-CIT. However, the past values of the increase of each of these variables have a significant impact on the change of investment in only one group of enterprises. Moreover, the SSESUM-CIT variable is the sum of SSE-CIT and SSEOLD-CIT variables (d_SSESUM-CIT respectively is the sum of d_SSE-CIT and d_SSEOLD-CIT variables).

Table 1. Causal dependencies between growth of value of tax incentives and increase in level of investments in industrial enterprises

	d_IM	d_IS	d_ID
d_SSE-CIT	–	–	VAR (1), <i>p</i> -value = 0.061
d_SSEOLD-CIT	VAR (1), <i>p</i> -value = 0.048	–	–
d_SSESUM-CIT	–	–	VAR (1), <i>p</i> -value = 0.043
d_SLU-CIT	–	VAR (1), <i>p</i> -value = 0.067	–

It should be noted that all of statistically significant dependencies based on the analysis of the VAR model with one delay so from the previous year. The extension of the model with data from two years ago makes that the examined causal relationships become insignificant. This means that changes in the level of investment in industry depend on the value of tax instruments only used in the previous year. Moreover, the signs of coefficients used are of great importance. In all models listed in the table, the values of these coefficients were positive. We can state that changes in the amount of used tax instruments the previous year had a positive impact on changes in the level of investment in industry.

4. Conclusions

In the chapter we set the following hypotheses:

The growth of the value of the fiscal instruments the previous year have a positive impact on the increase in the level of the investments of micro, small, medium and large-sized industrial companies.

The results of the statistical analysis support the hypotheses in the following parts:

- Changes in the value of income tax exemption (based on the CIT regulations) obtained by companies in special economic zones the previous year have a positive impact on the growth of investments in large companies.
- Changes in the value of income tax exemption (in 2003–2005 based on the previous CIT regulations) obtained by companies in special economic zones the previous year have a positive impact on the growth of investments in small enterprises.
- The total of income tax exemption (regardless of the legal basis) obtained by companies in special economic zones the previous year has a positive impact on the growth of investments in large enterprises.
- Changes in the value of losses in previous years deducted by companies from income in a given year have a positive impact on the growth of investments in medium-sized enterprises in the next year. Taking into account the construction of the relief, one can state that the change in the level of investments is influenced by deductible losses incurred from two to six years earlier. Unfortunately, it is difficult to say what the cause is.

Both the rules of deducting losses (an enterprise can deduct losses from the same source of revenue for 5 consecutive years and no more than 50% loss from each year) and the reasons for the loss do not allow to explain the issue. The loss may result from low income or high costs without being able to determine what kind of costs it is. A depreciation may be example of that cost, which in turn can indicate a high level of investment expenditures in the current year or previous years. However, the rules for depreciation of fixed assets are also not the same for all taxpayers. For example, the one-off *de minimis* depreciation for so-called “small taxpayers” (with annual sales below EUR 1.2 million – including VAT) can encompass not only micro and small-sized enterprises but even some medium-sized companies.

The chapter has also the following constraints:

- Data on investments broken down by size of enterprises are available from the year 2004. Earlier data would require additional access to the Statistical Office.
- Data on the value of used tax instruments are available from the year 2000 for PIT and from the year 2003 for CIT. Earlier data would require additional access to the Ministry of Finance. In addition, there is not always a homogeneity of the presented data, for example income tax exemption in special economic zones.
- Polish tax regulations often have been changed. Some incentives are introduced, others are significantly modified or eliminated. For example, tax relief for the acquisition of new technologies was introduced in the year 2006 and replaced by a fiscal break for research and development in 2016. Data for these two incentives are not comparable.

As the analyzed time series are relatively short, the results of analyzes can be treated only for information purposes. Moreover, there is not any causality between the values of various tax instruments or changes of their values and changes in the level of investment in small, medium or large-sized enterprises. In connection to the above, more studies are required.

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References

- [1] Sosnowski M. (2005), *Podatkowe instrumenty a rozwój przedsiębiorczości*, in: D. Kopycińska (red.), *Funkcjonowanie gospodarki polskiej w warunkach integracji i globalizacji*, Wydawnictwo Naukowe Katedry Mikroekonomii Uniwersytetu Szczecińskiego, Szczecin, pp. 177–186.
- [2] Barczyk R. (2005), Wpływ dyskrejonalnych instrumentów polityki fiskalnej na zmiany aktywności gospodarczej, in: D. Kopycińska (red.), *Funkcjonowanie gospodarki polskiej w warunkach integracji i globalizacji*, Wydawnictwo Naukowe Katedry Mikroekonomii Uniwersytetu Szczecińskiego, Szczecin, pp. 96–112.

- [3] Freeman J. (2003), *Small business taxation: Policy issues and the UK*, in: N. Warren (ed.), *Taxing Small Business: Developing Good Tax Policies*, Australian Tax Research Foundation, pp. 13–43.
- [4] Nowak P. (2014), *Preferencje podatkowe dla innowacyjnych przedsiębiorstw*, Prace Komisji Geografii Przemysłu Polskiego Towarzystwa Geograficznego, nr 28, pp. 162–183.
- [5] Pohulak-Żołędowska E. (2005), *Zastosowanie ulg i zwolnień w podatkach dochodowych a rozwój MSP-ocena, prezentacja wyników badań*, in: D. Kopycińska (red.), *Funkcjonowanie gospodarki polskiej w warunkach integracji i globalizacji*, Wydawnictwo Naukowe Katedry Mikroekonomii Uniwersytetu Szczecińskiego, Szczecin, pp. 155–166.
- [6] Trandafir A., Ristea L. (2014), *R&D Tax Relief in the European Union*, Economics, Management and Financial Markets, vol. 9(1), pp. 431–439.
- [7] Ortega-Argilés R., Vivarelli M., Voigt P. (2009), *R&D in SMEs: a paradox?*, Small Business Economics, vol. 33(1), pp. 3–11.
- [8] Stępień M. (2016), *Zarządzanie podatkami w aspekcie ulgi na nowe technologie*, Finanse, Rynki Finansowe, Ubezpieczenia, nr 5(83), pp. 141–149.
- [9] Żabiński A. (2016), *Rola systemu podatkowego w procesie zwiększania innowacyjności polskich przedsiębiorstw*, Finanse, Rynki Finansowe, Ubezpieczenia, nr 5(83), pp. 65–76.
- [10] Baghana R., Mohnen P. (2009), *Effectiveness of R&D tax incentives in small and large enterprises in Québec*, Small Business Economics, vol. 33(1), pp. 91–107.
- [11] Hamid N.A., Noor R.M., Zain M.M. (2011), *Factors affecting SMEs successful utilization of tax incentives in manufacturing sectors*, Malaysian Accounting Review, vol. 10(1), pp. 1–16.
- [12] Manzo M. (2011), *Corporate Taxation and SMEs: The Italian Experience: The Italian Experience*, OECD Taxation Working Papers, 6, OECD Publishing, Paris.
- [13] Woźniak M., Lisowski R. (2017), *Relationship between fiscal instruments and investments of industrial SMEs and LEs in Poland*, Managerial Economics, vol. 17(2), pp. 261–275.
- [14] Bartczek A. (2016), *Instrumenty podatkowe w polityce gospodarczej*, Studia Ekonomiczne, nr 272, pp. 9–20.
- [15] Grabia T. (2018), *Czynniki utrudniające skuteczne oddziaływanie polityki fiskalnej na gospodarkę*, Studia i Prace WNEiZ US, nr 51, t. 3. Problemy współczesnej ekonomii, pp. 101–112.
- [16] Główny Urząd Statystyczny (2004–2017), *Rocznik statystyczny przemysłu*, Zakład Wydawnictw Statystycznych, Warszawa.
- [17] Ministerstwo Finansów – Statystyki z zakresu PIT, <http://www.finanse.mf.gov.pl/pit/statystyki> [access: 20.01.2018].

CHAPTER 9

Investments and Development of Polish SMEs

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1. Introduction

Micro, small and medium-sized enterprises (MSMEs) are an extremely important component of the structure of modern economy. Their development contributes to the economic and social development of individual countries and the world. Therefore, the development of these enterprises should be a priority in economic policy, not only in our country, but also in the European Union. The competitiveness of the EU economy on the international market depends to a large extent on these enterprises.

In Poland, MSMEs play an extremely important role in both the economic and social field. They constitute over 99.8% of the total number of all active enterprises in Poland. In recent years, we have been observing a systematic increase in the number of these enterprises. In 2017, 2.08 million SMEs defined as active operated in Poland, while in 2010 there were less than 1.73 million SMEs. This is an increase of 20% over 7 years. Undoubtedly, SMEs play a very important role in the labor market. In 2017, 68.3% of people employed in the Polish economy, worked in these enterprises. The fact that nearly 50% of the Gross Domestic Product value is produced by SMEs is also very important for the Ministry of the Treasury. The entire enterprise sector in Poland generates almost three quarters of GDP (74%). Microenterprises have the largest share in generating GDP (30,5%) (based on: [1: pp. 12–35]).

Development is inseparable from the need to conduct investment activities. Investment is therefore a development factor. Over 43% of total investments in the Polish economy are investments of MSMEs. Investments of the enterprise sector consist of two components: expenditures on new fixed assets (almost PLN 173 billion in 2017, of which PLN 74.7 billion are SMEs expenditures) and purchase of used fixed assets (PLN 21.5 billion in 2017, of which PLN 15.4 billion are SMEs expenditures).

The strategic nature of financing business development activities makes investment decisions the most important from the point of view of maintaining and increasing the

competitiveness of the company. Although it is MSMEs that decide about the strength of the Polish economy, they still face numerous obstacles while running a business, which in turn often causes them to limit their development.

The aim of this chapter is to show the impact of changes in the size of investments on the development of MSMEs in Poland. For this purpose, the dynamics of SME investments was compared with the dynamics of the number of these enterprises, the number of SMEs employees, changes in gross value of fixed assets, revenues, gross profit and production value. The analysis covered the period from 2010 to 2017. The size and directions of SMEs investments in Poland in the analyzed period were also presented and the most important barriers to the development of these enterprises were discussed.

2. Nature and barriers to business development

In the economic literature many definitions of the concept of enterprise development can be found. The development concerns a process that takes place during a period in which successive, consecutive changes occur in an orderly manner and stay relatively permanent. [2: p. 11]. Development means occurrence of qualitative changes, assessed positively from the point of view of the goal they concern [3: p. 7]. Development is a long-term process of changes in the size and economic relations that characterize the size and structure of the enterprise [4: p. 174]. Development is a coordinated change in the company's systems adapting it to the constantly changing environment, these adjustments are effective if they ensure that the company achieve and maintain competitive advantage, which is its indispensable condition for maintaining the market [5: p. 11]. Development is a process of changes occurring in time, the essence of which can be interpreted as the elimination of the so-called development gap, or as a process of perfecting the spot where the organization is located, the development gap is defined as the difference between possessed capabilities, potential and actual achievements [6: p. 14].

All of the above definitions are combined by the concept of a change process that occurs over time. Every company in the course of its operation on the market is subject to change, as it develops.

One should pay attention to the difference between the concept of development and the concept of growth, because they are not completely identical. Development means occurrence of qualitative changes, assessed positively from the point of view of the purpose which they concern. In the case when it comes to quantitative changes, we deal with growth. However, growth and development have the same direction of changes [3: p. 7]. The company's growth has a quantitative and structural dimension. It is expressed in changes in the number or value of economic values indicating development [4: p. 174]. Development, as a qualitative phenomenon, as a multidimensional and complex process, includes changes that go beyond the scope of the company's current operations. It applies, among others, to innovative processes in the enterprise. On the other hand, the growth, theoretically based on quantitative changes, concerns the continuation of the current directions of the company's activities. The most frequently measured by the dynamics of sales value, market share, dynamics of investment value, employment size or achieved economic and financial results

[7: p. 176]. However, development should not be associated only with qualitative changes and growth with quantitative changes. In fact, quantitative and qualitative changes never occur in isolation from each other. The growth of an enterprise should lead to its development [8: p. 45]. It seems that development and growth are coupled together. Growth is an integral part of company's development [9: p. 220].

The development of the company results both from external conditions related to the need to meet the new challenges of the environment, as well as internal business needs. External factors come from both the further environment of the company, i.e. macro-environment, as well as closer or micro-environment. Those originating from macro-environment result, among others, from the political and legal system in which the enterprise operates, as well as the technological and socio-cultural field. It includes, among others, the state of the economy in which the company operates, the inflation rate, unemployment, technological development, legal regulations, environmental awareness of society, but also culture, customs, religion. On the other hand, external factors resulting from microenvironment and influencing the enterprise are mainly owners, suppliers, recipients, competitors, clients, cooperators, financial institutions, authorities [10: p. 63].

An enterprise operating on a dynamically changing market must have so-called developmental capacity to achieve success. It is the productive potential of the enterprise understood as the entirety of material and intellectual resources and skills which will ensure the enterprise carrying out projects of qualitative and quantitative changes in all areas of its activity. SMEs show more development potential than large enterprises. Through the ability to react quickly to changes, they often build a significant advantage over large enterprises, especially in the issues of focusing their business on the needs of the market, conducting innovative activities, using opportunities and occasions on the market, fast and efficient information flow, and the ability to achieve high level of competitiveness through control and cost reduction [11: p. 8]. The starting point in assessing development potential is usually the so-called financial development capability, which indicates the possibility of efficiency of operations to such an extent that the ability is confirmed by the current and future economic results of the enterprise. The development of each enterprise should be documented with economic benefits as they provide financing for investment and operational activities in the subsequent stages of the manufacturing process [12: pp. 244–245].

The concept of enterprise development adopted in the study mainly includes changes expressed in growth. The development of SMEs was defined by the intensity of changes in investments of these enterprises, the number of enterprises, the number of employees in SMEs, changes in the gross value of fixed assets of SMEs, their revenues as well as the dynamics of gross profit and production value of SMEs.

MSMEs face numerous inconveniences on the path of development. In the literature, barriers to development are divided into internal barriers resulting from the enterprise strategy itself, and external ones resulting from the market situation, i.e. the size of demand and supply, government policy, macroeconomic situation or availability of capital [13: p. 64]. Internal barriers include, above all, the so-called capital barrier resulting from insufficient capital in the enterprise needed to finance investments. Internal barriers also include the lack of sufficient skills of managers who need to run their business effectively, the so-called production barrier, i.e. the need to modernize machines, limited supply of parts and materials, and so-called housing barrier, or the standard of the premises [14: p. 622].

External barriers result from the situation on the market. Entrepreneurs do not have a direct impact on reducing their scale. On the one hand, entrepreneurs face an internal capital barrier, and therefore are forced to use foreign sources of investment financing, on the other hand they face external financial barriers. They mainly come from the limited availability of capital from external sources of financing, but also from financial burdens when applying for public contracts or from unfavorable payment dates.

External barriers also include social, market and legal barriers, barriers resulting from economic policy, as well as limited access to information on introducing new regulations and amendments, adapting Poland's law to the law of European Union directives, the possibility of external financing for development, barriers related to the condition of infrastructure, resulting from insufficient development of transport and communication system, waste management, telecommunications and energy [15: p. 37]. Innovative and technological barriers related to the obsolete machinery park and difficult access of small and medium enterprises to new technologies are also mentioned [11: p. 12].

It is also important whether the barriers concern the start-up of a given business or the further development of the enterprise. In this context, entry barriers and development barriers should be distinguished. Entry barriers arise when the company is founded and are related to its existence on the market. Development barriers concern a company operating on the market [13: p. 61].

In the chapter barriers to the development of SME enterprises were identified on the basis of the opinions of the interested parties, i.e. the opinion of entrepreneurs.

3. Size and directions of SME investments destination in Poland

Investments of enterprises in Poland from 2010 to 2017 increased by 37%. Large enterprises recorded growth by as much as 47.8%. In case of SMEs, this was a growth by 26.2%.

At the end of 2017, investments in tangible fixed assets of enterprises in Poland amounted to PLN 194.44 billion. In comparison with the previous year, it was a 3% increase in this value. This is the result of an increase in SME investments (by 9% compared to 2016), with a 2% decline in large enterprises' investments. The investments of SMEs in 2017 amounted to over PLN 90 billion, which is 46.3% of total investments. Changes in the volume of investments in Poland in 2010–2017, including the share in investments of SMEs and large enterprises, are presented in the Figure 1.

According to the research of the Ministry of Enterprise and Technology [16: p. 22] in the second half of 2017, 72% of SMEs made investments. Most of them were investments in the range of PLN 5,000 to 50,000 (33% of enterprises). 19% of surveyed SMEs invested less than PLN 5,000. Every fifth investing enterprise invested more than PLN 50,000.

Analysis of the directions of corporate investment in Poland in 2010–2017 has shown that enterprises most often invest in new fixed assets. In each year of analysis, these investments accounted for nearly 90% of capital expenditure. In 2017, the amount allocated by enterprises for this purpose amounted to PLN 172,978 million. These are investments requiring mostly high financial outlays, therefore in the group of large enterprises investments in new fixed assets amount to around 95% of all annual investments. Due to the more difficult access to sources of financing for SMEs, the percentage investing in new fixed assets in this group

is lower, amounting to around 83% annually. The remaining investments of the enterprise are designated for the purchase of used fixed assets. The amount allocated by enterprises in Poland for this purpose in 2017 was PLN 21462 million, of which as many as 71.1% were investments of SMEs. This shows that large enterprises choose investment in used fixed assets much less often. They have resources to invest in new assets. Difficult access to sources of financing for micro, small and medium enterprises determines largely the purpose of their investment. The structure of investments of enterprises in Poland in 2017 according to the directions of their allocation is presented in Figure 2.

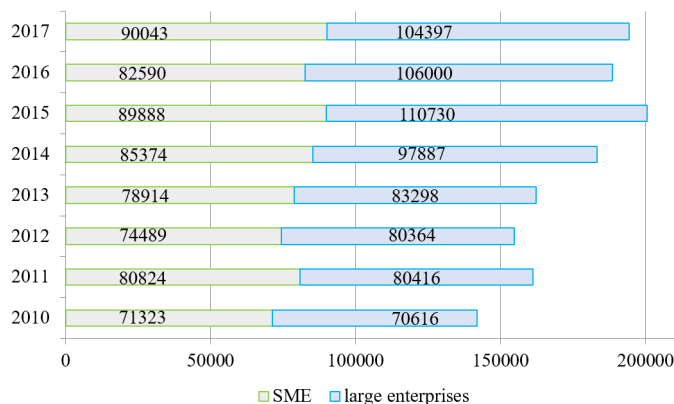


Fig. 1. Volume of investments of enterprises in Poland (in million PLN) in years 2010–2017

Source: own study based on data published in [17]

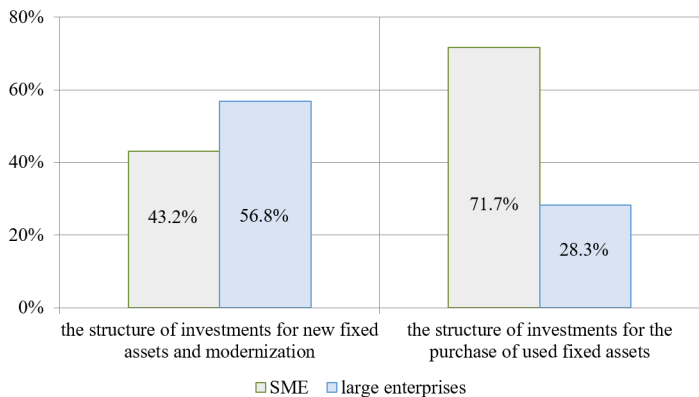


Fig. 2. Structure of investment expenditures of enterprises in Poland in 2017 by their destination

Source: own study based on data published in [17]

The scale and directions of investments depend on the investment possibilities of individual enterprises, which in the first-place result from their economic and financial situation. It exerts an unquestionable impact on the size and use of own resources and the availability of external sources of financing investments.

4. The dynamics of investments and the development of SMEs in Poland

Implementing the goal assumed in the introduction that the level of SME development measured by selected measures is correlated with the dynamics of their investments, below we compared the dynamics of SME investments with the dynamics of the number of these enterprises, the number of employees in SMEs, changes in gross value of fixed assets, revenues, profit level, gross value and production value from 2010 to 2017.

The analysis showed that in the analyzed period, the number of SME enterprises increased by 20.3%. This increase was accompanied by an increase in investments of SMEs by 26.2%. (Fig. 3).

Micro-entrepreneurship was developing dynamically at this time. In 2010, there were 1,655,064 enterprises employing less than 10 people, while in 2017 there were already 2,004,288 (an increase of 21%). At the same time, the number of small enterprises increased by only 2%, and the medium ones decreased by 3%. The demonstrated increase in SME investments in the analyzed period was also the case in most micro-enterprises. The investments of the smallest enterprises in the analyzed period increased by 38.2%, while in the case of small enterprises, the increase amounted to only approx. 2%, and the medium to approx. 30%.

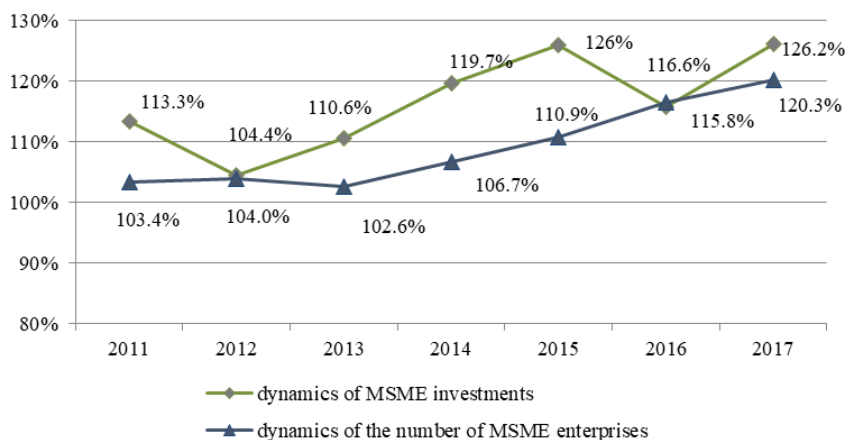


Fig. 3. Dynamics of SME investments and dynamics of number of SMEs in Poland (2010 = 100%)

Source: own study based on data published in [17]

Since approximately 70% of the total number of people working in our country is employed in SMEs, the employment in this group of enterprises is one of the most important measures of their development. It was shown that in Poland in 2010–2017 the increase in investments by 26% was accompanied by an increase in the number of employees in SMEs by 9%. The dynamics of the number of employees in SMEs in Poland in comparison with the dynamics of investments of these enterprises in 2010–2017 are presented in Figure 4.

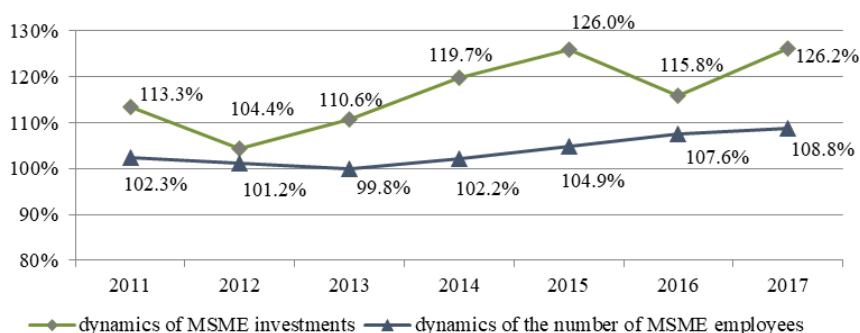


Fig. 4. Dynamics of investments and dynamics of the number of employees in SMEs (2010 = 100%)

Source: own study based on data published in [17]

Another analyzed measure of the effects of investment activities of SMEs are changes in the dynamics of the gross value of fixed assets, i.e. the value of investments for the purchase of fixed assets or their generation. This analysis showed that in 2010–2017, SMEs in Poland recorded a 47% increase in the value of these funds, with an increase of 26.2% (Fig. 5).

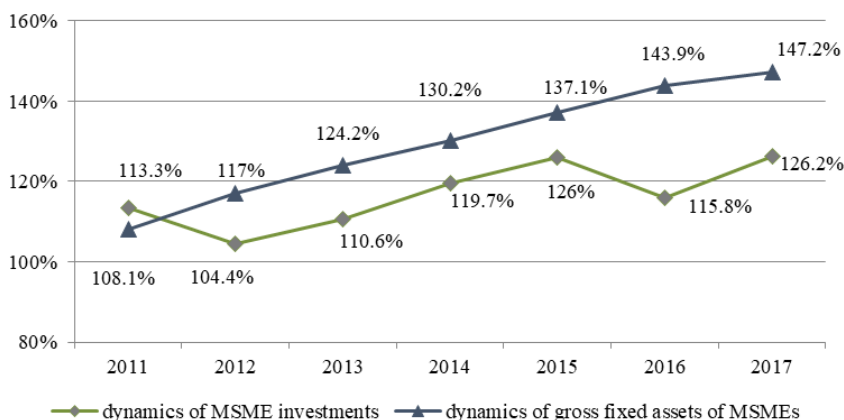


Fig. 5. Dynamics of investments and dynamics of gross value of fixed assets in SMEs (2010 = 100%)

Source: own study based on data published in [17]

The gross value of fixed assets of SMEs at the end of 2017 amounted to less than PLN 872 billion, while in large enterprises this value reached about PLN 1260 billion. Such differences in the value of fixed assets between enterprises of different sizes affect their ability to external financing and development. Banks, providing capital to enterprises (loans, credits), require collateral, usually on property, plant and equipment. This means that enterprises with small fixed assets are in a more difficult situation than enterprises with a high value of such assets. Even if they use, for example, the surety and guarantee system, the capital obtained on the financial market will be more expensive, and thus the effectiveness of the credited enterprise will be lower [18: p. 14].

The change in the level of total revenues was considered another factor for the development of SME. The increase in investments of SMEs contributes to the increase in sales revenues of these enterprises. In the analyzed period, the revenue of these enterprises increased by 34.8%, with the increase in SME investments amounting over 26% (Fig. 6).

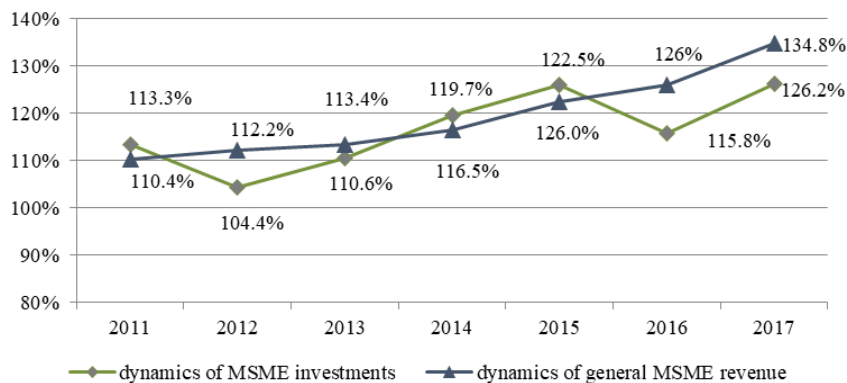


Fig. 6. Dynamics of investments and dynamics of total revenues of SMEs (2010 = 100%)

Source: own study based on data published in [17]

The analysis of the dynamics of gross profit of enterprises achieving a positive financial result is a supplement to the analysis of changes in total revenues of SMEs. In the analyzed period, the increase in investments was accompanied by an increase in the gross profit of SMEs, and the reduction in investments led to its decrease. In 2012, there was an 8% decrease in SME investments in comparison to the previous year. This was accompanied by a 3% reduction in the profit of these enterprises. Similarly, in 2016 an 8% decrease in SME investments was accompanied by a drop in the gross profit of SMEs. In the remaining years, the increase in investments was accompanied by an increase in the gross profit of SMEs. In the whole analyzed period, the investments of SMEs increased by 26%, and gross profit by 27% (Fig. 7).

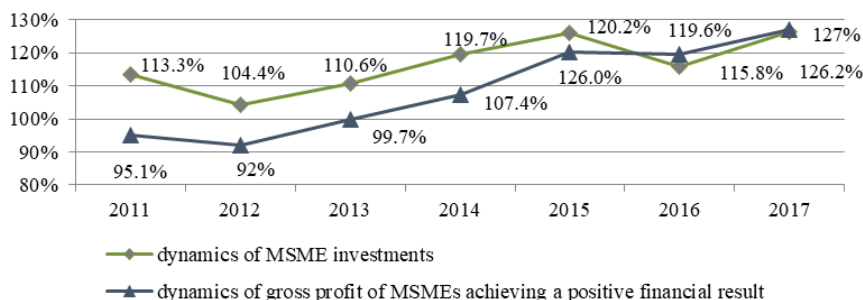


Fig. 7. Dynamics of investments and dynamics of gross profit of SMEs that achieve a positive financial result (2010 = 100%)

Source: own study based on data published in [17]

Often the reason for investment is the willingness of entrepreneurs to increase production volumes. What is important for the economy, the share of SMEs in the value of total production in Poland is about 57%, of which the share of microenterprises is the largest. In the analyzed period, enterprises employing up to 10 people generated a 30% share in the value of production in Poland. 10.5% is the share of small enterprises and 16.5% of large enterprises. The remaining 43% of the production value was generated by large enterprises.

The analysis of the dynamics of SME production value in 2017–2010 shows a significant impact of investments on the value of production of these enterprises. It has been shown that changes in the value of investments are accompanied by one-way changes in the value of SME production. In 2013–2015, when the volume of SMEs investments in each subsequent year of the analysis showed an increase, the value of production of these enterprises also increased. The decrease in SME investment, which occurred in 2016 (8% compared to 2015) also resulted in a slight decrease in the value of production of these enterprises (by 1%). From 2016, an increase in investments and an accompanying increase in the SME production volume was again observed. In general, from 2010 to 2017, investments of SMEs increased by 26.2%, and the value of production of these enterprises increased by 42% (Fig. 8).

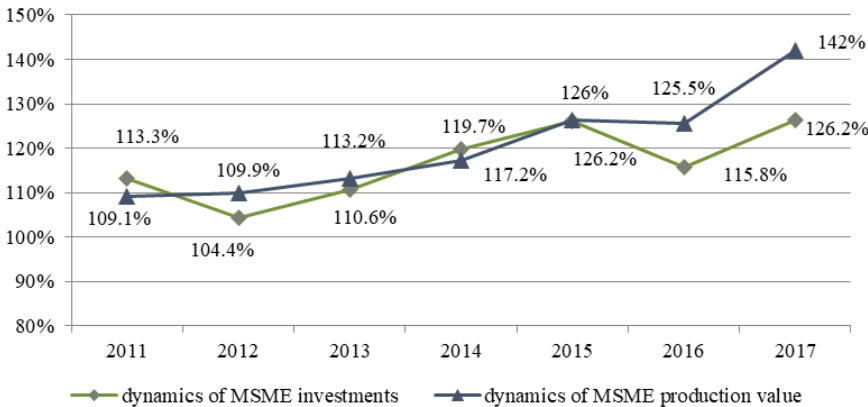


Fig. 8. Dynamics of investments and production values of SMEs (2010 = 100%)

Source: own study based on data published in [17]

5. Barriers to SME development in Poland

Despite their irrefutable importance, SMEs still face many difficulties in their own development. The most important result of the identification of barriers to the development of the SME sector is research carried out among entrepreneurs. According to micro, small and medium entrepreneurs, there are many barriers in Poland that hinder them from their activity both current and development.

Among the listed barriers, the difficult access to foreign sources of financing, with insufficient own resources, is one of the main barriers to development. According to a report commissioned by Deutsche Bank [19] 35% of the surveyed enterprises indicated difficult

access to external financing, as the biggest barrier to development. For 25% of respondents, the main barriers to development are payment bottlenecks and financial liquidity problems. As for issues not directly related to finance, entrepreneurs most often indicated difficulties in finding appropriate employees (13%). For 9% of respondents, external factors affecting the industries are a big obstacle, and for 4% a significant barrier is growing competition.

Analysis of the results of research carried out in the second half of 2017 by the Ministry of Economy [16: pp. 6–7] shows that the most distinctive for entrepreneurs are too high taxes and fees provided for by law (22.9% of respondents). This factor is more severe for microenterprises (24.5% of indications). For comparison, among small entrepreneurs it was 20.9% of indications, and among medium-sized ones – 15%. Entrepreneurs also complain on low turnover (16.6% of indications) and complicated legal regulations (11.9% of responses). The last barrier was most often felt by small enterprises (20.9% of indications among these enterprises). In turn, for medium-sized enterprises the most important problem is the lack of adequate qualifications of the workforce. Lack of workers with specific qualifications was a problem for every fifth of the surveyed medium-sized enterprise. According to the Ministry of Treasury, development is also hindered by competition from large enterprises (7.6% of responses) and high costs of employment (6.4% of responses).

Polish entrepreneurs finance their development primarily from their own resources. These funds are a source of financing for about 75% of the value of investments. The most frequently used source of external financing is loan. In 2017, 10% of company investments were financed with the help of domestic and foreign bank loans. Leasing also plays an important role in external financing. This is the main, beside the loan, external source of financing in the Polish economy. Venture capital funds still play a small role [20: p. 76]. Among the main reasons for the difficult access of SMEs to external financial sources are: short history (including credit) of these enterprises, small and not always good quality of collateral, poor information transparency of these entities, their low survival rate and lack of knowledge or experience of managers in obtaining external funds [21: pp. 4–5]. To a large extent, such a structure of financing Polish enterprises also results from the reluctance of entrepreneurs to become dependent on a foreign capital and incur financial liabilities [22: p. 22]. The situation is also affected by such factors as insufficiently wide offer proposed by banks and financial institutions, or in the case of tools newer than credit, such as factoring, lack of knowledge about them.

6. Conclusions

Investments are one of the most important ways to develop each enterprise. The necessity of their implementation results, among others, from the growing competitiveness on the market, constantly changing environment and growing customer expectations. The study, in accordance with the assumed objective, showed that the amount of investments determines the development of SMEs. It was shown that SME development rate measured by the dynamics of the number of these enterprises, the number of SMEs employees, changes in gross value of fixed assets, revenues, gross profit and production value is correlated with the dynamics of investments. Although these changes are not always proportional, they are certainly unidirectional.

Native MSMEs most often purchase or plan to purchase fixed assets, i.e. investments requiring large financial outlays. In Poland, on average, 90% of the value of SME investments are investments in new fixed assets. In the group of large enterprises, the share of these investments is even higher. The majority (almost 57%) of expenditures on investments in new fixed assets are investments of large enterprises. On the other hand, 70% of the investments in used fixed assets are SME investments.

The main source of financing of SME development projects in Poland, irrespective of the size of the enterprise and directions of investment, have been for the most part own funds, mainly retained profits. Their share in financing SME investments in Poland is about 75% and is larger than in large enterprises. Reaching for a foreign source of financing, Polish SMEs, regardless of the size of the enterprise or its position on the market, choose a bank loan, leasing, or subsidies from the EU structural funds. The share of loans in financing SME investments in Poland is around 20%. Other foreign sources of financing are used to a very small extent.

Lack of sufficient own financial resources, high crediting barriers, excessive bureaucracy and lack of access to reliable information mean that enterprises in the SME sector have difficult conditions of access to external financing and thus it is more difficult for them to maintain a competitive position on the market. It should also be noted that the investment growth also results in the increase of innovative solutions used in enterprises, and one of the areas conditioning the survival and market successes of SMEs in the modern economy is the wide introduction of innovations.

References

- [1] Skowrońska A., Tarnawa A. (red.) (2018), *Raport o stanie sektora małych i średnich przedsiębiorstw w Polsce*, Polska Agencja Rozwoju Przedsiębiorczości, Warszawa.
- [2] Fabiańska K., Rokita J. (1986), *Planowanie rozwoju przedsiębiorstwa*, Państwowe Wydawnictwo Ekonomiczne, Warszawa.
- [3] Stabryła A. (1995), *Zarządzanie rozwojem firmy*, Księgarnia Akademicka Sp. z o.o., Kraków.
- [4] Chomętowski S. (1996), *Warunki, a czynniki rozwoju przedsiębiorstwa, Próba identyfikacji i klasyfikacji*, in: A. Jaki (red.), *Restrukturyzacja w procesie przekształceń i rozwoju przedsiębiorstw: materiały z ogólnopolskiej konferencji naukowej, Kraków, 22-24 listopada 1996 roku*, Ośrodek Postępu Organizacyjnego. Zarząd Oddziału Towarzystwa Naukowego Organizacji i Kierownictwa w Krakowie, Kraków 1996, pp. 174–177.
- [5] Pierścionek Z. (1996), *Strategie rozwoju firmy*, Wydawnictwo Naukowe PWN, Warszawa.
- [6] Machaczka J. (1998), *Zarządzanie rozwojem organizacji: czynniki, modele, strategia, diagnoza*, Wydawnictwo Naukowe PWN, Warszawa – Kraków.
- [7] Rojek T. (2010), *Wartość przedsiębiorstwa, a kierunki jego rozwoju*, UE w Krakowie, Kraków [Ph.D. thesis].
- [8] Gabrusewicz W. (1995), *Istota rozwoju przedsiębiorstwa*, in: E. Kurtysa (red.), *Studia nad funkcjonowaniem i rozwojem przedsiębiorstwa*, Zeszyty Naukowe – Akademia Ekonomiczna w Poznaniu, seria 1, z. 225, pp. 35–50.

- [9] Strużycki M. (red.) (2002), *Zarządzanie przedsiębiorstwem*, DIFIN, Warszawa.
- [10] Penc-Pietrzak I. (2000), *Strategie biznesu i marketingu*, Wydawnictwo PSB, Kraków.
- [11] Skowronek-Mielczarek A. (2005), *Małe i średnie przedsiębiorstwa. Źródła finansowania*, C.H. Beck, Warszawa.
- [12] Stabryła A. (2007), *Zarządzanie strategiczne w teorii i praktyce firmy*, Wydawnictwo Naukowe PWN, Warszawa.
- [13] Bławata F. (red.) (2004), *Przetrwanie i rozwój małych i średnich przedsiębiorstw*, Scientific Publishing Group, Gdańsk.
- [14] Onak-Szczepanik B. (2006), *Miejsce i rola sektora małych i średnich przedsiębiorstw w gospodarce Polski*, *Nierówności Społeczne a Wzrost Gospodarczy*, nr 9: Problemy globalizacji i regionalizacji. Part 2, pp. 613–626.
- [15] Chomątowska M., Chomątowski S. (2003), *Bariery rozwoju polskich przedsiębiorstw*, *Zeszyty Naukowe – Akademia Ekonomiczna w Krakowie*, nr 631, pp. 37–43.
- [16] *Trendy rozwojowe mikro, małych i średnich firm w ocenie przedsiębiorców w drugiej połowie 2017 roku* (2018), Ministerstwo Przedsiębiorczości i Technologii, Departament Analiz Gospodarczych, Warszawa.
- [17] *Działalność przedsiębiorstw niefinansowych w... r.* (2011–2018), Główny Urząd Statystyczny, Warszawa.
- [18] Starczewska-Krzysztozek M. (2015), *Curriculum Vitae mikro, małych i średnich przedsiębiorstw 2014: Finansowanie działalności i rozwoju*, Lewiatan, Warszawa.
- [19] *Polskie firmy: plany, rozwój, finansowanie działalności* [Deutsche Bank report], November 2016, <http://www.egospodarka.pl/136723,Polskie-firmy-plan-y-rozwoj-finansowanie-dzialalnosci,1,39,1.html> [access: 10.06.2019].
- [20] *Przedsiębiorczość w Polsce* (2018), Ministerstwo Przedsiębiorczości i Technologii, Warszawa.
- [21] *Dostępność finansowania przedsiębiorstw niefinansowych w Polsce* (2016), Departament Stabilności Finansowej NBP, Warszawa.
- [22] *Raport – Finansowanie Biznesu w Polsce, Związek Przedsiębiorców i Pracodawców*, Warszawa, czerwiec 2018, <https://zpp.net.pl/materialy/> [access: 10.06.2019]

CHAPTER 10

Foreign Direct Investment in Innovative Sectors in Poland

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1. Introduction

Nowadays, the competitive position, investment attractiveness or the level of development of a given economy and enterprises operating in this economy are increasingly often assessed through the prism of innovation and capacity for innovation. Since the beginning of its political and economic transformation, Poland has been struggling with low innovativeness of its economy and enterprises. Yet, innovation and innovativeness of enterprises and the entire economy are the main drivers of their competitiveness. Accordingly, a capacity for innovation and flexibility contributes to building and maintaining a competitive advantage. Broadly understood innovation is therefore an intrinsic quality of an enterprise and the economy that determines the ability to operate, survive and develop in a difficult, competitive environment [1: p. 18]. Insufficient equity capital and long-term underperformance in the area of innovation in Poland mean that external sources of backing for innovative processes are sought. Currently, foreign direct investment (FDI) in innovative industries is perceived as the driving force behind economies as a result of its potential contribution to economic development (the so-called spillover effect and diffusion of innovations). The idea is that the presence of multinational corporations, which are among the most technologically advanced firms, can facilitate the transfer of technological and business know-how. This transfer may then spread over the entire economy leading to productivity gains in domestic firms. This kind of considerations has motivated governments in many countries to ease restrictions on foreign direct investment and even to offer foreign investors more favorable conditions than those granted to domestic firms.

The chapter aims to present major trends regarding FDI in innovative sectors in Poland. The research period covers the years 2011–2017. The research tools used in the chapter are the review of Polish and foreign literature as well as desk research based on the data from the statistical database of the National Bank of Poland (NBP).

2. Innovation and innovation models

The term “innovation” has a broad meaning. On the one hand, it embraces technological improvements, on the other hand, it also has a social dimension. The multidimensionality of the concept of innovation is reflected in vast reference literature. The classic definition of innovation, proposed by Schumpeter [2: p. 14], emphasizes not only the effect of “the novelty of products”, i.e. the launch of a new product, previously unknown to consumers, or a new variation of the existing product, but also the implementation of a new production process.

The term “innovation” also means the emergence of a new market for a specific industry (including a foreign market), the use of new raw materials or components in a production process, or the application of a new production organization. According to OECD [3: pp. 49–55], innovation should be understood as the introduction of a new or meaningfully improved solution to a company practice in relation to a product, process, marketing or organization. This means that innovations fall under four categories: product innovations, process innovations, marketing innovations and organizational innovations [4: p. 117].

Concepts related to innovation are also innovative activity and innovativeness. The former concerns scientific, technical, organizational, financial and commercial actions that lead to the implementation of innovation. Innovativeness, on the other hand, involves the activity aimed at implementing innovations, both in the private and public sectors [3].

Jensen [5] identifies two key modes of innovation (Tab. 1). The basic criterion is a way of defining and transferring knowledge that is the basis for innovation. The two modes are:

- the STI mode (Science, Technology, Innovation) based on R&D expenditure. In the STI model, knowledge is codified as instructions, specifications, process descriptions, etc;
- the DUI mode (Doing, Using, Interacting) based on learning through relationships and interactions with research institutions, clients and suppliers; in the DUI model, knowledge tends to be more informal (tacit knowledge), often local (contextual) and based on experience and skills (individual and team).

Table 1. Innovation models: STI and DUI

Specification	STI Mode	DUI Mode
Type of knowledge	Analytical, codified, explicit, scientific, know-what, know-why	Tacit, implicit, contextual. know-how and know-who
Knowledge acquisition	R&B activity	learning-by-doing, by-using, by-interacting
Type of innovation	Radical	Incremental
Innovation activity	The production of knowledge, knowledge transformation	Knowledge transformation, Product placement
Knowledge context	Global and general	Local and territorial

Table 1. cont.

Knowledge management strategy	Disseminated within the organization as codified knowledge	Exchange of knowledge between organizational departments, network structures of cooperation facilitating learning, project teams, teams solving specific problems, employee turnover, proximity of consumers
Innovation promotion strategy	Innovation pursued based on the in-house model or close business networks	Innovation pursued based on the networking model

Source: own elaboration based on [5]

In the countries in political and economic transition, such as Poland, only to a very limited degree is innovation funded by its own R&D expenditure. A much greater role is played by innovations coming from abroad. The process that makes it possible for enterprises operating in the country importing innovations from highly developed economies to use new technologies is a multi-stage process known as the process of international diffusion of innovations. In the reference literature, the definitions of diffusion of innovations tend to emphasize their technological dimension [6: p. 3]. Increasingly, however, depending on the nature of an innovation and the area of its implementation, the definitions of diffusion are extended to embrace the aspects related to social sciences [7: p. 12 and further].

3. FDI and its role in creating innovation

Nowadays, one of the paths for the diffusion of innovation is through the links to foreign entities that take the form of FDI. Foreign direct investment is made in a country other than an investor's country of origin and it involves investing capital – usually long-term – in a foreign enterprise in order to obtain effective management control over this enterprise and, as a result, generate profits. Investment of this type includes: an acquisition of shares in existing foreign companies, an establishment of a new subsidiary abroad, an establishment of a joint venture with a foreign entity and an acquisition of real estate abroad in order to expand activity [8: pp. 124–125]. According to the OECD terminology [9: p. 17], direct investment occurs when a foreign investor holds a stake of minimum 10% in a given enterprise, while at the same time it does not necessarily exercise absolute control over this enterprise, as it is only important that it has some decision-making involvement in its management. Direct investment may be a greenfield project (i.e. building an entirely new business), a brownfield project (i.e. takeovers or acquisitions of existing enterprises through privatization), or a capital involvement in an enterprise (if the 10% threshold is exceeded).

Literature proposes a number of theories which explain why investors invest their capital abroad, for example monopolistic advantage theory, international product life-cycle theory, location theory, internalization theory. However, the most quoted theory that constitutes their synthesis is the eclectic theory of international production developed by J.H. Dunning [10, 11], also known as the OLI paradigm. It posits that the condition for FDI is the simultaneous occurrence of three elements, i.e. the company having a ownership advantage,

a location advantage and an internalization advantage. Apart from the classic OLI paradigm, contemporary corporations also incorporate – in their decisions on the choice of the FDI target market – other “soft” factors that account for specific “added value” of a location. There embrace, for example, the character of the labor market, economic infrastructure, economic climate, public relations of the location, and cultural determinants [12: pp. 217–218].

Determinants conducive to the diffusion of innovation through FDI can be analyzed at the level of the economy and at the level of enterprises. The ability to benefit from access to knowledge, technologies and new markets through FDI depends on the absorption capacity of the economy at both technological and social level. The absorptive technological capability of the economy means the ability to understand and effectively apply technical knowledge. This often requires the accumulation of skills, hidden knowledge, internal development work and technical infrastructure, through which transfer and assimilation of innovations can take place. The social absorptive capacity of the economy refers to the existence of adequate human and social capital as well as favorable institutional conditions. Human capital is the carrier of knowledge and skills as well as the means of their transfer (this applies in particular to specialist, technical and engineering skills) [13]. Social capital, which consists of social norms and values, determines the level of social trust, inclination to change, and risk aversion. The quality of institutions is, on the other hand, related to the intensity of competition between entities. Institutional determinants tend to concern issues related to the protection of innovators’ rights and institutional barriers encountered when implementing new technologies.

The ability to benefit from access to innovation through FDI also depends on the factors related to companies operating in the host market as they affect the ability to identify external innovations and the possibilities of their assimilation, imitation and development. The acquisition and implementation of innovations, especially those of technological nature, is expensive, which usually means that only enterprises with adequate resources can afford it. In this context, the twofold role of national R&D expenditures is emphasized. On the one hand, research increases knowledge resources and can contribute to the development of new, innovative solutions, on the other hand, it strengthens the capacity for adapting technologies and solutions already used outside even if it does not lead to new ideas (the so-called other face of R&D) [14]. Moreover, the ability of enterprises to effectively implement innovation depends on their intellectual capital, considered at three levels: human capital (knowledge, skills and competencies), structural capital (organizational ability to learn, the organization of the workplace, cooperation) and relational capital (networks, clusters, associations, informal relationships).

4. FDI in innovative sectors in Poland through prism of selected statistical data

For the purposes of this study, innovative industries are defined as those that report the highest R&D expenditure (this group has been extended to include the entities related to motor vehicle retail due to the classification of some automotive manufacturers in this industry). They include the manufacture of basic pharmaceutical products and pharmaceutical preparations (C21), the manufacture of basic metals (C24), the manufacture of fabricated

metal products, except machinery and equipment (C25), the manufacture of computer, electronic and optical products (C26), the manufacture of machinery and equipment n.e.c. (C28), the manufacture of motor vehicles, trailers and semi-trailers (C29), other production related sectors (total) (C_OTH), wholesale and retail trade and repair of motor vehicles and motorcycles (G45), wholesale trade, except of motor vehicles and motorcycles (G46), telecommunications (J61), other information and communication related operations (J58, J62, J63), scientific research and development (M72) [15: p. 47 and further].

In the years 2011–2016, FDI transactions in innovative industries in Poland were reported in positive values (Fig. 1). In 2016, the FDI inflow amounted to PLN 24.4 billion as compared to PLN 10.8 billion in 2011, which means that in the analyzed period the trend exceeded a two-fold increase.

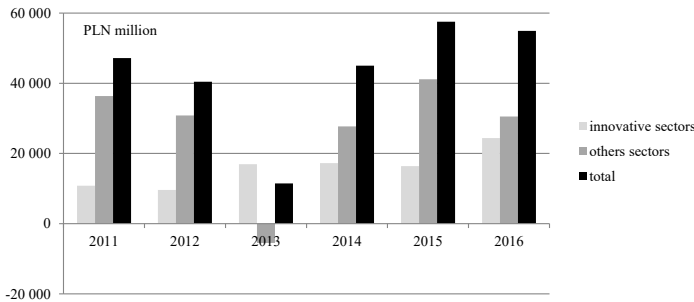


Fig. 1. FDI inflow in innovative sectors and in other industries in Poland, 2011–2016

Source: own elaboration based on [15]

The highest dynamics were reported in 2013 compared to the previous year – an increase of 76% – and in 2016 as compared to the previous year – an increase of nearly 59%. In 2013, other industries reported total divestment, which proves the relative resilience to changes in the business cycle of investments pursued in innovative industries. Considering the share of FDI in innovative sectors in relation to the value of FDI in Poland in total, it increased from nearly 23% in 2011 to 44% in 2016.

Foreign investors, investing in innovative sectors, chose various types of economic activity (Fig. 2).

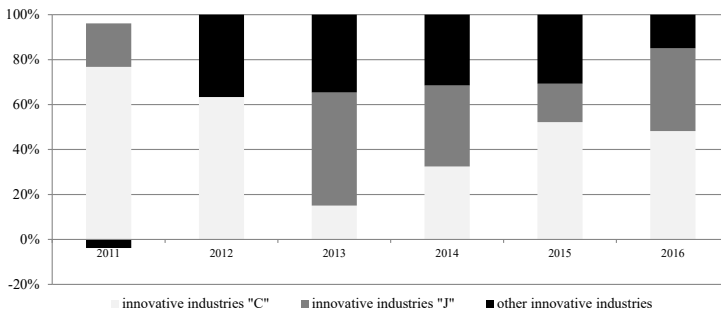


Fig. 2. Breakdown of FDI inflow in innovative industries in Poland by trade, 2011–2016

Source: own elaborating based on [15]

In the years 2011–2012 and 2015–2016, the highest FDI came from entities dealing in the production of motor vehicles, trailers and semi-trailers, excluding motorcycles – 83% and 63% respectively, and 52% and 48% in the FDI invested in innovative industries. In the years 2013–2014 and in 2016, a relatively high share of FDI was recorded in entities operating in information and communication – 50%, 36% and 37% respectively. However, the lowest value of investment in the years 2011–2016 was recorded for the activity related to scientific research and development. In the years 2011–2016, the strongest fluctuations were observed in the FDI inflow into enterprises operating in information and communication, the manufacture of motor vehicles, trailers and semi-trailers, excluding motorcycles, and wholesale and retail trade of motor vehicles with the repair of motor vehicles. On the other hand, the inflow of investment to the industrial processing and scientific research and development was more stable [14].

An important feature distinguishing innovative industry from other industries in Poland is their profitability (Fig. 3).

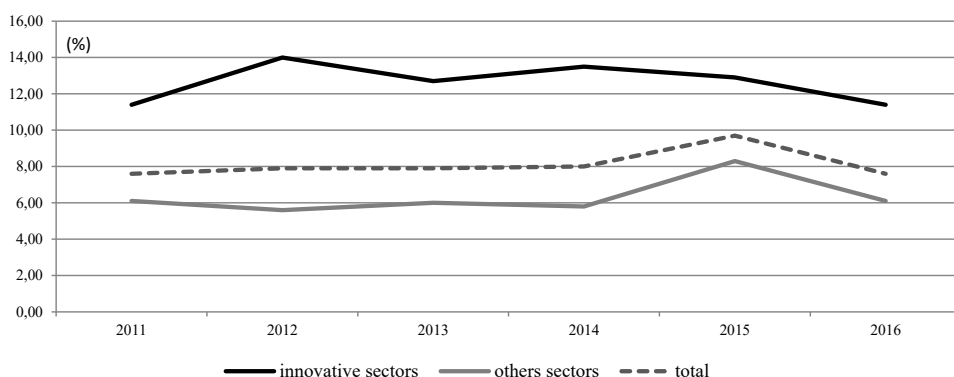


Fig. 3. FDI rate of return in Poland, 2011–2016

Source: own elaboration based on [15]

The analysis of the rates of return in 2011–2016 shows that the return rates achieved by foreign investors (an average of 12.65%) on the entire capital invested in innovative sectors were twice as high as in other industries (an average of 6.32%). The highest rates of return on FDI in innovative sectors in Poland were reported in 2012 and 2014 – they amounted to 14.0% and 13.5% respectively. Relatively high rates of return are probably one of the reasons for FDI inflows in innovative sectors in Poland.

5. Conclusions

Based on the synthetic analysis and evaluation of the FDI inflow to innovative sectors in Poland, the following conclusions can be made:

- FDI in Poland is gaining in importance. An increasing number of foreign investors establish their subsidiaries in Poland and tie up their capital here, which contributes to the improved financial situation of the country.

- In recent years, the significance of direct investment in industries classified as innovative has been growing in Poland. The most important contribution is made by FDI related to the manufacture of motor vehicles, trailers and semi-trailers, excluding motorcycles, and information and communication related operation. The lowest involvement of FDI was recorded in the area of scientific research and development.
- Increased FDI inflows into innovative sectors are primarily associated with the profitability of such enterprises, which is higher than average, and, in consequence, the greater possibility of reinvesting profits. To a lesser extent, FDI leads to the establishment of new enterprises.

Poland's government, recognizing the positive impact of FDI on innovative sectors, introduces a number of new regulations and incentives for foreign investors. It is expected that FDI will positively affect the economic situation in Poland in the long run. However, due to the FDI inflow into the economy, a variety of problems may also arise. Excessively aggressive investor activity (e.g. demanding tax and legal incentives) may result in unfavorable opinions about foreign investors (e.g. alleged efforts to infringe on the sovereignty of the host country).

References

- [1] Nowacki R., Staniewski M.W. (red.) (2010), *Podejście innowacyjne w zarządzaniu przedsiębiorstwem*, Difin, Warszawa.
- [2] Schumpeter J. (1960), *Teoria rozwoju gospodarczego*, Państwowe Wydawnictwo Naukowe, Warszawa.
- [3] OECD (2005), *Oslo Manual – Guidelines for Collecting and Interpreting Innovation Data*, OECD Publishing & Eurostat, Paris.
- [4] Grudzewski W.M., Hejduk I.K., Sankowska A., Wańtuchowicz M. (2010), *Sustainability w biznesie, czyli przedsiębiorstwo przyszłości: zmiany paradygmatów i koncepcji zarządzania*, Poltext, Warszawa.
- [5] Jensen M.B., Johnson B., Lorenz E., Lundvall B.A. (2007), *Forms of Knowledge and Modes of Innovation*, Research Policy, vol. 36(5), pp. 680–693.
- [6] Comin D., Mestieri M. (2013), *Technology Diffusion: Measurement, Causes and Consequences*, NBER Working Paper No. 19052.
- [7] Rogers E.M. (2003), *Diffusion of Innovation*, Free Press, New York.
- [8] Krugman P.R., Obstfeld M. (2005), *Międzynarodowe stosunki gospodarcze*, Wydawnictwo Naukowe PWN, Warszawa, pp. 124–125.
- [9] OECD (2008), *OECD Benchmark Definition of Foreign Direct Investment*, 4th ed., <http://www.oecd.org/daf/inv/investmentstatisticsandanalysis/40193734.pdf> [access: 5.10.2018].
- [10] Dunning J.H. (1981), *Explaining the international direct investment position of countries: towards a dynamic or developmental approach*, Weltwirtschaftliches Archiv, Bd. 117(1), pp. 30–64.
- [11] Dunning J.H. (2000), *The eclectic paradigm as an envelope for economic and business theories of MNE activity*, International Business Review, vol. 9(2), pp. 163–164.

- [12] Rosińska-Bukowska M. (2009), *Rola korporacji transnarodowych w procesach globalizacji. Kreowanie globalnej przestrzeni biznesowej*, Dom Wydawniczy Duet, Białystok.
- [13] Borensztein E., De Gregorio J., Lee J.W. (1998), *How does foreign direct investment affect economic growth?*, Journal of International Economics, vol. 45(1), pp. 115–135.
- [14] Cohen W.M., Levinthal D.A. (1989), *Innovation and Learning: The Two Faces of R&D*, Economic Journal, vol. 99(397), pp. 569–596.
- [15] NBP (2018), *Zagraniczne inwestycje bezpośrednie w Polsce i polskie inwestycje bezpośrednie za granicą w 2016 roku*, Narodowy Bank Polski, Warszawa.

CHAPTER 11

Competitiveness of New Member States of European Union in Foreign Trade in Agri-Food Products

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1. Introduction

Competitiveness is a basic notion in economic studies, both in micro-, meso-, and macroeconomic terms. However, this notion has no clear universal definition, which is a result of the fact that it derives from at least three trends in the theory of economics: theory of international trade, theory of economic growth and microeconomics. It is often identified with competitive advantage only, although it is not completely correct as Siggel [1] notes. Latruffe [2] defines it as the ability to face the competition and to succeed against such competition. The European Commission [3] in the report “Measuring Competitiveness” emphasizes that competitiveness at the sector level is strongly connected with productivity and trade.

The consequences of the wide interpretation of competitiveness are difficulties connected with the proper selection of measures for its assessment. This chapter focuses on the assessment of the external competitiveness of the sector, manifested in achieving, maintaining and increasing the market share in relation to other competitors in the international market [2, 4, 5]. According to International trade is one of the oldest forms of economic cooperation between countries and it means the flow of goods connected with crossing the borders. It drives the development of the economy, sectors and businesses. However, many countries have insufficient potential to compete in the export market. The importance of foreign trade for the development of the member states is also emphasized in the strategy “Europe 2020” [6]. Trade stimulates improvement in efficiency and innovativeness, which is reflected in the increased level of employment, pay and welfare [7]. Thus, respective member states are interested in building a strong competitive position in the trade in goods and services since it contributes to increasing the value of trade and at the same time the level of economic openness.

The basic premise, and simultaneously the condition for developing international trade is differentiation of production between respective countries, that is, specialized production.

In the agri-food sector, more than in other divisions of national economy, it is determined by the availability, dynamics but, above all, by the effective utilization of necessary production factors, including natural resources. For this reason, the significance of trade in agricultural and food products is different in respective countries [8]. The expansion of the European Union, globalization processes, progressing liberalization in the global trade in agricultural and food products, progress in transport and communications technologies, decreasing costs of logistics and evolution, have contributed to changes in the level and structure of international trade in the Community [9, 10].

With regard to the aforementioned, this chapter aims to evaluate the competitiveness of new member states of the European Union in comparison to member states forming the so-called ‘old 15’ in terms of international trade in agricultural and food products.

2. Materials and methods

The competitive position of the member states of the European Union was assessed with reference to Section 0 of the Standard International Trade Classification (SITC) – food and live animals. Years covered by the study were 2004, 2010 and 2016. Thus, the research period covers two six-year periods starting from 2004 when the largest expansion of the European Union in its entire history took place. New EU members were 13 countries that acceded to the European Union in and after 2004, i.e. Cyprus, Czech Republic, Estonia, Lithuania, Latvia, Malta, Poland, Slovakia, Slovenia, Hungary, Bulgaria, Romania, and Croatia (EU-13). The study was carried out using data from the international trade database ComExt – EUROSTAT [11]. Analyzing international trade, it was assumed that it was a sum of intracommunity trade with third countries.

The analysis was based on selected indicators describing international competitiveness in the aspect of trade:

- The index of revealed comparative advantage (RCA) of export [12]:

$$RCA = \frac{X_{ij}}{\sum_{i=1}^n X_{ij}} \bigg/ \frac{X_{iw}}{\sum_{i=1}^n X_{iw}} \quad (1)$$

where:

- X_{ij} – export of product i by the specific country to market m ,
- X_{iw} – export of product i by the group of countries to market m ,
- n – number of product types.

- Trade Coverage Ratio (TC) ratio calculated as the relation between the export of food from the specific country and import of food to such a country [12]:

$$TC = \frac{E_x}{I_m} \quad (2)$$

where:

- E_x – value of export,
- I_m – value of import.

- Intra-industry trade (Grubel–Lloyd) index which at the level of respective industries (commodity groups) is as follows [12]:

$$GLI_i = \frac{x_i + m_i - |x_i - m_i|}{x_i + m_i} \quad (3)$$

where:

x_i – export of goods forming part of industry i ,
 m_i – import of goods forming part of industry i .

The selection of the above-mentioned indices was dictated by the objective of the study and by the fact that for similar analyses it is definitely better to use more than one measure. For the purposes of correct reasoning it was also significant that the selected indices could be calculated based on the same data source and for the same time horizon.

3. Results of the research

Authors such as Ucak et al. [13] and Baiardi et al. [14] emphasize that export is a relevant variable for measuring the competitiveness of the specific sector. The volume of trade turnover resulting from competitive activities is shaped both under the influence of exogenous factors (following from the evaluation of international trade relations) and endogenous factors (connected with specific features of economies of respective countries following from their policy, e.g. volume, quality, structure and effective utilization of available production resources) [15, 16]. In addition, Carraresi and Banterle [17] indicate that in the last fifteen years, two significant events have affected the competitive performance of agriculture and food industry in different EU countries, namely the EU accession of Central and Eastern European countries (CEECs) and the global economic crisis of 2008. Studies showed that EU-13 member states increased their share in the EU exports of agricultural and food products in 2004–2016 (Tab. 1), which must be associated with the processes of integration and liberalisation occurring in the Community at that time. The growth took place despite relatively strong distortions in trade and fluctuations due to the seasonality of production. For many developing countries it is a chance for faster economic growth [18]. Despite the upward trend, in 2016 new member states had only 13.5% share in the value of exported products included in Section 0. Countries in which this group of products was the most significant one in international trade exchange are, for instance, Poland, Hungary, Czech Republic and Romania. In other EU-13 member states this share was lower than 1%. The export capacity of agri-food sector is determined by the competitive position of that sector. According to many authors, the competitive position of agriculture in new EU member states is relatively low [19–21].

The assessment of the competitive position of new member states of the European Union in foreign trade in agricultural and food products expressed by means of the relative comparative advantage of export is presented in Table 2. It must be emphasized that the indices of RCA show realized comparative advantage in the exports of a country, not a source of comparative advantage [22]. Comparative advantage is assessed comparing the relative share of commodity group ‘ i ’ in the exports of the specific country to the share of the same commodity group in the exports of other countries. When the index is higher than 1, it means

that the country has comparative advantages over the reference market. However, if the value of the index is lower than 1, the country has no revealed comparative advantages in trading in the specific commodity or a group of commodities. In 2004 countries with the highest level of the index were represented by one new member state – Cyprus (3.35) – accompanying member states such as Denmark (2.87), Greece (2.52), Spain (1.92) and the Netherlands (1.89). However, it must be emphasized that the share of Cyprus in the EU exports of food is very low (0.08%), which follows from the marginal importance of agriculture in that country. In 2016, the share of agricultural production of that country in the production of EU-28 accounted for 0.16% only [11]. In 2016, the index for that country decreased to 1.52, which must be associated with a considerable decrease in the share of agricultural and food products in total exports from Cyprus (from 20% to 11.5%). In 2016, EU-13 member states with a relatively high RCA index were also Lithuania (1.93), Latvia (1.75), Croatia (1.58), Cyprus (1.52), Bulgaria (1.51) and Poland (1.45). In all those countries the value of the index was higher than on average in EU-15. The indicators of dynamics point to an improvement in the competitive position of most new member states in foreign trade in agri-food products after their accession to the EU. The RCA decreased in 2016 in comparison to 2004 only in Cyprus, Estonia, Hungary and Slovakia.

Table 1. Share of new EU member states in the EU exports of agri-food products in 2004, 2010 and 2016 [%]

Country	2004	2010	2016	Changes in 2004–2016 in percentage points
Bulgaria	0.29	0.62	0.75	+0.46
Croatia	0.22	0.28	0.41	+0.19
Cyprus	0.08	0.07	0.08	0.00
Czech Republic	0.82	1.12	1.42	+0.60
Estonia	0.15	0.23	0.23	+0.08
Hungary	1.39	1.76	1.70	+0.31
Latvia	0.11	0.31	0.39	+0.28
Lithuania	0.41	0.85	0.90	+0.49
Malta	0.05	0.05	0.07	+0.02
Poland	2.54	4.13	5.45	+2.91
Romania	0.22	0.70	1.07	+0.85
Slovakia	0.15	0.39	0.39	+0.24
Slovenia	0.35	0.65	0.64	+0.29
EU-13	6.79	11.16	13.50	+6.71
EU-15	93.21	88.84	86.50	–6.71
EU-28	100.0	100.0	100.0	0.00

Source: own elaboration based on data from ComExt – EUROSTAT [11]

Table 2. Revealed comparative advantage (RCA) of export for agricultural and products in new EU member states as compared with EU-15 in 2004, 2010 and 2016

Country	2004	2010	2016	2004 = 100
Bulgaria	1.11	1.55	1.51	136.04
Croatia	1.03	1.24	1.58	153.40
Cyprus	3.35	2.52	1.52	45.37
Czech Republic	0.45	0.44	0.47	104.44
Estonia	0.98	1.01	0.93	94.90
Hungary	0.94	0.96	0.89	94.68
Latvia	1.07	1.70	1.75	163.55
Lithuania	1.67	2.12	1.93	115.57
Malta	0.74	0.71	1.18	159.46
Poland	1.28	1.34	1.45	113.28
Romania	0.35	0.74	0.91	260.00
Slovakia	0.48	0.70	0.44	91.67
Slovenia	0.34	0.52	0.64	188.24
EU-13	1.06	1.19	1.17	110.38
EU-15	1.16	1.14	1.14	98.28

Source: own elaboration based on data from ComExt – EUROSTAT [11]

The Trade Coverage Ratio (TC) shows the export specialization of the specific country in the analyzed group of products. If this ratio is higher than 100%, it means that the specific country specializes in export, which makes it possible to infer that it has a relative advantage over the partners. In all the analyzed years the highest coverage of import with export (Tab. 3) in new member states was noted down in Hungary, Poland and Lithuania. In Bulgaria in the analyzed years the ratio was also higher than 100%. On the other hand, the largest trade deficit with reference to the analyzed group of products is observed in Cyprus where the import/export coverage ratio ranged from 25.68% in 2010 to 37.63% in 2016.

Table 3. Ratio of coverage of import with export for new EU member states as compared with EU-15 in 2004, 2010 and 2016 [%]

Country	2004	2010	2016	Changes in 2004–2016
Bulgaria	104.79	113.61	129.59	+24.8
Croatia	42.18	55.90	67.35	+25.17
Cyprus	37.09	25.68	37.63	+0.54
Czech Republic	65.32	67.77	81.25	+15.93

Table 3. cont.

Country	2004	2010	2016	Changes in 2004–2016
Estonia	63.55	83.40	80.42	+16.87
Hungary	157.45	158.48	151.90	–5.55
Latvia	44.58	78.87	97.37	+52.79
Lithuania	116.74	126.94	133.46	+16.72
Malta	30.26	33.57	45.82	+15.56
Poland	135.26	126.93	147.74	+12.48
Romania	31.11	63.23	72.15	+41.04
Slovakia	67.15	62.71	71.08	+3.93
Slovenia	36.96	69.61	66.54	+29.58
EU-13	71.73	82.05	90.95	+19.22
EU-15	90.12	90.17	91.26	+1.14

Source: own elaboration based on data from ComExt – EUROSTAT [11]

Another measure adopted for the purposes of the study – the intra-industry trade index (Tab. 4) – was also variable both in the analyzed years and in the member states. High competitive advantage with reference to the analyzed group of products determined by the discussed index was noted down for new member states such as Bulgaria, Lithuania, Latvia, Czech Republic and Estonia. Among the states of the so-called ‘old 15’, the highest intra-industry trade index was noted down in France, Germany, Belgium, Austria and Italy. In 2016 in all the above-mentioned countries it was higher than 90%. High values of this measure, close to 100%, testify to the occurrence of intra-industry trade exchange, which means that the streams of export and import of food products are overlapping to a large extent. They reflect the capacity of the above-mentioned countries, and in particular France, to satisfy the demand-related preferences of foreign customers, which in turn is a proof that the specific economy is capable of adaptation and is competitive [23].

Table 4. Grubel-Lloyd Intra-Industry Trade Index (IIT) for new EU member states as compared with EU-15 in 2004, 2010 and 2016 [%]

Country	2004	2010	2016	Changes in 2004–2016
Bulgaria	97.66	93.63	87.11	–10.55
Croatia	59.33	71.71	80.49	21.16
Cyprus	54.11	40.86	54.68	0.57
Czech Republic	79.02	80.79	89.66	10.64
Estonia	77.71	90.95	89.15	11.44
Hungary	77.68	77.38	79.40	1.72

Table 4. cont.

Latvia	61.67	88.19	98.67	37.00
Lithuania	92.28	88.13	85.67	−6.61
Malta	46.46	50.27	62.85	16.39
Poland	85.01	88.13	80.73	−4.28
Romania	47.46	77.47	83.82	36.36
Slovakia	80.34	77.08	83.10	2.76
Slovenia	53.98	82.08	79.91	25.93
EU-13	70.21	77.44	81.17	10.96
EU-15	73.41	77.27	78.84	5.43

Source: own elaboration based on data from ComExt – EUROSTAT [11]

4. Conclusions

The presented study attempted to evaluate the competitive position of new member states of the European Union as compared with old member states (EU-15) in foreign trade in agricultural and food products. This assessment was based on selected indices referring to international trade. The studies showed that the significance of agri-food products in international trade is differentiated in the member states of the European Union and in most new member states their significance increased in the analyzed period. The share of the specific group of products in total exports that was higher than average for EU-13 was noted down in Bulgaria, Croatia, Cyprus, Latvia, Lithuania, Malta and Poland.

Changes in RCA index in 2004–2016 point to an improvement in the competitive position of most new member states in foreign trade in agri-food products after their accession to the structures of the EU. The Trade Coverage Ratio (TC) showed the specialization of selected countries in food products. Among new member states, Hungary, Poland, Lithuania and Bulgaria revealed a relative advantage over partners in the analyzed years. On the other hand, out of the ‘old 15’, countries specializing in the export of the analyzed group of products are: Denmark, Ireland, the Netherlands, Spain and Belgium. In addition, the studies showed that EU member states were considerably differentiated in terms of intra-industry trade exchange. High ability to satisfy the demand-related preferences of foreign customers was observed in particular in France, and as regards new member states – in Bulgaria, Lithuania, Latvia, Czech Republic and Estonia.

Changes in the competitive position of new member states in relation to trade exchange in agricultural and food products must be associated with new conditions in which these countries started to operate after their accession to the European Union. However, such a position largely depends on the level of agricultural development in respective member states. Meanwhile, as found by, among other authors, Nowak et al. [20], the level in EU-13 is much lower than in old member states. In addition, convergence processes are very slow and they require alignment processes and effective utilization of EU grants [24, 25]. The variety of

determinants shaping the competitive position of respective countries in trading in agricultural and food products justifies the need for undertaking further studies in order to identify and evaluate them.

References

- [1] Siggel E. (2006), *International Competitiveness and Comparative Advantage: A Survey and a Proposal for Measurement*. *Journal of Industry, Competition and Trade*, vol. 6, pp. 137–159.
- [2] Latruffe L. (2010), *Competitiveness, productivity and efficiency in the agricultural and agri-food sectors*, OECD Food, Agriculture and Fisheries Papers, No. 30, OECD Publishing.
- [3] European Commission (2017), *Measuring Competitiveness*, Background documents at the European Semester, Pet. Ares (2018) 1159686-01/03/2018.
- [4] Bojnec Š., Fertő I. (2015), *Agri-Food Export Competitiveness in European Union Countries*, *Journal of Common Market Studies*, vol. 53(3), pp. 476–492.
- [5] van Rooyen J., Esterhuizen D., Stroebel L. (2011), *Analyzing the competitive performance of the South African wine industry*, *International Food and Agribusiness Management Review*, vol. 14(4), pp. 179–200.
- [6] European Commission (2010), *EUROPE 2020. A strategy for smart, sustainable and inclusive growth*, Brussels, 3.3.2010, COM(2010) 2020.
- [7] OECD (2018), *Innovation, Agricultural Productivity and Sustainability in Estonia*, OECD Food and Agricultural Reviews, OECD Publishing, Paris.
- [8] Pawlak K. (2013), *The development and significance of foreign trade in agri-food products in selected preferential trade agreements*, *Problemy Rolnictwa Światowego*, vol. 13(4), pp. 131–139.
- [9] Banterle A., Carraresi L. (2007), *Competitive performance analysis and European Union trade: The case of the prepared swine meat sector*, *Food Economics*, vol. 4(3), pp. 159–172.
- [10] van Berkum S. (2015), *Prospects of an EU-Mercosur trade agreement for the Dutch agri-food sector*, LEI Report 2015-036, LEI Wageningen UR (University & Research Centre), Wageningen.
- [11] ComExt-EUROSTAT, <http://epp.eurostat.ec.europa.eu/newxtweb/> [access: 15.02.2018].
- [12] Nosecka B., Pawlak K., Poczta W. (2011), *Wybrane aspekty konkurencyjności rolnictwa*, Instytut Ekonomiki Rolnictwa i Gospodarki Żywnościowej – Państwowy Instytut Badawczy, Warszawa.
- [13] Ucak H., Ozturk I., Sarac T.B. (2012), *Total Factor Productivity and export relationship: The case for agriculture sector in four Mediterranean countries*, *Actual Problems of Economics*, vol. 135(9), pp. 514–525.
- [14] Baiardi D., Bianchi C., Lorenzini E. (2015), *Food competition in world markets: Some evidence from a panel data analysis of top exporting countries*, *Journal of Agricultural Economics*, vol. 66(2), pp. 358–391.

- [15] de Frahan B.H., Vancauteren M. (2006), *Harmonisation of food regulations and trade in the Single Market: evidence from disaggregated data*, European Review of Agricultural Economics, vol. 33(3), pp. 337–360.
- [16] Marks-Bielska R., Lizińska W., Serocka I. (2015), *Polish agri-food foreign trade and its comparative advantage in 2008–2013*, Journal of Agribusiness and Rural Development, vol. 38(4), pp. 757–767.
- [17] Carraresi L., Banterle A. (2015), *Agri-food competitive performance in EU countries: A fifteen-year retrospective*, International Food and Agribusiness Management Review, vol. 18(2), pp. 37–62.
- [18] Cheong D., Jansen M., Peters R. (2013), *Shared harvests: Agriculture, trade and employment*, International Labour Office and United Nations Conference on Trade Development, UNCTAD, Geneva.
- [19] Csaki C., Jambor A. (2009), *The diversity of effects of EU membership on agriculture in New Member States*, Report of FAO Regional Office for Europe and Central Asia, Policy Studies on Rural Transition No. 4, Budapest.
- [20] Nowak A., Janulewicz P., Krukowski A., Bujanowicz-Haraś B. (2016), *Diversification of the level of agricultural development in the member states of the European Union*, Cahiers Agricultures, vol. 25(5), 5004.
- [21] Nowak A., Kamińska A. (2016), *Agricultural competitiveness: The case of European Union countries*, Agricultural Economics (Zemědělská ekonomika), vol. 62, pp. 507–516.
- [22] Utkulu U., Seymen D. (2004), *Revealed Comparative Advantage and Competitiveness: Evidence for Turkey vis-à-vis the EU/15*, paper presented at the European Trade Study Group 6th Annual Conference, Nottingham, September 2004, <http://www.etsg.org/ETSG2004/Papers/seymen.pdf> [access: 10.02.2018].
- [23] Cimpoeș L. (2014), *Competitiveness of Moldova's agri-food sector in the context of the deep and comprehensive free trade agreement (DCFTA)*, Știința agricolă, nr. 1, pp. 115–122.
- [24] Hamulczuk M. (2015), *Total factor productivity convergence in the EU agriculture*, in: *Proceedings of the Fourth International Conference Competitiveness of Agro-Food and Environmental Economy CAFEE 2015*, Competitiveness of Agro-Food and Environmental Economy (ISSN 2285-9179), pp. 34–43.
- [25] Barath L., Fertő I. (2017), *Productivity and convergence in European agriculture*, Journal of Agricultural Economics, vol. 68(1), pp. 228–248.

CHAPTER 12

Opportunity Perception and Entrepreneurs' Motivation in SME Context

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1. Introduction

Entrepreneurship is identified with pursuing opportunities [1]. Entrepreneurs strive to create, recognize and exploit opportunities. This process is analyzed by researchers representing various fields of science. In parallel, entrepreneurs' motivation is investigated. It is believed, that both opportunity perception and entrepreneurs motivation affect the entrepreneurial performance, what has its consequences both for organizations and economy. The previous research differentiate opportunity-driven and necessity-driven entrepreneurial activity [2].

The main questions behind this chapter are:

- What specific opportunities are followed by entrepreneurs?
- What specific motivation leads them to pursue opportunities?

These are core questions related to entrepreneurial activity in general.

The aim of this study is to examine the opportunity perception and entrepreneurs' motivation, as well as their association with entrepreneurial orientation (EO) and firm's innovativeness in small and medium-sized enterprises. Our sample consists of 108 enterprises operating in the Małopolska region in south Poland. From many possible opportunities and motivation, we test seven selected opportunities and seven selected motivations and rank them according to their importance. Additionally, we employ correlation analysis to identify their associations with EO and firm's innovativeness.

The structure of the chapter is as follows:

- First, we review the literature to identify possible opportunities and motivations.
- Second, we describe the sample and method.
- Third, we present the results.
- Finally, we discuss the results and its limitations and recommend some future developments in this line of studies.

2. Theoretical background

Throughout the development of the theory of economics, entrepreneurship has been identified with ownership, risk-taking, innovativeness. Nowadays, entrepreneurship is defined as pursuing opportunities [1] as well as resources [3]. Morris [4: p. 8] states that entrepreneurship “starts with an opportunity, and opportunities are rooted in the external environment”. Opportunity is defined as a “future situation which is deemed desirable and feasible” [1: p. 23], “in which new goods, services, raw materials, and organizing methods can be introduced and sold at greater than their cost of production” ([5], as cited in: [6: p. 220]). Shane and Venkataraman [6] acknowledge that opportunities themselves are objective phenomena that are not known to all parties at all times, but the recognition of entrepreneurial opportunities is a subjective process. Kirzner [7] mentions that entrepreneurial opportunities require the discovery of new means-ends relationships, whereas the other for-profit opportunities involve optimization within existing means-ends frameworks.

Stevenson and Jarillo [1: p. 23] argue that “opportunities vary among individuals and for individuals over time because individuals have different desires and they perceive themselves with different capabilities.” Moreover, desires can vary with the current position and future expectations, while capabilities vary depending upon innate skills, training, and the competitive environment. Prandelli et al. [8] posit that opportunity identification can be enhanced by entrepreneur’s ability to take the perspective of the user in a market as well as prior knowledge of the market. The role of opportunities in entrepreneurial action is highlighted in research of Global Entrepreneurship Monitor (GEM) ([9]). Among entrepreneurship’s indicators, there is “perceived opportunities” that reflects the percentage of the 18–64 population who see good opportunities to start a firm in the area where they live.

According to Shook et al. [10: p. 381] opportunity search and discovery as well as opportunity exploitation is crucial elements of the entrepreneurial process. Among major factors that influence the process of opportunity recognition and development leading to business formation are entrepreneurial alertness; information asymmetry and prior knowledge; social networks; personality traits (including optimism and self-efficacy, and creativity); and type of opportunity itself [11]. Chandler and Hanks [12: p. 78] highlight the ability to recognize and envision taking advantage of opportunity. Leutner et al. [13] posit that opportunity recognition (alongside with opportunity exploitation, innovation and value creation) are behaviors consistently identified in relations to individual differences in entrepreneurial success. Baggen et al. [14] found a positive association between entrepreneurial employee activities (which was expressed as to how often the employees were involved in innovation-related activities) and opportunity identification competence. They also found that opportunity recognition is influenced by self-perceived creative self-efficacy. The above review indicates that opportunities and the process of their recognition are a crucial element of entrepreneurial activities. We can assume that the more entrepreneurial organization, the more opportunities it recognizes and follows. Thus, we propose the hypothesis that perception of opportunities is positively correlated with entrepreneurial orientation (H1).

Entrepreneurial orientation (EO) is one of the conceptualizations of organizational entrepreneurship. It is rooted in the definition proposed by Miller [15: p. 771] that describes entrepreneurial firms as that “one that engages in product-market innovation, undertakes somewhat risky ventures, and is first to come up with ‘proactive’ innovations, beating competitors

to the punch". EO includes the following dimensions: risk-taking, innovativeness, proactiveness, autonomy and competitive aggressiveness [16].

To associate opportunities with entrepreneurial orientation, it is necessary to reflect the different types of opportunities. D'Souza [17] distinguishes innovative and imitative opportunities, while Holcombe [18] posits that opportunities can result from innovative activity or perception of opportunities offered by the market. Krupski [19] differentiates opportunities in terms of their sources (internal and external) and approach towards them (active and passive). Thus, we include in our examination seven types of opportunities: new markets and customers' needs; new resources; technology development; new financial sources (including subsidies); highly demanding clients; competitors' weaknesses and failures; and legal and tax regulations. We expect, that all of them are relevant, however, we examine their importance in the opinion of surveyed entrepreneurs.

We assume, that all of them are positively correlated with entrepreneurial orientation. However, we expect that the strength of the correlation can be different for each opportunity. Thus, we compare the level of correlation of the selected opportunities with EO. Additionally, we examine their correlation with firm's innovativeness, which has been perceived as the most important characteristic of entrepreneurship, and contemporary is one of the EO's dimensions.

One of the key issues related to people and their behaviors in organizations is motivation. This relates to entrepreneurial activity as well. This leads to the implementation of planned behavior theory and motivation-opportunity-ability concept in entrepreneurship studies [20]. Stevenson and Jarillo [1] argue that an individual's motivations are decisive for the emergence of entrepreneurial behavior. They posit: "By definition, nobody will pursue an opportunity if he/she does not want to, and we have seen argued that the very exceptional nature of pursuing opportunities without adequate resources makes it very difficult for top management to 'force' that pursuit through the typical managerial mechanisms by prespecifying task goals" [1: p. 24]. Hui-Chen et al. [20] have found that motivation affects entrepreneurial intentions. In this context special role is played by HRM (e.g. assessment and compensation) that can affect organizational entrepreneurship [21]. Thus, we propose the following general hypothesis (H2): entrepreneurs' motivation is positively correlated with entrepreneurial orientation.

However, entrepreneurs are motivated by different motives. This is reflected in GEM methodology. GEM distinguishes "necessity-driven entrepreneurial activity" (people get involved in entrepreneurship because they had no better options for work) and "improvement-driven opportunity entrepreneurial activity" that represents those, who state they are driven by opportunity (as opposed to having no better options for work) and who indicate the main driver for being involved in this opportunity is being independent or increasing their income, rather than just maintaining their income [9]. In this study, we investigate deeper an entrepreneur's motivation. We compare seven motivations: exploitation of market opportunities; economic profit; entrepreneur's independence; societal profit; verification of own ideas; self-test of entrepreneur's capabilities; and an opportunity to compete. Our aim is to rank them according to their importance in the opinion of surveyed entrepreneurs. As in the case of opportunities, we will correlate selected motivations with EO and the firm's innovativeness.

3. Sample and method

Our sample consists of SMEs operating in the Małopolska region (south Poland, with Kraków as the region's capital city). They represent different industries. They are located both in urban and rural areas. They are diversified in a period of business activity. The data was collected with PAPI method from December 2017 till January 2019. After verification of the collected data, the answers obtained from 108 enterprises were analyzed. The sample characteristic is presented in Table 1.

Table 1. Sample description

Characteristics	Variants	N	Percentage
Number of firm's employees	10–49	66	60
	50–249	42	40
Location	urban	29	26.9
	rural	79	73.1
Firm age	≤10 years	35	32.4
	11–20 years	37	34.3
	>20 years	36	33.3

Basing on the literature review, we have selected seven opportunities and seven motivation. Additionally, we have included two latent variables, namely entrepreneurial orientation (EO) and the firm's innovativeness. EO consist of nine items related to risk-taking, innovativeness and proactiveness. The index of a firm's innovativeness comprises three items. Cronbach's alpha coefficient for EO and firm's innovativeness are respectively 0.88 and 0.79. Our respondents were assessing each item in seven-points Likert's scale. Our analysis consists of ranking the means related to opportunities and motivations, as well as correlating them with indices of EO and firm's innovativeness. The analysis uses Statistica 13.1.

4. Results and discussion

The results of the analysis are presented in Table 2.

Table 2. Correlation matrix

Variable	Mean	St. dev.	EO	Innov.
Technology development as opportunity	5.26	1.42	0.42**	0.42**
New markets and customers' needs as opportunity	4.93	1.22	0.35*	0.23
Highly demanding clients as opportunity	4.33	1.32	0.12	0.14
New resources as opportunity	4.21	1.10	0.02	−0.18
New financial sources, including subsidies, as opportunity	4.09	1.38	0.12	0.10

Table 2. cont.

Legal and tax regulations as opportunity	3.51	1.71	−0.17	−0.42**
Our competitors' weaknesses and failures as opportunity	3.37	1.48	−0.06	−0.14
Economic profit as motivation	5.63	1.09	0.04	0.01
Exploitation of market opportunities as motivation	5.02	1.16	0.31*	0.30*
Entrepreneur's capabilities self-test as a motivation	4.74	1.20	0.28	0.14
Entrepreneur's independence as motivation	4.67	1.15	0.10	0.11
Societal profit as motivation	4.40	1.12	0.15	0.01
Verification of own ideas as motivation	4.07	1.24	0.39**	0.33*
Competition as motivation	3.44	1.12	0.20	0.02
Entrepreneurial orientation	4.58	0.61	1.00	0.79***
Innovativeness	5.20	0.96	0.79***	1.00

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The results presented in Table 1 show that entrepreneurs perceive as the most important the opportunities related to technology development (5.26) and new markets and customers' needs (4.93). Additionally, the entrepreneurs are motivated mainly by the possibility of economic profit (5.63) and exploitation of market opportunities (5.02). These results indicate that entrepreneurs represented in our sample are driven by opportunities.

Our results unveil the correlation between motivation to verifying of own ideas and EO (0.39), as well as between motivation to exploring market opportunities and EO (0.31). The perception of technology development and EO are also significantly correlated (0.42), as well as the perception of new markets and customers' needs as opportunity and EO (0.35).

The innovativeness is correlated most strongly with the perception of technology development as an opportunity (0.42), while its correlation with perceiving legal and tax regulations as an opportunity is strongly negative (−0.42). This indicates the role of entrepreneurs' opportunity perception in the innovation processes, namely, entrepreneurs' interests in technology development that they can impact on, instead of changes of the legal environment that are created and given by the policymakers.

The above results support our hypotheses that perception of opportunities is positively correlated with entrepreneurial orientation (H1) and entrepreneurs' motivation is positively correlated with entrepreneurial orientation (H2).

The possibility to gain economic profit is the main motivation among entrepreneurs in the surveyed sample, however, economic profit is not significantly correlated with EO. This ambiguous observation may indicate that pursuing profit is not so important as pursuing opportunities, or that EO does not fully reflect entrepreneurial spirit and overestimates the role of economic profit.

Finally, the results show that competition plays a less important role than other motivations investigated in this study. This is accompanied by observation, that competitors' weaknesses and failures are perceived as opportunity much less than other situations. These findings

suggest the need to examine the entrepreneurs' approach towards other entities (including their competitors) and the need to revise the position of competition in the EO construct.

Other variables are not significantly correlated with neither innovativeness nor entrepreneurial orientation. There is no significant difference in correlation levels in terms of our control variables (number of firm's employees, location, firm's age).

The presented results confirm the role of opportunities and market orientation in entrepreneurial activity. The observation that technology development and new markets and customers' needs are perceived as an opportunity and are correlated with EO supports the previous direction of the entrepreneurship theory development, wherein opportunities are constitutive characteristics of entrepreneurial actions [1]. Our results are in line with international comparison provided by GEM, that shows that the perception of opportunities among Polish entrepreneurs is at a high level (68.5 comparing to a range from 19.2 to 81.6 observed in 21 countries from Europe and North America, that counts as third place in the rank), while perceived capabilities is also relatively high (46.6 comparing to range of 27.4 to 56.8) [22]. Our study contributes to the previous entrepreneurship research body by indicating these opportunities that may be most recognized by entrepreneurs (i.e., technology development, new markets, new customers' needs). Moreover, our study confronts entrepreneurs' opportunity perception and motivation with entrepreneurial orientation, which is one of the most common operationalizations of organizational entrepreneurship. Additionally, our findings contribute to the innovation theory development by indicating that motivation to verification of own ideas and motivation to the exploitation of market opportunities are correlated with innovativeness (as well as with EO). This observation highlights the role of entrepreneurial approach in innovative activity.

This study provides also one observation important for policymakers: legal and tax regulations play a less important role than other opportunities, and it can be interpreted as neutral (the results suggest that the same number of entrepreneurs in the sample see and do not see it as an opportunity).

The study here has some limitations. First, it is an exploratory study that focuses only on several possible motivations and opportunities selected from a wide range of them. Second, the sample is limited in number, location and size of enterprises, while previous studies indicate the impact of the context and entrepreneurial ecosystem. Third, we refer to the entrepreneurial orientation that is only one of conceptualizations of organizational entrepreneurship. Fourth, the method of collecting data is based on self-descriptive responses which imply subjective components and may result in self-evaluation bias. And finally, the data are examined with basic statistics.

The above limitations suggest that the study's results should not be generalized to total populations, but rather be interpreted as an indication of the relative importance of examined opportunities and motivations (from the perspective of a particular group of entrepreneurs).

5. Conclusions

This study contributes to theory development by providing a deeper understanding of entrepreneurs' opportunity perception and motivation. In particular, our results show that entrepreneurs see opportunities mainly in technology development and new markets and

customers' needs. They are motivated mainly by economic profit and the possibility to exploit market opportunities. Additionally, an important finding is that perception of new markets and customers' needs and technology development, as well as motivation to verifying own ideas and to exploit market opportunities are significantly positively correlated with entrepreneurial orientation. This confirms the constitutive position of opportunities in entrepreneurship theory.

The findings shed light on opportunity driven entrepreneurship, however further studies are recommended. The perception of opportunities may be affected by an organization's characteristics, thus it is recommended to investigate it within the bigger and more diversified sample. In particular, the examination of opportunity perception in different contexts (industry, economy, culture) may develop an understanding of the role of the entrepreneurial ecosystem. Finally, long-term studies may explain how an entrepreneur's perception evolve over time.

References

- [1] Stevenson H.H., Jarillo J.C. (1990), *A Paradigm of Entrepreneurship: Entrepreneurial Management*, Strategic Management Journal, vol. 11(4), pp. 17–27.
- [2] Kelley D.J., Singer S., Herrington M. (2011), *The Global Entrepreneurship Monitor 2011. Global Report*, Global Entrepreneurship Research Association (GERA).
- [3] McGrath R.G., MacMillan I.C. (2000), *The Entrepreneurial Mindset: Strategies for Continuously Creating Opportunity in the Age of Uncertainty*, Harvard Business School Press, Boston, MA.
- [4] Morris M.H. (1998), *Entrepreneurial Intensity: sustainable advantages for individuals, organizations and societies*, Quorum Books, Westport, CT.
- [5] Casson M. (1982), *The entrepreneur*, Barnes & Noble Books, Totowa, NJ.
- [6] Shane S., Venkataraman S. (2000), *The promise of entrepreneurship as a field of research*, Academy of Management Review, vol. 25, pp. 217–226.
- [7] Kirzner I. (1997), *Entrepreneurial discovery and the competitive market process: An Austrian approach*, Journal of Economic Literature, vol. 35, pp. 60–85.
- [8] Prandelli E., Pasquini M., Verona G. (2016), *In user's shoes: An experimental design on the role of perspective taking in discovering entrepreneurial opportunities*, Journal of Business Venturing, vol. 31(3), pp. 287–301.
- [9] Bosma N., Kelley D. (2018), *Global Entrepreneurship Monitor. 2018/2019 Global Report*, Global Entrepreneurship Research Association (GERA).
- [10] Shook C.L., Priem R.L., McGee J.E. (2003), *Venture Creation and the Enterprising Individual: A Review and Synthesis*, Journal of Management, vol. 29(3), pp. 379–399.
- [11] Ardichvili A., Cardozo R., Ray S. (2003), *A theory of entrepreneurial opportunity identification and development*, Journal of Business Venturing, vol. 18, pp. 105–123.
- [12] Chandler G.N., Hanks S.H. (1994), *Founder competence, the environment, venture strategies and venture performance*, Entrepreneurship Theory and Practice, vol. 18(3), pp. 77–89.
- [13] Leutner F., Ahmetoglu G., Akhtar R., Chamorro-Premuzic T. (2014), *The relationship between the entrepreneurial personality and the Big Five personality traits*, Personality and Individual Differences, vol. 63, pp. 58–63.

- [14] Baggen Y., Lans T., Biemans H.J.A., Kampen J., Mulder M. (2016), *Fostering entrepreneurial learning on-the-job: evidence from innovative small and medium-sized companies in Europe*, European Journal of Education, vol. 51(2), pp. 193–209.
- [15] Miller D. (1983), *The correlates of entrepreneurship in three types of firms*, Management Science, vol. 29(7), pp. 770–791.
- [16] Lumpkin G.T., Dess G.G. (1996), *Clarifying the entrepreneurial orientation construct and linking it to performance*, Academy of Management Review, vol. 21, pp. 135–172.
- [17] D’Souza R., 2010, *Opportunity Identification: Role of Knowledge Heterogeneity and Opportunity Identification Process*, in: *ICSB World Conference Proceedings, 55th International Council for Small Business (ICSB) Conference. Cincinnati, OH, 24–7 June*, <https://icsb.org/wp-content/uploads/2017/07/icsb2010.pdf> [access: 23.12.2018].
- [18] Holcombe R.G. (2003), *The Origins of Entrepreneurial Opportunity*, The Review of Austrian Economics, vol. 16(1), pp. 25–43.
- [19] Krupski R. (2011), *Okazje w zarządzaniu strategicznym przedsiębiorstwa*, Organizacja i Kierowanie, vol. 147(4), pp. 11–24.
- [20] Hui-Chen C., Kuen-Hung T., Chen-Yi P. (2014), *The entrepreneurial process: an integrated model*, International Entrepreneurship and Management Journal, vol. 10, pp. 727–745.
- [21] Glinka B., Gudkova S. (2011), *Przedsiębiorczość*, Wolters Kluwer, Warszawa.
- [22] GEM Data (2018), <https://www.gemconsortium.org/data/key-aps> [access: 17.05.2019].

CHAPTER 13

Contemporary Trends in Motivating Employees

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1. Introduction

Etymologically, motivation is associated with stimulation to performance and its task is to persuade to act in the intellectual or physical sphere [1: p. 112]. In an enterprise, motivating is a process of deliberate influencing the behavior of employees by creating conditions which enable employees to meet their needs in order to contribute to the organization's goals [2: p. 121]. The motivating unit is usually the supervisor to whom the employees are subject. The applied systems and motivational actions play an important role in managerial work and should create conditions for fulfilling the motivational expectations of the decisive agent [3: p. 199]. Employees are motivated by the ability to meet their needs. In order for motivation to be effective, the incentives used should create a coherent system, they should be accepted by the employees while management should distinguish the incentive process that is individualized and specific for every person, from the process of motivating, or the process of affecting by incentives [4: p. 24]. The variety of human characteristics, needs, values held and aspirations as well as ways of thinking and changing all of these under the influence of various circumstances, cause that the design of motivational systems should be subject to modifications and even ought to be individualized, while the design of an incentive system is a difficult tasks in management [5: p. 17]. Motivating is a system of actions implemented by managements that guide and support the behavior of subordinates, allowing the achievement of organizational goals. The motivating process in an enterprise is regulated by motivating tools. They are a collection of procedures and organizational solutions. There are three main groups of motivating factors: coercive, encouragement or persuasion measures [6: p. 503]. Along with social and economic development, views on effective management have changed, which in turn influenced changes in motivation models [7]. They have evolved from the traditional model, through the human relations model and to the human resources model. The

main assumption of the last of these is a subjective treatment of employees, introducing integration of an organization's goals with its employees' goals and the creation of technical and organizational conditions that trigger self-direction and self-control among employees [8: p. 45]. The aim of the research was to learn about motivating employees in enterprises, to get to know employees' opinions on the subject and to identify the most motivating factors.

2. Methodology

The data provided by the two companies were used. Information was obtained from the management of these enterprises, HR departments, marketing departments and employees who, with the consent of the management, filled out questionnaires. The survey covered all employees from the companies. In enterprise 1, 56 employees completed the survey, which accounted for 75% of all employees. In company 2, completed questionnaires were received from 70 employees, which accounted for 82% of employees. In total, the two companies provided opinions from 126 people. The database was created and calculations were made in Excel. The research was anonymous, its respondents passed the questionnaires to an interviewer, who was not an employee of any of the enterprises.

3. Characteristics of enterprises

Company 1 started its activity in 1992 as a civil partnership. Currently, it is a large and well-known bicycle accessories wholesale company on the Polish market, it produces bicycle wheels and sells and services bicycles. The enterprise cooperates with numerous world-renowned companies producing bicycle tires, lighting, frames, meters, pulsometers and monitors for bicycles, devices that help to lead an active lifestyle with a bicycle as well as bicycle clothing. These are such companies as: Kenda, Trigon, Rower Tour de France, Bion, Ravx. A wide range of products from the bicycle industry makes the company provide everything that a cyclist needs. In 2011, the company resigned from its own transport and established cooperation with specialist shipping companies and now customers can order goods online.

Company 2 started its activity in 1982 and in the first years it was involved in the production and selling of furniture. In 2000, the company resigned from furniture production. It focused on the manufacture of power tools and parts for them and started the production of cast iron products, mainly gate automation and metal fittings for gardens and furniture. The company produces, retail sales and wholesale, as well as provides assembly services. Customers can also place orders online, and external shipping companies deliver goods to a given address. The company cooperates with Italian, Chinese and Belgian enterprises from related industries, which allows to expand its commercial offer.

4. Findings

In both enterprises, employees with secondary education prevail. In company 2 there are more employees with higher and vocational education. Few employees in the companies

reported that they have primary education. The gender structure in both enterprises is dominated by men. The structure of seniority in the surveyed enterprises shows that the most people have worked longer than 6 years, which informs that the movement of the crew is not excessive. It can be positively assessed that in the structure of seniority there are also junior employees who have been employed for less than a year. The monthly gross salary for a majority of the respondents ranges from 2001 to PLN 4,000. In company 1, one fifth of the respondents and in company 2 one fourth reported a level of gross remuneration from PLN 4001 to PLN 6,000. Individual employees from company 2 reported that their remuneration ranged from PLN 6001 to PLN 10,000. In both enterprises, no one reported a salary higher than PLN 10,000 (Tab. 1).

The respondents pointed out that in their enterprises, occasional bonuses (92%, 97%) and monthly bonuses (94%, 85%) are used in the context of financial incentive. Occasional bonuses are Christmas and Easter bonuses. In company 2, a monthly financial reward is paid out for the best employee. There are seasonal bonuses in enterprise 1, which is related to the seasonality of bicycle sales.

Table 1. Demographic characteristics of respondents and level of remuneration

Level of education, gender, seniority in the enterprise		Enterprise	
		1	2
Level of education	full higher	19	29
	incomplete higher	–	6
	secondary	62	35
	vocational	13	24
	elementary	6	6
Gender [%]	females	30	19
	males	70	81
Seniority in the current company [%]	<1 year	13	9
	1–3 years	19	17
	4–6 years	11	23
	>6 years	57	51
Monthly gross salary [PLN]	>10,000	–	–
	6,001–10,000	–	6
	4,001–6,000	21	25
	2,001–4,000	71	65
	1,001–2,000	8	4

Source: based on data from questionnaires

When asked to indicate the most important factors based on which a bonus is paid and its amount calculated, the employees stated that it depends on the degree of personal involvement (100%, 100%) and on the quantity and quality of work (88%, 92%). In third place they reported various coincidental factors (24%, 25%).

The degree of motivation of the indicated factors to performing work-related duties was assessed on a five-point scale, where the number 1 expressed the lowest mark and the number 5 the highest. The highest score was obtained by the level of remuneration (5.0 and 5.0). In the second and third place with the similarly high rating in both companies, the respondents pointed to the atmosphere at work and good relations with superiors (4.9 and 4.6).

The employees comparably assessed the possibility of receiving pay rises (4.6 and 4.3) and employment stabilization (4.5 and 4.5). In the five-grade scale, the respondents also positively assessed the possibility of self-realization at the place of employment (4.0 and 4.1) and the ability to make decisions (4.2 and 4.1). In further places, the respondents emphasized the importance of praise, the possibility of participating in courses and also appreciated work benefits (Tab. 2).

Table 2. Assessment of motivating factors in respondents' opinions

Factor	Enterprise	
	1	2
Satisfying remuneration for work	5.0	5.0
Good atmosphere at work	4.9	4.6
Good relations with superiors	4.9	4.6
Receiving pay rises	4.6	4.3
Stability of employment	4.5	4.5
Possibility of self-realization and development	4.0	4.1
Possibility to make individual decisions	4.2	4.0
Interesting and satisfying job	3.9	3.8
Use of public praise	3.5	3.2
Possibility of participating in courses and trainings at the company's expense	2.5	3.0
Attractive benefits	3.0	3.9

Rating scale: 1 – lowest rating, 5 – highest rating.

Source: Prepared on the basis of data from questionnaires

The respondents in their opinions stated that the factors of non-wage motivation are also important to them. Among the factors used in their enterprises, they rated highest the use of a mobile phone (56%, 70%). The next were satisfactory working conditions (41%, 57%), followed by a laptop computer (40%, 45%), co-financing holidays (25%, 30%), integration meetings for employees and families (19%, 32%), financing trainings or co-financing studies

(15%, 26%) and medical care (18%, 25%). The employees expressed that their workplaces also offer free or discounted swimming pool and gym passes, as well as interest-free employee loans.

The responses regarding satisfaction with the received remuneration level were as follows: 'rather yes' 63%, 80%, 'definitely yes' 37%, 20%. Among the respondents there were no indications for the response variants: 'not happy' and 'definitely not happy'.

The employees in their statements stressed that their enterprises also use penalties (100%, 95%). Most of the respondents believe that the use of penalties in a company mobilizes for better work (81%, 88%). Some have a different opinion and believe that the application of penalties discourages better work (13%, 6%). According to a small group, penalties have no impact on the quality of work (6%, 6%). The employee incentive system used in the enterprises was positively assessed (95%, 95%). Few people chose the answer of 'rather yes' (5%, 5%). None of the respondents indicated a negative answer, or 'rather not'. The non-wage incentive system was assessed by the respondents as follows: 'very good' 5%, 15%; 'good' 62%, 55%; 'sufficient' 29%, 25%, 'weak' 4%, 5%. A vast majority of the respondents from both companies are currently not considering changing their place of employment (92%, 85%). Some pointed out that they were considering employment changes in the past, but currently, after a change in the remuneration system, they are not considering it (8%, 10%). Only a few respondents from company 2 (5%) are considering this situation, but are not ready to make a decision.

5. Conclusions

Although the statements of particular respondents were diverse, which is a result of the individuality of each of the employees, the analysis of the collected opinions allowed to state that the incentive system is assessed positively by the employees in the enterprises concerned. In the motivation process, the managements use a wide set of wage and non-wage factors. Salaries are the most motivating factor. Other motivational factors of an economic nature are positively assessed by the employees. Non-wage benefits are characterized by high freedom and one can accept the thesis that the assessed enterprises have yet to take into account the needs and expectations of the employees. There is a need to review the penalties applied, because in the opinions of some employees they do not stimulate better work or do not affect the quality of work.

References

- [1] Bartkowiak G. (1999), *Psychologia zarządzania*, Akademia Ekonomiczna w Poznaniu, Poznań.
- [2] Poczrowski A. (1998), *Zarządzanie zasobami ludzkimi: zarys problematyki i metod*, Antykwa, Kraków.
- [3] Sajkiewicz A. (2000), *Zasoby ludzkie w firmie*, Poltex, Warszawa.
- [4] Kopertyńska W. (2007), *Motywowanie pracowników sfery produkcyjnej – doświadczenia badawcze*, Zarządzanie Zasobami Ludzkimi, nr 3–4, pp. 23–34.

- [5] Sikorski C. (2004), *Motywacja jako wymiana: modele relacji między pracownikami a organizacją*, Difin, Warszawa.
- [6] Penc J. (2008), *Encyklopedia zarządzania: podstawowe kategorie i terminy*, Wyższa Szkoła Studiów Międzynarodowych w Łodzi, Łódź.
- [7] Janowski J. (2018), *Personality Traits and Sales Effectiveness: The Life Insurance Market in Poland*, Journal of Entrepreneurship, Management and Innovation vol. 14(1), pp. 143–160.
- [8] Sekuła Z. (2008), *Motywowanie do pracy: teorie i instrumenty*, Polskie Wydawnictwo Ekonomiczne, Warszawa.

CHAPTER 14

Competitiveness Factors of Large Enterprises in Polish Economy

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1. Introduction

Competitiveness accompanies man in each area of activity and its idea is rivalry of groups or individuals to achieve the same objectives). In a dynamic economy, continuous search for and use of unique (internal and external) factors, standing out in a market, and taking a better position than competitors become sources of market success. In response to growing expectations of their environment, enterprises include more and more aspects of Corporate Social Responsibility in their strategies.

It is the objective of this chapter to specify factors affecting competitiveness of large enterprises. Two research hypotheses are proposed:

- H1: Implementation of Corporate Social Responsibility (CSR) is a statistically significant factor influencing enterprise competitiveness.
- H2: Advertising and public relations are statistically significant instruments of competing.

The theoretical section presents a critical review of specialist literature. Factor analysis is applied to verification of the research hypotheses. Statistica 12 and an auxiliary support MS Excel 2016 spreadsheet are utilized as tools of data analysis.

2. Enterprise competitiveness – literature review

Economic theory presents a range of approaches to competitiveness [1: p. 8, 2: pp. 89–96, 3: pp. 13–21, 4: p. 88, 5: pp. 511–545]. This is partly due to the fact competitiveness may be studied at several levels: of a state or region [6, 7], sector, industry, part of economy [8, 9], group of countries [10, 11], an enterprise [12, 13] and adopting a wide range of metrics and indicators. Some authors even stress the issue is not defined in economic

theory (e.g. [14: p. 1283]). Added to all that, many recognized economists employ the term competitiveness without providing a definition. E. Szymanik [15] and R Nowacki [16] present a detailed review of the definitions. Some focus on micro- and mezzo-economic foundations, others address transnational aspects of competitiveness.

Competitiveness is one among many characteristics of each enterprise. A minimum of two enterprises engaged in the same or related activities must exist so that one competes against the other. Competitiveness has become a starting point of market analyses and discussions and an integral part of economies, sectors, and individual enterprises that carry out market trade. It is for these reasons that recent literature has made a number of attempts at defining competitiveness from the viewpoint of an enterprise as well.

Competitiveness of an enterprise may denote:

- its ability to discover changes in its environment and inside it by continuing improvement of market competitiveness criteria compared to its rivals [17: p. 10];
- its economic power relative to its competitors in the global market where products, services, people, and innovations move freely across geographical borders [18: p. 563];
- its ability to achieve and maintain competitive advantage; in this sense, it can be synonymous with a firm's competitive ability [19: p. 77];
- its ability to keep creating a development trend, productivity growth (measured on the micro scale), and effective development of sales markets where competitors offer new, improved, and cheaper goods and/or services ([13: p. 125];
- its ability to profitably manufacture products that meet market requirements in respect of prices and quality [20: pp. 294–295];
- overall activities of an enterprise including not only effective sales but other types of operations as well [21: p. 3];
- its ability to effectively pursue objectives in a free market economy and to gain advantage over other players in the competition process [22: p. 75];
- its ability to provide customers with appropriate goods or services of adequate quality in the right place and at the right time, so that customer needs are fulfilled more efficiently and effectively than by other enterprises [23: p. 9].

Enterprise competitiveness is employed both in the context of global competition for shares in the world market and in the micro context of attaining specific results against other players in local markets [24: p. 93]. M. Dzikowska and M. Gorynia [25: p. 5] are of the opinion a universal and generally acceptable definition of enterprise competitiveness does not exist. In effect, the notion may have diverse meanings for different researchers or stakeholders in business entities. Absence of an unambiguous, generally acceptable definition of competitiveness is exacerbated by the fact experts propose their own classifications, thus constructing more definitions, for the purposes of their research.

Enterprise competitiveness is influenced by a range of factors [26: p. 217], i.e.:

- internal (tangible, intangible, human, and financial) resources,
- result-driven (products, distribution, economic conditions of market exchange),
- external (subjective and qualitative).

The first group, that is, resources, makes up competitive potential of an enterprise. Their skillful application decides possibilities of competing and assures maintenance of competitive standing in future. Result-driven factors, or instruments of competing, depend on internal

factors. This is by means of these instruments that an enterprise struggles for its competitive standing against rivals with increasing intensity. The third group of external competitiveness factors consists of subjective factors, which M.E. Porter names driving forces of competition, and qualitative factors, that is, macro-environment.

M.E. Porter [27] believes a firm's ability to compete is the greater, the lower the risk of rivals bringing new production capacities and considerable resources and being capable of interfering with realization of activities in line with existing pattern entering its sector. The threat of entry in a given sector depends on entry barriers combined with responses from existing competitors a new rival can expect. M.E. Porter distinguishes the following barriers:

- Economies of scale – reduction of unit product cost as production volume rises in a unit of time. They force an entrant to operate on a large scale and become exposed to sharp responses of existing enterprises or to operate on a small scale and accept a poorer cost situation.
- Diversification of products – firms existing in a sector have established brands and loyal customers, which forces entrants to incur large spending to overcome current loyalties in the sector.
- Capital requirements – a serious barrier to starting activities in a sector as they are associated with substantial risks, which gives advantage to existing businesses.
- Access to channels of distribution – an entrant in a sector must provide for distribution of its products by means of discounts and rebates. The more limited the number of distribution channels of a given product, the harder it is to enter a sector.
- Weaker cost situation regardless of scales – firms in a sector may enjoy a better cost situation regardless of their size and outcomes owing to exclusive ownership of know-how, patents, sources of raw materials, and advantageous location.
- State policies – a government may restrict entry in a sector with appropriate tools like compulsory licensing, limited access to raw materials, need to meet environment protection standards, etc.

M. Gorynia and B. Jankowska [28] claim competitiveness is a theoretical concept referring to market potential for regulation. Conduct of businesses boils down to rivalry, competing, and confrontation in the market. Competitiveness can be assumed to mean the ability to compete, that is, survive and operate in a competitive environment. In the long run, the attribute of competitiveness applies to an organization capable of surviving, while in the short term, an advantage over rivals is a feature of competitiveness.

Competitiveness is a fundamental parameter serving to evaluate an enterprise. However, it is vague, complex, many-sided, and multi-dimensional. As a result, estimating competitiveness requires addressing a number of aspects in an enterprise. Therefore, some authors have decomposed and defined elements of enterprise competitiveness (e.g. [29–31]).

M. Gorynia [19] proposes to describe competitiveness of an enterprise along three dimensions (groups of variables): competitive standing in future, competitive potential, and competitive strategy (instruments of competing). Strategy of competition is presented as a formulated response to the question about areas in which an enterprise is to compete (markets and segments), products it is to offer, and ways of securing continuing competitive advantage on specific conditions. The author additionally considers instruments of competing as components of a competition strategy [25].

3. Methods

Significance of individual factors of enterprise competitiveness (observable variables) was measured and evaluated by means of Exploratory Factor Analysis (EFA), which consists in identification of main factors and examining their correlations with all observable variables. It is designed to identify all factors potentially inherent in correlations of a given system of variables while preserving as much information as possible from primary variables and then reducing these factors [32].

This analysis has been created by psychologists Ch. Spearman [33] and L.L. Thurstone [34]. Ch. Spearman introduced the notion of single general factor to explain results of IQ testing. It was only L.L. Thurstone who laid theoretical foundations for the factor analysis, which aims at identifying all factors potentially inherent in correlations of a given system of variables while preserving as much information as possible from primary variables and then reducing these factors. The possibility of determining an optimum number of latent variables that help to explicate relations among a number of observable variables is the key advantage of the Exploratory Factor Analysis [35: p. 280].

The method of principal components analysis, a typical method of classifying variables (reducing data), is applied. It was developed by H. Hotelling in 1933 [36, 37]. This method transforms primary variables into a set of new, non-correlated variables known as principal components [38: p. 222]. It is intended to reduce a set of indicators to factors.

In the following step of the analysis, a matrix of factor loadings was created that consisted of observable variables and the factors containing maximum information. A matrix of factor loadings allows for identification of distinct principal components that are defined by means of such sets of primary variables that exhibit particularly high loading value modules [39: p. 84].

An optimum number of factors (factor loadings) was selected on the basis of Kaiser criterion which stipulates preserving factors with characteristic values above 1 and Cattell's scree test. The method involves specifying a number of factors based on a diagram with a number of factors on its horizontal axis and determined characteristic values along its vertical axis. The number of factors eligible for further analysis is based on the so-called inflection points that indicate where a curve's angle of inclination changes [37: pp. 30–55]. The analysis should address factors that make up the so-called slope while ignoring those constituting the so-called scree on a diagram plotted by joining points which describe characteristic values (variance) of subsequent factors [40: p. 95].

In order to generate the so-called simple factor structure, the matrix of factor loadings was subject to Varimax rotation in order to simplify factor interpretation by minimizing the number of variables needed to explicate a given factor. Statistica 12 and an auxiliary MS Excel 2016 spreadsheet were used as tools of the data analysis.

4. Characteristics of research sample

The study was carried out in January 2018 and applied to large enterprises operating in Poland. The sample was random stratified. As of 30.06.2017, the general set consisted of 4436 large enterprises [41: p. 30]. 1600 enterprises were drawn from that population

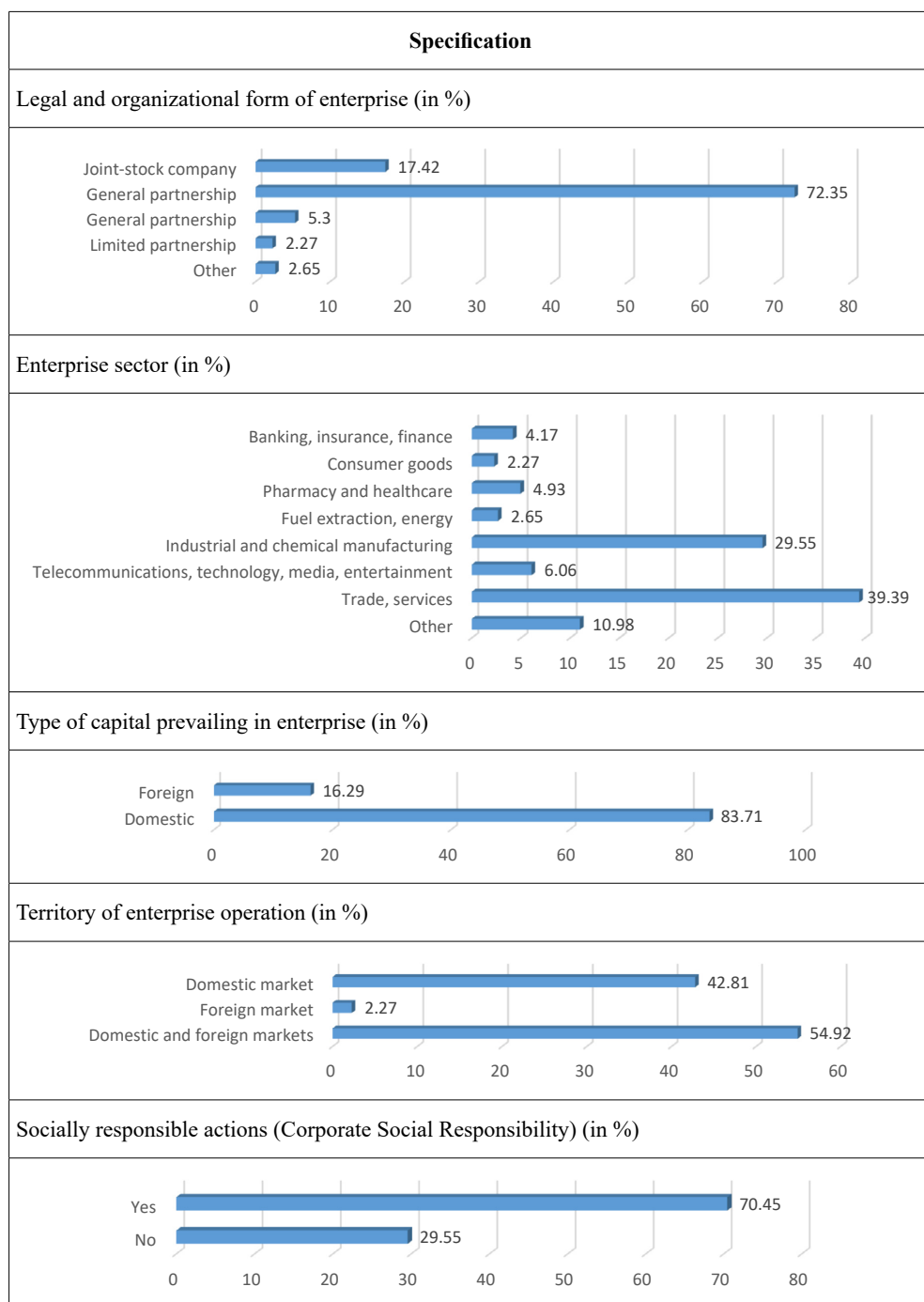
so as to guarantee each individual in the general set an equal chance of selection for the sample. The resultant sub-group represents and is representative of the entire population, that is, it allows for making conclusions applicable to the general set. The method of Computer-Assisted Telephone Interview (CATI) produced 264 correctly completed survey questionnaires.

The number of correctly completed surveys was $n = 264$, which means, assuming $\alpha = 95\%$ and $\beta = 6\%$, results of the analysis are representative of the general population.

The empirical part of the study employed the survey method, with an original questionnaire serving as the research tool. It consisted of two parts: particulars and contents. Six objective (or close to objective) criteria were adopted as part of the former to characterize the sample. The latter section utilized 34 variables (competitiveness factors) recorded along 10-point ordinal scales, with 1 denoting low and 10 high significance. They were divided into three groups defining three dimensions of enterprise competitiveness. 5 variables (market share, financial standing of enterprise, knowledge of enterprise and its products in the market, customer satisfaction, implementation of Corporate Social Responsibility), 16 variables (financial liquidity of enterprise, enterprise profitability, equity level in enterprise, customer loyalty, extensive network of distribution, correct management of IT infrastructure, quality of managerial staff, creativity of workers, condition of plant and machinery, research and development activities of enterprise, technical standard of products, mastery of technologies, creation of strong product brand, availability of materials, standard of servicing, implementation of Corporate Social Responsibility), 13 variables (quality of product/ service, quality of support, product brand, advertising, public relations, enterprise image, highly qualified workers, product pricing, innovative products, range of products, matching of product structure to consumer demand structure, availability of products, implementation of CSR) were employed as part of the particular dimensions, respectively.

The survey questionnaire contained six particular questions (discriminating variables) to characterize the enterprises studied. The first question asked about legal and organizational form of an enterprise. The limited liability company was the basic format, accounting for more than 72% of the firms. It was followed by joint-stock companies (more than 17%). Sector of an enterprise was the second criterion formally discriminating the sample. Trade and service entities were the largest group (104, or ca. 40% of all the businesses). The second largest comprised manufacturing industrial and chemical enterprises (approximately 30%). Enterprises dealing with consumer goods and fuel extraction and energy made up the smallest groupings of the enterprises, 2.27% and 2.65%, respectively. Type of prevailing capital was another variable discriminating the groups of enterprises. Analysis suggests domestic capital prevailed in 221 enterprises, while more than 16% firms had majorities of foreign capital. Area of enterprise activities was the next particular variable. The data indicate more than a half of the enterprises, namely, 54.92%, were active in both the domestic and international markets. Barely six firms were oriented solely towards foreign markets. Socially responsible actions (Corporate Social Responsibility) was another variable discriminating the set. The data collected show more than 70% of the enterprises examined (i.e. 186) have implemented socially responsible actions. Fewer than 30% enterprises, on the other hand, failed to engage in any actions relating to protection of the natural environment or aid to the local community. The situation is illustrated in Table 1.

Table 1. Sample structure in respect of legal and organizational form of enterprises



Registered office of an enterprise was another variable discriminating the sample. The data indicate most firms were based in Mazowieckie (56) and Śląskie (36) regions. Their shares corresponded to 21.21% and 13.64%, respectively. Most enterprises were distributed evenly, with their proportions ranging between 3–8%. Fewest were recorded for Opolskie (1.90%), Lubuskie, and Świętokrzyskie (2.27% each) regions. Results for this particular variable are shown in Figure 1.

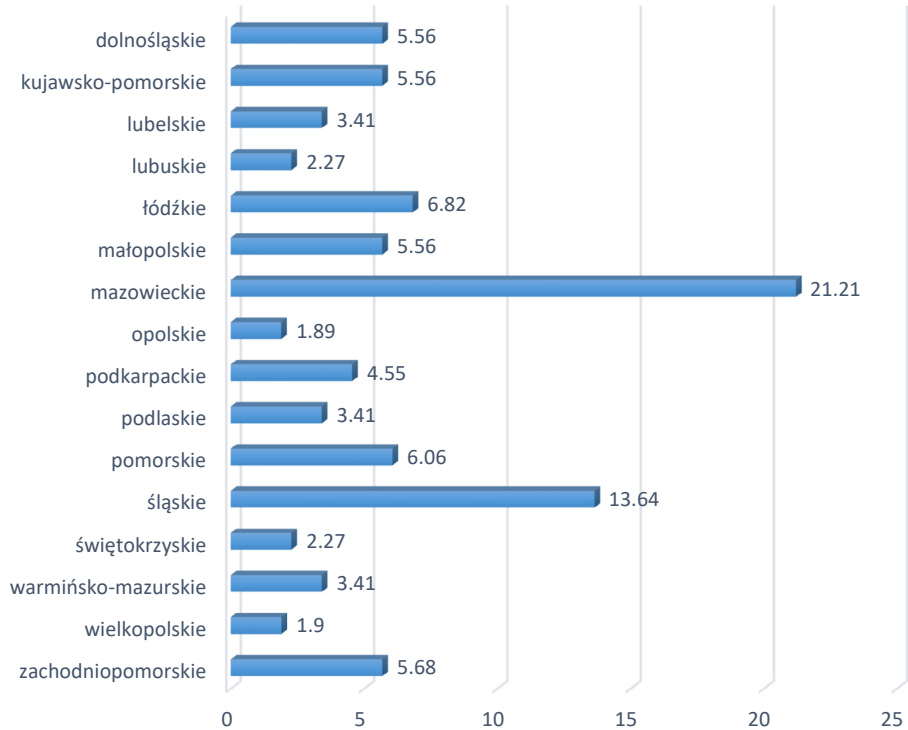


Fig. 1. Sample structure with regard of regions of enterprises' registered offices [%]

5. Results

Exploratory Factor Analysis serves to explicate interrelations among the observable variables. Cattell's scree test (1966), on the other hand, was used to determine the number of factors, according to which only the factors building the so-called slope were taken into account in further analysis and those making up the so-called scree were ignored on a graph plotted by joining the points describing characteristic values (variance) of successive factors, as well as Kaiser criterion (1960) that says factors with characteristic values above 1, that is, loaded with a minimum of one observable variables, can be included.

A factor scree diagram of characteristic values contributed to the model by particular factors is shown in Figure 2.

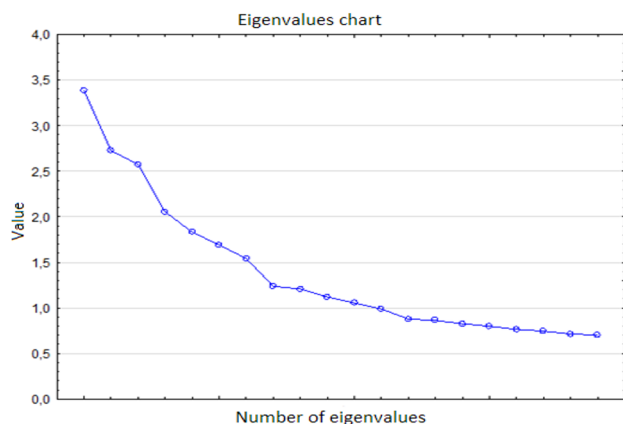


Fig. 2. Scree diagram of characteristic values for competitiveness factors

Source: The authors' own compilation

Figure 2 shows a sharply declining curve turning into a mild factor scree after eleven individual factors. This means the subsequent factors contain little information, or have low characteristic values, and are therefore rejected. A model of eleven factors is adopted for the purposes of further analysis. Table 2 includes a matrix of characteristic values for the selected factors.

Table 2. Matrix of characteristic values for factors describing enterprise competitiveness in Poland

Factor	Characteristic value	General variance [%]	Accumulated characteristic value	Accumulated percentage [%]
F.1	3.39	9.97	3.39	9.97
F.2	2.73	8.02	6.12	17.99
F.3	2.58	7.57	8.69	25.56
F.4	2.06	6.05	10.75	31.61
F.5	1.83	5.39	12.58	37.00
F.6	1.69	4.97	14.27	41.97
F.7	1.54	4.54	15.81	46.51
F.8	1.24	3.64	17.05	50.15
F.9	1.21	3.55	18.26	53.70
F.10	1.12	3.30	19.38	57.00
F.11	1.05	3.10	20.43	60.10

The data imply the subsequent characteristic values, that is, parts of the explicated variance for the eleven factors, are in the range $<1.05; 3.39>$. There are no dramatic disproportions, since each factor is explained by 3.10% to 9.97% of the overall variance. This is proof the identified factor structure is uniform, which means roles of all the factors are significant.

The accumulated characteristic value for the eleven factors is 20.43. It means the system of factors explicates as much as 60.10% of the total variance and the model formulated below well matches the reality studied.

In order to improve and produce the so-called simple factor structure, the matrix of factor loads was subject to Varimax rotation to simplify interpretation of the factors by minimizing the number of variables required to explicate a given factor. Table 3 shows a matrix of factor loadings for the factors describing dimensions of enterprise competitiveness, namely, the correlation between the observable variables and factors introduced to the model. A minimum significant correlation was assumed to be 0.6.

Table 3. Matrix of factor loadings for factors of enterprise competitiveness

Variable	Principal components (the loadings are greater than 0.6) Factor loads (normalised Varimax)										
	F.1	F.2	F.3	F.4	F.5	F.6	F.7	F.8	F.9	F.10	F.11
1	0.00	0.11	0.05	0.66	0.17	-0.07	-0.11	0.16	-0.09	0.01	0.01
2	0.11	-0.10	-0.06	0.26	0.54	-0.23	-0.04	-0.04	0.06	0.36	0.02
3	0.01	-0.02	0.00	0.81	0.01	0.12	0.14	-0.05	0.05	0.02	-0.06
4	-0.01	-0.02	-0.02	0.77	-0.09	0.07	0.02	-0.10	0.04	-0.02	0.00
5	0.06	0.00	-0.06	0.14	-0.14	0.67	-0.04	-0.14	-0.06	0.24	0.10
6	-0.11	0.08	0.08	0.10	0.74	0.07	0.02	0.10	0.02	0.07	0.09
7	-0.01	0.00	-0.03	-0.04	0.74	-0.12	0.16	-0.15	0.04	0.03	-0.04
8	0.26	-0.10	0.16	-0.13	0.60	0.21	-0.01	0.06	0.03	-0.19	-0.05
9	0.39	0.00	-0.19	0.03	0.18	0.02	0.28	0.30	0.21	-0.03	0.19
10	0.27	0.60	-0.18	0.11	-0.02	0.10	0.08	-0.08	0.00	0.13	0.27
11	-0.15	0.22	-0.49	0.08	-0.13	0.05	0.04	0.27	-0.31	-0.01	0.12
12	-0.16	-0.11	0.06	0.14	0.19	0.09	0.75	-0.05	-0.09	0.13	0.03
13	0.19	0.20	0.06	-0.20	0.02	0.06	0.64	0.02	-0.05	0.10	-0.15
14	-0.05	-0.11	0.74	0.13	0.07	-0.08	0.09	0.05	-0.08	0.05	-0.02
15	-0.01	-0.01	0.77	-0.05	-0.05	0.00	0.05	-0.01	0.09	-0.01	0.12
16	0.02	-0.03	0.60	-0.02	0.14	0.04	-0.15	0.25	0.03	0.45	-0.03
17	-0.13	-0.11	0.31	0.07	0.01	0.07	0.23	0.26	-0.07	0.61	0.07
18	-0.02	0.68	0.02	-0.06	0.10	0.05	-0.19	0.09	0.02	-0.01	0.05
19	-0.20	0.00	-0.16	-0.12	0.00	0.19	0.00	-0.07	0.57	-0.08	0.45
20	0.00	0.20	0.06	-0.02	0.03	0.02	-0.01	0.03	0.03	0.09	0.78
21	0.13	0.12	0.08	0.06	0.10	0.75	0.01	0.03	-0.07	-0.18	0.05
22	-0.04	0.08	0.02	-0.05	0.04	-0.01	0.06	-0.14	0.12	0.74	0.02
23	-0.08	0.20	-0.26	0.06	0.00	-0.03	0.23	0.01	0.37	0.33	-0.40
24	-0.09	0.65	-0.17	0.13	-0.16	0.09	0.08	-0.05	0.09	-0.01	0.08

Table 3. cont.

Variable	Principal components (the loadings are greater than 0.6) Factor loads (normalised Varimax)										
	F.1	F.2	F.3	F.4	F.5	F.6	F.7	F.8	F.9	F.10	F.11
25	0.79	0.07	-0.06	-0.03	0.06	0.09	0.03	0.10	0.04	-0.04	0.00
26	0.78	-0.18	0.11	0.00	-0.03	0.07	0.06	0.11	-0.07	-0.05	-0.07
27	0.27	-0.08	-0.02	0.15	-0.04	-0.14	0.54	0.31	0.16	-0.04	0.08
28	-0.40	0.58	0.05	-0.11	-0.01	-0.09	0.19	-0.05	0.13	-0.02	-0.12
29	0.13	0.22	0.25	-0.05	0.06	-0.05	0.03	0.00	0.43	0.25	0.08
30	0.02	0.04	0.09	0.10	0.06	-0.13	-0.06	0.18	0.72	0.04	-0.08
31	0.34	0.17	0.04	-0.09	0.01	-0.02	-0.08	0.64	0.10	0.04	-0.18
32	0.32	-0.39	0.28	0.00	-0.15	-0.01	0.16	0.51	0.11	0.00	0.11
33	0.03	-0.07	0.00	0.02	0.00	0.12	0.07	0.74	0.02	-0.03	0.07
34	0.01	0.04	-0.16	-0.04	0.01	0.70	0.10	0.36	0.04	-0.01	-0.08

Values in excess of 0.6 are bold. Variables loading the individual factors are easier to note in this way. Factor one (F.1) explicates 9.97% of the total variability and is represented by variables 25 and 26, i.e. advertising and public relations. The second factor (F.2) explains 8.02% of the overall variance and is represented by two variables, 18 and 24, that is, creation of strong product brand and product brand, Factor number three (F.3) explicates 7.57% of the total variance and is represented by variables 14,15 and 16, namely, the condition of plant and machinery, an enterprise's development activities, and technical standards of products. The fourth factor (F.4) explains 6.05% of the total variability and is represented by variables 1,3 and 4, that is, market share, knowledge of an enterprise and its products in the market, and customer satisfaction. Factor number five (F.5) explains 5.39% of the total variability and is represented by variables 6 and 7, or financial liquidity and profitability of an enterprise. The sixth factor (F.6) explicates 4.97% of the total variance and is represented by variables 5, 21 and 34. This is implementation of CSR, a factor present in three dimensions of enterprise competitiveness, i.e. competitive standing, competitive potential, and instrument of competing. The seventh factor (F.7) explains 4.54% of the total variance and is represented by variables 12 and 13, which are quality of management staff and creativity of workers. Factor number eight (F.8) explains 3.64% of the total variability and is represented by variables 31 and 33, namely, product range and availability of products. The ninth factor (F.9) explicates 3.55% of the total variance and is represented by variable 30, or innovativeness of products. Factor ten (F.10) explains 3.30% of the total variability and is represented by variables 17 and 22, that is, mastery of technology and quality of product/ service. The eleventh factor (F.11) explicates 3.10% of the total variance and is represented by a single variable, 20, the standard of servicing.

The approach suggested by literature was adopted of naming factors after variables with maximum factor loadings or after a shared characteristic. In effect, the first factor was termed 'marketing communication', factor 2 – 'brand', 3 – 'enterprise innovativeness', 4 – 'effect of marketing', 5 – 'financial standing of enterprise', 6 – 'CSR', 7 – 'human capital', 8 – 'product range', 9 – 'innovativeness of product', 10 – 'quality', and factor 11 – 'standard of servicing'.

The foregoing terminology served to develop a model of enterprise competitiveness in its three dimensions as illustrated in Figure 3.

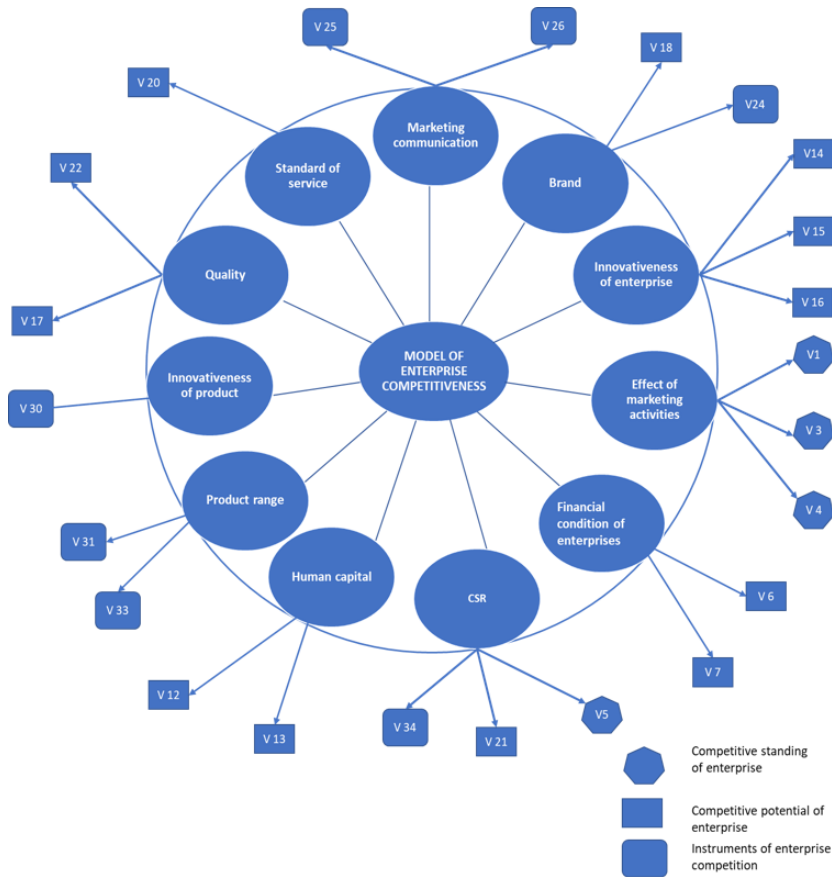


Fig. 3. Model of enterprise competitiveness

The particular observable variables (points on the scale) are represented by means of polygons and divided into three categories, i.e. competitive standing of an enterprise, competitive potential, and instruments of competing, whereas the factors are shown as oval shapes. Correlation dependences are illustrated with unidirectional arrows and mutual correlations among factors in the model are included in the circle described.

Only the 'CSR' factor acts on three competitiveness dimensions at the same time as it is loaded with implementation of CSR, a factor of competitive standing, competitive potential, and instrument of competing. The remaining factors are loaded with variables that are factors of one or two dimensions. An important role of advertising and public relations as instruments of competing deserves to be noted. They load the factor F-1, 'marketing communication'. These variables load as much as 9.97% of the overall variance. This is presented in Table 4.

Table 4. Factor-loading variables along the individual dimensions of competitiveness

Factor	Dimension of competitiveness		
	Competitive standing	Competitive potential	Instruments of competing
F.1 – marketing communication	–	–	2
F.2 – brand	–	1	1
F.3 – enterprise innovation	–	3	–
F.4 – effect of marketing actions	3	–	–
F.5 – financial standing of enterprise	–	2	–
F.6 – CSR	1	1	1
F.7 – human capital	–	2	–
F.8 – product range	–	–	2
F.9 – product innovativeness	–	–	1
F.10 – quality	–	1	1
F.11 – standard of servicing	–	1	–

Most variables (11) load the 7 factors defining competitive potential, whereas merely 4 variables affect competitive standing of enterprise. 8 instruments of competing variables load 7 factors. This implies 23 variables tested influence competitiveness of large enterprises.

6. Conclusion

Competitiveness of enterprises is the object of multiple analyses. Specialist literature fails to offer synthetic studies to identify key factors that would serve to evaluate competitiveness of enterprises, though.

The authors' study of 264 large enterprises has defined factors of competitiveness as measured in three dimensions: competitive standing of an enterprise, competitive potential, and instruments of competing. Based on managers' opinions on significance of the particular variables (factors) to be rated 1 to 10 and using Exploratory Factor Analysis, an original model of enterprise competitiveness consisting of eleven factors has been developed.

Its analysis suggests:

- 'CSR' explains 4.97% of the total variance. It is the only factor acting on three dimensions of competitiveness at the same time. It is loaded by the variable implementation of CSR, a factor of competitive standing, competitive potential, and instrument of competing. This means CSR affects competitiveness of enterprises in a statistically significant way, which confirms hypothesis H1.
- The variables advertising and public relations, instruments of competing, load factor C.1, 'marketing communication', and explain 9.97% of the overall variability. This implies that these are statistically significant instruments of competing, which corroborates hypothesis H2.

Measurement of enterprise competitiveness is a multi-dimensional area of research. The set of factors proposed here is not final or exhaustive, therefore. It may be extended with factors concerning both nature of business and macro-environment of enterprises.

References

- [1] Fajnzylber F. (1988), *International competitiveness: agreed goal, hard task*, Cepal Review, vol. 36(1), pp. 7–23.
- [2] Huggins R. (2003), *Creating a UK competitiveness Index: regional and local benchmarking*, Regional Studies, vol. 37(1), pp. 89–96.
- [3] Markovics K. (2005), *Competitiveness of domestic small and medium enterprises in the European Union*, European Integration Studies, vol. 1(4), pp. 13–24.
- [4] Markova V., Marakova V., Hiadlovsky V., Wolak-Tuzimek A. (2014), *The concept of Corporate Social Responsibility in selected economic sectors*, Instytut Naukowo-Wydawniczy “Spatium”, Radom.
- [5] Huggins R. & Thompson P. (2014), *A network-based view of regional growth*, Journal of Economic Geography, vol. 14(3), pp. 511–545.
- [6] Alarcon A.L. (2004), *Regional Competitiveness; the need for coordination between public and private action*, in: S. Rudolf (ed.), *Emerging Markets. Social, Political and Economic Challenges*, University Press, Łódź, pp. 87–91.
- [7] Porter M.E. (2011), *The Competitive Advantage of Nations, States and Regions*, https://www.hbs.edu/faculty/Publication%20Files/2011-0707_Malaysia_vcon_b3574e10-758b-483f-b6c5-f7439d7c58e9.pdf [access:15.05.2019].
- [8] Bednarz J. (2013), *Konkurencyjność polskich przedsiębiorstw na rynkach europejskich na przykładzie wybranych branż*, Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk.
- [9] Maráková V., Dyr T., Wolak-Tuzimek A. (2016), *Factors of tourism's competitiveness in the European Union countries*, E + M Ekonomie a Management, vol. 19(3), pp. 92–109.
- [10] Boltho, A. (1996), *The Assessment: International Competitiveness*, Oxford Review of Economic Policy, vol. 12(3), pp. 1–16.
- [11] Komarkova L., Pirozek P., Pudil P. (2014), *The Factors and Other Characteristics Influencing Competitiveness of Enterprises in Countries in the Post-Transition Phase of the Economy*, Inżynieria Ekonomika – Engineering Economics, vol. 25(5), pp. 513–521.
- [12] Leśniewski M.A. (2011), *Konkurencyjność przedsiębiorstw: wybrane problemy*, Wydawnictwo Dom Organizatora, Toruń
- [13] Adamkiewicz-Drwiłło H.G. (2010), *Konkurencyjność przedsiębiorstw w świetle uwarunkowań współczesnej gospodarki*, Dom Organizatora, Toruń.
- [14] Ahearn M., Culver D., Schoney R. (1990), *Usefulness and limitations of CPO estimates for evaluating international competitiveness: a comparison of Canadian and U.S. wheat*, American Journal of Agricultural Economics, vol. 72(5), pp. 1283–1291.
- [15] Szymanik E. (2016), *Konkurencyjność przedsiębiorstwa – główne aspekty*. Zeszyty Naukowe – Uniwersytet Ekonomiczny w Krakowie, 5(953), pp. 107–124.

- [16] Nowacki R. (2015), *Diagnoza poziomu konkurencyjności przedsiębiorstw w Polsce na podstawie oceny ich menadżerów*, Handel Wewnętrzny, nr 5(358), pp. 446–462.
- [17] Nemethné Gál A. (2010), *Competitiveness of small and medium sized enterprises – a possible analytical framework*, <https://pdfs.semanticscholar.org/9bf3/1ae1c8461eb524f6eefaf2709a926650dab2.pdf> [access: 25.05.2019].
- [18] Chao-Hung W., Li-Chang H. (2010), *The Influence of Dynamic Capability on Performance in the High Technology Industry: The Moderating Roles of Governance and Competitive Posture*, African Journal of Business Management, vol. 4(5), pp. 562–577.
- [19] Gorynia M. (2009), *Konkurencyjność w ujęciu mikroekonomicznym*, in: M. Gorynia, E. Łażniewska (red.), *Kompendium wiedzy o konkurencyjności*, Wydawnictwo Naukowe PWN, Warszawa, pp. 67–99.
- [20] Domazet T. (2012), *Regional cooperation striving for competitiveness and finance*, Serbian Association of Economists Journal, SAE – Serbian Association of Economists, issue 5-6, pp. 290–300.
- [21] Macias J. (2015), *Konkurencyjność przedsiębiorstwa*, Problemy Jakości, nr 5, pp. 2–9.
- [22] Dolata M., Hadryjańska B. (2016), *Wewnętrzne czynniki determinujące konkurencyjność przedsiębiorstw branży piekarniczej*, Ekonomika i Organizacja Przedsiębiorstwa, nr 11(802), pp. 74–84.
- [23] Kraszewska M., Pujer K. (2017), *Konkurencyjność przedsiębiorstw sposoby budowania przewagi konkurencyjnej*, Exante, Wrocław.
- [24] Wolak-Tuzimek A. (2010), *Determinanty małych i średnich przedsiębiorstw w Polsce*, Wydawnictwo Naukowe PWN, Warszawa.
- [25] Dzikowska M., Gorynia M. (2012), *Teoretyczne aspekty konkurencyjności przedsiębiorstwa – w kierunku koncepcji eklektycznej?*, Gospodarka Narodowa, nr 4(248), pp. 1–30.
- [26] Mantura W. (2001), *Systematyzacja czynników konkurencyjności przedsiębiorstwa przemysłowego*, in: E. Skawińska (red.), *Konkurencyjność podmiotów gospodarczych w procesie integracji i globalizacji*, Zeszyty Naukowe Politechniki Poznańskiej. Organizacja i Zarządzanie, z. 32, Wyd. Politechniki Poznańskiej, Poznań, pp. 211–218.
- [27] Porter M.E. (1994), *Strategia konkurencji: metody analizy sektorów i konkurentów*, Polskie Wydawnictwo Ekonomiczne, Warszawa.
- [28] Gorynia M., Jankowska B. (2008), *Klasy a międzynarodowa konkurencyjność i internacjonalizacja przedsiębiorstw*, Difin, Warszawa.
- [29] Głabiszewski W. (2004), *Kształtowanie konkurencyjności przedsiębiorstwa*, Ekonomika i Organizacja Przedsiębiorstwa, nr 4, pp. 14–21.
- [30] Stankiewicz J.M. (2005), *Konkurencyjność przedsiębiorstwa: budowanie konkurencyjności przedsiębiorstwa w warunkach globalizacji*, Towarzystwo Naukowe Organizacji i Kierownictwa “Dom Organizatora”, Toruń.
- [31] Gębczyński M. (2006), *Zarządzanie zasobami ludzkimi a konkurencyjność przedsiębiorstw przemysłu wydobywczego*, Zeszyty Naukowe – Politechnika Śląska. Organizacja i Zarządzanie, z. 34, pp. 63–72.
- [32] Czopek A. (2013), *Analiza porównawcza efektywności metod redukcji zmiennych – analiza składowych głównych i analiza czynnikowa*, Studia Ekonomiczne – Uniwersytet Ekonomiczny w Katowicach, nr 132 Zastosowania metod matematycznych w ekonomii i zarządzaniu, pp. 7–23.

- [33] Spearman Ch. (1904), *The proof and measurement of association between two things*, Americal Journal of Psychology, vol. 15, pp. 72–101.
- [34] Thurstone L.L. (1931), *Multiple factor analysis*, Psychological Review, vol. 38, pp. 406–427.
- [35] Cheba K. (2013), *Wykorzystanie analizy czynnikowej do wielowymiarowej oceny możliwości rozwoju prośrodowiskowej orientacji przedsiębiorstw*, Śląski Przegląd Statystyczny, nr 11(17), pp. 275–288.
- [36] Harman H. (1975), *Modern Factor Analysis*, University of Chicago Press.
- [37] Zakrzewska M. (1994), *Analiza czynnikowa w budowaniu i sprawdzaniu modeli psychologicznych*, Wydawnictwo Uniwersytetu Adama Mickiewicza w Poznaniu, Poznań.
- [38] Sztemberg-Lewandowska M. (2017), *Analiza niezależnych głównych składowych*, Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, nr 468, Taksonomia 28, pp. 222–227.
- [39] Lotko A. (2009), *Ocena jakości usług w centrach kontaktu z klientem*, Wydawnictwo Naukowe PWN, Warszawa.
- [40] Górniak J., Wachnicki J. (2010), *Pierwsze kroki w analizie danych: SPSS for Windows*, SPSS Polska, Kraków.
- [41] GUS (2017), *Zmiany strukturalne grup podmiotów gospodarki narodowej w rejestrze REGON, I półrocze 2017 r.*, Główny Urząd Statystyczny, Warszawa.

CHAPTER 15

Corporate Social Responsibility as Factor of Enterprise Competitiveness

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1. Introduction

Interest in Corporate Social Responsibility (CSR) and actions in this area are an increasingly common practice of enterprises. CSR is a new role of organizations in society, a new vision of partnership and a new treatment of this idea as part of enterprise strategy [1]. Any actions by contemporary firms are bolstered by an awareness care for quality of goods and services are insufficient in itself. For an enterprise to operate in the market properly, its strategy must address elements like: care for the natural environment, for broadly-defined safety of human resources, interests of the local community and society as a whole.

J. Adamczyk [2] is of the opinion CSR means encouraging enterprises to improve working conditions and to create public welfare to an extent broader than required by law. Benefits of CSR implementation for enterprises and society are commonly seen as sources of competitive advantage of socially responsible enterprises. It is the objective of this chapter to explore impact of implementation of the CSR concept on choice of factors determining enterprise competitiveness measured along three dimensions (competitive level of enterprises, competitive potential of enterprises, and instruments of competition).

Results of empirical research are presented into factors of enterprise competitiveness carried out among 264 large enterprises operating in Poland.

Two research hypotheses are posited:

- H1: Enterprise actions in the field of CSR have a statistically significant effect on selection of factors defining competitive standing of such enterprises.
- H2: Enterprise actions in the field of CSR have no impact on choice of factors determining their competitive potential and instruments of competition.

The hypotheses are verified by means of non-parametric ANOVA. Kruskal–Wallis and Mann–Whitney U tests served to establish if the resultant differentiation can be generalized to the population of large enterprises in Poland

2. CSR and enterprise competitiveness

The contemporary approach to CSR can be regarded as: a philosophy of business activity [3, 4], a management concept [5], factor of competitiveness [6, 7], concept of enterprises voluntarily considering social aspects [8–10], pro-social action [11], set of an organization's commitments [12], action strategy [13], business necessity [14], and an important strategic factor for enterprises in all sectors [15]. By following principles of CSR and exhibiting ethical business conduct, an enterprise is considered to enhance its goodwill [16, 17] and promote social development [18]. Such actions enhance differentiation of a given entity from its competitors [19, 20].

K. Chudy and U. Siedlecka [21] believe a continuing search for and utilization of unique (internal and external) factors distinguishing an enterprise in the market and helping it to gain a better standing than its competitors become sources of market success in a dynamically developing economy. In response to growing expectations of their environment, enterprises incorporate increasing numbers of social responsibility aspects in their strategies. The concept of social responsibility, which not only contributes to achievement and acquisition of competitive advantage but also to provision of conditions conducive to social and economic development in an innovative manner, can therefore be treated as a major source of competitive advantage. Functioning of enterprises in such a competitive market depends on social acceptance of methods and outcomes of their operation by both their social environment and its participants. Thus, social acceptance of an enterprise and its objectives determines existence of an organization.

According to M.E. Porter and M.R. Kramer [22], implementation of CSR to enterprises improves an entity's competitive standing by way of charity, which increases goodwill. They believe charity of enterprises brings better results than individual charity does. Accordingly, an enterprise seeks best donation recipients (most commonly charity organizations that will take proper advantage of such funds and will thus contribute to publicizing the donor's actions). An enterprise publicizes its commitment to social actions and the aims it supports more often than an organization to realization of such aims.

An enterprise's standing in the market is currently determined by the way it is perceived by its staff, customers, partners, local authorities and communities and the latter's needs are increasingly often reflected in long-term strategies of company development. In the opinion of B. Rok [23], implementation of the CSR idea may help to solve major social challenges and attain a number of important social objectives, such as:

- enhancing social integration by employing workers from excluded groups, inter alia;
- investments in qualification improvement, continuing education and assuring employability, necessary to build competitiveness of the knowledge economy;
- increasing enterprise innovativeness, primarily in respect of innovations serving to solve social problems;
- strengthening the process of building intellectual capital, in particular, social capital, civic activity, trust, and strategic planning skills by propagating methods of stakeholder dialogue and participatory forms of management;
- improving quality of life and public health as a result of voluntary enterprise initiatives in areas like health education, elimination of toxic chemicals, expanding the range of and access to services, inclusion of marginalized individuals in the market;

- more rational use of natural resources and cutting pollution, especially through investments in environmental innovations and voluntary adoption of environment management and labelling systems;
- developing a more positive image of business and entrepreneurs with society, which may assist with triggering entrepreneurship and creativeness, readiness to take risks, particularly among young people;
- enhanced respect for human rights, protection of the natural environment and fundamental work standards, reduction of poverty, and helping suppliers to follow these principles.

The debate on the strategic potential of CSR and a possible relation between CSR and competitiveness has gained in importance in the last decade. The literature contains a gap, however, for a detailed analysis of CSR's effect on growth of enterprise competitiveness. What is more, research has not been undertaken yet into effects of CSR on the three dimensions of competitiveness, that is, competitive standing of an enterprise, competitive potential, and instruments of competition. Published results have focused on four problems: CSR as a source of an enterprise's competitive advantage, role of CSR in an enterprise's innovative activities, impact of CSR on financial results, and CSR reporting.

3. Methods

The study was carried out in January 2018. The sample was selected at random and comprised large enterprises operating in Poland. As of 30.06.2017, the general population consisted of 4,436 enterprises [24]. 1600 firms were drawn out of that population so as to guarantee each member of the general set has an equal chance of finding itself in the sample. The resultant sub-group of the elements represents and is representative of the entire population, that is, it allows for conclusions concerning the general set. The method of Computer-Assisted Telephone Interview (CATI) generated 264 correctly completed survey questionnaires.

The number of correctly filled surveys was $n = 264$, which means results of the analysis are representative of the general population assuming $\alpha = 95\%$ and $\beta = 6\%$.

The empirical study utilized an original survey questionnaire which consisted of two sections: metrics and contents. Six objective (or close to objective) criteria were adopted in the former to characterize the sample. In the other part, 34 variables (competitiveness factors) were recorded on 10-point ordinal scales, with 1 denoting low significance and 10 – high significance. They were divided into three groups defining three dimensions of enterprise competitiveness. 5, 16 and 13 variables were used in the individual dimensions, respectively.

The study took advantage of the infrastructure and human resources of Voice Contact Center Sp. z o.o. of Warsaw, a member of OEX Group, a major business service provider in Poland. That enterprise's share in the research was limited to providing the technical facilities for CATI interviews, generation of a random phone number database, and collection of the statistical materials, namely, interviews and recording of raw data as a spreadsheet. The study was prepared, its results compiled, and conclusions were drawn by the author herself.

Non-parametric methods are applied to variables measured on the ordinal scale. Mann–Whitney U and Kruskal–Wallis tests were employed, therefore, to define variables differentiating choice of enterprise competitiveness factors.

Mann-Whitney U test was used for differentiating variables with two codes in order to verify the hypotheses of insignificant differences between medians of the test variable in two populations (with the variable distributions close to each other) [25]. In respect of differentiating variables with more than two codes, on the other hand, Kruskal–Wallis test was utilized [26]. This is a non-parametric test helping to verify statistical hypotheses of variations of the individual dimensions across the groups.

The survey questionnaire used in the study contained six metric (differentiating variable) questions characterizing enterprises. Analysis of the test sample shows the limited liability company was the principal organizational status. These accounted for more than 72% of all the businesses. Joint-stock companies followed (more than 17%). The remaining enterprise classes constitute less than 6% each. Service and trade firms constituted the largest grouping (104 entities, or approx. 40% of all the firms). These were followed by industrial manufacturing and chemical enterprises – their share was approximately 30%. Enterprises dealing with consumer goods, fuel, extraction and energy generation were the smallest groups of businesses: 2.27% and 2.65%, respectively.

Registered address of enterprises was the third variable differentiating the sample. A majority of firms were based in Mazowieckie (56) and Śląskie (36) regions. Their shares accounted for 21.21% and 13.64%, respectively. Most enterprises were evenly distributed across regions, with shares in the range 3%–8%. Fewest businesses were located in Opolskie (1.90%), Lubuskie and Świętokrzyskie (2.27% each) regions. Majority capital was another variable differentiating the enterprise group studied. Analysis suggests domestic capital prevailed in 221 enterprises, with firms with majority foreign capitals accounting for more than 16%. Field of enterprise operations was the next metric variable. The data imply more than a half of the enterprises, i.e. 54.92%, were active in both the domestic and international markets. Merely six businesses only targeted the international market.

CSR actions were the final variable differentiating the sample. It can be noted more than 70% of the enterprises studied (i.e., 186 entities) have implemented CSR actions. Fewer than 30% firms did not engage in actions relating to environment protection or help for the local community, on the other hand.

The situation is illustrated in Table 1.

Table 1. Structure of the study sample according to specific criteria

Criterion	Number	Percentage [%]
Organizational status of enterprises		
Joint-stock	46	17.42
Limited liability	191	72.35
General partnership	14	5.30
Limited partnership	6	2.27
Other	7	2.65

Table 1. cont.

Enterprise sector		
Banking, insurance and financial sectors	11	4.17
Consumer goods	6	2.27
Pharmaceutical and medical	13	4.93
Extraction, fuels, energy generation	7	2.65
Industrial and chemical manufacturing	78	29.55
Telecommunications, technology, media, entertainment	16	6.06
Services, trade	104	39.39
Other	29	10.98
Location of enterprise's registered address		
Dolnośląskie region	15	5.68
Kujawsko-Pomorskie region	15	5.68
Lubelskie region	9	3.41
Lubuskie region	6	2.27
Łódzkie region	18	6.82
Małopolskie region	15	5.68
Mazowieckie region	56	21.21
Opolskie region	5	1.89
Podkarpackie region	12	4.55
Podlaskie region	9	3.41
Pomorskie region	16	6.06
Śląskie region	36	13.64
Świętokrzyskie region	6	2.27
Warmińsko-Mazurskie region	9	3.41
Wielkopolskie region	22	8.33
Zachodniopomorskie region	15	5.68
Type of majority capital in enterprises		
Prevailing domestic capital	221	83.71
Prevailing international capital	43	16.29
Area of enterprise operations		
Domestic market	113	42.80
Foreign market	6	2.27
Domestic and foreign market	145	54.92
Socially responsible actions		
YES	186	70.45
NO	78	29.55

4. Results

Analysis of Corporate Social Responsibility's effect on enterprise competitiveness employed the final differentiating variable: actions in the field of Corporate Social Responsibility. Figure 1 shows levels of enterprise competitiveness factors divided by average values relative to this variable.

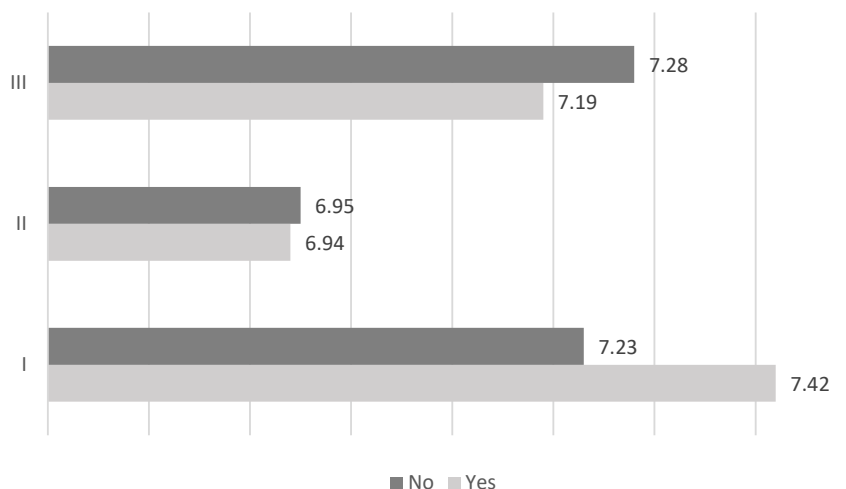


Fig. 1. Average enterprise competitiveness factors divided with regard to Corporate Social Responsibility actions: I – factors of enterprise competitive standing, II – factors of enterprise competitive potential, III – instruments of enterprise competition

Analysis of the data in Figure 1 implies the enterprises active in the field of CSR (YES) rated competitive standing factors most highly (7.42), whereas the enterprises not conducting actions in this field (NO) attributed maximum significance to factors of competitive potential (6.95) and instruments of competing (7.28).

Standard deviations of enterprise competitiveness factors in respect of this metric variable are presented in Figure 2. Analysis of these data implies the most scattered responses related to competitive standing factors, whereas they were most consistent with regard to importance of enterprise competitive potential. The enterprises that have introduced the concept of Corporate Social Responsibility exhibited lower standard deviations for factors of competitive potential and instruments of competition than the firms without CSR.

It was subsequently tested whether the foregoing differentiation can be generalized to the population of large enterprises in Poland. Since the differentiating variable has two codes (YES, NO), Mann–Whitney U test was employed. Test results are contained in Table 2.

The following hypotheses were postulated:

- H0: Average value of enterprise competitiveness factors (for its three dimensions) is identical for the variable category of CSR actions.
- H1: Average value of enterprise competitiveness factors (for its three dimensions) is not identical for the variable category of CSR actions.

If $p \leq \alpha$, H_0 must be rejected and the alternative H_1 needs to be accepted, whereas if $p > \alpha$, there are no grounds for rejecting H_0 .

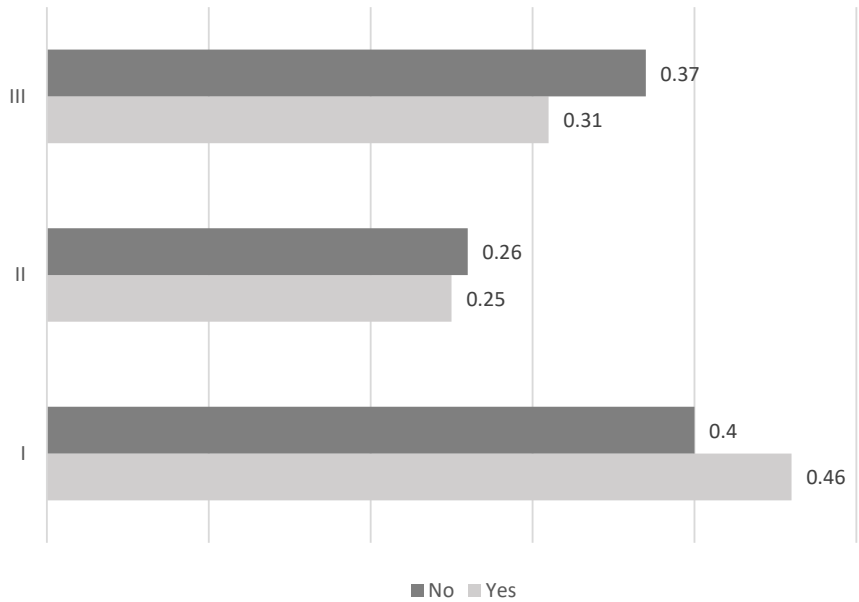


Fig. 2. Standard deviations for competitiveness factors as divided with regard to CSR actions:
I – factors of enterprise competitive standing, II – factors of enterprise competitive potential,
III – instruments of enterprise competition

Table 2. Test results for values of enterprise competitiveness factors divided in respect of conducting Corporate Social Responsibility actions

No.	Zero hypothesis	Test	Significance	Decision
1	Average factors of enterprise competitive standing are identical for the category variable of conducting CSR actions	Mann–Whitney U test	0.001	reject the zero hypothesis
2	Average factors of enterprise competitive potential are identical for the category variable of conducting CSR actions		0.942	accept the zero hypothesis
3	Average factors of enterprise competition instruments are identical for the category variable of conducting CSR actions		0.953	accept the zero hypothesis

The data in Table 2 imply the zero hypothesis should be rejected for factors of enterprise competitive standing, since the boundary probabilities are lower than the assumed level of significance ($\alpha = 0.05$). The zero hypothesis must be accepted with regard to the remaining factors of enterprise competitiveness, on the other hand. This means Corporate Social Responsibility actions are the variable differentiating only the choice of competitive standing factors in the general population.

5. Conclusions

Socially responsible enterprises attempt to increase their goodwill in the long term, but also conduct actions for the environment and improved relations with stakeholders. These actions may boost competitiveness of enterprises.

In light of results of the author's own research that consisted in surveying 264 enterprise operating in the Polish economy concerning effects of CSR on choice of competitiveness factors, the following can be concluded:

- Socially responsible actions by enterprises affect selection of factors determining competitive standing. Application of Mann-Whitney U test resulted in rejection of the zero hypothesis: average value of enterprise competitive standing factors is identical for the variable category of CSR actions. This means conduct of socially responsible actions is the variable differentiating only choice of the enterprise competitive standing factors for the adopted level of significance ($\alpha = 0.05$). The hypothesis H1 has been successfully verified.
- Socially responsible actions by enterprises have no impact on choice of factors defining competitive potential and competition instruments of enterprises. Two zero hypotheses were accepted following application of Mann-Whitney U test: average value of enterprise competitive potential factors is identical for the variable category of CSR actions and average value of enterprise competition instruments is identical for the variable category of CSR actions. This means conduct of socially responsible actions is not a variable differentiating choice of factors determining enterprise competitive potential and instruments of competition for the adopted level of significance ($\alpha = 0.05$). The hypothesis H2 has been successfully verified.

Measurement of enterprise competitiveness is an important and multidimensional area of research. Studies should be carried on, therefore, concerning selection of factors serving to evaluate levels of enterprise competitiveness.

References

- [1] Wolak-Tuzimek A., Duda J. (2015), *Corporate social responsibility as an innovative concept of enterprise management*, in: *Basiq 2015: international conference "New trends in sustainable business and consumption": 18–19 June 2015, Bucharest, Romania*, Editura ASE, București, pp. 33–41.

- [2] Adamczyk, J. (2009), *Spoleczna odpowiedzialność przedsiębiorstw: teoria i praktyka*, Polskie Wydawnictwo Ekonomiczne, Warszawa.
- [3] Wołowicz T. (2004), *Spoleczna odpowiedzialność przedsiębiorstwa nową formułą zarządzania*, *Ekonomika i Organizacja Przedsiębiorstwa*, nr 3, pp. 3–11.
- [4] Amalric F., Hauser J. (2006), *Economic drivers of corporate social responsibility activities*, *Journal of Corporate Citizenship*, vol. 20, pp. 27–38.
- [5] Gołaszewska-Kaczan U. (2009), *Zaangażowanie społeczne przedsiębiorstwa*, Wydawnictwo Uniwersytetu w Białymstoku, Białystok.
- [6] Porter M., Kramer M.R. (2006), *Strategy & society: The link between competitive advantage and corporate social responsibility*, *Harvard Business Review*, vol. 84(12), pp. 78–92.
- [7] Ratajczak M., Stawicka E. (2008), *Spoleczna odpowiedzialność biznesu (CSR) jako narzędzie podnoszenia konkurencyjności sektora MSP*, in: M. Bąk, P. Kulawczuk (red.), *Spoleczna odpowiedzialność biznesu w małych i średnich przedsiębiorstwach*, Instytut Badań nad Demokracją i Przedsiębiorstwem Prywatnym, Warszawa, pp. 131–143.
- [8] Craig Smith N. (2003). *Corporate social responsibility: whether or how?*, *California Management Review*, vol. 45(4), pp. 52–76.
- [9] Kotler Ph., Lee N. (2005), *Corporate social responsibility: Doing the most for your company and your cause*, John Wiley and Sons, Hoboken.
- [10] Green Paper (2001), *Promoting a European Framework for Corporate Social Responsibility*, Brussels.
- [11] Bartkowiak G. (2011), *Spoleczna odpowiedzialność biznesu w aspekcie teoretycznym i empirycznym*, Difin, Warszawa.
- [12] Griffin R.W. (1998), *Podstawy zarządzania organizacjami*, Wydawnictwo Naukowe PWN, Warszawa.
- [13] Makuch Ł. (2010), *Na drodze do równowagi*, *Harvard Business Review Polska*, dodatek Brief: Zrównoważony rozwój, wyzwanie i szansa dla biznesu, p. 12.
- [14] Carvalho S.W., Sen S., de Oliveira M.M., de Lima R.C. (2010), *Consumer reactions to CSR: A Brazilian perspective*, *Journal of Business Ethics*, vol. 91, pp. 291–310.
- [15] Rahman F., Norman R.T. (2016), *The effect of firm scale and CSR geographical scope of impact on consumers' response*, *Journal of Retailing and Consumer Services*, vol. 28, pp. 189–198.
- [16] Orlitzky M., Schmidt F.L., Rynes, S.L. (2003). *Corporate social and financial performance: a meta-analysis*, *Organization Studies*, vol. 24, pp. 403–441.
- [17] Luo W., Bhattacharya C.B. (2006), *Corporate Social Responsibility, customer satisfaction, and market value*. *Journal of Marketing*, vol. 70(4), pp. 1–18.
- [18] Hur W.M., Kim Y. (2017), *How does culture improve consumer engagement in CSR initiatives? The mediating role of motivational attributions*, *Corporate Social Responsibility and Environmental Management*, vol. 24(6), pp. 620–633.
- [19] Gupta S., Czinkota M., Melewar T.C. (2013), *Embedding knowledge and value of a brand into sustainability for differentiation*, *Journal of World Business*, vol. 48(3), pp. 287–296.
- [20] Marin L., Rubio A., Ruiz de Maya S. (2012), *Competitiveness as a strategic outcome of corporate social responsibility*, *Corporate Social Responsibility and Environmental Management*, vol. 19, pp. 364–376.

- [21] Chudy K., Siedlecka U. (2011), *Determinanty zainteresowania CSR a konkurencyjność przedsiębiorstwa-zestawienie macierzowe*, Zeszyty Naukowe Uniwersytetu Szczecińskiego. Finanse, Rynki Finansowe, Ubezpieczenia, nr 46, pp. 37–47.
- [22] Porter M., Kramer M.R. (2007), *Filantropia przedsiębiorstwa jako źródło przewagi konkurencyjnej*, Harvard Business Review Polska, nr 7, pp. 82–97.
- [23] Rok B. (2013), *Podstawy odpowiedzialnej konkurencyjności*, in: W. Gasparski (red.), *Biznes, etyka, odpowiedzialność: podręcznik akademicki*, Wydawnictwo Naukowe PWN, Warszawa, pp. 354–365.
- [24] GUS (2017), *Zmiany strukturalne grup podmiotów gospodarki narodowej w rejestrze REGON, I półrocze 2017 r.*, Główny Urząd Statystyczny, Warszawa.
- [25] Mann H., Whitney D. (1947), *On a test of whether one of two random variables is stochastically larger than the other*, Annals of Mathematical Statistics, vol. 18(1), pp. 54.
- [26] Kruskal W.H., Wallis W.A. (1952), *Use of ranks in one-criterion variance analysis*, Journal of the American Statistical Association, vol. 47, pp. 583–621.

CHAPTER 16

Approach to Development of Enterprise in Changeable Environment

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1. Introduction

One of the approaches to modelling of future enterprises involves a systemic model of enterprise improvement. The model is based on identified stages of improvement and specific management methods used in the selected areas of activity. The enterprise's flexibility involves not only adjusting to the changes taking place in the environment, but also the possibility of selecting numerous scenarios generated inside the organization [1: p. 22].

The new economic reality triggers activities pertaining to shaping the model of the organization of the future, while the latter boasts its learning skills, creativity, ability to manage through flat organizational structures. Today, when the world is becoming more and more complicated and unpredictable, people begin to notice the need to create new organizational forms. Responding to and meeting challenges in the form of unpredictable changes likely to occur in the nearest future, are, to a large extent, dependent on our ability to create new ideas as to the future of management [2, 3]. In order to properly carry out the process of developing future organizations one should ponder on the following questions: what managerial model or what criteria should we consider in order to be able to deal with new challenges posed by enterprises of the future.

Virtual organization is a promising model of the 21st century organization, which model is applied to increase the effectiveness of the entire organization and its flexibility measured by the level of the enterprise's adjustment to changes occurring within the environment, with a special emphasis put on the employment of telecommunications technology.

The aim of the chapter is to find answers to the following research questions:

- What model or approach should be employed to create an optimal organization in terms of changes occurring in the environment?
- What valued economic tendencies should be considered while creating a company in the new economic reality?

- What organizational structures will be optimal in the process of developing a 21st century enterprise?
- What should the individual and collective work in the modern organization be like?

Upon analyzing the environment and activity of enterprises and conducting literature research, the author attempts to create a new approach to the development of enterprises in the changeable environment. With a many-year experience in managing small and medium-sized enterprises, the author has acted as a counsellor and expert in enterprise management.

2. Enterprise in new economic reality

In 1960s, P. Drucker warned that ‘enterprises would not able to exist without customers’. Enterprises and customers are intertwined, at least because of reciprocal services, and hence, one cannot successfully operate without another [4: p. 89]. The flexibility of organizational system is reflected in its ability to initiate and implement changes aimed at adjusting to new situations in which the organization’s operative strategy is to be implemented. Due to its flexibility, the organizational structure is able to react to changes coming from the inside and changes of the environment. Great flexibility of organizational structures is a pre-condition for obtaining a complex readiness of the said organization to accept adaptation changes [5: p. 128].

Managing is seen as a practical activity; it involves conscious and deliberate actions of people who are attempting to change current economic and social reality. With regard to the foregoing, the main function of management science is the projective one – determining recommendations on how to improve the management process. The border between scientific research and practical activities seems to be rather small. It refers, in particular, to numerous non-routinized engineering activities that show all basic features of scientific activity, e.g. putting research findings into practice [6: p. 115]. Perhaps we are heading to new ways of running a business and working in there. Perhaps future enterprises will manage to successfully combine innovativeness and profitability, and new ways of management will blur the divisions between innovativeness and profitability, cheerfulness and severity, work and free time will [7].

Managing the 21st century company entails understanding and accepting the changeability, complexity and multi-aspect character, where fluidity and instability are a common occurrence, regarded, in some cases, as something obvious [8: p. 25].

Currently, one can notice the following trends in the economy [9: pp. 35–36]:

- drive to become aware of the enterprise’s structure of activities,
- subordinating the organization to the structure of activities,
- drive for specialization,
- outsourcing: transferring of the management, including risk, onto other business partners,
- inclination to have recourse to alliances,
- decentralization of management,
- teambuilding: creating social integration between employees and the environment.

The organization of the future will be based on an ever-growing commitment of all employees of the enterprise, improved competitiveness of the enterprise with the purpose of struggling more aggressively for its own development. The idea of the Total Quality Management (TQM) affecting all areas of the enterprise will become a standard within the process of the enterprise's development. TQM will be supported by the leaderships based on Total Quality Leadership (TQL). The latter is perceived as a style, and course of acting and managing tasks adopted by dynamic leaders [10: pp. 75–77].

The enterprise of the future will be characterized by interactions between teams and the environment, also under the form of information processes. While managing the enterprise of the future in a modern way, one will have to deal with an open system covering multi-directional bonds among particular subsystems, processes and projects which, thanks to the flexibility of the internal structure, are able to adjust to changes. As the ever-growing number of tasks is performed by teams which, on their hand, exceed traditionally determined boundaries of competencies, the significance of the teams to the process of management is becoming more and more essential. How to supervise and control teams responsible for projects or processes?

Setting the employees in the center of the processes and granting responsibility to them stimulate their creativity. Employees are thus encouraged to create procedures tailored to changing situations, within a given process and within the scope of multi-functional teams. That is why, any development of team structures and responsibilities may indicate trends encompassed by far-reaching goals of the enterprise, and tactical and operational goals which determine the boundaries and roles of particular teams.

The enterprises of the future will be established on the ground of knowledge and skill resources; the said enterprises will attempt to fully use diverse abilities and skills of people, in order to become learning organizations [11: p. 102]. Task teams will focus around processes and projects. Nowadays, there appears a new definition of a company – an entity that relies on teams of specialists- and a new approach to the individual and team work. Properly established teams may be the ground for the effective operation of the company. The teams should include employees of various specializations, which allows for implementing the said competencies during the process of continuous changes. The teams will be target-oriented aggregations created *ad hoc*. Hence, the hierarchy cannot be forced upon, instead, it should emerge in a natural way, as a reply to ever changing, process- and project-related needs of the enterprise. In organizations which operate on the basis of the teams, the structure and course of problem-solving processes are characterized by their temporariness. Due to the fact that the project and, consequently, the project-related team have their limited duration, managing this temporary structure in an effective way will require from leaders of particular processes to have interpersonal skills and abilities to unite scattered teams in one complex mechanism. Teams have certain life cycles of their own – the cycles depend on the pace of these processes and projects. The best teams are put together when people are given the chance to pick the group they wish to work with. That is why one can measure the managers' interpersonal skills through, e.g. finding out to what extent subordinates' talents are utilized. The heart and soul of enterprises of the future are project teams, focused on the execution of a given task. On the basis of the teams, there naturally emerges an image of integrated organizations, acting to achieve a common goal [12].

One should create modern organizational structures in such a way as to reduce or even eliminate unnecessary managerial actions. It is vital to attempt to strengthen the auxiliary function of the enterprise's management, taking into account economic rationality. In the enterprises of the future, organizational structures should be established not only on the basis of internal elements, but also with consideration given to legally and economically independent entities operating in the closest environment. Enterprises operating under the 21st century conditions should consider requirements of the 'new economy' which focuses on intangible resources, namely intellectual capital. The concepts underlying the intellectual capital cover employees' knowledge resources, their creativity and relevant information systems of the enterprise [13: p. 39].

3. Virtual global organization

The flexibility of its organizational structure allows the enterprise to introduce continuous changes in line with ever-changing environment. In the virtual global (networked) organization, the role of the decision center is limited to coordination, actions which support communication between fractals, motivation, promotion of the common vision related to creation of the organizational culture. A success of the global organization notably depends on the employees' commitment to matters affecting the whole organization, as well as to the issues pertaining to particular fractals and their loyalty. It is necessary to develop mechanisms which would allow to use employees' knowledge in a better way. The loss of attractiveness of the organization can cause massive resignations of employees and the beginning of the organization's end. Changes occurring in the environment will force the global organization to change its structure. The globalization is becoming a common occurrence and will affect more and more companies. The virtual global organization is a new organizational form which makes it possible to achieve wider market opportunities and increased operational effectiveness. In reference books, the notion of virtuality often corresponds to the following adjectives: apparent, imaginable, invisible, ubiquitous (the word *virtual* originates in a Latin *virtus* and means 'able to exist, possible'). The basic feature of the enterprise's virtuality is that it does exist, although it remains invisible [14]. The majority of authors consider virtuality as a phenomenon that cannot be seen (unlike its results), and therefore it is, in a sense, an invisible occurrence. In reference books one can notice a growing tendency that the notion of virtuality is either limited or narrowed. Some authors point out that 'virtuality of economic processes means that more and more economic actions are performed electronically' [15].

Managing a virtual organization needs to be based on trust. It is difficult to manage staff that one does not see [16: p. 61]. One should pose a question whether controlling, as a function of management designed to measure operation effectiveness is successful?

The global virtual organization is the most promising model of the 21st century organization. It is designed, practically speaking, to improve the entire organization's effectiveness and flexibility, whereas the latter is defined by the enterprise's ability to adjust to changes. Global virtual organizations consist of organizational entities which possess required competencies. Members of the organizations can simultaneously take part in the execution of

numerous projects. The co-operation of human resources within the framework of the global virtual organization undergoes frequent changes, and is perceived as time-limited co-operation compliant with aims to be fulfilled. These particular determinants and co-operation systems allow to decrease operating costs, reduce risks and improve the organization's flexibility, in compliance with market needs. The organization's flexibility means its ability to react to changes occurring in the environment, but, above all, it is an ability to introduce changes. The flexibility of the virtual organization mostly results from its structure; however, it also increases the risk of losing the organization's coherence. The increased level of flexibility may result in higher operational costs [17: pp. 483–484].

Functioning of the global virtual organization in the conditions of the new economy needs to be established on unique resources, key processes and projects, quality, innovativeness and co-operation. Since organizational knowledge creates a useful database pertaining to methodical and practical aspects, one should assume that success is within reach of especially those organizations which consistently and consciously acquire new knowledge, disseminate it around the entire organization, and which are able to turn smoothly into intelligent organizations. The assessment of the actual state of the business entity requires that its results are compared with the results of its competitors or any other entities that may constitute a model example in particular areas of its activity [18: p. 377].

Single-plant enterprises – the property of natural persons and general partnerships – are a basic legal and organizational form of conducting the business activity. Nowadays, the opportunities to develop organizations within their scope of activity – i.e. focusing solely on a single business or national market – are exhausting. The development of the enterprise should require a new strategy based on a more structured business activity [19: pp. 297–298].

Good practice is a process that allows to achieve a set aim in an effective and efficient way (the best result with the least effort), based on practically proven procedures, despite of possible unexpected problems [20: p. 45]. The operation of management systems is connected to the necessity of using tools and instruments. The level of diversity and complexity of the tools is growing in line with the enterprise's development. Formal management systems and the level of their perfection is minor in big companies. It happens often that simple tools are used to collect data and visualize it, instead of analyzing a set aim, to name just one [21: p. 191]. The changed character of the modern enterprise is reflected in creation of new organizational forms, designed to meet new challenges. The said new forms are less formal, egalitarian and co-operative; they have created a proper link between the enterprise and its environment [22: p. 84].

Both power and hierarchy occupy an important place among social genres, particularly because of the fact that they impose on a leader a role of a dominator and main decision-maker who imposes his/her will not only upon particular individuals but also upon the entire social group [23: p. 41]. It is a difficult and challenging undertaking to define an optimal size of an enterprise. How to measure the size of the enterprise whose production profile is diverse? What criteria should one adopt in order to determine the optimum size of the enterprise? In highly developed countries, big and very big enterprises are steadily growing in importance. Their share in the industrial production is high; they influence the market developments. However, it needs to be underlined that there are no true regularities in the way big enterprises are established [24: pp. 202–207].

4. Conclusions

Organizations have been operating in entirely different conditions that have generated the emergence of the new economy and its development. In order to meet current and prospective challenges, organizations of the future are obliged to redirect their forces to human resources, endeavoring to extract the best from their staff [25]. It is not possible to create a company of the future without a greater emphasis on human needs. Only employee-friendly enterprises will enjoy the opportunity to develop themselves and compete with other organizations. As a result of already occurring slow changes, trust becomes the primordial goal, notably because of its fundamental role in interpersonal relations. Taking the foregoing into account, the organization of the future should be essentially based on trust; it should also constantly improve trust management [26]. In this meaning, continuous improvement involves endeavors to seek new opportunities – amelioration of current standards. Every attempt to undermine the status quo is perceived as a basis for developing and grasping new opportunities. Willingness to change is the main prerequisite for every organization facing the process of continuous improvement, even for organizations of the future [27].

Modern organizations have been operating in more and more volatile conditions than they used to operate in the past. Thus, modern management-related science needs to face a particular challenge; it needs to seek solutions in terms of structuring the organization and management system in such a way as to be characterized by a great level of flexibility. The flexibility is understood as an ability to adjust to quick changes, or, more specifically, as an ability to adjust one's reactions to changes occurring in the environment [28: p. 11].

References

- [1] Krupski R. (2005), *Elastyczność organizacji*, in: R. Krupski (red.), *Zarządzanie przedsiębiorstwem w turbulentnym otoczeniu*, Polskie Wydawnictwo Ekonomiczne, Warszawa.
- [2] Grudzewski W.M., Hejduk I.K. (red.) (2002), *Przedsiębiorstwo przyszłości – wizja strategiczna*, Difin, Warszawa.
- [3] Perechuda K. (red.) (2000), *Zarządzanie przedsiębiorstwem przyszłości*, Placet, Warszawa.
- [4] Kuc R.B. (2008), *Strategiczne wymiary doskonałości w zarządzaniu*, in: W. Kowalczewski (red.), *Współczesne paradygmaty nauk o zarządzaniu*, Difin, Warszawa, p. 89.
- [5] Grajewski P. (2010), *Elastyczność i procesowość organizacji*, in: M. Czerska, A.A. Szpitter (red.), *Koncepcje zarządzania: podręcznik akademicki*, C.H. Beck, Warszawa, pp. 128–133.
- [6] Sudoł S. (2011), *Wielkość przedsiębiorstwa*, in: B. Godziszewski, M. Haffer, M.J. Stankiewicz, S. Sudoł, *Przedsiębiorstwo: teoria i praktyka zarządzania*, Polskie Wydawnictwo Ekonomiczne, Warszawa.
- [7] Srannegard L., Friberg M. (2001). *Already elsewhere: om lek, identitet och hastighet i affärslivet*, Raster Forlag, Stockholm.
- [8] Kostera M. (2008). *Nowe kierunki w zarządzaniu*. Wydawnictwo Akademickie i Profesjonalne, Warszawa.

- [9] Nogalski B. (2004), *Wybór paradygmatów zarządzania przedsiębiorstwem przyszłości*, in: I.K. Hejduk (red.), *Przedsiębiorstwo przyszłości – fikcja i rzeczywistość*, Warszawa: Instytut Organizacji i Zarządzania w Przemśle ORGMASZ, pp. 35–36.
- [10] Pawlak W.R. (2004), *Zarządzanie przez jakość totalną w organizacji przyszłości*, in: I.K. Hejduk (red.), *Przedsiębiorstwo przyszłości – fikcja i rzeczywistość*, Instytut Organizacji i Zarządzania w Przemśle ORGMASZ, Warszawa, pp. 75–77.
- [11] Misztal J. (2006). *Człowiek w organizacji* (p. 102). Politechnika Śląska, Gliwice.
- [12] Brzeziński M. (2003), *Przedsiębiorstwo przyszłości: nowe paradygmaty zarządzania europejskiego: książka poświęcona 50-leciu pracy naukowej prof. dr inż. Wiesława Grudzewskiego* wydana z okazji 50-lecia Instytutu Organizacji i Zarządzania w Przemśle "ORGMASZ", Wyd. Instytutu Organizacji i Zarządzania w Przemśle "ORGMASZ", Warszawa.
- [13] Borowiecki R., Wysocka E. (2003), *Analiza ekonomiczna przedsiębiorstwa jako narzędzie zarządzania zmianami o charakterze restrukturyzacji*, in: R. Borowiecki, M. Kwieciński (red.), *Informacja w zarządzaniu procesem zmian*, Zamykacze, Kraków, p. 39.
- [14] Bednarczyk M. (2001), *Organizacja wirtualna w zarządzaniu*, *Ekonomika i Organizacja Przedsiębiorstwa*, nr 6(617), pp. 18–18.
- [15] Nowicki A. (2002), *Wstęp do systemów informacyjnych zarządzania w przedsiębiorstwie*, Politechnika Częstochowska, Częstochowa.
- [16] Sobka B. (2007), *Zaufanie jako warunek powodzenia zespołu wirtualnego*, in: W. Sitko (red.), *Problemy współczesnego zarządzania w ujęciu wielowątkowym*, Lubelskie Centrum Marketingu Sp. z o.o., Lublin, p. 61.
- [17] Moroz M. (2007), *Elastyczność przedsiębiorstwa jako czynnik wzrostu jego konkurencyjności*, in: J. Pyka (red.), *Procesy restrukturyzacji i konkurencyjność w przemyśle i usługach*, *Nowoczesność przemysłu i usług*, 2, Towarzystwo Naukowe Organizacji i Kierownictwa, Katowice, pp. 483–484.
- [18] Żyżnarska-Dworcak B. (2012), *Benchmarking we wspomaganiu DSZ*, in: J. Kisielnicki, J. Turyna (red.), *Decyzyjne systemy zarządzania*, Difin, Warszawa, pp. 377–398
- [19] Pierścionek Z. (2011), *Zarządzanie strategiczne w przedsiębiorstwie*, Wydawnictwo Naukowe PWN, Warszawa.
- [20] Grocki R. (2012), *Zarządzanie kryzysowe: dobre praktyki*, Difin, Warszawa.
- [21] Borys T., Rogala P. (2011), *Doskonalenie sformalizowanych systemów zarządzania*, Difin, Warszawa.
- [22] Sankowska A. (2011), *Wpływ zaufania na zarządzanie przedsiębiorstwem: perspektywa wewnątrzorganizacyjna*, Difin, Warszawa.
- [23] Sułkowski Ł. (2010), *Ewolucjonizm w zarządzaniu: menedżerowie Darwina*, Polskie Wydawnictwo Ekonomiczne, Warszawa.
- [24] Sudoł S. (2011), *Zarządzanie jako dyscyplina naukowa. Charakterystyczne cechy nauk o zarządzaniu*, in: W. Kieżun (red.), *Krytycznie i twórczo o zarządzaniu: wybrane zagadnienia*, Wolters Kluwer Polska, Akademia Leona Koźmińskiego, Warszawa, pp. 111–122.
- [25] Hamel G., Breen B. (2007), *The Future of Management*, Harvard Business School Press, Boston.

- [26] Grudzewski W.M., Hejduk I.K., Sankowska A., Wańtuchowicz M. (2009), *Zarządzanie zaufaniem w przedsiębiorstwie: koncepcje, narzędzia, zastosowania*, Wolters Kluwer Polska, Kraków.
- [27] Grudzewski W.M., Hejduk I.K., Sankowska A., Wańtuchowicz M. (2010), *Sustainability w biznesie, czyli przedsiębiorstwo przyszłości. Zmiany paradygmatów i koncepcji zarządzania*, Poltext, Warszawa.
- [28] Grajewski P. (2012), *Procesowe zarządzanie organizacją*, Polskie Wydawnictwo Ekonomiczne, Warszawa.



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