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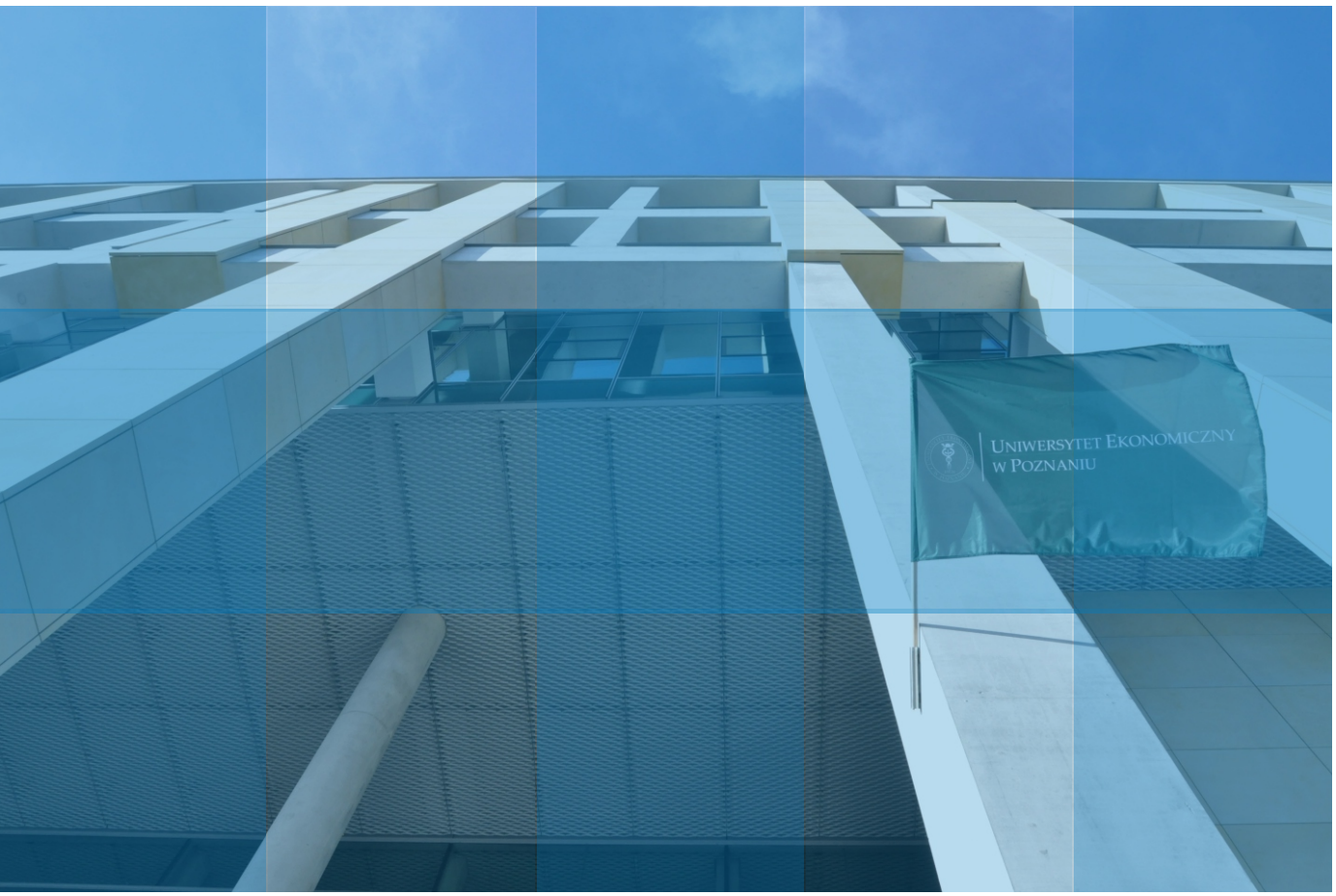

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CONTENTS

Preface 5

Strategic planning for Sustainable Development from the standpoint of economic security on the example of the railway transport of Ukraine
Yurii Kharazishvili, Andrii Shevchenko 7

The outlook for the development of the electric car market in Poland until 2025 compared to the Norwegian market
Piotr Dembiński 19

Development of the educational environment through the formation of Private Corporate Universities
Sergey Kravchenko 29

The control of the banking sector concentration in Poland – legal and economic aspects. Selected issues
Krystyna Nizioł 37

Current trends of development of HR-Management in the bank sphere of the Russian Federation
Nataliia Vodolazskaya 47

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PREFACE

Dear Readers,

We have the pleasure of presenting to you the next issue of our journal "Research Papers in Economics and Finance" (REF), published by the Faculty of Economics at Poznań University of Economics and Business. Bearing in mind the highest level of our publications, we publish only the manuscripts which have passed at least two reviews under the "peer review" procedure, after initial verification by the Editorial Committee. The articles published within REF are available online in English and through open access. REF is a quarterly journal, with the fourth issue this year containing five papers.

The first paper entitled "*Strategic planning for Sustainable Development from the standpoint of economic security on the example of the railway transport of Ukraine*" focuses on the concept of strategic planning of the sustainable development combining. Authors **Yurii Kharazishvili** and **Andrii Shevchenko** propose the original concept of strategic planning of the sustainable development of the country, regions or other types of economic activity from the standpoint of the economic security. They introduce a definition of the structure of sustainable development which subsequently they apply to identify and estimate the level of sustainable development and the imbalances at the constituent level. As a case study, they discuss the railway transport in Ukraine.

In the second paper "*The outlook for the development of the electric car market in Poland until 2025 compared to the Norwegian market*", **Piotr Dembiński** discusses the development of electric cars in Poland in comparison to Norway. To determine the possibility of developing and introducing this technology in Poland, the Author applied two measures: Weight Attractiveness Scores and Three-tiers of Noncustomers. According to his analysis, Poland is far away from implementing this technology on a significant level. The analysis shows that national policy is heading in the right direction. However, it is still not sufficient to become a leader, or a significant member, in implementing this technology, compared to Norway. The Author states that even though some electric cars in Poland will grow at a very rapid pace, the dissemination of this product on Polish roads is highly unlikely until 2025. As he concludes, the role of the state in the successful implementation and acceptance of this technology is crucial. Based on the Norwegian case, where the government created a great climate for the development of electric cars, the main recommendation for the Polish government is to offer several facilities and tax breaks.

The aim of the next paper "*Development of the educational environment through the formation of Private Corporate Universities*", written by **Sergey Kravchenko**, is to analyse experiences of establishing and functioning private corporate universities. They are an important element not only of the educational system but also of the social infrastructure. The Author lists potential benefits of the interactions and co-operation between an individual, a private corporate university and companies in a region. As he outlines, establishing private corporate universities could contribute

to the intensification of the corporate social responsibility practices, which is one of the possible ways to promote the development of an educational environment for life-long education.

Next two papers focus on banking sectors from different perspectives. **Krystyna Nizioł**, in her paper "*The control of the banking sector concentration in Poland – Legal and economic aspects. Selected Issues*", deals with an important economic problem of market monopolisation in the banking sector in Poland. She aims to analyse selected legal and economic issues connected with the control of bank concentration in Poland. In particular, she discusses the methods of measurement and aims of the control of the concentration applied by the Polish antitrust authorities (UOKiK) with respect to the financial regulations. Theoretical and legal discussions are followed by a statistical description of the scale of the concentration in the banking sector. In conclusion, the Author evaluates that the Polish antitrust authority has sufficient legal instruments to control mergers and takeovers which resist the monopolization of the financial market.

Finally, the fifth paper "*Current trends of development of HR Management in the bank sphere of the Russian Federation*", written by **Nataliia Vodolazskaya**, focuses on the personnel policy in the bank sector, highlighting its crucial role in the creation of competitive advantage. As she writes "The bank wins and succeeds if it not only is accurately organised, but also has the competent, devoted and disciplined personnel capable of being reconstructed and retrained quickly." She analyses Russian commercial banks and the development of HR management in them. Based on that, she discusses the perspectives of developing highly skilled personnel in banks which could cause higher financial performance.

This issue of Research Papers would not have been possible if it had not been for the support and work of the Authors, Reviewers and others who have been engaged in editing and publishing. We hope published papers will contribute to the discussion on the contemporary economic and financial problems.

Yours faithfully,

Katarzyna Szarzec
– Member of the Editorial Committee

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Strategic planning for sustainable development from the standpoint of economic security on the example of the railway transport of Ukraine

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ABSTRACT

The concept of strategic planning of sustainable development on the example of the railway transport of Ukraine from the standpoint of economic security, which includes methodology, methods and principles of research through the identification of the level of sustainable development, the definition of criteria, objectives and strategies for the modernisation of railway transport by using adaptive control techniques from control theory.

Keywords: strategic planning, modernisation, concept, sustainable development, economic security, integrated index, strategic landmarks, railway transport.

1. Introduction

The economic strategy, edited by S. Mocherny, contained in the economic dictionary, is "a long-term economic policy course that involves solving large-scale economic and social problems" [Mochernyj, 1995]. In most of the strategy formulations, there is a mandatory presence of certain target benchmarks in the definitions for which the strategy should be targeted. For example, A. Chandler explicitly interprets the strategy as "determining the main long-term purposes and objectives of the organisation, the adoption of the course of action and allocation of the resources necessary for these purposes" [Chandler, 1962]. Thus, as J. Zhalilo rightly states, "goal setting is the starting point for the strategy formation" [Zhalilo, 2009]. Strategic planning is a detailed description of the purposes, objectives and a set of measures to implement the fundamental objectives of the strategy of economic security [Horbulin, Kachyns'kyj, 2010]. Therefore, the scientific substantiation of the quantitative benchmarks of the Indicators of Development Strategies is necessary and relevant. Railway transport is one of the primary branches of the economy. Stable and efficient functioning of railway transport is a prerequisite for ensuring the defence capability, national security and integrity of the state, and raising the population's standard of living [Government of Ukraine, 2006]. A detailed analysis of the constituents of the sustainable development of railway transport suggests that railway transport (RT) is in a hazardous condition. On the one hand, there is a low level of renewal of fixed assets, share of wages in production, density of communications, electrification of railways, speed of movement, technical and technological backwardness of the infrastructure. On the other hand, at the same time, a high level of transport capacity of RT, shadowing of transport, wear of rolling stock, air pollution and final energy consumption create threats to the economic security of the country and stipulate the need for the reformation of RT.

2. Literature review and problem statement

Unfortunately, most of the strategies that were proposed in Ukraine up till now have determined the main areas and priorities of the Strategy implementation through declaring the necessary measures such as providing, enhancement, creation, formation, updating, implementation, improvement, attraction and development. Meanwhile, the definition of the priority areas of such strategies does not ensure the expected implementation of the targeted state policy, because it does not give clear, concrete results of the action – quantitative strategic indicators, monitoring which would allow controlling the development of certain areas. In other words, the definition of the areas and priorities of modernisation is a necessary, but insufficient condition. A striking example of this approach is the Transport Strategy of Ukraine for the period up to 2020 [Government of Ukraine, 2010]. That is why such a "declarative" approach does not give clear, concrete results of the actions – quantitative strategic benchmarks of the indicators, the monitoring thereof would allow controlling the development of certain areas. That is why the main conclusion of the national report "Innovative Ukraine 2020" is the statement that "...The final formulation of the priority areas should be determined by serious predictive and analytical research, as provided for by the law. Today, it is a half-intuitive vision of several specialists with whom the Verkhovna Rada of Ukraine agreed upon" [Heiets', 2015].

The works of both foreign and domestic scientists are dedicated to the research of problems of sustainable development of the regions of Ukraine [Zghurovskyj, 2006; Zghurovskyj, 2009; Pankratova, 2011; Novikova, Amosha, Antoniuk, 2012; Libanova, Khvesyk, 2014]

Despite the volume of the research, it should be noted that insufficient attention is paid to the scientific substantiation of the criteria of sustainable development, the methodology of integrated assessment of the level and strategic guidelines for sustainable development of the country, regions or types of economic activity.

The strategic vision of sustainable development first provides for the definition of what is the distance is the integral index from the point of sustainable development, or the social, economic and environmental components, from where the disproportions to their development arise. That is, it is desirable to determine the starting point and the endpoint for each component of sustainable development, on which the strategic vision of sustainable development depends. The ultimate point of sustainable development is the need for clear criteria for achieving sustainable development, both on the whole and at the component level. Lack of such criteria results in the substitution of scientifically grounded strategic goals by the intuitive vision of several experts, which puts into doubt the achievement of sustainable development. Therefore, the scientific substantiation of the quantitative benchmarks of the components and indicators of the Strategies for sustainable development is necessary and relevant.

The primary purpose of the development of a system of indicators is the monitoring of sustainable development of the society, which should reflect all aspects of the CEE development of the regions or the country. Most indicators, instead of being relevant indicators, are absolute indicators that distort the real reality. The conclusions from such studies may lead to the implementation of "not those measures and not in that place". Indicators are not always divided into stimulants (S) and de-stimulants (D), which leads to incorrect assessment results. Weights coefficients are determined expertly, which adds a certain proportion of subjectivity, or are generally taken equal to units that exclude the sensitivity of the economic system from the influence of various factors. There is no comparison of integral indexes with integral threshold values, which allows identifying the state of the CEE development. There is a need to improve the form of the integral index, methods of valuation, and methods of the formal definition of "dynamic" weight coefficients. Taking into account the significant changes in politics and in the external economic situation, which, after some time, lead to radical structural changes in the economy and changes in empirical estimates of econometric interconnections, the constancy of weighting factors throughout the period is inadequate and does not reflect reality. Pay attention to the methods of determining the vector of threshold values.

The purpose of the article is to provide a scientific basis for sustainable development criteria for identifying the current state and identifying the strategic orientations for the medium and long-term prospects for the country, regions and economic activities from the standpoint of security.

3. Methodology

Taking into account the importance of the balanced economic development, we can state that effective strategic planning of sustainable development of the country, regions or types of economic activity should be based on a combi-

nation of balanced development of economic, social, environmental and institutional components from the standpoint of safety of each component.

Thus, the concept of strategic planning of sustainable development should include the most priority areas of the development of the management object in a particular perspective and is, in fact, a scenario for achieving the purposes. Additionally, the concept defines the ways of transition from the current position of the control object to the desired one through the objectives set by the subject of management. Thus, the concept is a managerial structure that contains the general system representation of the ways of transition from the current position of the control object to the desired one.

The main conclusion of the UN report [United Nations Industrial Development Organization 2015] is that technologies can serve the achievement of goals in all three dimensions (economic, social, environmental), sustainable development, whose balance is one of the leading places among the problems of sustainable development of countries, regions or IED. Therefore, the precise coordination and balance of these three components, and on this basis development of the development strategy, is a task of extreme complexity [Zghurovskyj 2006; Zghurovskyj 2009].

Taking into account the above, we can propose the concept of strategic planning of sustainable development of the country, regions or types of economic activity from the standpoint of security, which includes the following stages [Kharazishvili, Shevchenko 2017, pp. 27-43]:

1. Determination of the sustainable development structure.
2. Determination of the safe existence limits.
3. Identification of the sustainable development level.
4. Definition of imbalances of sustainable development.
5. Substantiation of strategic benchmarks for sustainable development.
6. Institutional measures.

Determination of the sustainable development structure: This stage involves detailing the components and their indicators, forming the dynamics of the indicators and their belonging to stimulants (increase of which is desirable).

Sustainable development is an integral characteristic of the state of the economic system, as the system includes a number of sub-systems – the most important, from the standpoint of the authors, of the interconnected structural components of the economic system development, which reflect the functioning of certain spheres of the economy: economic, social, ecological components, which includes 19 indicators for railway transport (Fig. 1) [Shevchenko, 2016, pp. 158-166].

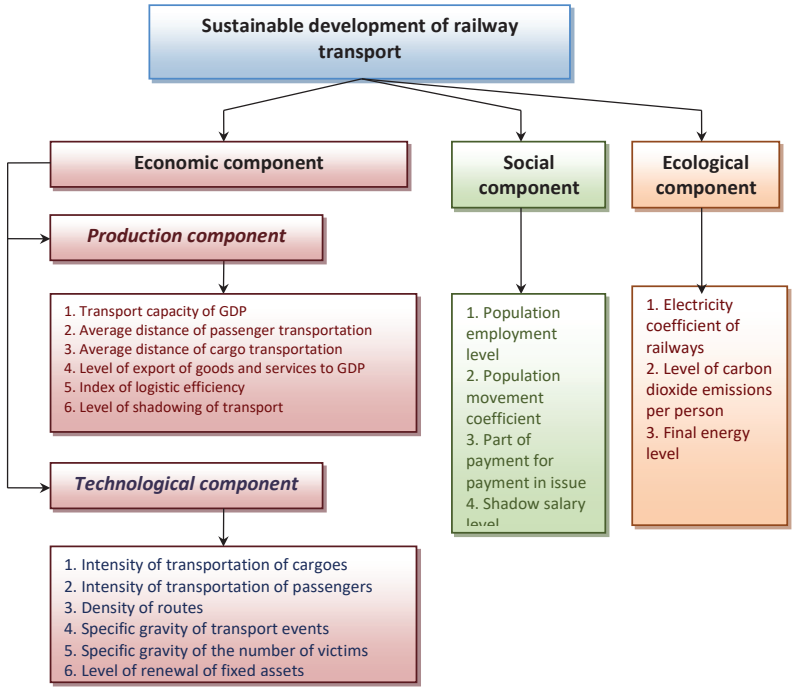

Figure 1. Components and indicators of sustainable development of the Ukraine railway
Source: own study

The list of components and their indicators is not an example and may vary depending on the goals and depth of the research. It is not enough to analyse separate indicators or indicators of the development of railway transport. This does not give a complete picture of the state of sustainable development in general.

Determination of the safe existence limits. A systematic study of the problem of strategic planning of sustainable economic development should include a definition of the boundaries of the safe existence of the system; therefore, an essential stage in monitoring the state of the system is defining a vector of threshold indicators, which makes it possible to identify potential "danger zones" by comparing them, as well as determine the conditions for strengthening economic immunity of the studied system. The vector of threshold values involves the definition of lower and upper critical (x^{l}_{cr}, x^{up}_{cr}), lower and upper threshold (x^{l}_{thr}, x^{up}_{thr}), lower and upper optimal (x^{l}_{opt}, x^{up}_{opt}) values of the indicators [Ministry of Economy of Ukraine 2007]. Taking into account the definition of the vector of threshold values, it is proposed to expand the "*homeostatic plateau*" [Dzh. Van Hyh 1981; Kachyns'kyj 2013] (Fig. 2) with the addition of a threshold zone and critical values of indicators.

On each side of the "homeostatic plateau," there are areas with neutral and positive feedback, the stay of which is dangerous or even threatens the existence of the system. In this sense, monitoring of the state of sustainable development as a whole and the individual components and indicators for the establishment of the existing state in comparison with the thresholds, the definition of threats and the justification of the strategic guidelines are of great importance.

It should be noted that the intersection of the threshold or critical point does not take place momentarily until the type of inverse link is changed. Each dynamic system has its stability margin, so the type of inverse coupling is first reduced by the exponent, and then expanded exponentially, but with the second type of overbound link.

To determine the thresholds of the indicators of security, it is proposed to use the following methods [Kharazishvili, Dron', 2015, pp. 3-21] with the priority of their listing, namely:

- *Functional dependencies* (macro/microeconomic analytical or statistical equations; Akhiezer-Golts; theory of information; "golden section");
- *Macroeconomic models* that adequately reflect the effects of destabilising factors on the conditions of a particular country in the current period;
- *Stochastic* (diagnostics: cluster analysis, fuzzy sets; t-criterion; logistic regression);
- *Nonlinear dynamics* (wavelet analysis);
- *Legislative approach* (setting thresholds at the legislative level);
- *Heuristic* ("snowball"; analogue approach – orientation to indicators of analogue countries; "calibration");
- *Expert assessments*; taking into account evaluations of international organisations.

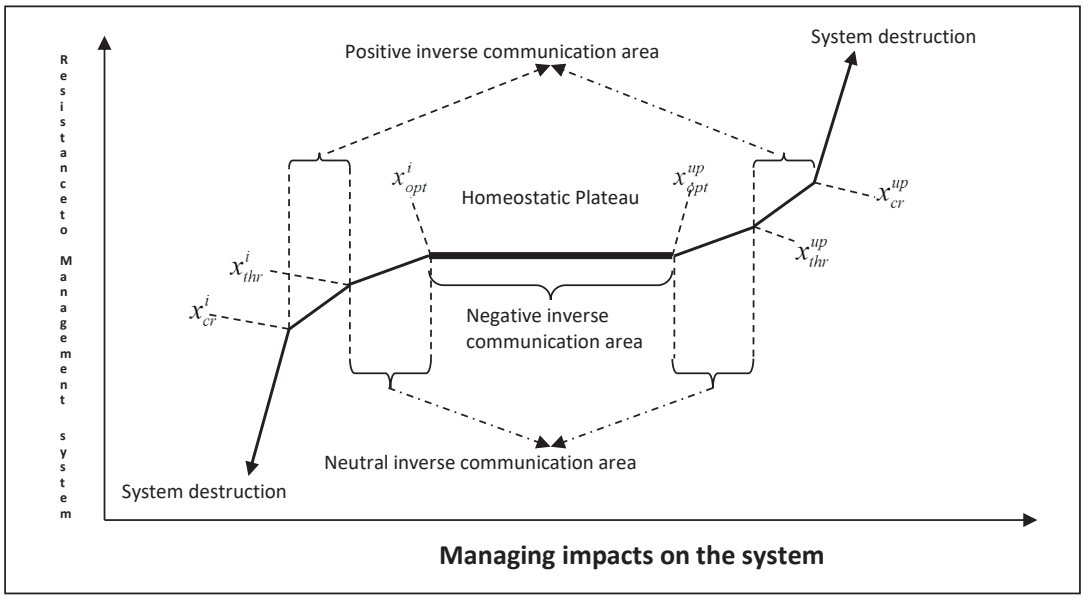

Figure 2. "*Homeostatic Plateau*" of the dynamic system
Source: own study

The definition of threshold values is quite closely related to the concept of the dynamic stability of the economic system and its components, or with the mechanism of homeostasis. Without knowledge of the boundaries of safe conditions for the functioning of the economic system, it is impossible to protect its vital interests.

Therefore, the main task of ensuring sustainable development is not to maximise the level (integral index) of development, but to ensure its location within the thresholds, yet preferably optimal values (within the limits of the "homeostatic plateau"). If we seek to ensure that the integral development index is within the threshold or optimal values, this is accompanied by a violation of equilibrium and the emergence of new industrial relations that permanently change the previous state of equilibrium. At the same time, the economic system is transformed into a new state, endowed with the best qualitative characteristics. That is, in the process of development, not only the structure of the system (the composition of elements and connections), but also the relationship between the elements of the system and the mechanism of its functioning is changing. Therefore, homeostasis in the economic system determines not only the ability of dynamic stability for the existing mode of operation but also the ability to control – the transition to a new state of economic equilibrium, that is, the governance of the economic system [Amosha, Kharazishvili, Liashenko, Kvilinskyi, 2016, 19-34; Kharazishvili, Liashenko, Shamileva, Zhykhareva, 2016; Kharazishvili, Lyashenko, Zaloznova, Kvilinskyi 2016, 108-119; Kvilinskyi, Mieshkov, Bondaryeva, 2016, 13-19].

Consequently, as a criterion for achieving sustainable development, the average value of the „homeostatic plateau" is proposed for both individual indicators and their integral values.

Identification of the sustainable development level: The state of the economic system is described by several dozen of indicators, each of which can increase or decrease in separate periods. Therefore, there is a question: in which of the two periods considered its state was the best? If there are more than three indicators, the task is much more complicated, necessary formalised mathematical methods – an integrated assessment of the level of sustainable development with the definition of dynamic weight coefficients. Furthermore, failure to take into account the shadow aspects of the economic activity distorts assessments of development that are inadequate in reality.

The study of the methodological approaches to an integrated assessment of the state of development or security revealed low deficiencies that lead to distorted assessments. Therefore, modern advances in the integrated assessment of the level of safety [Kharazishvili, Dron' 2015, pp. 3-21] have been proposed and applied, namely:

A form of the integral index is multiplicative (1):

$$I_t = \prod_{i=1}^{n} z_{i,t}^{a_i}; \quad \sum a_i = 1; \quad a_i \geq 0, \tag{1}$$

where I – integral index; z – normalised indicator; a – weight factor.

Valuation method – combined (2):

$$S: z_i = \frac{x_i}{k_{norm}}, \qquad D: z_i = \frac{k_{norm} - x_i}{k_{norm}}, \quad k_{norm} > x_{\max}, \tag{2}$$

where x – indicator value; k_{norm} – normalizing coefficient.

Weighting factors - dynamic: based on the application of the "Main Components" method (3) and the "*Moving Matrix*" method (Yu. Kharazishvili);

$$C_i \times D_i = \begin{pmatrix} d_1c_{11} + d_2c_{12} + \ldots + d_jc_{1j} \\ d_1c_{21} + d_2c_{22} + \ldots + d_jc_{2j} \\ \ldots\ldots\ldots\ldots\ldots\ldots\ldots \\ d_1c_{j1} + d_2c_{j2} + \ldots + d_jc_{jj} \end{pmatrix} = \begin{pmatrix} w_1 \\ w_2 \\ \ldots \\ w_j \end{pmatrix}, \quad a_i = \frac{w_i}{\sum w_i}, \tag{3}$$

where C – a matrix of absolute values of factor loads; D – vector-matrix of dispersions; c and d are elements of the matrices C and D; w – the resultant contribution i-th indicator in the integral index; a – weight coefficients.

4. Research results

Using the proposed approach, we obtain the dynamics of the integral index in comparison with the integral thresholds, which allows us to identify the state of sustainable development. It should be noted that the integral convolution is made not only for indicators but also for threshold values (Fig. 3, a).

Thus, the definition of integral indexes of the economic system and their comparison with the integral threshold values translate the concept of "*development*" into the concept of "*security*".

Definition of sustainable development imbalances. Using the obtained dynamics of integral indices of components of sustainable development and basic threshold values, one can calculate the deviations of integral indices from their average optimal values, which can be considered as criteria for achieving sustainable development, which testifies to the disproportio-

nality of their development (Fig. 3, b). As each component and its indicators have their thresholds, the integral thresholds for each component will be different. The dynamics of deviations of the current values of integral indices from their mean optimal values determines the importance of the threats to the components of sustainable development. This situation shows the ineffectiveness of the existing model of economic development and macroeconomic policy on the whole. Thus, the establishment of a system of indicators for sustainable development and the introduction of monitoring of sustainable development, the main task of which is the collection and modeling of macro-indicators, calculation, valuation of indicators, definition of integral CEE development indexes and their deviations from the corresponding average optimal values will determine the development strategy.

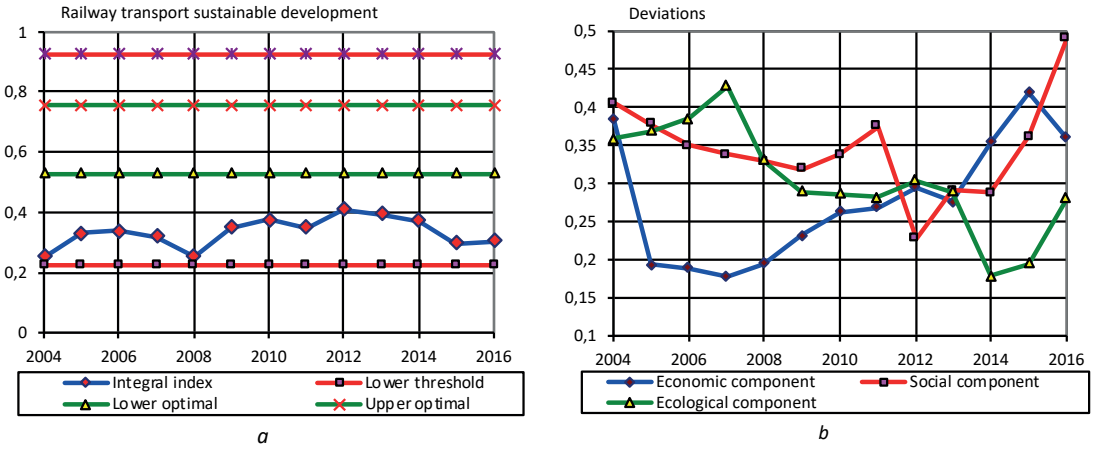

Figure 3. Dynamics of the integral index (*a*) and deviations of components of development from their average optimal values (*b*)
Source: own study

Justification of Strategic Guidelines for Sustainable Development. The definition of the dynamics of the integral indices of sustainable development determines the necessary regulatory actions and enables the scientific substantiation of strategic benchmarks for different scenarios of development strategies. Upon receipt of the dynamics of the integral index of the state of the economic system, it is necessary to determine the strategic objective (or several goals, for example, for pessimistic, realistic, optimistic scenarios and sustainable development scenarios), depending on the ratio of the value of the integral index with integral threshold values that characterize the optimal, pre-crisis, crisis or the critical state of the economic system (Fig. 4, a).

At the same time we have the strategic tasks of eliminating the deviations of the integral indices of components of sustainable development from their average optimal values - that is, the criteria for achieving the level of sustainable development (Fig. 4, b). Knowledge of strategic goals causes the need to solve the problem of decomposition of the integral index, that is, the task of synthesizing the necessary values of the components and their indicators for finding the integral index in the specified limits. Solving such a problem (inverse) for each component of sustainable development, when it is known (or given) its required value, allows taking into account the sensitivity of components or indicators, weight factors of influence and adaptive control methods [Kharazishvili, Dron' 2014, pp. 28-45] from the control theory to determine the necessary values of components and their indicators during the forecast period in each year.

Initially, such a procedure is carried out at the level of components of sustainable development, and then at the level of indicators of each component, that is, a consistent decomposition of the integral index is made, the result thereof is the scientific substantiation of strategic guidelines of key macro indicators that provide the desired level of development and are the basis for strategic planning of accelerated development of the country, economic activity or region of any level.

A generalized scheme of an adaptive system for regulating sustainable development with a reference model is given in Fig. 5.

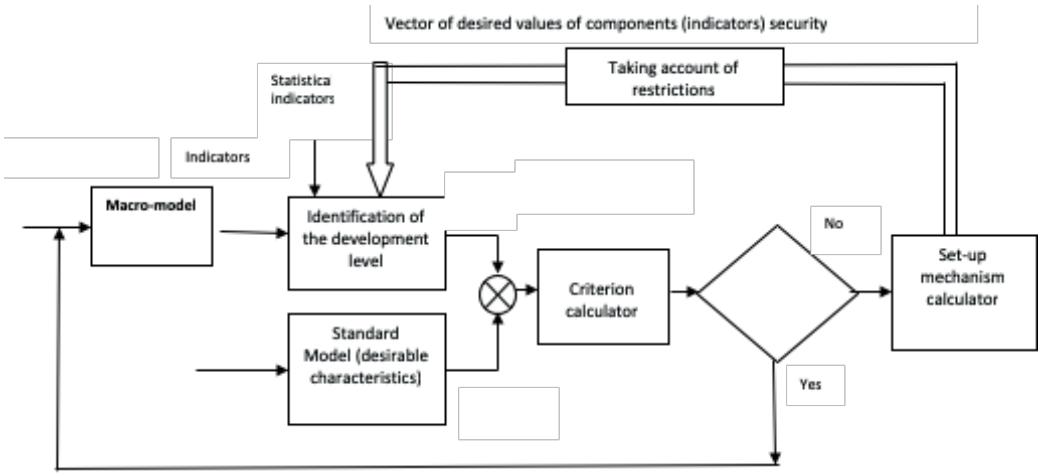

Figure 5. Generalised scheme of the adaptive regulation system
Source: own study

Thus, the task of regulating the components of the integral index and their indicators is to determine their values in the aggregate to ensure that the values of the integral index are found within the given (threshold/optimal) values. Of course, the mechanism of setting parameters of the model uses methods based, in particular, on the error function gradient. The main principle of the tuning mechanism is the minimization of the quadratic error function and its derivatives, and it is assumed that all functions are continuous and at least twice differentiated (4):

$$F_t = (I_t - I_t^{sp.val})^2 = (I_1^{a_1} I_2^{a_2} I_3^{a_3} - I_t^{sp.val})^2 \qquad (4)$$

We present the results of the strategic guidelines at the level of components of the development of the railway transport of Ukraine for various scenarios of development strategies (Table 1), which are obtained with the proposed approach – integral convolution of indicators and components of sustainable development, definition of strategic goals and adaptive regulation method [Kharazishvili, Shevchenko 2017, pp. 67-76].

According to the calculations, the preservation of existing developmental imbalances (Fig. 5, a) occurs when applying inertial scenarios of development under the current technical and technological structure of the railway transport economy (which is characterised by weight factors of influence), that is, the equidistance of integral indices is not observed. Such disproportionality of development can be eliminated by a balanced scenario of sustainable development from the standpoint of economic security – the equidistance of integral indices of components of development from their average optimal values. Strategic benchmarks for sustainable development and its components, which are determined taking into account the sensitivity of the impact of each component on the integral index, are the goal of strategic planning for the medium to long-term.

Using the appropriate formulas for calculating indicators for each component of sustainable development and the valuation formula in reverse order, one can get strategic benchmarks for crucial indicators that, along with the strategic values of indicators, are the ultimate goal of regulating the sustainable development of railway transport. Ultimately, the level of deviation of actual integral indexes and indicators of functional components from their strategic values will determine the effectiveness or efficiency of the management of the implementation of the sustainable development strategy of the Ukraine railway.

Table 1: Strategic benchmarks for integral indices of sustainable development of railway transport at the level of separate components

Development components	Year				
	2016	2017	2018	2019	2020
Realistic scenario (inertial)					
Sustainable development	0.3033	0.3215	0.3396	0.3577	0.3757
Social	0.1394	0.1607	0.1820	0.2033	0.2244
Ecological	0.4575	0.4700	0.4834	0.4977	0.5127
Economic	0.3087	0.3195	0.3311	0.3434	0.3561
Optimistic scenario (inertial)					
Sustainable development	0.3033	0.3594	0.4154	0.4714	0.5272
Social	0.1394	0.2053	0.2703	0.3333	0.3944
Ecological	0.4575	0.4991	0.5477	0.6004	0.6291
Economic	0.3087	0.3446	0.3857	0.4298	0.4754
Full Scenario (Balanced) – Sustainable Development					
Sustainable development	0.3033	0.4391	0.5238	0.6085	0.6422
Social	0.1394	0.2629	0.3855	0.5080	0.6295
Ecological	0.4575	0.5011	0.5439	0.5868	0.6291
Economic	0.3087	0.3983	0.4883	0.5783	0.6688

Source: calculated by the authors.

According to the calculations, the most significant effect from sustainable development of railway transport in Ukraine will be obtained by applying a scenario of sustainable development – the equidistance of integral indices of components of development from their mean optimal values. In the argument, it is advisable to show the dynamics of changes (increase, decrease) of indicators of sustainable development of Ukrainian railways for the period 2016-2020 for different scenarios of development (Table 2).

Table 2: Changing Indicators of Sustainable Development of the Railway Transport of Ukraine in 2016-2020

Index	Development Scripts		
	Realistic	Optimistic	Full-fledged sustainable development
1. Reducing the transport volume of GDP	0.9934	0.8951	0.6354
2. Reducing the average distance of cargo transportation	0.9636	0.7777	0.5282
3. Reducing the average distance of passenger transportation	0.9942	0.9062	0.6733
4. Increase in the level of export of goods and services to GDP	1.0022	1.0359	1.1320
5. Increase of the index of logistic efficiency	1.0041	1.066	1.2376
6. Reducing the level of shadowing of transport	0.9935	0.8938	0.6160
7. Increase in the intensity of cargo transportation	1.0005	1.0123	1.1263
8. Increase of passenger traffic intensity	1.0010	1.0264	1.2593
9. Increase in the density of communication paths	1.0022	1.0606	1.5479
10. Reducing the share of transport events	0.9984	0.9566	0.7777
11. Reducing the proportion of victims	0.9810	0.4791	0.2204
12. The level of renewal of fixed assets	2.0504	9.7389	32.524
13. Reducing the population employment rate in the RT field	0.9612	0.7734	0.4721
14. Increase in the mobility rate of the population	1.1316	1.8186	2.9788
15. Increase in the share of wages in the issue	1.0268	1.1944	1.5468
16. Reducing the level of shadow wage to the official	0.9032	0.6783	0.4046
17. Increase of the coefficient of railway electrification	1.0843	1.3377	1.3377
18. Reducing carbon dioxide emissions	0.9975	0.9975	0.9975
19. Reducing the level of final energy consumption	0.9229	0.7431	0.7431

Source: calculated by the authors.

Institutional measures. This stage involves developing and taking into account the institutional aspects of sustainable development: programming and policy planning, scientific developments, international legal instruments, information provision, strengthening the role of major groups of the population, etc. Knowledge of elasticity factors is important for conducting controlled influence on the condition of sustainable development of railway transport, which, due to weight components of components and indicators, explains the extent of influence of individual components and indicators and is the necessary information for the development of priority measures of influence.

The coefficients of elasticity of each component, which determine how many per cent change the initial value (y) when the input value (x) changes by 1 %, are calculated by the formula:

$$E = \frac{\Delta y}{\Delta x} \times \frac{x}{y} \quad (5)$$

According to the calculations, the coefficients of elasticity for the weight of the influence of the components of sustainable development of railway transport are as follows: ecological – 0,4682; economic – 0,2744; social – 0,2536. The coefficients of elasticity of individual indicators are given in Table 3.

Table 3: Elasticity Coefficients of the Sustainable Development Indicators

Indicators	*E*
1. Transport capacity of GDP. given t km per1 euro of GDP (D)	-0.0333 (9)
2. Average cargo transportation distance. km (D)	-1.25126 (2)
3. Average passenger transportation distance. km (D)	-0.03245 (10)
4. The level of export of goods and services to GDP. % (S)	0.0133
5. Index of logistic efficiency. % (S)	0.03361 (8)
6. Level of transport shadowing. % to GVA* (D)	-0.01522
7. The intensity of transportation of goods. mln t km per 1 km (S)	0.01996
8. The intensity of transportation of passengers. million passenger-kilometres per 1 km (S)	0.01996
9. The density of the routes. 1/km (S)	0.02243
10. Specific weight of transport events. per 100 mln t km (D)	-0.00001
11. The specific gravity of victims. per 100 million passenger-km (D)	-0.00038
12. Level of renewal of fixed assets. % (S)	0.01826
13. Employment rate (D)	-0.33244 (4)
14. Population mobility factor (S)	0.06214 (7)
15. The share of remuneration in the issue (S)	0.06339 (6)
16. The level of shadow wage to the official (D)	-3.12 (1)
17. Electricity coefficient of railways (S)	0.18578 (5)
18. Emission of carbon dioxide per person (D)	-0.02887
19. Final energy level (D)	-0.61297 (3)

Source: Calculations by the authors. Figures in parentheses indicate the ranking of indicators for the weight of influence.

The most serious threats to the economic safety of railway transport are indicators that are located on the priority of influencing its level of sustainable development:

1. Level of shadow wage to the official (social component).
2. The average distance of cargo transportation (economic component).
3. Level of final energy consumption (environmental component).
4. Level of employment of the population (social component).
5. The coefficient of railway electrification (ecological component).
6. The share of labour remuneration in the issue (social component).
7. The ratio of the population (social component).
8. Index of logistics efficiency (economic component).
9. Transport capacity of GDP (economic component).
10. Average distance passenger transportation (economic component).

Thus, the strategy of the development of railway transport in Ukraine should firstly be aimed at improving the state of these indicators of the economic safety of railway transport.

5. Conclusions

The concept of strategic planning of sustainable development of the economic system (on the example of the railway transport of Ukraine) from the standpoint of security has been developed, which includes the following stages: definition of the structure of sustainable development at the level of components and indicators, determination of the limits of the safe existence of the economic system, identification of the level of sustainable development, the imbalances at the constituent level, the scientific substantiation of the strategic benchmarks for sustainable development and development of the institutional measures. Identification of the sustainable development level is provided by the modern integral estimation of both indicators and their threshold values, which makes it possible to compare the dynamics of integral indexes with integral threshold values on a single scale. Thus, the definition of integral indices of the economic system and their comparison with integral threshold values translate the concept of "development" into the concept of "security".

Defining of the vector of the threshold values of each indicator and their integral convolution makes it possible to propose the criteria for achieving the level of sustainable development, both in individual constituents, and in general for sustainable development through its definition as the average optimal value homeostatic plateau (the arithmetic mean between the lower and upper optimal values).). Identifying of the level of the sustainable development, definition of integral thresholds values and criteria for achieving the level of sustainable development determines the ultimate goal and strategy of modernization by decomposing the integral index. This means the task of synthesizing the necessary values of c and their components and indicators to find the integral index within the specified limits by means of adaptive control methods from the control theory. The importance of the impact of indicators on the integral index of sustainable development of rail transport is calculated, and the main threats identified, as well as institutional measures need to be addressed.

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The outlook for the development of the electric car market in Poland until 2025 compared to the Norwegian market

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ABSTRACT

The article presents an outlook for the development of electric cars in Poland until 2025. To that end, the situation in Poland will be compared to the situation in Norway. In many scientific papers, little attention was paid to the possibility of developing this technology in Poland because researchers focused mainly on technical issues. In order to determine the current and future situation, two tools will be used: Weight Attractiveness Scores and Three-tiers of Noncustomers. The analyses show that Polish policy is heading in the right direction. However, it is still not enough to become a leader, or a significant member, in implementing this technology, like Norway. Electric cars in Poland will grow at a very rapid pace, however, the dissemination of this product on Polish roads until 2025 is unlikely.

Keywords: electric vehicle, the electric car market in Poland, assessment, development, the electric car market in Norway.

1. Introduction

Polluted environment and the threat of a shortage of resources of conventional energy sources trigger the need to look for a more eco-friendly source for driving car engines. A popular solution is an electric car, which is considered by many to be the future of motorisation, but it also has a large group of sceptical people. An electric car (a battery electric vehicle – BEV) is a motor vehicle meeting the traffic rules, which can drive only on the accumulated electricity by connecting to an external power source [Ustawa o elektromobilności i paliwach alternatywnych, 2018]. BEVs are becoming more and more visible on roads, especially in Norway, which is one of the leaders in the development of this technology. Similar ambitions in the last two years have been expressed in Poland. The Polish government plans a significant increase in the number of available stations, which contributes to the acceleration of the development of BEVs in Poland. However, on the other hand, a high purchase price and a different attitude of Poles, in comparison to the Norwegians, regarding ecology can be a brake on development. Many contradictions in the final assessments and a small number of articles about this issue have led to the review of the possibility of developing electric cars in Poland until 2025. The current situation and decisions taken by the Polish government will be compared with the policy implemented in Norway, because this country is a role model for the development of this technology. The year 2025 was chosen as the time horizon, since it is the right time to implement and develop planned investments, which may contribute to the universalisation of BEVs, and this is the time when the electric car market in Poland can be credibly evaluated.

The primary purpose of the article is to identify and evaluate the potential of the battery electric car market development in Poland until 2025. Two tools will be used to assess the potential: modified Weight Attractiveness Scores and Three-tiers of Noncustomers.

In the first part of the work, a review of the literature will be presented, in which the potential for development of BEVs in the country and around the world will be included together with the factors which have an impact on car buyers' decisions. In the further part of the article, the tools and conclusions from the conducted analysis will be used.

2. Literature review

2.1. Forecasts and assessments of the electric car market around the world and in Poland

Analyses carried out by Polish experts regarding electric cars focus mainly on technical issues, and the subject of development prospects for the market in Poland is not discussed. Probably, it is related to the lack of policy in Poland in the past supporting the purchase of such cars. This causes the market share of these cars being less than 0.1% [European Automobile Manufacturers Association, 2017] and in 2017, only 475 electric cars were sold [EAFO, 2018a]. This is an increase by almost 245% compared to 2016.

A large number of studies have been devoted to electric cars around the world and in some countries. According to the IEA [2017, p. 50], 467,000 BEVs were registered all over the world in 2016. The increase in registration in 2016 compared to 2015 was 43%. IEA [2017, p. 20] predicts that by 2030 electric cars will have been fully competitive with internal combustion cars. According to BP [2018, p. 36], the number of electric cars around the world should reach about 150 million in 2040. Experts from Bloomberg New Energy Finance [Morsy, 2018] predict that the number of newly registered electric cars in 2025 will amount to approximately 7.5 million, in 2030 approximately 25 million, and in 2040 almost 55 million. A nearly 50% share in all newly purchased vehicles would contribute to this.

Let us now have a look at the situation of electric cars in Europe. In 2008, the German government assumed that the number of electric cars would reach one million vehicles by 2020 [Gis and Menes, 2015]. On the other hand, Gis and Menes [2015, p. 3] think that it is impossible unless the cost of producing electric cars will drop and their performance will increase. A scenario assuming an increase in oil prices and increasing financial support by the government predicts only 189,000 vehicles on German roads [Propfe, Kreyenberg, Wind and Schmid, 2013, pp. 5206–5208]. Nonetheless, an increase in registration by over 850% was recorded in Germany between 2012 and 2017 (accordingly: 2,555 and 24,438 BEVs), and between 2016 and 2017 approximately 117% [EAFO, 2018b]. This proves that the market is growing fast. However, the market share in 2017 was only 0.71% [EAFO, 2018b]. The leader in the development of electric cars in Norway, in which in 2017 the share of these vehicles in the whole number of newly registered cars was over 20.82% (33 025 cars) [EAFO, 2018c]. Moreover, the increase in registration in 2017 compared to 2016 was 36% (compared to 2012, when it was 673%) [EAFO, 2018c]. This is a result of significant state support, a well-developed accompanying infrastructure and high ecological awareness of Norwegians. Forecasts for the whole of Europe are promising. If the other countries follow the path taken by Norway, electric cars could become a serious competitor for ICE cars [Berkeley et al., 2017, pp. 330–331]. The research prepared by BCG [Mosquet et al., 2018] shows that in 2025, 13% of all newly registered cars are said to be electric cars, while in 2030 this value is to rise up to 22% (about 5 million).

Perspectives on the US market, which always sets trends in terms of motoring, look promising. Becker, Sidhu and Tenderich [Becker et al., 2009, p. 26] believe that electric cars are going to restructure the car industry in the US for the next two decades, but they predict that the market will grow at a rapid pace. They state that many incentives will encourage consumers to switch an ICE car to a BEV one. For instance, more extended distance travel on one charge, good opinions issued by electric car owners, an increase in oil prices and growing public awareness of health and environmental protection. According to the BCG report [Mosquet et al., 2018], in the USA, the sale of electric cars should reach more than 1,300,000 per year in 2025. Lee and Lovellette [2011, pp. 30–32] connect the development of the electric car market with oil prices and state support. They point out that the efficiency achieved by cars is also important. However, electric cars are no longer inferior to combustion cars.

2.2. Factors which have an impact on car buyers' decisions

The main criteria for the consumer who is going to buy a car are the price of the car, maximum range, performance, reliability, durability and environmental impact [Lieven, Muhlmeier, Henkel and Waller, 2011, p. 237]. The high purchase price of a car is the most significant barrier to the development of electric cars [Power, 2010, p. 15]. A similar conclusion was re-

ached by Axsen and Kurani [2013, p. 541], who researched car buyers' decisions. They have unequivocally shown that consumers do not want to spend considerably more on an electric vehicle than a conventional one (Internal Combustion Engines - ICE). Deloitte research [2011, p. 10] depicted that a consumer is willing to pay only $2,000 more (about 5,000-8,000 PLN). However, another study shows that a consumer is willing to pay an additional $6,000 - $16,000 (about 20,000 – 55,000 PLN) [Hidrue, Parsons, Kempton and Gardner, 2011, pp. 690–702]. This could be a little bit confusing. Nevertheless, in the second research, consumers set their expectations for some parameters above current standards, e.g. the range of travel larger than currently is possible. For this reason, another study will be presented, which shows that nearly 30% of respondents are willing to pay up to $5,000 [Larson, Viáfara, Parsons and Elias, 2014, p. 311]. To sum up, consumers want to spend up to 20,000 PLN more on an electric car than on a car with an internal combustion engine. The high price of batteries causes higher BEVs prices. However, the report "Global trends in renewable energy investment 2016" seems to be optimistic [Frankfurt School, UNEP, Bloomberg New Energy Finance, 2016, p. 36], which shows that the average price of batteries for electric cars has dropped from $1,000/kWh down to $350/kWh. This change can cause significantly lower costs of purchase and use of electric cars shortly. However, during the process of buying a car the consumer considers the total cost of use. In ICE, the necessary expenditure is the purchase of fuel, the prices of which are very fluctuating and vulnerable. Forecasts of the Energy Information Agency are not favourable for conventional cars, because until 2030 the price per barrel of oil, in the least optimistic scenario, may total almost $200. Moreover, in the most likely to happen scenario a barrel might cost about $140 [Becker, Sidhu and Tenderich, 2009, pp. 5–7]. This information can have an enormous impact on consumers' decisions as regards choosing a car [Becker et al., 2009, p. 7]. However, according to Innogy Polska, the total cost of obtaining and using an electric car within five years is higher by 19,100 PLN than a car with a diesel engine [2017, p. 32]. This depicts that currently buying a car with an electric motor is not an economically rational decision. However, comparing this information with previously presented surveys concerning willingness the consumer to pay extra for an electric car, the conclusion was reached that these two prices are similar to each other. It allows forecasting that people interested in environmental protection will be able to buy an electric car. Nonetheless, in our market, in some cases, there are more considerable disparities. Considering the example of the popular Volkswagen Golf on Polish roads, we will have to pay almost 100,000 PLN more for the basic BEV version [Volkswagen AG, 2018a]. Such a significant price may discourage the majority of people interested in buying an eco-friendly car. Moreover, this is not the only one case.

The maximum range on single charging of the BEV depends on the capacity of batteries installed in cars and the cars' demand for energy. ICE cars can travel a distance of two times longer on a single tank than electric cars [Raca, 2014]. However, Rob van Haaren's study [2011, p. 6] depicts that the average distance covered by the most popular cars in the United States of America is about 400 km on a single tank. Comparing this number to the 300 km covered by a BEV (e.g. VW e-Golf [Volkswagen AG, 2018b]), the results obtained show that there is no significant difference. However, the cars used in the study had large engine capacity. Moreover, the author [Haaren, 2011, pp. 29–31] analysed daily distances covered by drivers, which shows that almost 70% of drivers in the USA travel up to 40 km a day. Because of that, it appears that the argument of an overly short range of electric cars [Hacker, Harthan, Matthes and Zimmer, 2009, p. 34; Szyjko, 2013, p. 4] is exaggerated. Nonetheless, there is another critical factor which is crucial to travelling by electric car. Namely, an accompanying infrastructure which is necessary for the development of a BEV. Hacker and other authors [2009, p. 42] think that the infrastructure is insufficient to meet the basic needs of electric car users. They note that it is indispensable to build open-access spots for charging cars. In Poland, an act has recently been signed based on which 6,000 electric charging points with standard power and 400 high-power charging points are going to be created until 2020. These spots are going to be built in 32 agglomerations and densely populated areas [Business Insider Polska, 2017; Ministerstwo Inwestycji i Rozwoju, 2017; Ustawa o elektromobilności i paliwach alternatywnych, 2018]. However, according to Lee and Lovelette [2011, p. 23], the private sector is not interested in building such stations because it could not be profitable. A similar situation was at the beginning of the development of combustion cars, since entrepreneurs did not see building a petrol station as a viable business. This causes a necessity for the involvement of the government in the construction of the infrastructure

for electric cars. Nowadays, in Poland, there are 582 charging points [EAFO, 2018a].

In addition to the availability of charging points, the speed of charging is crucial as well; slow chargers can provide energy for several hours to overcome 100 km, which makes this solution ineffective [Hacker et al., 2009, p. 42]. Nonetheless, according to Polakowski [2011, p. 33], the charging time has decreased in recent years. The fast chargers CHAdeMO can charge a medium-sized battery up to 80% in approximately 30 minutes [Barycki, 2017].

One of the main advantages of electric cars is the lack of direct emissions to the environment [Hacker et al., 2009, p. 91]. However, Chłopek [2012, pp. 106–107] has noticed that eco-friendliness of electric cars occurs only in a Tank-to-Wheel cycle, i.e. from the tank to the drive wheels. In the situation when we additionally take into account the Well-to-Tank cycle (from the source of the energy carrier to the energy tank), eco-friendliness changes. It is connected with the fact that in order to produce electricity fossil fuels are used predominantly (in particular in Poland). Moreover, Szyjko [2013, pp. 3–4] has noticed a problem related to the production and utilisation of batteries, which relatively often require changing as battery life plummets after 200,000 km. However, a significant number of producers allow free disposal. In the assessment, we should take into account the entire cycle, i.e. Well-to-Wheel. According to Szyjko [2013, p. 3], assuming the average European emissions of pollution, electric cars emit less harmful substances into the atmosphere than conventional cars. An internal combustion engine car would have to burn three or four litres of fuel per 100 km in order to be at the same level as the electric one. Moreover, if the share of renewable energy sources increases, the situation will be even more favourable for electric cars. An additional factor affecting the improvement of the situation is very low noise emissions by a BEV, which, as Łebkowski [2016, p. 159] highlights, is a considerable problem in Polish society. The results of his research show that electric cars cause noise reduction form 2 to 5 times [2016, p. 158].

In order to be fully competitive, electric cars must achieve similar performance, failure-free operation and provide equipment at the same level [Lee and Lovellette, 2011, pp. 18–23]. In this respect, it is noted that these conditions have already been met because the failure-free operation is ensured by a small number of moving parts in electric motors and the simplicity of the car's construction. High efficiency has also been achieved, e.g.Tesla Roadster reaches a speed of 96.5 km/h in 1.9 s [Tesla Motors Inc, 2018].

To sum up, the statement of Gyimesi and Viswanathan [2011, p. 6] has confirmed that the main incentives for buying an electric car are environmental advantages, technological innovation and no cost associated with the purchase of petrol. Whereas, the main barriers in development BEVs are: the cost of acquisition, the availability of charging infrastructure and the range on single charging. However, the statement about the range on one charge is dubious because, as was mentioned, vehicles should be able to withstand a typical day of driving by an average user on a single charge. Nonetheless, there is a conviction among people and researchers, e.g. Power [2010, pp. 6, 14], that electric cars cover only a very short distance.

Governments can also encourage consumers to buy BEVs by implementing friendly policy for electric cars. At the other end of the spectrum, Kochhan and Horner [2015, p. 20] claim that the most crucial activity increasing the attractiveness of the electric car market is to focus on improving the infrastructure and technical level of the car. Moreover, tax breaks are a short-term solution, and in the long-term, they will not improve the prospects for the sector's development. This opinion seems quite controversial, especially taking into account that a large number of experts note that state support is a crucial activity. A similar position is held in the report prepared by the International Energy Agency [2017, pp. 15–16], in which the authors claim that subsidies, tax breaks and free parking in city centres are crucial factors which can contribute to development, and in many cases have already caused the development of the electric car market. Lee and Lovellette [2011, p. 25] note that the government support in building an infrastructure for charging cars is also crucial.

3. Methodological research

In order to carry out the assessment of the potential of electric cars in Poland the author has applied modified Weighted Industry Attractiveness Scores and a tool from Blue Ocean Strategy – Three-tiers of Noncustomers.

Weighted Industry Attractiveness Scores was presented by A.A. Thompson, A.J. Strickland, J.E. Gamble and M.A. Peteraf [2012, pp. 313–331]. The authors used the tool to evaluate the attractiveness of the industry, but in this case, the idea of this tool will be utilised for an entirely different purpose and with changed components. This enables identifying the cur-

rent situation and possibilities for growth. Moreover, this will give the opportunity to compare the situation of electric cars to conventional cars. Additionally, the situation in Poland will be compared to the situation in Norway, because the Norwegians are one of the leaders in the deployment of technology for electric cars around the world. Modified Weighted Industry Attractiveness Scores seem to be the best option, especially in evaluating the potential of growth and attractiveness to customers. In traditional Weighted Industry Attractiveness Scores several factors are used, e.g. the market size, intensity of competition, industry profitability, etc. However, in this case, these elements are not useful. As was mentioned, factors which are suitable for evaluating the potential of the electric car market will be used. Nevertheless, first of all, the idea of this tool will be discussed. Each of the factors has a weight, which shows how important a specific factor is for car buyers. Next, each factor is rated on a scale of 1 to 10 (where 10 is the best and 1 is the worst) to show the situation in a particular sector. The next step is to multiply the relevant weight by an applicable rate. The last step is to sum each score. Markets with a score below 5 will probably have problems with thriving [Thompson Jr. et al., 2012, pp. 315–316].

The second tool, which is going to be used, is Three-tiers of Noncustomers invented by W. Chan Kim and Renee Mauborgne. This tool depicts opportunities and ways to unlock the noncustomers. Firstly, the most important thing is to define the three tiers. The first tier of noncustomers is closest to the current market. They are buyers who are looking for something better and accept the current offer of the market in minimum level. Whereas the second tier of noncustomers are people, who refuse or do not use the current offer, because of, e.g. financial aspects. The third tier of noncustomers is the furthest from the market. They have never been considered as the market's clients [Kim and Mauborgne, 2015, pp. 160–176].

4. Weighted Industry Attractiveness

The factors, which are used to assess the growth potential are similar to the criteria which were used by Lieven and other authors of the article entitled "Who will buy electric cars? An empirical study in Germany". However, more factors will be employed – station availability and the impact on the environment, divided into two aspects (Well-to-Tank and Tank-to--Wheel). In the author's opinion, these 7 factors, presented in the table below, are the most critical criteria in the decision-making process of buying cars, and thus, with these criteria it is possible to figure out the attractiveness and predict the possible development of electric cars. The weight, which is registered in table 1 arises from the article of Lieven and other authors, which has been widely described in chapter 1. The price of electric cars in Poland is considerably higher than that of conventional cars. Therefore, BEVs in Poland have obtained 3 points, and ICEs have received 6 points. A completely different situation is in Norway, where the price of an electric car is more profitable than that of a conventional one. In the Well-to--Tank stage, a much smaller value of BEVs was also attributed to the fact that in Poland, only 11.8% of energy is generated from renewable sources [Główny Urząd Statystyczny, 2017, p. 3], whereas in Norway, 96% of electricity is produced by hydroelectric power plants. There are 6803 gas stations in Poland [Polska Agencja Prasowa, 2017], while there are only 582 electric chargers (172 fast charging and 410 regular charging spots) [EAFO, 2018a]. The result is that this factor cannot create value for the customer, which translates into only 2 points for BEVs, whereas conventional cars received 9 points. On the other hand, in Norway, there are almost 1,600 fast charging spots and 7,100 places for normal charging [Lorentzen, Haugneland, Bu and Hauge, 2017]. Other factors do not require additional explanation because they are related to the operation of cars that are not dependent on the country and are discussed in the first chapter of the article.

This tool depicts expressly that electric cars in Poland will have great problems to develop because in the overall score the winner is a conventional car with sufficient advantages. According to Thompson Jr. et al. [2012, pp. 315–315], electric cars in Poland will have difficulty flourishing because of the score below 5 points. However, why is the situation in Norway completely different? The main reason is government support. The generosity of the Norwegian government has been developed for 20 years. The main incentives for buying electric cars are:
- Exemption from the VAT on purchase and leasing,
- No purchase/import taxes,
- Free spaces in public parking,
- BEVs can use bus and collective traffic lanes,
- Exemption from fees on toll roads and free car ferries,
- 50% reduced company car tax (the amount depends on the company's income) [Figenbaum, 2017, pp. 15–16; Holtsmark and Skonhoft, 2014, pp. 161–162].

Thus, the electric car market in Norway has obtained such a high mark, even better than the ICEV market. These results have been reflected in the current situation – 141,951 battery electric vehicles were on roads in 2017 [elbil.no, 2017; Haugneland, Lorentzen, Bu and Hauge, 2017, pp. 1–2]. Moreover, Norway's advantage in individual factors was achieved by significant government support. These examples show how important government support is for the development of this technology. The only Well-to-Tank stage is connected with long-term policy, and it is tough to change quickly. However, even with a lower mark of that factor, the electric car market in Norway has excellent results, which is competitive with the result of the conventional car market.

Table 1: Assessment of market attractiveness and growth potential

Criteria		Poland				Norway			
		Electric cars		Conventional cars		Electric cars		Conventional cars	
Factors	Weight	Points	Score	Points	Score	Points	Score	Points	Score
Price	0.2	3	0.6	6	1.2	8	1.6	7	1.4
Range (distance)	0.175	5	0.875	7	1.225	5	0.875	7	1.225
Performance	0.15	6	0.9	7	1.05	6	0.9	7	1.05
Well-to-Tank – the impact on the environment	0.075	2	0.15	7	0.525	9	0.675	7	0.525
Durable and reliable	0.15	8	1.2	8	1.2	8	1.2	8	1.2
Tank-to-Wheel – the impact on the environment	0.075	10	0.75	3	0.225	10	0.75	3	0.225
Station availability	0.175	2	0.35	9	1.575	8	1.4	9	1.575
Overall score	1	-	4.825	-	7	-	7.4	-	7.2

Source: own study.

Until 2018, Poland had no plan to support electric cars. However, optimism may increase due to actions taken by the Polish government aimed at building a developed accompanying infrastructure by 2020. This allows it to move freely around the country. An additional incentive is to exempt electric cars from excise tax and higher amortisation charges for the consumption of electric vehicles for companies. BEVs will also receive additional privileges in cities, such as free parking in paid zones and the possibility of using bus lanes until 2025 [Business Insider Polska, 2017; Ministerstwo Inwestycji i Rozwoju, 2017].

By comparing the situation in Poland with the situation in Norway, a conclusion was reached that Poland has much to do to make the attractiveness of an electric car at a satisfactory level. The analyses clearly show that electric cars in Poland are not at the same level as internal combustion engine cars. However, this situation is possible to change. Namely, the Norwegians have significantly managed to promote electric cars. Some conclusions have been drawn that the role of the state in the success of this technology is significant. The Norwegian government has created an excellent climate for the development of electric cars by offering numerous facilities and tax breaks. This caused the electric car in Norway to be comparable, and even better, than an internal combustion engine. This is because the conclusions from the previously mentioned works have been confirmed, i.e. the high price and the lack of accompanying infrastructure are effective barriers to the development of electric cars. The government has the most significant impact on these issues, and the example of Norway depicts that the impact may have awe-inspiring effects. Of course, Poland has taken some actions to encourage people to buy electric cars. However, it still seems insufficient. Electric cars will remain much more expensive than the ICE ones, and the price is the primary motive when choosing the type of a car. Poland must significantly reduce the final cost of purchasing BEVs so that it is comparable to internal combustion engine cars. Only this solution will result in substantial sales results, as is the case in Norway. Moreover, the government's plan to reach more than 6,000 recharging points does not have to be fulfilled, because nowadays this investment may seem unattractive for entrepreneurs, given such low demand for these services. Therefore,

we have reached a paradox because one of the reasons for the low volume of car registration is the low number of charging points (supply). It underlines the significance of the influence of the state on the development of electric cars.

5. Three-tiers of Noncustomers

Three noncustomer tiers in the electric car market in Poland will be defined. The first tier is people who are going to change BEVs to Hybrid electric vehicles or Plug-in hybrid electric vehicles, because of the lack of charging spots or the short range of BEVs. This corresponds to the analysis carried out in the second part of this chapter - a significant problem for Polish residents who would like to purchase an electric car is the issue of free movement, in particular over longer distances. Although electric cars are developing in terms of the distance travelled, there is still lack of adequate accompanying infrastructure. The second tier consists of people who cannot afford to buy electric cars due to the price, and for this reason, they use conventional cars. The second tier reflects the conclusions of the previously used tool, namely the price of an electric car is decidedly overly high for an average inhabitant of Poland. The difference is even more noticeable if compared to the situation in Norway. The third tier contains customers who relied on public transportation and people who are fascinated by conventional cars.

Development of charging spots has made it possible to unlock the first tier, and the range of electric cars is continuously enhanced by electric car manufacturers. To unlock the second barrier it is necessary to create incentives for buyers, e.g. exemption from the VAT on the purchase. The main task should be alignment of the prices of electric cars and conventional cars. Fans of conventional cars may be encouraged to purchase BEVs by producers, who could increase the efficiency of an electric car, so that they become even more competitive compared to conventional cars. The second part of the third tier are people who for the most part choose urban transport, because of moving faster in crowded cities and also due to significant problems with finding parking space. To unlock this group of people, local governments should increase the number of parking spaces only for electric cars and free them from the charges for such parking.

Through the use of Three-tiers of Noncustomers, it is confirmed that the main barriers now are: price and availability of charging points. However, through the presented solutions it is possible to overcome unfavourable factors. Furthermore, some activities (e.g. free parking in city centres) have already been implemented. Moreover, this tool depicts how vital the Polish government is in developing this technology. In each of the tiers, the government can significantly improve the situation and encourage people, even those very distant from the electric car market, to buy such a car.

6. Discussion

Sales of electric cars should increase at a rapid pace, but until 2025 there will not be a revolution on Polish roads. This technology will continue to develop, and after 2020 the pace should accelerate because of an increase in the number of charging points. However, the discretionary income in Poland is too low to buy more expensive BEVs, and the support of the Polish government seems to be not enough. Nonetheless, it has to be underlined that there is a turn toward eco-friendly technology in Poland. Even without the support of the government, the price of electric cars will decrease in the future, so this technology will become popular in the long-term, but this change will only be a slow substitution.

Electric cars are a product which can significantly contribute to reducing the ecological problems of the developed world. In particular, when there is a shift towards renewable energy. It is a technology that requires further improvements and significant development of the accompanying infrastructure, but it is undoubtedly a perspective. Development in Poland should accelerate in particular after 2020. However, the dissemination of this product on Polish roads by 2025 is unlikely. This will be caused in particular by the price of electric cars compared to ICE cars. However, a lot depends on the Polish government, as the Norwegian example shows.

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Development of the educational environment through the formation of Private Corporate Universities

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ABSTRACT

This article aims to analyse the experience of creating and functioning of corporate universities as a way of developing an educational environment – a component of corporate social responsibility (CSR) and an essential element of social infrastructure. This article lists the possible benefits of interaction between an individual, a corporate university and a region in the co-operation based on continuous development and education. The methodology of the narrative literature review is applied in order to achieve the above aim.

Keywords: educational environment, corporate social responsibility, social infrastructure, individual human needs, corporate university, continuous development.

1. Introduction

Corporate social responsibility that allows finding a consensus between the commercial interests of corporations and the expectations of society is a new civilisational stage in the development of society and business [Kolot, 2012]. According to this concept, enterprises should make decisions based not only on financial or economic factors but also on social, environmental and other consequences of their activities. Stakeholders of companies realise that business development is possible only with social development, and social development is possible only with business development.

The concept of CSR in companies of different levels and various spheres of business can include different components: health care, labour protection, environmental protection, human rights, fighting corruption [Abe and Ruanglikhitkul, 2012]. However, the ever-changing technologies and the uncertainty of the modern environment lead to the fact that the companies activities depend on the level of employees' development and ability to adapt to turbulent conditions. In this connection, such components as human resources management and the educational environment considered as space in which the process of personal development is taking place are becoming increasingly critical.

2. Literature review

Corporate social responsibility has been researched extensively in Western Europe [Steurer and Konrad, 2009], and to some extent in Central and Eastern Europe [e.g. Furrer, Egri, Ralston, Danis, Reynaud, Naoumova, Molteni, Starkus, Darder, Dabic, Furrer-Perrinjaquet, 2010], as well as in the countries of the former USSR [e.g. Kolot, 2012, Kurinko, 2011, etc.]. Problems of an institutional design of the intellectual capital of corporations, providing their competitiveness, are presented in the works of Johnson and Daron [2005], Knack and Keefer [1995], Pająk, Kamińska and Kvilinskyi [2016],

Udovichenko [2007], etc. The issues of development of business education systems were discussed in details in the works of such foreign researchers as Blass [2001], Drucker [1997], Meister [1998], Patterson [1998], Walton and Martin [2000]. Problems of formation and development of human capital, determined in the development of business education, are presented in the works of Balychin, Safaraliev and Berdashkevich [2011], Belolipetsky [2006], Kvilinskyi, Mieshkov and Bondaryeva [2017], Mieshkov, Kravchenko, Bondaryeva and Kvilinskyi [2017], Pietrykowski [2001], Huitt [2007] etc. There is considerable interest in this problem both in literature and in practice. On the one hand, it shows the relevance of the problem, but on the other hand, it demonstrates the lack of sufficient systematisation and generalisation of theoretical material, which requires further research.

3. Methodological

This article aims to analyse the experience of creating and functioning of corporate universities, as a way of developing an educational environment – a component of corporate social responsibility (CSR) and an essential element of social infrastructure. To achieve the aim of the study, the author critically analysed a selection of literature on the subject. However, applying for a narrative literature review as the only method of data collection and analysis should be considered as the limitation of the study.

The paper begins with a theoretical review of the issues related to the role of private corporate universities in the development of the educational environment as an essential element of social infrastructure and a component of corporate social responsibility. Then, the approaches to the definition of the corporate university are determined, and the process of building a corporate university for the company is analysed. Further, the possible benefits of interaction between an individual, a corporate university and a region in the co-operation based on continuous development and education are discussed.

4. Research results

4.1. The role of developing private sector educational services

Even though education is an essential component of the social infrastructure of society, which has a vital role in the socialisation and development of individuals, significant changes are currently taking place in higher education. Nowadays, universities have lost their monopoly power in knowledge. In addition to the widespread inadequacy of the source of knowledge (professors) and the form of education (lectures), a firm diagnosis – "long, inefficient, expensive" [Anders, 2012], can be put to the modern education system represented by traditional (conservative) universities. In other words, it is not adequate for the price, the terms and the quality.

On the other hand, business recognises the potential opportunities and tries to master a new educational trend. Thus, the 2Tor start-up gathered $90 million from venture investors, and venture capitalists from Charles River Ventures invested $5 million in the Udacity start-up [Balatsky 2015]. In this way, business diversification is a significant factor in social infrastructure development.

At the same time, many countries show rather low levels of innovation and high-tech products on the market. The task of overcoming the technological gap could be done only in case of ensuring the effective integration of education, science and industry [Sanderatne, 2011]. According to McKinsey's research, public entities around the world need more than $8 trillion to fund social infrastructure projects by 2020. This figure exceeds the capital requirements of the oil and gas and mining industries combined. More than 40% of the $8 trillion is required for the creation of social infrastructure in developing countries. With public finances tighter than ever, expectations for public-private partnerships (PPPs) are growing. While private sector interest in the financing of infrastructure projects has increased in recent years, barriers to private sector involvement remain. Many government agencies do not have the capacity and capabilities for the planning, execution and management of PPP projects [McKinsey &Company]. At the same time, the performance of educational processes needs improvement. Managing this complexity can be a hard task even for developed countries.

The integration of scientific, industrial and educational activities could be implemented on a platform of specialised schools. They are designed for intensive training to enable people to work in a specific branch or a particular company. The requirements of the dynamically developing business are so high that the external market is just unable to provide the inflow of necessary specialists for each company [Gerbman, 2000]. Nowadays, many organisations reached a new level of training of qualified per-

sonnel and established their educational institutions (departments) for staff development. International experience in the field of professional education suggests that one of the most effective ways to solve this problem is creating a company's corporate university.

Defining the concept of a corporate university, the majority of experts tend to call a corporate university as the existing in the company's forms of training, the in-house staff training system. At the same time, there is more than a narrow understanding of a corporate university as a system of training young professionals in specialised universities [Walton, Martin, 2000]. They are trained by a specially designed training program, which takes into account the specifics and the corporate culture of the company. Herewith the supporters of this concept do not exclude the university's function of in-house staff training at various levels.

U.S. companies use the term ‚university' for the name of a department for personal training and development without any restraint. In Europe, the term 'university' is used with restraint, only with reference to higher education. Among 30 corporate universities operating in Europe, only 14 are known as 'universities', five are called 'centres', four use the name 'institute', 3 – 'academy' and one is called a 'business school'. While using the term 'university', European companies explain it in their way. For example, Daimler Chrysler (Germany) presents a corporate university as "the place for the exchange of knowledge and competence" [Allen, 2002]. Heineken (Netherlands) describes a corporate university as a "link between knowledge transfer and creation" [Allen, 2002]. The term 'university' in this case is used carefully as it implies a certain institutional and functional addictiveness.

According to the Ukrainian legislation:

> "University is a multidisciplinary higher education institution of the fourth accreditation level, which carries out educational activities related to obtaining certain higher education and wide range qualifications in natural, human, technical, technology, culture art, economic and other areas of science. It carries out fundamental and applied researches, is the leading scientific and methodical centre with a developed infrastructure of educational, scientific and industrial divisions, and appropriate level of staffing and logistical support, contributing to the spread of scientific knowledge and carrying out cultural and educational activities" [The Law of Ukraine on Higher Education, 2014].

According to the analysis of legislation, the existing legal framework does not provide such a type of educational institution as a corporate university.

The experts pay attention to the specific characteristics of education in corporate universities. First of all, it refers to the fact that education (its content and form) is aimed at a specific target group, i.e. employees of a company or an industry. Another essential feature is the presence of a single company's development strategy and the corresponding concept of staff development of the company. A further feature is that a corporate university is a system that allows people to improve their skills regularly through training, coaching and traineeship. Thus, a corporate university provides continuous professional education in the lifelong learning concept. Finally, the function of a corporate university is the intellectual component, which allows being engaged in strategic research, to determine the company's strategy [Udovichenko, 2006]. Therefore, despite some differences in the definition of the corporate university, almost all experts agree that a corporate university is a system of in-firm training, combined in a single concept within the strategy of the organisation's development and applied to all staff levels.

From the determined meaning of a corporate university, education there is an interesting consequence: the current system of professional higher education cannot and does not have to reproduce in full the corporate university functions. The higher professional education system should prepare graduates, who are oriented to work in any corporation. On the other hand, the existence of competition leads to the constant appearance of new forms and methods for solving practical problems, knowledge of which would be very useful for future graduates (Walton, Martin, 2004]. Thus, there is a mutual influence of corporate education on the system of higher education and vice versa. This effect manifests itself in the formation of professionals and other requirements for graduates by employers (corporations).

Today, real requirements for graduates cannot be determined by any corporation, as the goals and objectives of corporate entities differ from one another, even in the same industry. Thus, to entrust to companies the formation of professional and other requirements for graduates means to consider only private interests that will prevail over the general one. It is necessary to develop employees' specific skills in the private educational institutions or the companies itself.

Corporate education is an integral part of business, so it should make real direct/indirect economic effects. Corporate education should be cost-effective, and therefore, use easily replicable educational technologies, with minimum disruption of staff from production responsibilities and minimising the costs of the implementation of educational programs.

4.2. Creating and commercialising corporate university

In the modern understanding, a corporate university is a system of staff training and development within the company, in connection with the strategy of the organisation development [Balatsky, 2015]. Indeed, each industry has its specifics; however, the majority of learning centres and corporate universities use similar forms and methods of training:
– thematic training, master classes and workshops,
– professional development courses,
– projects, lectures, group work, case studies solution,
– gamification,
– e-learning covers all levels of employees and various geographical locations.

The main reason that encourages companies to invest millions into the creation of corporate universities is ensuring sustainable development of employees at a single training standard. A pioneer in creating a corporate training centre was McDonald's. Its famous Hamburgers University was opened in 1961, but it took six more years to realise a critical thing: ensuring the same quality of service in the city centre, as well as in the outskirts of small towns, is possible only if all employees are trained at the same standard. For other countries, it took another 30 years to come up to this conclusion. The boom for creating corporate universities was observed in the 1990s [Hearn, 2001; Meister, 1998]. Such companies as General Electric, Motorola, Coca-Cola, Procter&Gamble continue to set trends in the corporate training development.

Thus, creating an internal corporate university, a company solves its needs to increase business efficiency and support the development of its employees. However, this is not the only option of functioning corporate universities. It could have an open form and provide training services and expertise to external clients, companies and businesses. The economic crises of the mid-1990s forced experts of corporate training centres to search for ways to survive. One of the most fruitful ideas turned out to be a transition to self-sufficiency. One of the first companies which gave its corporate university the status of a separate business unit was the Motorola company. Moreover, Motorola U (university) began to teach not only the internal customers (employees) but external individuals as well. Eventually, leaders in the commercialisation of corporate training were IT companies [Hearn, 2001]. Providing customers with IT products, they offered to train their employees, so that corporate users in the future would be able to self-serve and modify complex IT products.

Transformation of corporate universities in an open mode of training and consulting centres is a serious project that requires significant investment at the initial stage. Such an important decision requires a balanced risk analysis and calculation of long-term consequences. Nowadays, the market offers a range of various corporate university models [Belolipetsky, 2006]: based on the objectives, directions, budgets and organisational forms (a non-profit educational institution and its subsidiaries, a company's branch or its structural subdivision, department or division and so on).

Creating an active learning centre is a costly project, which may amount to 15-60% of the staff budget [Kvilinskyi, Mieshkov and Bondaryeva, 2017]. Therefore, it is necessary to assess whether a corporate university is required at this stage of the company's development. Additionally, proceeding with such a project, there is a need to understand that the return of investments will start with a considerable delay of about one year after launching a corporate university.

The first step in creating a corporate university is conducting an audit of the existing system of personal training. Auditing can be performed with the use of the following analytical procedures [Meister, 1998]:
– evaluation of training objectives;
– assessment of implemented learning concepts;
– assessment of the current organisational structure of training;
– evaluation of teaching methods;
– evaluation of the learning quality control systems;
– evaluation of the effectiveness of training;
– evaluation of existing corporate training and development budget.

Carrying out such an audit is necessary to obtain a comprehensive understanding of the processes related to the training and development of staff implemented in the company. Business objectives can change, and therefore the

activity of a corporate university should be able to change its direction. Accordingly, the work of a corporate university has to be flexible and responsive to business objectives. All this brings us to the necessity of developing the concept of corporate training and staff development. The purpose of this step is to establish relevant principles and elements of a corporate system of training and staff development. At this step, it is important to develop not only a target concept but also the stages and principles of the learning system reorganisation from the current format to the format defined in the concept. It is essential to identify the resources needed for carrying out the changes, namely the budget of the project and the project team.

The next step in creating a corporate training centre is to develop competency profiles of key positions and levels. It is critical to integrate the competence assessment procedure to the staff development program. Only then, a company can form and choose teaching methods that would satisfy the need for the development of critical competencies. There are many formats of training and development. To improve the efficiency of a corporate university, the entire arsenal of existing formats of learning should be used. Selection of the teaching format has to be applied to a particular module and goals. It is necessary to create and approve the schedule of the training activities implementation.

Finally, one of the most critical stages for the success of establishing a corporate university is the development of a methodology for assessing its effectiveness. The evaluation criteria may be, for example, the following:
– an increase in sales and revenue;
– reducing costs by standardising management processes (management of knowledge, staff, changes);
– improved customer satisfaction;
– improving the quality of products and services;
– optimisation of the cycle of order execution;
– reduction of waste;
– improved safety performance;
– increasing employee satisfaction;
– reducing staff turnover.

The implementation of the indicators above enables a company to understand what positive effects are generated by corporate training. The steps for creating a corporate university are summarised in Table 1.

The introduction of a corporate university to the external market as an independent provider of educational services requires much effort. It is necessary to consider all the advantages and disadvantages carefully. It is advisable to launch training for external clients when [Walton, Martin, 2004]:
– the primary goal of a corporate university is achieved (staff training and development at all levels is established, unified and standardised),
– all processes are digitised, and key performance indicators (KPIs) are established,
– the effectiveness of the staff training is proved in practice,
– corporate training programs provide the necessary knowledge and skills relevant to the needs of individual departments and the whole company.

Table 1: The process of creating a corporate university

Steps	Tasks
Assessment of existing training and development system	– To understand whether: – the need for training staff cannot be satisfied by existing educational institutions – employees need specific skills that require regular training
Development of the concept and the corporate university strategy	– to create a mission, vision of the future knowledge centre (based on analysis of the information obtained in the first stage) – to form a project team – to develop and justify the business plan for a corporate university
Development of the methodology of training, trainers education	– to create training programs (in line with the company's strategy, key positions profiles and competencies) – to standardise learning processes
Development and implementation of performance criteria	– to define the success criteria, key performance indicators – to provide the continuous monitoring of performance and effectiveness of a corporate university

Source: compiled by the author on the basis of Allen [2002]; Heckscher and Adler [2006]; Udovichenko [2006].

4.3 The benefits of creating corporate universities

To summarise what has already been mentioned, as well as to highlight the feasibility of operation of a corporate university, it is reasonable to combine and compare benefits of a given region, the company (which establishes a corporate university), as well as a specific individual who is potentially trained in the corporate university (Table 2).

It is worth emphasising the trends in corporate education development within the social infrastructure of a region. The primary trend in corporate universities performance nowadays is their quantity growth and going mass-scale. At present, there are more than 3000 corporate universities and their rapid growth continues [Gerbman, 2000].

Table 2: Assessment of market attractiveness and growth potential

Region interests	Company interests	Individual interests
– development of scientific and technical progress – improving the quality of educational services – private investments in social infrastructure	– a solution of the conflict between quality of education and business requirements – targeted training of employees at the same standards – increasing the efficiency of employees, and business efficiency therefore	– satisfying the needs in education and development – the possibility of sustainable development – socialisation in a possible new circle – an opportunity to show yourself as a trainer

Source: compiled by the author on the basis of Blass [2001]; Walton and Martin [2004].

Through the cooperation of a corporate university with leading universities in a region, a staff training system is formed. The forms of such cooperation may vary from the participation of students in the internships at companies to establishment of specialised educational and research departments at universities, financed by corporations. At the same time it is possible for a corporate university to select talented students with the use of corporate grants, as well as exciting and promising work.

The next trend in the cooperation of educational institutions of the social infrastructure is the participation of a corporate university in the development of the professional and educational standards for different specialities. Leading companies are already involved in this process, working with the government to develop such standards.

Another trend is related to the need for a more dynamic update of educational programs content. Experience shows that the dynamics of teaching materials renovation in corporate universities is much higher than in traditional universities. It should be noted that this trend sharply tightens the requirements for the teaching staff of corporate universities and traditional educational institutions.

What should be taken into consideration is another feature of the development of corporate universities, namely the development of both professional and 'soft' skills. Their range may include training of personal growth, self-development, leadership and team building, performance and organisation, systematisation, creativity and public speaking skills, etc. Building an enterprise knowledge accumulation system is necessary.

Finally, the latest trend is cooperation between corporate universities in the development of educational methods. This is especially important for the leading industries of the region. Today it is essential for corporate universities to express a united opinion on teaching and staff development. This cooperation will make it possible to improve the system of training in companies, to solve common systemic issues, to create conditions for the free exchange of experiences.

5. Conclusions

A higher level of economic development could be achieved through the development of social infrastructure. Many a time it will require significant investments, including substantial resources for educational development. The intensification of CSR practices through the creation of private corporate universities is one of the possible ways to promote the development of an educational environment for life-long education. This satisfies three essential needs: skilled workers for the companies, spiritual and cultural development for individuals and one way of solving the main tasks of social infrastructure.

The paper contributes to the discussion on the development of the educational environment (regarding material systematisation and generalisation) and could be useful for stakeholders and managers of companies (as regards increasing the degree of management of decisions validity).

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The control of the banking sector concentration in Poland – legal and economic aspects. Selected issues

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ABSTRACT

The paper aims to analyse selected legal and economic issues connected with control of concentration in the banking sector in Poland. The antitrust law aims to counteract the monopolisation of the market. Undertakings, including banks, can take actions which lead to mergers or takeovers which can strengthen the market power of some of them. The antitrust authority has normative instruments to influence the market in order to counteract its monopolisation. These instruments usually concern control of the concentration of companies (also banks). In Poland, the antitrust authorities (the President of the Office of Competition and Consumer Protection – UOKiK) also have a legal instrument which can counteract the anticompetitive actions of banks.

Because of the specific features of the financial market and financial services, general characteristics of these issues are presented in the paper. Moreover, the methods of measurement and aims of control of concentration are analysed. The main legal instrument of limiting the concentration is connected with an administrative procedure. Therefore, general provisions of these procedures are also shown in the paper. To illustrate the above-mentioned theoretical issues the statistical data concerning the level of concentration in the Polish banking sector is also analysed.

Keywords: banking sector concentration, antitrust law, government policy and regulation.

1. Introduction

Competition is one of the main features of the market mechanism. Microeconomics analyses different structures of markets, such as monopolistic competition, monopoly or oligopoly. In each structure, competition plays an important role. Therefore, any imperfect competition can disturb the market mechanism. That is why the antitrust law aims to protect the market against monopolisation. The antitrust law also concerns situations in which market competition begins to disappear or change into monopoly [Kępiński, 2013]. In this case, the reason for the state's intervention on the market (e.g., connected with the consequences of the market's monopolisation) is to limit the dominant position on the market or to control entrepreneurs' concentration. It is also important because the consequences of de facto monopoly are negative for an effective allocation of goods. The monopoly controls, for example, the prices of goods, supply on the market or access to the market through illegal market practices [Powałowski, 2010, p. 104, Hylton, 2003, p. 30].

One type of a market is the financial market. This market is quite specific because of its essential role in the national economy, the types of entrepreneurs and the products which are financial services. Therefore, the financial market is under particular state supervision. There are two kinds of state institutions which control and oversee the financial market in Poland. The first one is the Financial Supervision Authority (hereafter referred to as KNF) which is the financial regulatory authority. The other

is the Office of Competition and Consumer Protection (hereafter referred to as UOKiK) which, among others, controls the concentration on the market, also in the banking sector, which is part of the financial market.

The entities on financial market are also specific because there are financial institutions, mainly banks, but also other institutions which provide loans, the so-called shadow banks (in Polish: „parabanki"). The products on the financial market which are financial services are specific as well. A characteristic feature of financial services is the asymmetry of the decomposition of an economic risk between parties of financial transactions. In financial transactions, consumers are the weaker party in comparison with financial institutions such as banks. That is why states should protect consumers on the financial market. One of the aims of UOKiK is to control the concentration (i.e., its market force) of the financial institutions on the financial market (also in the banking sector) in Poland. The reason for these actions is to prevent creating or strengthening the dominant market position of entrepreneurs in the banking sector. Therefore, the planned mergers or takeovers in the banking sector are under concentration control (i.e., the supervision by the President of UOKiK) and also require the consent of financial regulatory authority (KNF).

The general aim of this paper is to analyse selected legal and economic aspects of the control of concentration in the banking sector in Poland. The specific objective of the study is to find out if legal instruments of the antitrust authority in Poland are sufficient to control the concentration in the banking sector in Poland in order to counteract its monopolisation.

The antitrust authority has normative instruments to influence the market in order to counteract its monopolisation. These instruments usually concern control of concentration of companies (including banks or other financial, credit institutions, such as insurance companies). The aim of this is to limit anticompetitive actions of undertakings such as mergers or takeovers, which could lead some of them to dominate on the market.

Because of the specific features of the financial market and financial services, general characteristics of these issues are presented in the paper. The study uses analysis of legal regulations of the Polish antitrust law and statistical data of the banking sector connected with control of concentration the sector's concentration. Therefore, the methods of measurement and aims of control of concentration are analysed. The main legal instrument of limiting the concentration is connected with an administrative procedure, and therefore general provisions of these procedures were also shown in the paper. To illustrate the above-mentioned theoretical issues, statistical data concerning the level of concentration in the Polish banking sector are also analysed.

2. The financial market and financial services – general characteristics

The financial market is one of the markets in the national economy. The financial market is defined as „*total transactions concerning securities, which are the instruments of giving short-term, mid-term and long-term credits*" [Niczyporuk, Talecka, 2011, p. 44]. The financial market can be divided in many ways[1]. A specific feature of the financial market, which is a flow of money from suppliers to buyers, is one of the causes that this market should be under a special normative regime, especially in the field of state supervision and organisation [Kosikowski, 2010, p. 94 and subsequent]. The main aims of state regulation and supervision on the financial market are also, among others, investors and consumer protection (which should be efficient and effective)[2] or financial stability [Grünbichler, Darlap, 2003]. The subject of the transaction on the financial market is financial services. In Polish and European Union (hereafter abbreviated as UE) Financial Law, financial service is not defined [Rutkowska-Tomaszewska, 2014, p. 67]. There is no legal definition of financial service in the

[1] See more: M. Frańczuk, K. Gałązka, *Teoria finansów, rynek finansowy [The Theory of Finances, Financial Market]* [in:] A. Paździor (ed.), *Finanse. Funkcjonowanie, instytucje i instrumenty rynku finansowego, finanse publiczne przedsiębiorstw i gospodarstw domowych [The Finances. The Functioning, Institutions, and Instruments of Financial Markets, Public Finances of Companies and Households]*, Lublin 2014, p. 21.

[2] *Supervision of financial services in the OECD area*, http://www.oecd.org/finance/financial-markets/1939320.pdf, (accessed: 15.09.2018), p. 3, see also: J.C. Marquardt, *Financial Market Supervision: Some Conceptual Issues*, Bank for International Settlements, Economic Papers 1987, no. 19, p. 3 and subsequent; R. Hetes, A. Crâşneac, A. Avram, *The Impact of the Financial Crisis on the Theory and Practise of Financial System Supervision*, Annals of the "Constantin Brâncuşi" University of Târgu Jiu, Economy Series 2013, no. 2, http://www.utgjiu.ro/revista/ec/pdf/2013-02/26_Hetes%20Roxana,%20Crasneac%20Alex.pdf (access: 15.09.2918), p. 173-174;

Polish Law on Financial Market Supervision of 21 July 2006[3]. However, by this Act specific parts of the financial market under the supervision of KNF can be distinguished. These parts are, among others, the bank market, insurance and pension market, capital market [Nieborak, 2012, p. 573]. In consequence, usually, the financial market in Poland (in a subject aspect) is created by these three segments (i.e., the bank market, the insurance market, the capital market) [Jurkowska – Zajdler, 2010, p. 252].

Additionally, in the Polish Law on Consumers Laws of 30 May 2014[4], the term "financial services" is not defined. However, in this Act, the examples of financial services, such as bank services, consumer's credit agreement and insurance actions are mentioned. The regulation of this Act is not used for these types of financial services (which are established in Article 4 item 2 of this Act).

Financial services are defined in the literature as "*services provided by financial institutions, which are at the same time professional market participants of the financial market, which in the frame of an economic activity provide services to professional subjects and non-professional market participants, including consumers*" [Rutkowska-Tomaszewska, 2014, p. 68]. It should be stressed that financial services are a specific kind of services because of their financial character. The features of financial services are, among others, their intangible and complicated character.

3. Concentration in the banking sector – the methods of measurement and aims of control

In the economic literature, market concentration is defined as "*an exogenous variable of market structure, which indirectly, through enterprise conduct (possible collusive behaviour), affects the industry performance measured by the level of output, profitability, or other kinds of indicators*" [Krivka, 2016, p. 526].

Concentration is also defined as a process of consolidation of entrepreneurs as organisation units and subjects of property laws, which causes changes in the structure of the economy (relevant markets), within control and property relations [Kohutek, Sieradzka, 2014]. Therefore, the measurement of market concentration should deliver information about the market power of individual entities. If the level of concentration is high, it may be, for example, a sign of an entrepreneur with individual market power. Usually, markets with a high level of concentration are markets on which the entry barriers are high and permanent. On the other hand, a low level of concentration can indicate lack of market power [Kwiatkowska, 2013, p. 80]. Therefore, the measurement of market concentration is necessary to evaluate the market power of the entrepreneur and to arrange if there is market monopolisation which threatens competition [Kohutek, Sieradzka, 2014].

Economic literature shows different methods for measuring concentration on the market. One of the best-known ways of measuring market concentration is the Herfindahl-Hirschman Index, hereafter referred to as HHI [Jackowicz, Kowalewski, 2002]. The HHI is defined as the sum of the squares of market shares of companies in the total value of an examined feature [Jackowicz, Kowalewski, 2002, p. 14]. An advantage of the HHI is that it includes all entities in a given sector, not only those in which the market share is the most significant [Kwiatkowska, 2013, p. 84]. The HHI can take values to form 1/n (where n means the number of entities on the market) to 1 (the situation of perfect concentration of the value of a feature) [Jackowicz, Kowalewski, 2002, p. 14]. If the value of the HHI is close to zero, it indicates that the market is fragmented and there are many entities on it. On the other hand, if the value of the HHI is close to one, it shows the monopolisation of the market [Kwiatkowska, 2013, p. 84]. For example, if the HHI is 0.49, it indicates the market with the leading company with 70% of the market share. For the highest levels of concentration, the HHI is not applied. It is used mostly to oligopoly (in this case the HHI is between 0.10 to 0.25) [Rogowski, 2001, p. 44].

Other methods of measuring market concentration are concentration ratios CRn such as CR5 (the share in the assets of the banking sector of five biggest banks), CR10 (the share in the assets of the banking sector of ten biggest banks). These concentration ratios show the market share of only the biggest banks, mostly the level of monopolisation of supply in the given sector. It should be mentioned that there are also other methods of measuring market concentration, such as the Gini Concentration Index illustrated by Lorenz Curve [Rogowski, 2001, p. 44] or others [Krivka, 2016].

The concentration of entrepreneurs in many

[3] Journal of Laws of 2017, item 196 as amended.
[4] Journal of Laws of 2017, item 683 as amended.

cases may limit competition on the market. Moreover, it can destroy proper competition relationships in the economy or strengthen the dominant position of confident entrepreneurs on the market. Therefore, counteracting these negative market phenomena is the assignment of the President of UOKiK [Powałowski, 2010, p. 252].

The aims of controlling concentration in antitrust regulation are to control mergers and acquisitions in order to limit the dominant position of companies or market shares of the largest companies on the market [Krivka, 2016, p. 526]. The oligopoly market is an excellent example of the rationale of control of market concentration, especially connected with the antitrust merger control. The aim of it is to control the number of market shares of companies on the market in order to avoid the merger or acquisition of companies which would enhance monopoly power or dominance [De Leon, 2009].

The impact of concentration on competition on the market is various. In Poland, the institution which controls whether the level of concentration on the market is not anticompetitive is the President of UOKiK. One of the essential issues of concentration control is the term of the relevant market, as it is the first stage of concentration assessment. The relevant market is defined in article 4 point 9 of the Act of 16 February 2007 on Competition and Consumer Protection [Journal of Laws of 2017, item 229 as amended], hereafter referred to as u.o.k.k. as "*a market of goods, which by reason of their intended use, price and characteristics, including quality, are regarded by the buyers as substitutes, and are offered in the area in which, by reason of their nature and characteristics, the existence of market access barriers, consumer preferences, significant differences in prices and transport costs, the conditions of competition are sufficiently homogeneous*". A relevant market is a normative form of some segment of the market in an economic sense. It investigates the market in geographic and product aspects in order to examine if the concentration of companies does not disturb the competition on the market.

There are different ways of examining the impact of concentration on competition, such as horizontal and vertical impact. For example, the horizontal impact of concentration on competition (non-coordinated effects) boils down to "*eliminating the competitive pressure the concentration participants exercise on each other, which leads to reinforcing the position of a merged entity towards the trading partners and competitors. Therefore it is possible to raise the prices (worsen the quality)*" [UOKIK, Clarifications..., p. 26 and subsequent]. There are also coordinated effects of concentration which may appear on oligopolistic markets[5].

The vertical impact of concentration is connected with operating on the levels of trade (when potentially the entities are suppliers and recipients for each other). There are three forms of the negative impact of concentration in vertical setting (two of them concern unilateral conduct, resulting in limiting access to the market or foreclosure, and one is connected with coordinating market behaviour) [UOKIK, Clarifications..., p. 42].

4. Proceedings connected with the control of concentration in the banking sector in Poland – general provisions

Firstly, it should be noticed that the above-mentioned Act on Competition and Consumer Protection established regulation connected with the prohibition of competition-restricting practices. The main instruments of counteracting the antitrust market behaviour of companies are restrictive competition agreements and the abuse of the dominant position.

Article 6 item 1 of u.o.k.k. contains a catalogue of antitrust practices which are forbidden (e.g., fixing, directly or indirectly, prices and other trading conditions; limiting or controlling production or sale as well as technical development or investments; dividing sale and purchase markets). Another anticompetitive market practice which is prohibited according to Article 9 item 1 of u.o.k.k is the abuse of the dominant position on the relevant market by one or more undertakings[6].

The above-mentioned Act of Competition and Consumer Protection entitles the President of UOKiK to conduct the administrative proceedings concerning competition restricting practices and practices infringing collective consumer interests (also using commitment decisions)[7]. There is also an administrative

[5] See more: *Clarifications Concerning...*, p. 41.

[6] According to Article 9 item 2 of u.o.k.k., the abuse of a dominant position may, in particular, consist: the direct or indirect imposition of unfair prices, including excessive or predatory pricing, long time limits for payment or other trading conditions; limiting production, sale or technological progress to the detriment of contracting parties or consumers.

[7] See more: *Clarifications on Issuing the Commitment Decision in Cases of Competition Restricting Practices and Practices*

procedure connected with the control of concentration (Articles 13-23 of u.o.k.k.). The first part of this procedure is the notification of the intention of concentration (by undertakings[8]). The intent to concentrate is subject to notification submitted to the President of UOKiK, who in turn verifies if the conditions established in Article 13 para. 1 of u.o.k.i.k. (the criterion of turnover) are fulfilled. The President of UOKiK controls only those concentrations which cause or may cause effects in the territory of Poland) [UOKiK, Guidelines..., p. 8 and subsequent].

It the Act of Competition and Consumer Protection the legal definition of concentration was not established. Nevertheless, Article 13 para. 2 of u.o.k.k. established a closed catalogue of the forms of concentration as following a combination of two or more independent undertakings, the so-called mergers (Article 13 para. 2 point 1 of u.o.k.k.) – by acquiring or taking up stocks, other securities, shares or in any other way of direct or indirect control over one or more undertakings by one or more undertakings (Article 13 para. 2 point 2 of u.o.k.k.), creation of one joint undertaking by undertakings (Article 13 para. 2 point 3 of u.o.k.k.), acquisition of a part of the assets of another undertaking (the whole or part of the enterprise) if the turnover generated by these assets in any of the two financial years preceding the notification exceeded the equivalent of EUR 10 million on the territory of Poland (Article 13 para. 2 point 4 of u.o.k.k.) [UOKiK, Guidelines..., p. 8 and subsequent].

There are also cases where the undertakings do not have to notify the intention of concentration (e.g., the concentration applies to undertakings participating in the same capital group)[9].

The procedure of concentration leads in particular to the following decisions issued by the President of UOKiK: a decision expressing consent to the implementation of the concentration or a decision expressing the so-called conditional consent to the implementation of concentration, decision of prohibiting the implementation of concentration [UOKiK, Guidelines..., p. 43 and subsequent].

If the procedure of notification of the intention of concentration fails, undertakings must be prepared for bearing negative consequences such as sanctions established in the Act of Competition and Consumer Protection. Usually, these are financial sanctions such as fines imposed on undertakings, fines imposed on persons performing managerial functions or being members of the undertaking's managing authority[10].

There is no particular procedure for controlling concentration in the banking sector in Poland. In consequence, the President of UOKiK applies the same rules to control concentrations of banks or other non-bank entities[11]. Because of the specific features of banks, which are financial instructions concerning participants on the financial market, also the Financial Supervision Authority must issue consent for a merger of banks. According to Article 124 para. 1 of the Act of 29 August 1997 – Banking Law[12] (hereafter referred to as pr. bank.), a bank can get through with another bank or credit institution if they receive the consent of KNF. The Financial Supervision Authority does not give the consent if this merger would violate legal regulations, interests the banks' clients or would threaten the security of the financial means gathered in this bank (Article 124 para. 2 of pr. bank.). Accordingly, a merger in the banking sector has to obey the rules of antitrust law and banking law at the same time. Banks which take part in these actions have to receive the consent of UOKiK and KNF.

5. General characteristics of the banking sector in Poland and the level of its concentration

The banking sector in Poland has features of a monopolistic structure. It means that it has features of two market models: perfect competition and monopoly [Rogowski, Lipski, p. 48]. On the market, there are a large number of participants, but they offer different services. Therefore, products (services) are diversified. In consequence, each bank does not have monopolistic power because of offered (financial) products. Moreover, participants who offer similar services have freedom of entry and exit to branches (of the market) [Rogowski, Lipski, p. 48]. In banking sector the increase of con-

Infringing Collective Consumer Interests, UOKiK, https://uokik.gov.pl/download.php?plik=12177 [accessed on 8 February 2018], p. 1 and subsequent.

[8] The legal definition of the undertaking is established in the Article 4 point 1 of u.o.k.k.

[9] See more: art. 14 of u.o.k.k.

[10] See more: *Guidelines on the Criteria and Procedure...*, p. 45 and subsequent.

[11] See also para. 3 of *Regulation of the Council of Ministers of 23 December 2014 on the notification of intended concentration of undertakings*, Journal of Laws of 2015, item 79 as amended.

[12] Journal of Laws of 2017, item 1876 as amended.

centration is mostly caused by mergers and takeovers, whereas changes in competition are the results of mergers, takeovers and regulations, which stimulate the entry and exit barriers [Pawłowska, 2013, p. 22]. Nonetheless, in the opinion of KNF in 2013, i.e., under the conditions of high stability and efficiency of the national bank system, the level of concentration in the Polish banking system was close to optimum [KNF 2013].

It can be said that, on the one hand, the number of mergers and takeovers in the Polish banking sector is not significant, but on the other hand, taking into account the share in the assets of this sector, there is a small increase in concentration. The data in Table 1 confirm this assumption.

Table 1: Measures of concentration in the Polish banking sector in the years 2008-2013

Specification	2008	2009	2010	2011	2012	2013
Number of banks	649	643	646	642	642	640
CR5	44.3%	44.19%	43.88%	44.32%	45.00%	46.07%
CR10	62.19%	63.46%	63.01%	63.37%	64.61%	67.30%
CR15	72.93%	74.07%	74.92%	75.70%	77.41%	78.78%
HHI	549	580	570	577	580	600

Source: [Mikołajczyk, 2014].

The number of banks did not change significantly. In 2008, it was 649 banks, and in 2013, it was 640. The share of five biggest banks in the assets of the entire bank sector had an increasing trend in the period considered. A similar trend was for ten and fifteen biggest banks (CR10 and CR15). On the other hand, the concentration of ten biggest banks in Poland is lower than the average in Central Europe (where it is 76%). Similar, the value of the HHI in Poland is also lower than in Europe [Mikołajczyk, 2014, p. 131]. Similar assumptions are also included in the Financial Authority Report, according to which, low concentration in comparison to Europe marks the Polish banking sector. It could change in the future because of mergers and takeovers. The reasons for this are actions of some strategic investors of Polish banks, the more significant involvement of the most prominent national insurance group in the banking sector. Moreover, the decline of profitability of the banking sector can strengthen the tendency to increase concentration, because more important institutions are more profitable [KNF, 2017, p. 132].

It should be taken into consideration that the above mentioned ratios of concentration are a little different as regards commercial banks only (i.e. excepted cooperative banks). It shows that cooperative banks in Poland influenced the value of the HHI. Therefore, possible changes or consolidations among these banks can automatically yield, changing the data for the entire banking sector [Mikołajczyk, 2014, p. 131].

The data in Table no 2 shows Herfindahl index for credit institutions and share of total assets of five largest credit institutions (CR5) in the EU countries in the years 2013-2017.

According to the data from table 2, in the years 2013-2017 the number of banks in Poland was: in 2014 – 654, in 2015 – 670, in 2016 – 659 and in 2017 – 645, respectively. Thus, the number of banks in Poland also did not change a lot in the period considered. The Herfindahl index in other European countries is diverse. For example, in the year 2017 in Germany there were 250 banks and in Slovakia – 1,332.

The share of total assets of five largest credit institutions in Poland in the years 2014-2017 was at a similar level of circa 48% (decreased from 48.3% in 2014 to 47.5% in 2017). In comparison to the year 2013, in which CR5 was 45.2%, it shows a little increase in concentration in the Polish banking sector. The CR5 in other European countries were also diverse. Poland has lower concentration than the other countries of Central Europe (e.g. in the year 2017 in the Czech Republic – 64.1%, in Estonia – 90.3%, in Lithuania- 90.1%, in Romania – 59.4%).

The main reasons for increasing concentration in the banking sector in Poland in the years 2014-2016 were mergers and takeovers, which were 2 or 3 per annum (in the case of commercial banks)[13]. The President of UOKiK

[13] See more: *Raport o sytuacji banków w 2014 r. [The Report about bank situation in 2014]*, KNF, Warsaw 2015, p. 20, *Raport o sytuacji banków w 2015 r. [The Report about bank situation in 2015]*, KNF, Warsaw 2016, p. 19, *Raport o sytuacji banków w 2016 r. [The Report about bank situation in 2016]*, KNF, Warsaw 2017, p. 18.

has a dozen cases annually concerning control of concentration in the banking sector (e.g. in the year 2015, there were 15 cases). Therefore, the reason for this little increase in concentration was also the decisions of the President of UOKiK (e.g. in the year 2014 there was a significant increase in concentration from 45.2% in 2013 to 48.3% in 2014)[14].

Table 2: The Herfindahl index* for credit institutions and share of total assets of five largest credit institutions in the years 2013-2017 (index ranging from 0 to 10,000 and share of five largest credit institutions in %)

Country	Herfindahl index for credit institutions (based on total assets)					Share of total assets of five largest credit institutions				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Bulgaria	730	836	919	939	906	49.9	55.0	57.6	58.0	56.5
Czech Republic	999	949	987	1,009	1,028	62.8	61.3	63.3	64.7	64.1
Denmark	1,16	1,19	1,18	1,224	1,123	68.4	68.1	67.8	68.3	65.7
Germany	266	300	273	277	250	30,6	32.1	31,4	31.4	29,7
Estonia	2,483	2,445	2,409	2,406	2,419	89.7	89.9	88.6	88.0	90.3
Ireland	671	673	672	636	658	47.8	47.6	45.9	44.3	45.5
Greece	2,136	2,195	2,254	2,332	2,307	94.0	94.1	95.2	97.3	97.0
Croatia	1,384	1,364	1,396	1,405	1,387	72.9	72.3	72.7	73.0	72.8
Spain	719	839	896	937	965	54.4	58.3	60.2	61.8	63.7
France	568	584	589	572	574	46.7	47.6	47.2	46.0	45.4
Italy	406	424	435	452	519	39.6	41.0	41.0	43.0	43.4
Cyprus	1,645	1,445	1,443	1,366	1,964	64.1	63.4	67.5	65.8	84.1
Latvia	1,037	1,001	1,033	1,08	1,235	64.1	63.6	64.5	66.5	73.5
Lithuania	1,892	1,818	1,939	1,938	2,189	87.1	85.7	86.8	87.1	90.1
Luxembourg	357	330	321	260	256	33.7	32.0	31,3	27,6	26,2
Hungary	862	792	763	787	802	51.9	49.3	49.4	49.8	49.6
Malta	1,458	1,648	1,62	1,602	1,599	76.5	81.5	81.3	80.3	80.9
Netherlands	2,105	2,131	2,104	2,097	2,087	83.8	85.0	84.6	84.7	83.8
Austria	405	412	397	358	375	36.7	36.8	35.8	34.5	36.4
Poland	586	656	670	659	645	45.2	48.3	48.6	47.7	47.5
Portugal	1,197	1,164	1,215	1,181	1,22	70.3	69.2	72.3	71.2	73.1
Romania	821	797	860	894	909	54.4	54.2	57.4	59.1	59.4
Slovenia	1,045	1,026	1,077	1,147	1,133	57.1	55.6	59.2	61.0	61.5
Slovakia	1,215	1,221	1,25	1,264	1,332	70.3	70.7	72.3	72.7	74.5
Finland	3,41	3,63	3,16	2,3	1,7	87.1	89.7	88.0	80.5	73.5
Sweden	876	880	866	845	914	58.3	58.5	57.8	56.3	58.2
United Kingdom	525	462	438	422	453	43.7	38.9	37.0	35.5	36.9

Source: EU structural financial indicators, http://sdw.ecb.europa.eu/reports.do?node=1000002869 (accessed: 15.09.2018).

* The Herfindahl index refers to the concentration of banking business (based on total assets). It is obtained by summing the squares of the market shares of all the credit institutions in the banking sector. The exact formula according to which data must be transmitted to the ECB is reported in the ECB Guideline on monetary and financial statistics (recast), (ECB/2014/15).

Notes to table: 1) The data in these tables represent amounts recorded at the end of period, with the exception of the number of employees of credit institutions in Table 1 in which the average number in the period is in question. 2) These data as well as EU and euro area aggregates are available in the Statistical Data Warehouse. 3) The Herfindahl index (HI) refers to the concentration of banking business (based on total assets). The HI is obtained by summing the squares of the market shares of all the credit institutions in the banking sector. The exact formula according to which data must be transmitted to the ECB is reported in the ECB Guideline on monetary and financial statistics (recast), (ECB/2014/15).

5. Closing Remarks

The market mechanism is based on competition. Without competition, it would not provide optimal allocation of goods and services. That is why the protection of market competition is so important. The antitrust law aims to protect the market against the anticompetitive behaviour of companies, especially against monopolisation. Negative consequences of monopolisation of the market can destroy this optimal allocation. Therefore, the antitrust authorities control the level of the monopolisation of the market. A method of counteracting this is to control market concentration. Market concentration has different forms, such as mergers and takeovers of companies, but the aim of these actions is one – to strengthen market power and dominance on the market by a small number of companies (or banks in the banking sector). These actions can lead to monopolisation. Therefore they are under control of antitrust authorities.

The banking sector is a part of the financial market. The financial market is a specific kind of a market because it plays a vital role in the national economy. The financial market, and especially the banking sector, provides the flow of financial means among different entities (private and public). Any disturbances in the banking sector can influence the entire economy. That is why the banking sector is under

[14] See more: UOKiK, *The Report…*, 2015, s. 22.

individual state supervision and has a unique legal regime.

Furthermore, financial services are specific because of their immaterial and complicated character. The consumers usually do not have professional, financial knowledge which is necessary to assess the economic risk of these services. Therefore, the state should protect consumers against (possible) harmful actions of financial institutions such as banks.

All issues mentioned above contribute to the fact that the antitrust institutions protect the market (and also consumers) against anticompetitive market practices and monopolisation. In the legal aspect, these actions in Poland assume the procedural form of counteracting of the President of UOKiK who, among others, has procedural instruments to control concentrations on the market. The same rules of controlling concentration exist in the banking sector, so the President of UOKiK issues consents on bank mergers or takeovers, but in this case, the consent of KNF is also required.

Concentration in the banking sector in Poland is at a similar level as in some European countries. It can be assumed that, in the future, the number of mergers and takeovers in the Polish banking sector could increase because of, among others, actions of some strategic investors of Polish banks, more significant involvement of the most prominent national insurance group in the banking sector . In the years 2014-2017 the share of total assets of five largest credit institutions in Poland was at a similar level of circa 48%.

The analysed legal regulations of the Polish antitrust law and the data concerning control of concentration in the banking system leads to the conclusion that the Polish antitrust authority has sufficient legal instruments to control mergers and takeovers in order to prevent monopolisation of the financial market.

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Current trends of development of HR Management in the bank sphere of the Russian Federation

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ABSTRACT

The article presents a short retrospective journey into the history of formation and further development of a banking system on the example of the banking sphere of the Russian Federation. Thus, a significant role in the formation of competitiveness of credit organisations represents a „human" component of bank work. The author considers questions of management by human resources as one of the primary functions of management in the banking sphere. It is specified that the basis of the management concept of the personnel structure of an organisation is the increasing role of workers, knowledge of their motivational installations, ability of their organisation and direction according to the tasks which the organisation faces. A block diagram of an operational office, which is the lowest link of any credit organisation, is provided and analysed. Categories of employees working in a credit organisation, with the description of their primary functions are presented. The article also contains illustrative material in the form of the following schemes and charts: a general scheme of a credit organization, a volume chart of a ratio of professional categories in the conditions of activity specialization in one of regional offices, flat charts of the age structure of the personnel of credit organizations of the Russian Federation and a percentage ratio of workers with higher education. Finally, the author presents formation of perspective directions of highly skilled personnel potential for ensuring the guaranteed achievement of positive results.

Keywords: HR management, categories of bank employees, „front-office", „back-office", HR bank audit.

1. Introduction

Prospects of economic development of any state are inseparably linked with the human factor. Competence, knowledge of business and a feeling of the new are the defining qualities of modern workers, defining their potential and an internal resource of innovative development. Among the works of the experts studying personal features, of greatest popularity are the scientific works of Atkinson J., Becker Gary S., Mulligan C.B., Sala-i-Martin X., Mincer J., Schultz T., Daffi D., Egorov S., Bruking E. Korchagin Yu.I., Kravchenko A.I., Andrew S. Grove, Sakalas A., Liepe Z. Doktorovich A. Vanin E.V., Schetinin V. [Sakalas, 2011, World Economic Forum, 2013, Mincer, 1994]. Scientific research of the above authors reflects diverse and versatile approaches to studying business and innovative activity, however, questions of formation of personal potential in the banking sphere are insufficiently considered. This circumstance has also defined the purpose of this work.

Considering the issue of the banking business, it should be noted that on the territory of Russia, there were no private banks before the 1860s. The birthday of the banking system of Russia is considered to be the creation of the national loan bank (in fact, a state pawnshop) in 1733. The first commercial banks emerged in Russia during the era of Great reforms of Emperor Alexander II. Thus, in 1860 the National Bank of Russia was opened by the national commercial bank, and right after this an inten-

sive rocess of creation of various commercial and public banks began. By 1914, in Russia the following two-level banking system was created:
1) the National Bank and several specialised state banks,
2) Public city and land banks as well as private banks.

By 1926, the number of commercial banks grew to 61, and the share of the State Bank in the credits decreased from 66% to 48%. However, in 1927 commercial banks passed under the management of the National Bank and were liquidated as independent credit institutions. The division of banks into a central bank and national banks took place in 1987. The creation of commercial banks began in Russia since 1988 [Korchagin 2008]. For comparison, in Great Britain, the Bank of England was founded in 1694, due to the need to regulate the activity of the already created system of private banks. Furthermore, only in 1844, the monopoly of the Bank of England was proclaimed. Now, about 1000 commercial credit institutions function in the Russian Federation according to the statistical bulletin of the Bank of Russia [Statistical bulletin of the Russian Bank No. 1 (272), 2016] of 1 January 2016, and formation of the market relations in Russia in many respects functions depending on the successful work of commercial banks and level of development of HR of management in these banks. The purpose of this work is research on the crucial tendencies of development of HR management on the example to the banking sphere of the Russian Federation. Now, about 1000 commercial credit institutions function in the Russian Federation according to the statistical bulletin of the Bank of Russia [№ 1 (272), 2016] on 01.01.2016 and formation of the market relations in Russia in many respects function depends on successful work of commercial banks. and a level of development of HR of management in these banks.

2. Methodology and discussion

Management in the banking sphere is characterized by the management expertise in strategic analysis, planning, policy development and management functions, quality of planning, management of human resources, ect. A significant role in the formation of the competitiveness of credit institutions is played by a "human" component of banking work. A bank wins and succeeds if it not only is accurately organised but also has competent, devoted and disciplined personnel capable of being reconstructed and retrained quickly. Management of human resources represents one of the functions of banking management aiming at such an essential resource of the company as people. Management of personnel structure of foreign and Russian banks is based on same platform. [Jarmochowicz 2008, Kaimierczyk 2014, Kvilinskyi 2012, Pająk 2012, Lyashenko V. 2017]. Training of qualified personnel and successful formation of a team of managers is the key to success of any financial enterprise. The basis of the management concept of the personnel structure of an organisation is made now by the increasing role of the identity of the worker, knowledge of its motivational installations, ability to form them and to direct according to the tasks facing the organisation [Shpilina 2014]. Creation of a specific internal atmosphere when all personnel are interested in the achievement of a common goal, development and prosperity of the organisation is a guarantee of productive activity and functioning of the bank. To form development directions of improving the internal atmosphere and increasing the competitiveness of the bank, first of all, it is necessary to analyse its structure. The analysis of functions and block diagrams of regional financial organizations [VTB bank 2008, the Annual report of bank of Russia 2014], using the existing methods of formation of interrelations between the flow of various information [Vodolazska 2008, 2009], allowed to develop a block diagram of operational office, which is the lowest link credit institution (figure 1)

By the order No. 1794-U of February 21, 2007, the Bank of Russia granted the right to credit institutions to open a new type of internal structural division – an operational office. The office can carry out everything or a part of banking operations provided by the license of the Central Bank for the monetary institution (branch) which created it. The divisions which are outside the territory of the establishment of the Bank of Russia, which controls the activity of credit institutions (branches), have some restrictions on the implementation of operations.

It is possible to mark out the following categories of employees working in a credit institution. First of all, there are operational workers who are obliged to advise any entering client even if they are only potential. They are one of the structural units of a credit institution forming the general image and functional perception of establishment in general. They process documents on credit and deposit operations, channelise for decision-making by natural and legal entities within cash and non-cash flows. The framework of competence of an operational worker includes knowledge of the product

line, the ability to competently offer services and to remain loyal to the client during the period of communication. The head of this link is obliged to distribute responsibilities competently between workers so that there are no queues, as well as to solve a serious problem of redistribution of employees to cover most convenient to clients working hours of a credit institution (evenings and days off) without violating the labour law. For cashiers, the functionality of development of banking institutions has practically not changed: they still either give out or accept cash. Only the equipment set is changed which is allowing to automate recalculation and identification of note.

The issuance of credit is a more difficult operation on parameters of responsibility and risks. At present, the structure of an ordinary bank division cannot incorporate loan officers, but at the same time is successful in performing operations of issing loans, for example, to natural persons. It is possible when the system is built as follows: operators, having found out the needs of the client, fill in a questionnaire with personal information, and the decision is made in a higher division, in which credit workers analyse the received inquiries and draw conclusions.

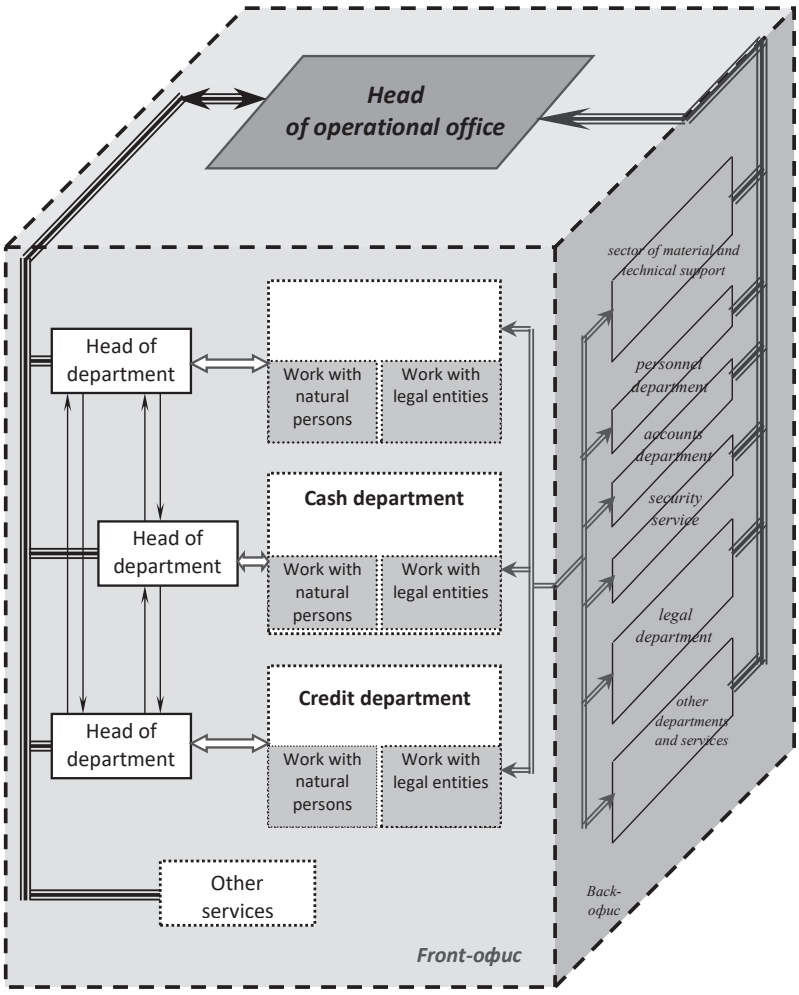

Figure 1. Block diagram of the operational office of a credit institution
Source: own work

Another matter is the issuance of credit to legal entities. There, depending on the sum, term and interest rate, particular business and analytical projects allowing to estimate the degree of risk are quite often done. In this case, as a rule, there is a personal contact between the credit worker with the client's representative. The above-described bank structure represents the so-called "front-office" making direct contact with the clients of the bank. However, an integral part of any process is also the "back-office" – in particular, security service which provides data processing the entering flow of clients, cutting out those obviously unreliable; department of material and technical support which is responsible for technical provision of all departments and sectors; collection services which can be both own and hired, as well as some other services and divisions. These structural units are most often outside the operational office and advise remotely. The leader of the presented structure is a head of the operational office. He coordinates the activity of the structural divisions, appoints, if necessary, heads of lower link who are motivated on the performance of planned targets. Such structural divisions as operational office unite around service branch by location. The functions of this branch are personal work, accounts department, document flow and technical maintenance by system administrators of software and equipment. Branches have a separate balance, a separate correspondent account in the office of the Central Bank, submit regulatory reporting in the Central Bank, IFNS and other fiscal bodies. The head of the branch of a credit institution has competences to make decisions within the network, though in some banking systems heads of operational offices are equated to them.

The structure of management concentrates on the head office which is characterised, first of all, by the existence of the departments which are responsible for offering strategic planning of all networks and also for the directions of development and tactical solutions of the current tasks. Within the head structure, as a rule, there are divisions which are responsible for marketing and advancing a brand on the banking market of the country. Additionally, a crucial separate link providing activity of all structure is the management of automation which is engaged in development, introduction and service of new software products, with continually raising requirements to quality and speed of data processing.

The principal governing body – the Board of the bank, consists of owners, principal shareholders or their plenipotentiaries. They gather on a periodic basis, and they are just engaged in the adoption of strategic decisions, as well

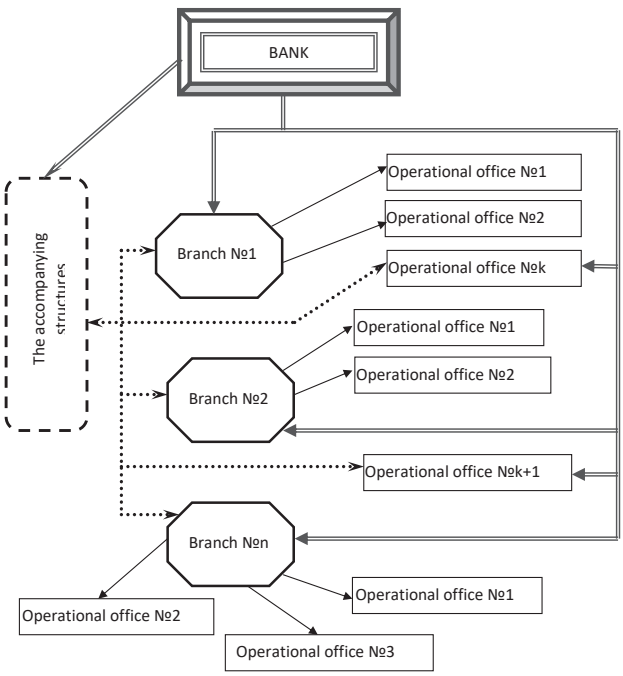

Figure 2. General scheme of a credit institution
Source: own work

as appointment of top managers. The general scheme of the credit institution given in figure 2 is made on the basis of research of network models of enterprise management [Vodolazskaya, 2009].

A rational approach to efficiency assessment of human resources is one of the essential tasks of HR management of credit institutions. The general assessment should be divided into quantitative and qualitative indicators. Quantitative indices enable estimating the level of prevalence of certain professional qualities of the personnel. The quantitative assessment of employees is more objective. These are such methods as the method of ranks, mark system and graphic reception of assessment. Qualitative methods of assessment are valid in the case when it is difficult to measure the required parameters of the quantitative assessment of workers. Procedures of quality standard of personnel mean work of experts as external (invited experts, experts of the branch, consulting companies), and internal (top management, experts of different levels and linear heads). In this case, as a rule, what is measured is the level of compliance of individual workers to the profile of their positions or a reference set of characteristics, and also by specific criteria and competencies.

The results of assessment give information for the management of the company and the HR manager concerning the professional condition of the personnel structure and also about the need to take measures to correction of this state by hiring, selection, training, retraining and other actions. [Shpilina 2014, Vodolazskaya, 2011].

The main objectives of assessment are:
1. Increase in the objectivity of procedures of selection and arrangement of personnel;
2. Definition of compliance of employees to the requirements of their positions;
3. Preparation of development programs of employees,
4. Planning of career development,
5. Identification of the most prospective employees.

The most bank workers (up to 90%) can be ranked despite the positions they hold as technical specialists with accurately regulated performing functions [VTB Bank 2008]. Moreover, only a small part of workers (no more than 10%) are given creative, analytical functions. The high demand of "mechanical" work is caused by a rigid hierarchy and orderliness of financial operations and procedures, need of protection of information which is contained in them, and eventually – the nature of monetary relations. Figure 3 presents the ratio of professional categories in the conditions of specialisation of activity in one of the regional offices.

The age structure of distribution of bank employees is illustrated by the scheme in figure 4.

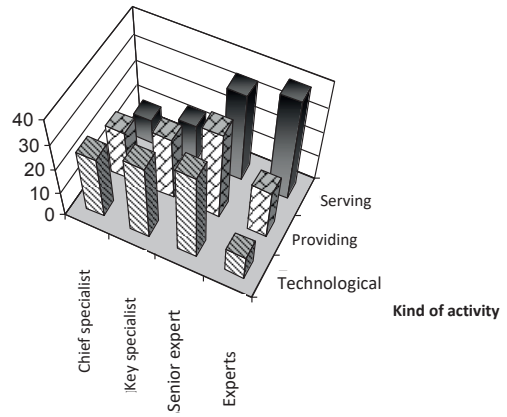

Figure 3. The ratio of professional categories in the conditions of specialisation of activity in one of regional offices
Source: own work

As of January 1, 2015 [The Annual report of 2015] the number of positions of heads and specialists of credit institutions increased by 0.8%, the indicator of their completeness amounted to 96.5%. More than a half of workers (56.1%) were aged from 30 to 50 years old, with experience in the system of the Bank of Russia of more than 15 years. The number of workers up to 30 years increased by 0.8 percentage points and made 11.2% of the total of heads and experts. The share of workers with retirement age decreased by 0.6 percentage points – to 10.7%.

Modern conditions impose new, stricter requirements to the structure, professional knowledge and abilities of workers, to the volume and pithiness of the resolved issues. Considering high dynamics of modern reforms of activities and structural optimization of credit institutions, HR service solves a problem of maintenance of competences level and knowledge of employees according to the growing production requirements which rely on the basic knowledge gained in higher educational institutions [Vodolazskaya 2012, 2013]. In recent years the share of workers with higher education continually increases (figure 5). A rather high rate creates a positive picture of the educational level of personnel [Bondareva 2016, Vodolazskaya 2016, 2017, Lavrov, 2015].

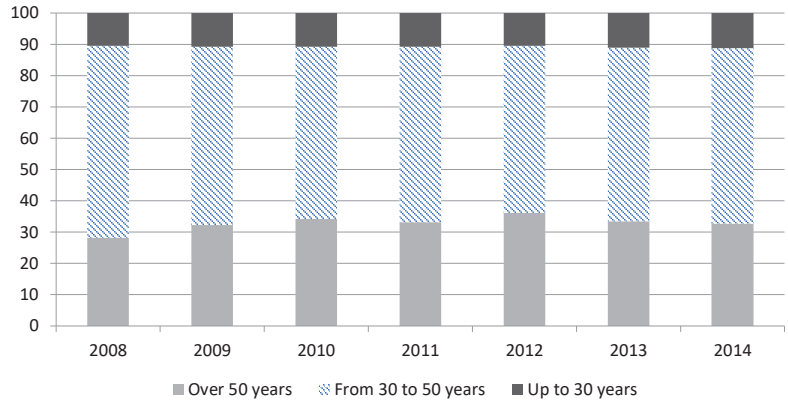

Figure 4. Age structure of personnel of credit institutions of the Russian Federation
Source: *The Annual report of 2015*

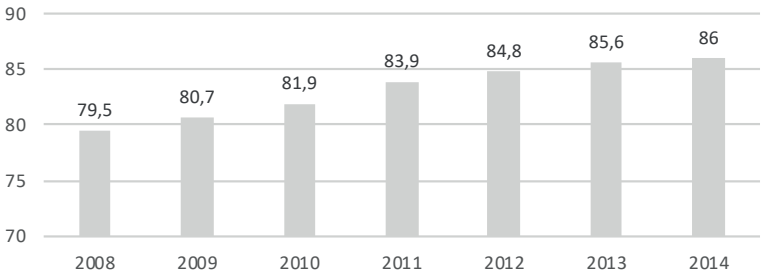

Figure 5. A share of workers with higher education
Source: *The Annual report of 2015*

For optimisation of the current and prospective need for personnel, it is necessary to use scientific methods (mathematical statistics, recognition of images, psychoanalysis). The audit of human resources of a bank has to begin with total efficiency assessment of the activity of permanent members of staff. One of the ways to solve this problem is formation of own knowledge centres as well as strengthening and development personnel's capacity of the company, creation of high-performance collectives, the highest effects of activity of the organisation.

The approximate range of services of a bank training centre can be the following [Krasovskaya, 2009, Vodolazskaya, 2012]:
– implementation of such forms of professional development as courses, seminars, training, including foreign language and computer preparation. A relevant contract is concluded with each worker and in case of its violation penalties apply,
– definition (together with heads of divisions of the bank) the necessary volume of the required knowledge and forms of the current training of employees,
– regular assessment of professional qualities of workers, level of its qualification, compliance of the available knowledge and skills of duty regulations,
– instructing in newly applied bank technologies,
– information support for employees.

3. Conclusion

The analysis of personnel policy in the banking sphere of the Russian Federation makes it possible to draw the following conclusions:
– positive dynamics of the number of employees due to development of a system of operational offices with a high degree of the remote solution of questions is noted,
– the tendency of an increasing number of workers in the age group from 30 to 50 years old is observed and a decrease of labor fluctuations in this group,

– the overwhelming number of workers have higher education that allows fulfilling official requirements concerning the level of necessary knowledge and skills by each group of professions of a bank and structuring positions,
– creation of own knowledge centres in credit institutions will allow meeting high requirements for the resource, including information support of activity for employees,
– formation of highly skilled personnel potential provides a guaranteed achievement of the planned results.

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