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THE ISSUE OF AUDIT IN MULTINATIONAL COMPANIES

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Abstract

The main goal of the submitted paper is to define the Sarbanes-Oxley Act, specify costs which are connected with its implementation and to analyze costs of application of internal control based on rules defined in this act in a selected company. The paper consists of four main parts and Conclusion summarizing the results. The first part is focused on general characteristics of audit. In the second part the difference between internal and external audit is defined. The third part deals with the Sarbanes-Oxley Act, its form, benefits and costs. In the last part there is analysis of costs of implementation and testing of controls according to SOX controls in a selected company.

Introduction

Sarbanes-Oxley Act of 2002 is a very powerful but also a very controversial law that regulates the business environment in the USA. It deals with the transparency and accuracy of the accounts and financial statements, tightening of internal control systems, detection and sanctions against economic crime.

The aim of imposing this law was to create an environment in which the financial problems of companies would be nipped in the bud, in other words before they developed into large scandalous frauds, which in turn would adversely affect the economic environment. Thus, the main objective was to increase investors' confidence in the results published by companies trading on the American Stock Exchange. All companies listed on the American Stock Exchange, which also have the obligation to carry out their audits, shall keep accounts in accordance with this Act.

From the perspective of the Czech Republic, it usually concerns any entities with a parent company in the United States. This Act does not affect the accounting according to Czech accounting legislation, but has an effect on the process of recording individual accounting operations for the parent company in accordance with U.S. GAAP. Taking into account the globalization of the economy, all companies have to process their financial transactions in accordance with SOX. In order to achieve this state, it is necessary that their subsidiaries or affiliates respect the principles mentioned above, also outside the USA territory.

1 The issue of the audit

There are many definitions of an audit. Over the years this term has been defined by a large number of institutions and individuals. The particular conception of an audit as it is generally understood is that its scope means accounting, financial statements and annual report. Audit is mainly perceived in this way because it is a reflection of accounting that provides information about the management of a company. Thus, users of this information are interested whether financial statements have been prepared correctly and truthfully.

The definitions compiled by the Committee of the American Accounting Association is following: "*Auditing is the systematic process of objectively obtaining and evaluating evidence regarding assertions about economic activities and events to ascertain the degree of*

correspondence between the assertions and established criteria and communicate the results to interested users." [8]

Domestically, the definition of the audit created by the Chamber of Auditors of the Czech Republic goes as follows: "*The mission and purpose of an audit of financial statements is to express an opinion of an independent qualified person on the veracity of financial statements published by the management. Auditor verifies that the information in the financial statements give a true and fair view of the financial position and results of operations and cash flows in accordance with the rules given by Czech or other accounting regulations, often with International Financial Reporting Standards (IFRS). Auditor's opinion contains sufficient information entirely in conjunction with a complete set of financial statements, which the auditor expresses their opinion on. Auditor's opinion which is out of context with specific accounts is confusing*." [3]

In the Czech Republic, audit is legislatively modified as follows: "*Statutory audit means (§ 2, paragraph a) of Act No. 93/2009 Coll.) verification of the ordinary and extraordinary accounts or consolidated accounts, in case such verification requires a different legal regulation; possibly auditing interim financial statements, if such verification is required by another applicable law*." [12]

1.1 Objectives and types of audit

From the above definitions the basic objective of the audit follows. It is defined by Králíček as "*the increase the credibility of financial information from companies that mandatorily publish their financial statements and annual reports*". As another goal, its moral and protective effect against the occurrence of errors and fraud can be stated. Sedláček in his publication Basics of Audit also mentions its educational and advisory role, which, together with the auditor's work and the work of the company's employees, leads to a gradual and continuous improvement of the accounting system. General public tend to see audit as a means of revealing all errors and fraud in the audited company. [9] Auditor's opinion, however, does not mean that the statements have been made absolutely correctly; the auditor should only express their professional and qualified opinion on whether the financial statements are made truthfully and faithfully. The aim of the audit is not:

- confirmation of the accuracy of accounting in business,
- investigation of possible fraud,
- affirmation of compliance with all legal norms by an entity,
- confirmation of the accuracy of tax returns,
- evaluating the effectiveness and soundness of business management,
- affirmation of viability of the entity in the future.

Audit should mainly benefit, whether economically or socially. Audit can be directed to different areas of human activity. There are several types of audits:

- **Audit of financial statements**: also called the audit of the financial closing, financial or external audit, which verifies the accuracy of the final reports and balance sheets and verifies the quality of the ongoing internal control of the company. It is performed by an independent external auditor and its primary mission is to enhance the credibility of financial statements of the company.
- **Internal audit**: focuses on business process and is provided by an internal auditor.
- **Audit of quality**: checks the quality of the management system in the company. Its task is to determine whether the company meets the requirements of international standards, including building a system of documentation. It usually results in being

granted a certificate within ISO standards; certificates are granted by specialized institutions.

- **Environmental audit**: is a systematic evaluation of the management and checking of enterprise processes that could have an impact on the environment.
- **Computer audit**: is used in control programmes of computer technologies and other components of information systems in the enterprise.

Further, audit can be divided according to who performs it into an internal audit and an external audit.

1.2 Audit legislation in the Czech Republic

Audit legislation is necessary for a number of reasons. One of the main reasons is the need or even the necessity to protect public interest. The auditor´s results primarily do not serve those who pay the auditor and their service, but generally public who rely on them. Furthermore, it is necessary to state the reason of informational imbalance. Users of the information which arises from the audit and accounting are in most cases not able to assess themselves whether the audit has been conducted properly. It is necessary to modify audit legislation also due to the fact that there are high demands placed on auditors, both in terms of theoretical knowledge and practical experience. On the one hand, legislative regulations of the audit in the Czech Republic define operators and conditions of statutory audit, and on the other hand of course modify the audit itself.

Current legislation governing the work of auditors is given by Act 93/2009 Coll., of the auditors and the amendment of certain laws. This law defines the status and activities of auditors, audit firms and audit assistants, as well as the status and competence of the Chamber of Auditors of the Czech Republic and the Council for Public Audit Supervision. Another basic source of law governing audit is Act No. 563/1991 Coll., of accounting (including its implementing regulations and Czech accounting standards) and Act No. 90/2012 Coll., of commercial companies and cooperatives (Law of Business Corporations). Proper preparation of the audited financial statements of the company is then influenced by other laws, in particular:

- Act No. 586/1992 Coll., The Income Tax,
- Act No. 235/2004 Coll., The Value Added Tax,
- Act No. 262/2006 Coll., The Labour Code.

The auditor must also take into account the documents issued by the Chamber of Auditors of the Czech Republic, such as the Code of Ethics and Auditing Standards and International and various local accounting standards.

2 The issue of internal and external audit

Internal audit has the potential to become one of the most influential services with the greatest added value, which is the apex body of the company available. It has the ability to make a tangible contribution to the proper performance of the company management for efficient functioning and profitability of any organization, whether small or large, in both the private and the public sectors. In theory, management control is considered an essential part of the control systems. [9]

External audit, otherwise also known as the audit of the financial statements or the statutory audit, is focused on the individual and consolidated financial statements. It is made to order, usually by the entity's owners or holders of a group of companies, and submitted to an external auditor. This can then be either an individual (natural person) or an audit company

that provides these services through its employees. Statutory audit forms an important element of the protection of property rights.

2.1 Development of internal audit

Internal audit is an independent, objective assurance and consulting activity designed to add value and improve an organization's operations. It helps an organization accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control processes and corporate governance of the organization. [11]

In 1941 The Institute of Internal Auditors Inc. was established in the U.S.A. It currently brings together internal auditors from both the USA and all developed countries. Internal audit profession began to evolve in the U.S. after World War II. The value of internal audit was further increased, particularly in the USA, with the implementation of Sarbanes-Oxley Act in 2002. [7] In its early days, the internal audit addressed a majority of financial auditing and internal accounting control, but over time more functions were formed. First companies to establish internal audit units were banks and insurance companies at the turn of the 30ies and 40ies of the last century. About 40 years later, this step was taken by industrial and commercial enterprises as well. Regarding the size of these institutions, it differed and still differs by the type of an organization, size of the company and also the intricacy and the complexity of the implemented activities. [9]

In the Czech Republic, the internal audit was introduced quite recently. The beginnings of internal audit in this area are connected to the inputs of foreign companies on the Czech market, which introduced this profession to the country. Internal audit has been introduced mainly in banking institutions, insurance companies, etc. Thanks to Act No. 330/01 Coll., of financial control in public administration (Financial Control Act), which established the scope of internal audit in the public sector, this profession has seen significant development. At present, the internal audit is still most represented in financial institutions, large enterprises and multinational companies. In small and medium business its role is still quite unused. [2]

Internal auditors are currently focused on many areas in companies. One of them is the financial audit, which includes the prevention and detection of fraud. In companies, auditors also examine certain economic transactions, contracts (e.g. with investors or suppliers), business performance, perform quality audit and the impact on the environment audit within the audit frame. Internal auditors also focus on human resources, which means, for example, management audit, personnel development and corporate relations audit. Generally, they focus on internal accounting control, corporate compliance policies and procedures, laws, regulations and various regulations auditing.

2.2 Development of external audit

External audit can also be called a financial audit, and as far as verification of financial statements drawn up according to Czech accounting standards is concerned, we can talk about the audit of financial statements and also the legal or statutory audit. External audit can be defined as an independent audit of financial statements by an external auditor to such an extent that the auditor is able to express the opinion that the submitted accounts are true and fair and comply with the appropriate legislation. Its essence is to determine whether the audited financial statements (financial statements and appendix) give a true and fair view of the assets and financial position of the entity, that is to the dates the financial statements are made. These findings further become the content of the auditor´s audit report. The mission of the audit of financial statements is to increase the credibility of financial statements that are

published by a corporate management. It is intended for all stakeholders, mainly the shareholders, but also other entities, such as tax authorities, banks, suppliers, customers and employees, who are also keen to make sure that the financial statements have been presented fairly, in correspondence with the company´s performance and position on the market. External audit is not set up to prove the absolute accuracy and certainty. It is based on testing samples, not testing all transactions and balances. It is rather designed to reduce errors in the financial statements due to fraud or error. Subsidiary purpose of the audit is therefore taking action against errors and fraud. [6]

The external audit function has changed in the course of its development. In the beginning, the auditor had to express their opinion on the financial statements, and confirm that the accounting information contained within was true and accurate. Emphasis was put on the detection of errors, accounting errors, or embezzlement, which could occur in a given period and affect the reported facts. In the course of time, exploration of potential mistakes was pushed into the background and emphasis was placed on the reliability of the reported information, which was expressed by the statement "a true and fair view". The accounting scandals that happened at the end of the last century led to the re-expansion of the requirements for auditors. The current auditors should pay particular attention to any signs of crime.

Due to the globalization of the world economy and due to the growth of information technologies, trade and financial companies and efforts to expand to major international financial markets, a lot of pressure on accessible, comparable and accurate information has been exerted. And based on these phenomena, there is a growing role of audit, particularly in marketable equity companies, where the aim is to prove the veracity and reliability of the data necessary for both current and potential investors. Audited financial statements should be a reliable source of information for decision-making of all users of accounting information. These users can be potential investors, banks, strategic business partners, government institutions, stock exchange or internal users as boards of directors, supervisory boards, shareholders etc.

3 Sarbanes-Oxley Act

Sarbanes-Oxley (SOX) is a U.S. law that came into force in July 2002. Its official title is "An Act to reform the financial corporations and investor protection" (Public Company Accounting Reform and Investor Protection Act of 2002). This Act introduces major changes in corporate governance and financial practices of companies that are listed on the New York Stock Exchange. It does not adjust only American companies, but it also affects many other businesses and interest groups. This law was named after its main authors, senator Paul Sarbanes and U.S. representative Michael Oxley. The reasons which led to the creation and adoption of the Sarbanes Oxley can be seen back at the end of the 90ies of the twentieth century and early years of the twenty-first century. In this period there were a number of financial scandals that affected not only the United States but the whole world as well. Many entities did not comply with the principle of equitable and fair presentation of conditions and results of operations and deliberately distorted the information. Therefore assets and incomes of these companies used to be overestimated; underestimation of costs and liabilities took place. Due to overvalued information about the real state entities, users of financial information had poorly evaluated the situation of individual companies, which resulted in an almost continuous rise in the value of equity securities.

Obviously, this could not be sustainable for a long time. Thus, the situation eventually escalated into bankruptcy of some entities. Examples of incriminated companies include those of such names as Enron, MCI, WorldCom, Tyco International and many others. With these

machinations the Big Five audit firms were connected and the situation led to the bankruptcy of the audit firm Arthur Andersen, which had been involved in the audit of Enron. Therefore, this bad situation could not but lead to public distrust in the published financial information, which resulted in a deepening distrust in the financial markets. This fact caused considerable losses not only in the U.S. A. but also globally, as many incriminated companies ran business not only in the United States, but performed their activities in many other countries. The top supervisory and regulatory authorities in the USA were forced to intervene to stabilize the situation. Their efforts led to the creation and approval of the Sarbanes-Oxley Act, which was issued in July 2002. Its mission is to ensure the accuracy and transparency of financial information, with a focus on reporting these data in the financial statements. [4]

3.1 Direct and indirect costs associated with the implementation of Sarbanes-Oxley Act in the corporate environment

Rules adopted by Sarbanes-Oxley Act increased the costs of all of the companies affected. Costs arising from the strict monitoring of internal control provided for in section 404 of the Act are moderated by the fact that companies had been required – prior to the introduction of the Act – to have an adequate system of internal control by the Foreign Corrupt Practices Act (Foreign Corrupt Practices Act). Some companies had also (themselves and voluntarily) drawn reports on the effectiveness of internal control. Sarbanes-Oxley Act gives companies a range of costs, both direct and indirect. [5]

Sarbanes- Oxley Act is often criticized for its cost. There are high direct costs related to SOX, which are mainly due to the high expense of internal control. Securities and Exchange Commission (U.S. Securities and Exchange Commission, hereinafter SEC) had originally assumed that the direct costs of implementation and compliance with SOX would be averaged for each company at about $ 91 000. Due to vastly increased costs, SEC provided an extended period of time to implement. Having originally planned the line to be drawn in September 2003, SEC postponed it until April 2005. Nevertheless, the costs associated in particular with Section 404 of the Act proved to be much higher after the first year. According to the research conducted by the Association of Financial Executives International (FEI hereinafter) with 224 companies with an average turnover of $ 5 billion, the average cost of one company was around $ 4,360,000. These high costs were primarily attributed to a sharp increase in hours that the auditors had to spend in companies. In subsequent years, auditors and company gained more experience and costs began to decline. Obviously, with the growth of corporate costs, the profit of audit firms increased. One of the key items for implementing SOX is the costs of upgrading information systems. Should these systems be in accordance with auditing and reporting requirements of SOX, the information parameters of the system must be altered. The system must be able to provide more detailed information, and archive more information for a longer period of time. This represents a complete replacement or a significant impact on the current system for some companies. [1]

According to many experts, the indirect costs associated with Sarbanes-Oxley are far greater than the direct ones. Perhaps most important, but largely unobservable costs are opportunity costs of managers whose time and attention are focused on the design, implementation, and ensuring compliance with the new internal control. The requirements of SOX call for hard work and attention, from top management to IT departments employees, accountants etc. Hence, the requirements of SOX thus distract managers from their standard work and also reduce overall profitability. CFOs do admit that projects such as internal staff development, capital expenditures, mergers and acquisitions have been suspended or even cancelled due to the implementation of a commitment to comply with Sarbanes-Oxley Act. Much research also shows that most CEOs developed greater aversion to taking risk.

According to PricewaterhouseCooper company research, in 2004 44% of U.S. CEO admitted that their companies were less risky projects oriented than for example ten years ago. 59% of U.S. CEO then considered excessive regulations given by SOX the biggest threat to the growth of their companies. According to several experts, the increase of personal responsibility of managers resulted in the fact that companies operated much more cautiously and tried to avoid risky operations after the implementation of SOX. And this is the result of the high amount of indirect costs. Many managers and directors, due to their fear of personal responsibility, may decide that it is better for a company to limit its growth and produce stable earnings than take the risks associated with trying to achieve a dominant market position and expand into new areas. But this approach inevitably stifles innovation and economic growth for the whole economy. Indirect costs are the sum of foregone investments and profits of all business activities, which corporate managers had not taken due to its more conservative investment strategy. [10]

4 Implementation of the Sarbanes-Oxley Act in an enterprise located in the Czech Republic

The aim of this chapter is to present the cost of implementation of the Sarbanes-Oxley Act in a company, which operates in the Czech Republic and is owned by the parent company in the USA. This particular company specializes in the production of automotive parts. Data presented here were provided on condition that the name of the company would be kept back.

4.1 The cost of implementing the Sarbanes-Oxley Act in the enterprise

Implementation of the rules and procedures under this Act was internal, using its own employees. The company did not globally quantify specific implementation cost of controls required by the Sarbanes-Oxley (SOX). It kept and still keeps only records on the time spent on implementation and compliance with this Act. The Finance Department estimates that the cost of implementing SOX in 2005 amounted to CZK 1,200,000.

There is a worker in charge dealing with SOX, and they must keep records of time spent on SOX in this company. The time spent on these issues is currently almost constant. The records for 2013 show that the average time spent on SOX during the test period is 23.5 hours per week. Outside the test period the time spent is obviously shorter; it is four hours a week. If we average the number of hours spent on SOX, multiply it by the number of test periods and the average wage of management staff the field of accounting and controlling in the Czech Republic, we get the cost of testing required by SOX for the given company. Acquired costs will again be wage costs only, as well as the quantification of the costs of implement, but even in this case, labour costs constitute the main component of the cost of such testing. The data are presented in Table 1.

Tab. 1: *The analyzed company total cost of testing according to SOX controls in CZK*

	During test period	**Outside test period**	**Total**
Average wage per hour (CZK)	328.20	328.20	-
Average number of hours per week	23.50	4.00	-
Average number of weeks spent on SOX in 2013	3.00	49.00	52.00
The total cost of testing according to SOX controls for 2013 (CZK)	**23 138.10**	**64 327.20**	**87 465.30**

Source: internal documents of the analyzed company

As apparent from Table 1, SOX testing costs for the year 2013 amount CZK 87,465. These costs, however, do not include the cost of the processes that are related to SOX, such as

checking various documents under this Act etc. These costs represent only the cost spent on the responsible person, who is in charge of SOX and performs tests of controls set by this Act.

Conclusion

The direct costs associated with implementation and compliance with SOX can be quantified and it is possible to enumerate at least some of the indirect costs of the transaction, however, if we focus on the benefits of this act, it quickly becomes apparent that the benefits are subjective in nature and that it is much more difficult to measure or quantify them. The first problem concerns the recognition and quantification of benefits. Numerous empirical studies and surveys have shown that SOX has improved the reliability of financial reporting, the effectiveness of corporate governance, liquidity, investors and companies and has resulted in a reduction of fraud relating to financial reporting.

The original intention of this act was to restore public confidence in financial statements compiled by public companies. One of the main objectives of internal control is to produce reliable financial information, because the more effective they are, the more reliable and true information will be reported. One of the requirements of SOX is to maintain effective internal controls, thus reliable information can be expected to be produced.

As the above analysis shows, in the case of the analyzed company the costs of implementing SOX and testing controls are appropriate; and based on the size of the business it is possible to state that these costs do not significantly affect the profitability of the given company.

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PROBLEMATIKA AUDITU V NADNÁRODNÍCH SPOLEČNOSTECH

Cílem předloženého článku je definovat zákon Sarbanes-Oxley Act, specifikovat náklady, které jsou spojené s jeho zavedením, a analyzovat nákladovost aplikace interních kontrol na základě pravidel definovaných tímto aktem ve vybrané společnosti. Článek je rozdělen do čtyř hlavních částí a závěru, ve kterém jsou shrnuty výsledky práce. První část je zaměřena na obecnou charakteristiku auditu. Ve druhé části je pak definován rozdíl mezi auditem interním a externím. Třetí část se věnuje samotnému zákonu Sarbanes-Oxley Act, je zde definována jeho podoba, přínosy i náklady, které přináší. V poslední části je analyzována nákladovost implementace a testování kontrol dle SOX ve vybrané společnosti.

DIE PROBLEMATIK DES AUDITS IN ÜBERNATIONALEN GESELLSCHAFTEN

Ziel des vorliegenden Artikels sind die Definition des Sarbanes-Oxley-Act-Gesetzes, die Spezifizierung der mit deren Einführungen verbundenen Kosten und die Analyse der Anwendung interner Kontrollen auf Grundlage der durch diesen Akt definierten Regeln in der ausgewählten Gesellschaft. Der Artikel ist in vier Hauptteile und einen Schlussteil gegliedert, worin die Ergebnisse der Arbeit zsuammengefasst werden. Der erste Teil zielt auf eine allgemeine Charakteristik des Audits ab. Im zweiten Teil wird der Unterschied zwischen internem und externem Audit beleuchtet. Der dritte Teil geht auf das Sarbanes-Oxley-Act-Gesetzes ein. Dort werden dessen konkrete Gestalt, dessen Vorteile und auch die anfallenden Kosten definiert. Im letzten Teil werden die Kostenintensität der Implementierung und die Testverfahren gemäß SOX in der ausgewählten Gesellschaft analysiert.

ZAGADNIENIE AUDYTU W SPÓŁKACH PONADNARODOWYCH

Niniejszy artykuł ma na celu przybliżenie ustawy Sarbanes-Oxley Act, wskazanie kosztów, które są związane z jej wdrożeniem oraz przeprowadzenie analizy kosztochłonności zastosowania kontroli wewnętrzych w wybranej spółce w oparciu o zasady zdefiniowane w wymienionym akcie prawnym. Artykuł podzielony został na cztery podstawowe części i zakończenie, w którym podsumowano wyniki pracy. Pierwsza część poświęcona jest ogólnej charakterystyce audytu. W drugiej zdefiniowano różnicę pomiędzy audytem wewnętrznym a zewnętrznym. Trzecia część dotyczy ustawy Sarbanes-Oxley Act, jej formy, korzyści i kosztów, jakie są z nią związane. W ostatniej części przeanalizowano kosztochłonność wdrożenia i testowania kontroli wg SOX w wybranej spółce.

EFFICIENT COMPANY TRAINING IN CASE OF COMPANIES IN THE CZECH REPUBLIC

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Abstract

Company training is an important part of employee care. It is seen as an employee benefit and at the same time it is an important factor that affects a company's success. Having well-educated employees who have the knowledge and skills and use them in their work is an important competitive advantage as well. Therefore, a company that invests in its employees´ training beyond the framework of mandatory legislative requirements invests in intangible, so called human capital at the same time. Research shows that investment in human capital is profitable, not only in terms of formal education, but also in the case of education in the company environment (training). The first part of this paper focuses on the issue of company education from the perspective of professional publications, particularly in relation to the effectiveness of investments in company training and the question of measurement. The second part of the paper examines the primary data collected among respondents from both individuals and companies in the Czech Republic in the year 2013 showing how Czech companies educate their employees and how they deal with the issue of evaluation of these investments.

Introduction

Company training is one of the most common employee benefits provided by companies in the Czech Republic as well as abroad. It is classified as an employee benefit on the grounds that even though the primary motive is to educate employees for the company to improve their job performance and thus the performance of the entire company, it is also an activity that the company provides beyond the legal requirements, giving the employees "something extra".

A productivity of employees depends among others on the quality and quantity of education and experience gained during the employment. Capital in general has got different forms, but the common attribute of all of them is to expect higher, additional income in the future from the costs invested to the capital nowadays. Capital investment expects the return and the appreciation. The theory of human capital may be regarded as the foundation of linking education and earnings at the labour market [4].

Moreover, it is important to realize that it is an investment that belongs and remains to the employees themselves, increases the value of their human capital, which they use specifically in the company they work in (if, of course, there is sufficient motivation), and that educates them. However, if employees decide to quit their job, the company's benefits from this investment are lost. Therefore, it can be concluded that such an investment is also associated with a high risk. The company – e.g. by signing a qualification agreement with an employee, or by a sufficient motivation and care for such employees, can help their about not leaving the company, which can eliminate this to some extent. For effects of abilities and skills of

employees on their effectiveness search also PIAAC (Programme for the International Assessment of Adult Competencies) survey done by respondents in 2012 [1].

The focus of education in companies should always be based on the needs of both the company and its employees, and should be clearly managed. The choice of the methods of company training depends on a number of factors, including the company size, budget, location and last but not least the core business. Among the current trends in business education, particularly the trends of the 21st century belong E-learning, Blended Learning, Leadership, Learning by doing, Mentoring, Coaching, Tutoring, Job rotation and Counselling [7, p. 267], [2, p. 545].

1 Investments in human capital within company training

All forms of investment in human capital are long-term investments. These investments are inseparable from a particular individual, his/her skills and abilities. Investments in human capital are usually expected to bring positive results; however, the results are often uncertain [3], [9]. These investments are perceived by companies as an opportunity to increase competitiveness and to increase the effectiveness and efficiency of their workers. The aim of investments in human capital is therefore to increase the value of human capital, adding new knowledge, skills, and improving the position of workers in the labour market.

Investments in human capital produce benefits both – to the individual and to society as a whole. We can say that individuals who take part in education or vocational training benefits by increasing his or her chances of employment and by lifetime earnings. On the other hand, society benefits from the increased productivity of educated workers [9].

The investment in human capital differs with each individual, and of course depends on time. The costs can be divided into direct and indirect ones.

Direct costs consist of the amount provided for the individual. These include the tuition fees, study material, study courses, tutoring etc. Direct costs are usually covered by the person raising their own human capital, or someone else, such as parents, employers, etc.

Indirect costs consist of opportunity costs, i.e. a person invests their time which could have been used for making money. These costs can include for example job training or part-time studies while working full time, while they could earn money through a business activity instead of studying. Indirect costs are generally lower in young people, as the price of time usually increases with the years of work experience.

Benefits that accrue from the development of human capital can be divided into several groups. One of the divisions is economic and non-economic yields.

Economic yields are usually measurable, such as higher future wages/salaries associated with an increase in job performance, a better position or a function associated with higher remuneration.

Non-economic yields can be further divided into individual and social ones. Individual yields are usually subjective feelings of each individual and their satisfaction. They might include employability, higher level of proficiency and improved skills, willingness to learn etc. Social non-economic yields include mainly social status and social prestige of an individual. These yields are very difficult to quantify, but they might be more important for individuals than the increase in pay [9].

2 Efficiency of company training

Efficiency is a term that is encountered in both private and public sectors. The notion of this term is different in different conditions, so there are also different interpretations of the term given in different sources. E.g., Economic Dictionary [11] understands the effectiveness in the most general meaning as the company's ability to assess the resources embedded in the business.

Company training will therefore question whether the company is able to assess the resources embedded in employee training. Generally, the effectiveness of investments could be assessed by numerous methods. From the basic point of view, these methods can be divided into static and dynamic ones.

The effectiveness of the educational process is very difficult to measure. Measurable costs are rather embedded in education. The benefits are difficult to measure, often even immediately after the training has finished. However, there are situations where the benefits of education can be measured rather objectively. These include the employees working in direct sales, where it is possible to "measure" the state prior training (e.g. turnover, sales during the previous period) and simultaneously measure the state after the training has been completed. This can be implemented to quantify the effectiveness of training and also to compare the investment and the return on investment as [9], [3] point out.

2.1 Static procedure to calculate the efficiency of investment in company training

In determining investment efficiency, comparison with a profit is used (as if the same amount was deposited into a bank account). The expected benefits from the investment and input costs are discounted by an interest rate. Should investments in education be realized, the effect of the deposit to the bank must be lower than the effect of education obtained [10, p. 176].

$$E_n = V * (1 + r)^n \quad (1)$$

wherein:

V = input costs
n = number of years
r = interest rate
E_n = amount after n years

An example of usage is demonstrated by the following example:

A company plans to invest in their employees' training CZK 100,000. What should be the evaluation of the benefits of this investment if the expected return on investment is two years?

The initial entry costs: V = 100,000 CZK
The annual interest rate in the bank: 5%: r = 0.05
Number of years: n = 2
The total amount after two years: E_n = 100,000 * (1 + 0.05) 2 = 110,250 CZK
Net income after two years: E_b = 110,250 – 100,000 = 10,250 CZK

The amount the company invested into a bank account would yield CZK 10,250 in two years. This example shows that should the educational activity produce a better effect than the money in the bank, it must deliver a higher return than CZK 10,250 [9, p.177].

2.2 The dynamic process of calculating the efficiency of investment

This procedure takes into account the quality and productivity of the training programme that is implemented in the long term and during which a certain number of staff is trained.

$$U_n = B - C \quad (2)$$

$U_n = (Q * P) - C(2)$
U_n = net benefit
C = total cost
Q = quality of the educational programme
P = the productivity of the educational programme
B = total benefits

If the increase in the value of the work produced by the employee education programme per year is higher than the costs incurred, the investment pays off, and vice versa.

An example of usage is demonstrated by the following example:

A company decides whether to implement the training. The educational programme should last three years and during this period all its 100 employees should be trained. In the first year 50, in both the second and the third year remaining 25 workers are trained. The estimated cost is CZK 300,000 in the first year, and in the 2nd and 3rd year CZK 100,000 each.

Total cost: 300,000 + 100,000 + 100,000 = 500,000 CZK
Number of trained staff: 50 + (50 + 25) + (75 + 25) = 225 person-years.

If U_n is equal to 0, the net benefit is therefore zero, then this educational programme must achieve a net increase in the value of the employee's work of CZK 2222 per person to cover their own costs:

Q = 2222

If we did not take into account the qualitative aspects of education, then the total cost would be divided by the number of persons trained, which would be 500,000 ÷ 100 = 5000 CZK per participant. The number is higher than productivity and quality educational programme taken into account. Thus, if the increase in the value of the employee's work resulting from their education was higher than CZK 2222 per person per year, then the realized investment would pay off, and vice versa. [9, p. 178].

3 Company training in Europe according to CVTS survey

Lifelong learning (continuing vocational training) is considered as a continuous process of acquisition and development of knowledge, intellectual abilities and practical skills of individuals, even beyond initial education. It can be realized in the form of an organized (formal) form through individual (non-formal) leisure activities or spontaneously, unconsciously (informal). It consists of school attendance, training in companies and senior education (the University of the Third Age). It applies to all adults, regardless of the employed seeking a referral to a higher level of qualification or the unemployed who need to retrain.

Contrary to lifelong learning, company training is an educational process organized only by a company with a systematic process of changing work behaviour, level of knowledge and skills, including motivation of the employees of the company. The goal of company education is not just a transfer of knowledge, but also to create the conditions for self-realization as the most effective motivational tool. Company training leads to unification of personal and company goals. This means that company education can be included in lifelong learning as

well. Eurostat survey deals with lifelong learning and in this connection also with company training. This chapter presents partial results of the investigation in relation to company education and illustrates the situation in company education in Europe.

Tab. 1: *Company Education in % depending on the type of education and the size of a company*

	CVT courses						Other forms of education					
	10 - 49 employees		50 - 249 employees		more than 250 es.		10 - 49 employees		50 - 249 employees		more than 250 es.	
Country / Year	2005	2010	2005	2010	2005	2010	2005	2010	2005	2010	2005	2010
European Union(27 countries)	44	:	68	:	84	:	43	:	65	:	80	:
Belgium	42	67	77	92	97	99	50	58	77	79	95	92
Bulgaria	16	16	37	38	57	70	20	24	35	45	52	76
Czech Republic	56	57	88	82	100	96	54	55	76	77	88	89
Denmark	78	:	91	:	98	:	57	:	76	:	97	:
Germany	50	:	65	:	78	:	62	:	78	:	83	:
Estonia	50	52	80	76	95	96	46	51	64	69	87	86
Ireland	48	:	79	:	100	:	53	:	79	:	96	:
Greece	14	:	35	:	70	:	10	:	25	:	52	:
Spain	34	68	61	88	87	97	35	51	54	66	73	76
France	66	67	95	93	99	98	40	42	65	57	74	65
Italy	23	:	53	:	82	:	17	:	39	:	66	:
Cyprus	41	42	78	74	100	100	24	63	46	77	78	96
Latvia	25	:	50	:	72	:	23	:	41	:	64	:
Lithuania	19	32	43	54	78	84	36	42	59	58	82	78
Luxembourg	56	60	78	83	94	99	60	55	74	72	92	89
Hungary	26	32	64	65	86	92	35	31	64	58	81	84
Malta	25	31	47	60	84	90	36	47	64	71	82	86
Netherlands	65	65	86	85	94	94	48	66	68	76	73	89
Austria	63	69	86	89	98	98	68	75	83	84	97	95
Poland	16	14	43	38	72	72	21	9	43	28	65	55
Portugal	27	39	63	74	88	92	32	51	56	74	71	91
Romania	23	12	38	28	64	56	29	16	41	29	63	54
Slovenia	54	34	78	66	93	86	55	60	69	81	86	93
Slovakia	33	49	57	73	80	86	46	58	61	74	78	83
Finland	66	62	83	82	87	89	53	51	63	81	85	84
Sweden	66	:	91	:	99	:	55	:	74	:	93	:
United Kingdom	63	56	75	76	83	85	85	72	88	87	94	96
Norway	54	:	65	:	57	:	79	:	84	:	91	:

Source: Eurostat, 2012

Table 1 shows that participation in company training in most of the cases of all countries gradually increases. Meanwhile, the larger the organization, the higher the percentage of employees involved. Again, we can infer that this result is related to the fact that in large companies there is usually an independent worker allocated who organizes various training courses for employees, ensures their strong participation, and among other things diligently reports all the obtained data. It is evident that the Czech Republic consistently holds above the European Union average of company training. However the Czech Republic is surprisingly one the countries where the % of participation on CVT training did not increased between years 2005 – 2010 which can be caused by an economic crisis in years 2008-2009. Primary data used later in the paper nevetheless confirm the importace of training for companies.

An important factor is the amount the companies spend in relation to education expenses. The following table 2 provides an overview of the total costs, direct costs, labour costs and potential benefits of CVT finances.

Tab. 2: *Structure of costs of CVT courses per employee in enterprises with further education in Euros*

	Total Costs		Direct Costs		Participants' Labour Costs		Financial Benefits		Incomes from funds and other sources	
Country2 / Year	2005	2010	2005	2010	2005	2010	2005	2010	2005	2010
European Union(27 countries)	599	:	279	:	272	:	77	:	28	:
Belgium	857	1 194	288	432	539	739	61	67	31	45
Bulgaria	178	207	111	115	67	101	0	0	1	9
Czech Republic	379	284	173	158	209	147	1	1	3	22
Denmark	1 157	:	701	:	436	:	27	:	8	:
Germany	629	:	295	:	333	:	1	:	1	:
Estonia	283	264	190	130	98	144	0	0	6	10
Ireland	827	:	547	:	282	:	3	:	5	:
Greece	292	:	176	:	163	:	28	:	75	:
Spain	561	593	213	197	290	305	109	160	50	52
France	898	998	325	418	362	379	252	356	41	153
Italy	683	:	242	:	369	:	92	:	20	:
Cyprus	424	907	203	263	159	446	109	136	47	61
Latvia	221	:	151	:	75	:	0	:	5	:
Lithuania	224	191	133	119	92	100	0	5	2	33
Luxembourg	969	903	466	388	565	621	20	19	82	115
Hungary	439	446	198	222	137	139	112	160	9	29
Malta	669	746	431	440	300	299	12	21	74	16
Netherlands	823	944	482	489	412	441	53	38	124	24
Austria	602	717	349	408	265	332	11	6	23	29
Poland	331	361	177	191	154	200	1	3	1	33
Portugal	389	663	175	288	227	416	1	6	14	47
Romania	181	412	110	2	70	313	0	8	0	168
Slovenia	630	782	359	355	336	463	1	2	66	38
Slovakia	382	490	202	245	200	257	3	18	24	28
Finland	521	553	275	290	244	263	7	:	4	:
Sweden	839	:	351	:	494	:	1	:	6	:
United Kingdom	416	320	276	195	101	119	87	23	48	19
Norway	734	:	338	:	381	:	20	:	6	:

Source: Eurostat, 2012

Denmark, Luxembourg, Belgium, France, the Netherlands and Sweden are countries which invest into company training the most. Companies in the Czech Republic together with Hungary, Poland and Slovakia compared to other Eastern European countries invest a considerable proportion of their assets in company training. However total amount of costs in the Czech Republic is bellow the EU average. In conformity with the previouw table also total cost spent for training decreased between years 2005-2010 in the Czech Republic. From the post-communists countries, the highest amount of training per employee provides Slovenia. Companies in Bulgaria and Romania rank the very last places.

EU data show importance of training in companies and validate necessity of investment in employees´training in the EU. However some countries as the Czech Republic has decreased number of trained employees as well as amount of money invested in trainig. This unflattering position of the Czech Republic comparing to other European countries confirms also resuts of OECD Skills Outlook 2013 survey evaluating investment in education and training of adults themselves. According to this data Czech edults invest into their education and training monthly only 80 CZK [6].

Due to the paper extent only selected data from the Eurostat are mentioned.

4 Company training in the Czech Republic

The situation in company training in the Czech Republic has also been mapped by the authors through a questionnaire survey that examines the provision and development of business education among part-time students of EF TUL. These respondents were selected because they were active in the labour market and thus had experience in providing company training. At the same time they were in the position of investing in their own human capital through

skills development at university. The information has been supplemented by data from a survey among selected companies in the Czech Republic.

The questionnaire survey was conducted at the end of 2013 (winter semester of an academic year 2013/2014). All part-time students of all grades at the Faculty of Economics TUL who attended the lectures were personally contacted. The respondents represented approximately 60% of the basic group, i.e. 267 part-time students studying at the Faculty of Economics, Technical University of Liberec. Thus results are representative for the group of part-time students of the Economic faculty and can be generalized for this group of students. They provide an interesting perspective of a sample of employees who decided to reach a university degree. As the data showed this initive was nearly in all cases personal initiative with no support from organisation. This can support previous findings that Czech firms and also individuals do not invest in education and training that much. Authors plan to continue and depen this survey in following years.

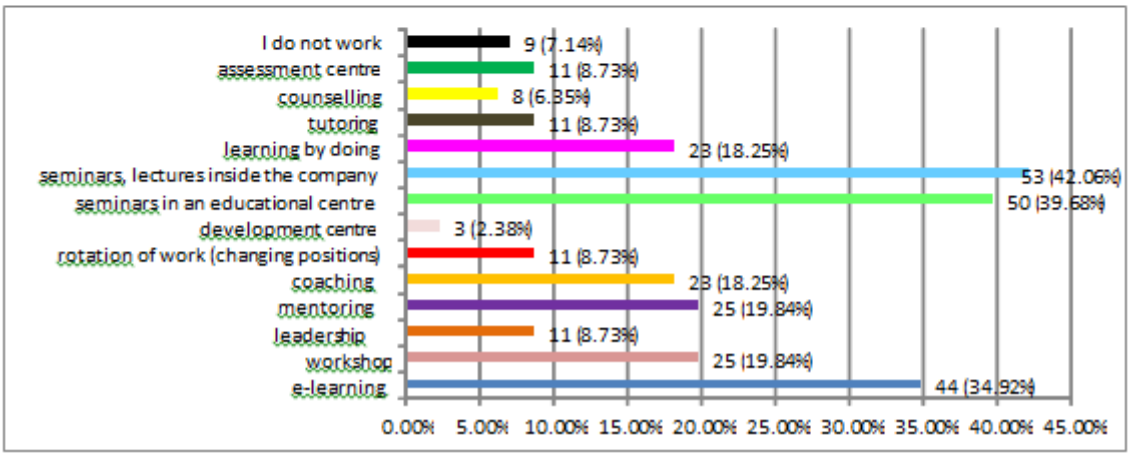
4.1 Results of the survey on company training among part-time students at the Technical University of Liberec, Faculty of Economics

The questionnaire survey among part-time students focused on company training provided to the addressed respondents. Results are ordered according to a structure of questions in the questionnaire. The obtained responses indicate that most companies provide their employees with language courses, as well as IT training, communication and presentation skills. A relatively large part, up to 27%, of companies does not provide company training at all. The most common forms of company training are lectures and seminars, both within the company, as well as in educational institutions, i.e. the respondents are sent to lectures and seminars outside the company. According to the respondents' answers, only few companies have an elaborate system of training their employees, most companies provide training according to the needs and the location of their employees. Less than a half of the respondents seem to rate the company training adequate, a significant proportion (up to 26%) would welcome more training. There are also those who consider company training as the loss of time (less than 2%).

Language courses are most common, up to 38%. Among other company training that firms provide in more than 20% are IT training, communication and presentation skills. Further, business, sales skills and management skills. Approximately 27% of companies provide no company training. Firms also provide specific skills, such as knowledge of tax laws and their amendments, controlling skills of engineering courses or certification in the field of investment. This question was answered by 158 respondents from 160.

Another question concerned the forms of company training. This question was answered by 126 respondents, 34 did not respond.

Answer	Answers	Percentage
e-learning	44	34.92%
workshop	25	19.84%
leadership	11	8.73%
mentoring	25	19.84%
coaching	23	18.25%
rotation of work (changing positions)	11	8.73%
development centre	3	2.38%
seminar in an educational institution	50	39.68%
seminars, lectures inside the company	53	42.06%
learning by doing	23	18.25%
tutoring	11	8.73%
counselling	8	6.35%
assessment centre	11	8.73%
I do not work	9	7.14%

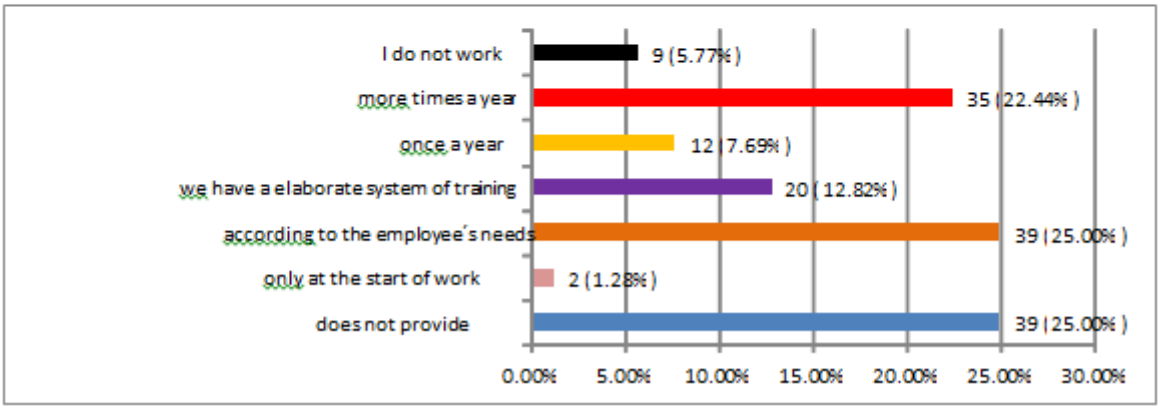


Source: Own

Fig. 1: *Forms of company training*

The most common forms of company training are seminars and lectures, whether they take place in the workplace or in an educational centre. A very frequent usage of the Internet as a medium of education is connected with the advent of IT technologies. These methods of education (seminars, lectures, e-learning) can be described as a "public" form of education. On the other hand, “individual” forms of education, such as counselling, tutoring, coaching or mentoring require a more differentiated approach, and are generally provided less frequently. It can be assumed that these “individual” forms of education are more expensive converted into “per an employee” cost, and therefore the companies thoroughly consider their use.

Answer	Answer	Percentage
does not provide	39	25.00%
only at the start of work	2	1.28%
according to an employee´s needs	39	25.00%
we have an elaborate system	20	12.82%
once a year	12	7.69%
more times a year	35	22.44%
I do not work	9	5.77%



Source: Own

Fig. 2: *How often an employer provides company training*

From the figure 2 it can be seen how often the employer provides company training. Most respondents, about 25%, said that it was organized according to the needs of employees. It is surprising that only 13% of respondents suppose that their employees had developed system of training and provide systematic training for them. This question was answered by 156 respondents.

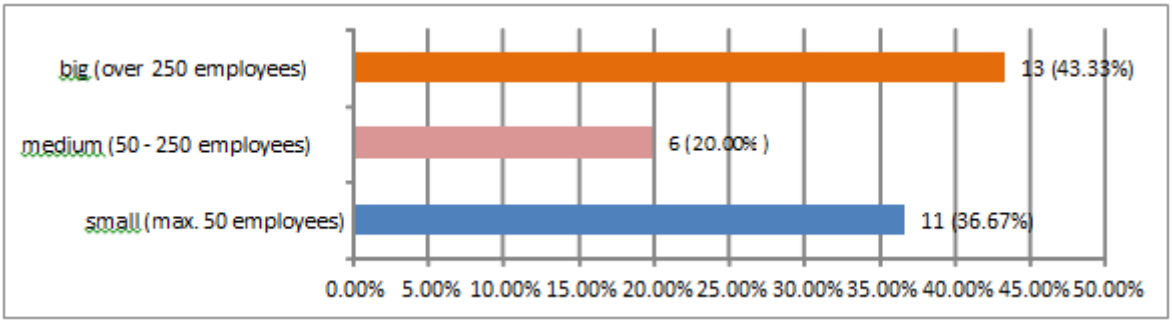
4.1.1 Company training in selected Czech companies

To obtain more information, some selected companies operating in the Czech Republic were also approached with a survey. For this purpose, one of the authors' clients' own databases were used. Thanks to that, a higher, almost one hundred percent return of questionnaires delivered to addressed companies was assured.

The questionnaires were sent to respondents via e-mail at the beginning of 2014 with a response deadline at the end of January 2014. Total of 33 companies were approached with a request to complete it. These companies were selected on the basis of personal ties with former colleagues or business partners willing to provide their data.

The addressed companies were of different sizes and from different business sectors. The questionnaires were directed at managers of human resources departments or persons responsible for staff development. We managed to get answers from 30 companies we had addressed. The return of questionnaires was therefore 90% of the surveyed entities.

Initial questions were focused on the information about the particular company. How big it was, which branch it operated in, and where the addressed company was based.



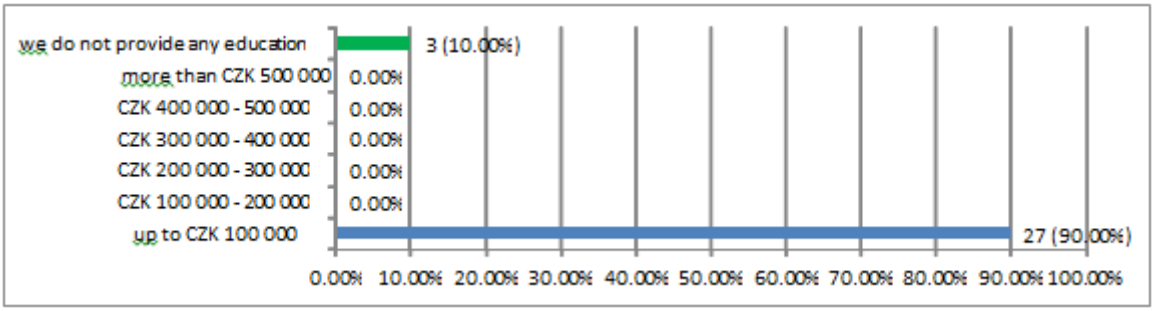
Source: Own

Fig. 3: *Size of interviewed companies*

Responses were received from companies of all sizes - small, medium and large. Due to the structure of contacts, these companies were mainly from the area of sales and marketing, and there were also building companies, which obviously affected the results. The contact structure lacks contact in the area of public administration and civil servants in general.

The results show - in terms of the type of training provided by companies - that training of business and sales skills prevails, but this is obviously related to the types of companies surveyed. In the second place there is language education, which is the most widespread and the most common type of company training in the Czech Republic. The results have shown that in general the most widespread type of education in the Czech Republic are language courses. Here, compliance with the surveyed students' answers has been observed: the basic forms of their studies are seminars and lectures, either inside or outside the company. Companies usually provide training according to their employees' needs, or otherwise regularly according to the needs of the company. Company training is mainly provided to middle management, blue-collar workers are often neglected in this aspect. Picture from Eurostat survey shows that in 2005 nearly 24% of companies did not invest in training their staff. In 2010, this percentage was significantly reduced, as shown in Figure 4.

Another part of the survey was aimed at examining the effectiveness of company training from the perspective of the companies themselves. The companies were asked about the amount they spent on education, and whether they themselves were able to assess the effectiveness of this investment. The results are detailed in the following figures.



Source: Own

Fig. 4: *Average cost of education per employee in CZK in 2010*

Only one company confirmed that it uses elaborate method, when present value of future costs equals the present value of future income from the investment in education (blue color in Figure 5. Two of questioned companies use shortened method, when we divide average earnings at some level by the time of education (pink colour in Figure 5), one company uses the function of income using the regression coefficients, where we calculate the rate of return

and most companies use rough estimates or return is not calculated at all. None of companies listed another method.

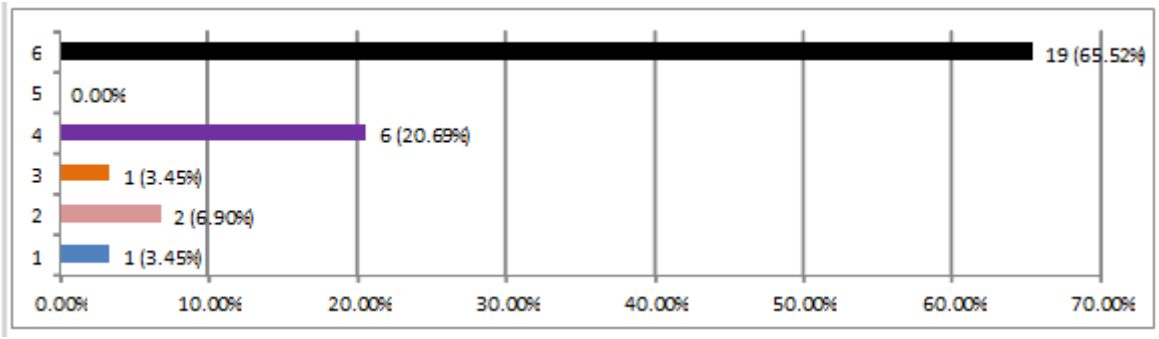


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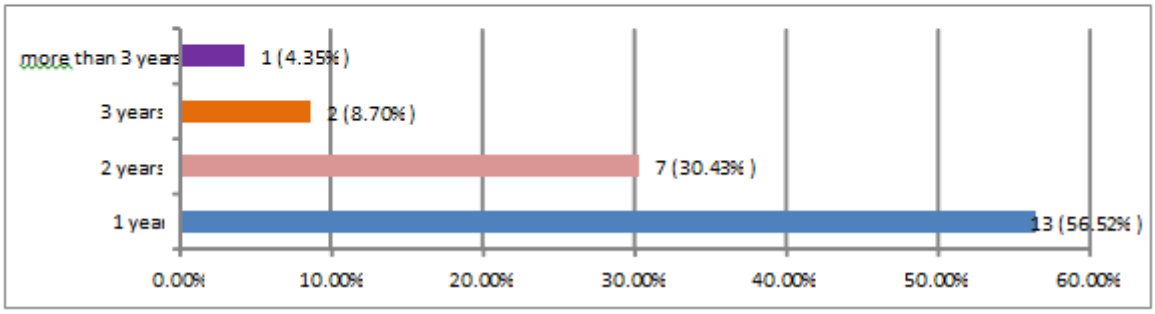
Fig. 5: *Method for calculating cost returns*

Here it is seen that most of the companies do not calculate return on the cost of training their employees. Another part of the companies only roughly estimated the return. Only about 14% of companies use one of the more sophisticated methods for calculating return on investment.

Figure 6 shows how fast expect companies return of their investment in training of employees.

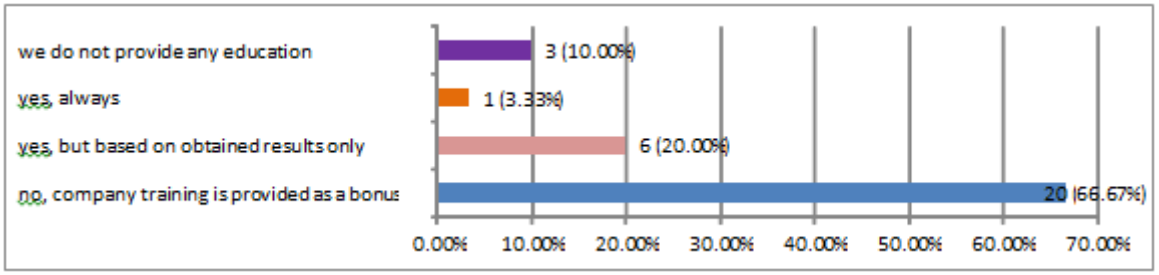
Answer	Answers	Podíl
1 year	13	56.52%
2 years	7	30.43%
3 years	2	8.70%
more than 3 years	1	4.35%



Source: Own

Fig. 6: *Expected payback period of staff costs*

It can be concluded from Figure 6 that the majority of companies expect a return on resources invested in education within one year. It is based on the companies' presumptions; nevertheless, further calculation would show that the return is not nearly as this short. Otherwise, the investment in training their own staff would seem to be very convenient and highly profitable for the company. However, it is far from simple to derive the return, especially when taking into consideration the results of the previous query, where about 60% of the companies stated not to expect the return of the investment at all.



Source: Own

Fig. 7: *Expected payback period of staff costs*

It can be observed from Figure 7 that most companies provide training to workers as one of the benefits and as one of the ways to motivate employees, rather than as a means to increase performance and efficiency of the company.

The last set of questions in the questionnaire summarizes the cost side of company training. The cost per employee per year shall not exceed the amount of CZK 100,000. In 2010, 10% of the surveyed companies did not provide company training, which is a significant decline in comparison with 2005 (in 2005 23% of the surveyed companies did not provide company training). The analysis shows that companies do not calculate the return of investment in company training; most of the companies only roughly estimate a kind of return. However, most of them expect return within one year. Companies consider company training as a benefit or motivation for their employees. This survey shows that companies do not consider company training as a means to increase their company´s performance and efficiency.

Conclusion

The paper is focused on the area of company training and the issue of detecting efficiency of investment in company training. As the data from Eurostat and the primary data collected among firms and individuals in the Czech Republic show, company training is significant for both companies and individuals, even though the amount of investment depends on a number of factors, such as a company size or branch and also external factors, such as economic situation of a state.

An analysis of the responses to company training shows that there are still a large percentage of companies that do not invest in human capital and do not provide their employees with company training. Beyond the legislative requirements, mainly language courses are provided, up to almost 40%. In addition, most companies provide IT, communication and presentation skills, business and sales skills training. The most commonly used forms of training are seminars and lectures, and nowadays so popular workshops. In most cases, companies do not have an elaborate system of training their staff members would attend, but most provide company training according to the needs of their employees. At the same time, almost 70% of respondents (working part-time students) assessed very positively the benefits of company training and would welcome any form of more intensive company training. The respondents themselves use their own resources to spend on education and acquisition of skills related to their profession, even in addition to university studies. However according to other studies the amount invested in the Czech Republic is much lower than in other European countries. This analysis of the lack of provision of company training has been confirmed by Eurostat surveys, where a decrease in the investment in company training has been monitored in the Czech Republic, while in other EU countries there is rather an upward trend.

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EFEKTIVITA FIREMNÍHO VZDĚLÁVÁNÍ NA PŘÍKLADU FIREM V ČESKÉ REPUBLICE

Firemní vzdělávání je důležitou součástí péče o zaměstnance, je chápáno jako zaměstnanecká výhoda a zároveň je důležitým faktorem, který ovlivňuje úspěšnost firmy. Mít vzdělané zaměstnance, kteří svoje znalosti a dovednosti využívají při své práci, je zároveň významnou konkurenční výhodou. Výzkumy ukazují, že investice do lidského kapitálu jsou výnosné, a to nejen v podmínkách formálního vzdělávání, ale i v případě vzdělávání ve firemním prostředí (training). Příspěvek se zaměřuje ve své první části na problematiku firemního vzdělávání z pohledu odborných publikací, a to především v souvislosti s efektivitou investic do firemního vzdělávání a otázkou jejich měření. Druhá část příspěvku pak zkoumá na primárních datech sebraných mezi respondenty z řad jednotlivců i firem v České republice v roce 2013 to, jak české firmy své zaměstnance vzdělávají a jak řeší otázku hodnocení těchto investic.

DIE EFFIZIENZ DER AUSBILDUNG IN FIRMEN - AM BEISPIEL DER FIRMEN IN DER TSCHECHISCHEN REPUBLIK

Die Aus- und Fortbildung in der Firma ist ein wichtiger Bestandteil der Betreuung der Angestellten. Sie ist ein Vorteil für die Angestellten und zugleich ein wichtiger Faktor, welcher den Erfolgsgrad der Firma beeinflusst. Gut ausgebildete Angestellte zu haben, welche ihre Kenntnisse und Fertigkeiten in ihre Arbeit einbringen, stellt zudem einen bedeutenden Konkurrenzvorteil dar. Umfragen haben ergeben, dass Investitionen in Menschenkapital sich als ertragreich erweisen, und das nicht nur unter Bedingungen der formalen Ausbildung, sondern auch im Falle der Aus- und Fortbildung innerhalb der Firma. Dieser Beitrag konzentriert sich in seinem ersten Teil auf die Problematik der firmeninternen Aus- und Fortbildung aus der Sicht von Fachpublikationen zu diesem Thema, und zwar vor allem in Zusammenhang mit der Effektivität von Investitionen in die firmeninterne Aus- und Fortbildung und mit der Frage, wie sich dies messen lässt. Der zweite Teil des Beitrags untersucht an Hand primärer Daten, die aus der im Jahre 2013 durchgeführten Befragung von Einzelpersonen und Firmen in der Tschechischen Republik hervorgehen, wie tschechische Firmen ihre Angestellten aus- und fortbilden und wie die Frage nach der Bewertung dieser Investitionen zu lösen ist.

EFEKTYWNOŚĆ KSZTAŁCENIA W FIRMIE NA PRZYKŁADZIE FIRM W REPUBLICE CZESKIEJ

Edukacja w firmie stanowi ważny element troski o pracowników. Traktowana jest jako przywilej pracowniczy a zarazem ważny czynnik wpływający na sukces przedsiębiorstwa. Posiadanie wykształconych pracowników, którzy swoją wiedzę i umiejętności wykorzystują w swojej pracy, stanowi zarazem ważną przewagę konkurencyjną. Badania pokazują, że inwestycje w kapitał ludzki są korzystne nie tylko w warunkach formalnego kształcenia, ale także w przypadku form kształcenia w przedsiębiorstwach (training). Pierwsza część artykułu poświęcona jest zagadnieniu kształcenia w przedsiębiorstwie z punktu widzenia literatury fachowej, przede wszystkim w związku z efektywnością inwestycji w ten rodzaj kształcenia oraz kwestii ich pomiaru. W drugiej części artykułu w oparciu o dane zgromadzone wśród respondentów z grona osób indywidualnych i firm w Republice Czeskiej w 2013 roku zbadano, w jaki sposób czeskie przedsiębiorstwa kształcą swoich pracowników i jak dokonują oceny tych inwestycji.

VERIFICATION OF THE USEFULNESS IN IMPLEMENTING DISCRIMINANT ANALYSIS MODELS IN THE ASSESSMENT OF POTENTIALLY BANKRUPT BUSINESSES IN THE WHOLESALE TRADE SECTOR WITHIN THE CONSTRUCTION INDUSTRY

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Abstract

The making of a proper financial assessment of a company may help in the protection of its interests and often prevent it from going bankrupt. If a company's bad financial situation is recognized early enough then the company can still be saved if the right decisions are made. The purpose of this article is to answer the question whether and to what extent the classical multivariate discriminant analysis model predicts the possibility of bankruptcy of companies in the wholesale construction industry, which in the recent years have been having problems due to payment gridlocks. The analysis shows that the bankruptcy models can only be used as a component within a more in-depth analysis, and not as the sole means of evaluating companies.

Introduction

The purpose of this article is to answer whether and to what extent the multivariate discriminant analysis models can predict the risk of bankruptcy of companies in the wholesale construction industry.

Seven multivariate discriminant analysis models were used to conduct an analytical assessment of the possible risk of business failure: D. Hadasik Model (1), A. Hołdy Model (2), the "Poznański"Model (3), D. Appenzeller and K. Szarzec Model (4), B. Prusaka Model (5), D. Wierzby Model (6) and the Z. Altman Model (7). The research group is comprised of ten businesses which were randomly chosen. These businesses belong to the same purchasing groups; they get similar prices for the purchase of goods which largely affects the profit made by their companies. The analysis covers the years of 2005-2011. The research period includes the years of solid economic growth, which was greatly influenced by EU funds, and the beginning of the great financial crisis which was strongly felt throughout the entire construction industry. The source of the data used in the financial analysis are financial statements which were provided directly by the selected companies and published in the Polish Monitor B, as well as business reports from the Euler Hermes and Cofface companies. The names of all the selected companies were replaced with the consecutive letters of the alphabet from A to J.

1 The nature and the leading causes of business failures

The problematic issue of corporate bankruptcy is a process intrinsically connected to the functioning of the market economy. According to economic theories, business failures are often associated with the spontaneous cleansing of the economy from weak business entities. Joseph A. Schumpeter called this process "creative destruction" [12, p. 82-84]. It is caused by the fact that certain companies badly utilize their assets and potential which consequently brings about their downfall while creating room for better organized and newly established businesses.

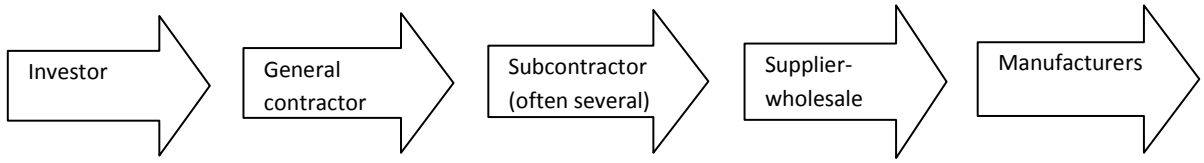
Bankruptcy can be examined from three standpoints: economic, legal and psychological [2, p. 29]. From the economic point of view, bankruptcy means that the company is not able to meet its own liabilities which, without receiving any additional funding, will lead to the loss of its payment capacity. The formal and legal aspect of bankruptcy is understood as an administrative decision made by the court, according to which the bankruptcy is declared by the debtor to be insolvent. Above-mentioned aspect is related to specific procedures which are stated in the Act of February 28, 2003 "The Bankruptcy and Reorganisation Law" [13]. The least mentioned aspect concerning bankruptcy is the psychological aspect. It is presented as the conscious decision made by the debtor or creditor to file bankruptcy and initiate proceedings (the impulse principle process) [2, p. 29]. More and more often, however, attention is being drawn to the deeper significance of this aspect. All kinds of psychological consequences are ascribed to it affect not only the participants in the proceedings, but also other people (eg, depression, divorce, temporary or lasting social exclusion, and even suicidal tendencies) [14].

The bankruptcy of a business entity is most commonly caused by various factors which act upon the company at the same time. Such factors are divided into two main groups [8, p 52]:

- internal factors which are mainly associated with management failure, erroneous financial policies and excessive risk-taking,
- external factors that influence the company but are not caused by its conduct. These include: interest rates, economic conditions, changes in law and fashion, and globalization.

The data published by Euler Hermes shows that the total number of declared bankruptcies in Poland has increased in the last five years more than twice (from 420 bankruptcies in 2008 to 926 in 2013). The largest number of bankruptcies are ascribed to the construction industry which includes wholesale trade companies which are the subject of this research. The number of bankruptcies in this sector represents almost 30% of court declared bankruptcies [11]. Within this sector, the causes of bankruptcy are greatly influenced by external factors, such as high prices in real estate markets, changes in mortgage loans, intentional lowering of the price-value of contracts, and delays in payments made by investors [6]. All of these factors create payment gridlocks which progressively have a negative impact on suppliers and subcontractors causing serious delays in payment, and also often lead to insolvency.

As can be seen by the following simplified cash-flow diagram, construction wholesalers are the intermediary-link between the contractors and the producers of building materials, in which payment issues are often accumulated.



Source: Own elaboration

Fig. 1: *A simplified cash-flow chain in the construction industry*

The amount of money given by the investor to the general contractor decreases due to various expenses, and in the case of an undervalued estimate, there may be no funds to pay the wholesalers for the building materials. That is why manufacturers must often analyze potential wholesale clients so as to avoid bearing the costs associated with insolvency.

Commercial credits are granted in the same way as bank credits. Companies who wish to provide commercial credit must carry out an analysis of the credit risk of contractors in order

to make a selection of solvent entities, which in the future would be able to fulfill their commercial agreement and settle liabilities there. For this purpose, financial analysis indicators and "bankruptcy" models are used.

2 Attributes of the selected discriminant analysis models

Seven models, including six Polish ones, were selected to verify the usefulness of discriminant analysis models in assessing the insolvency of wholesalers. Please note that these models are solely based on the financial data which was presented by each company according to their own accounting rules. This means that similar business transactions may be presented differently on the financial statements which may make it difficult to compare results. However, since the available data makes it possible to use the models, they can form the basis for the financial analysis which may be used by contractors. In the empirical research, the selected companies were assessed by using the following discriminant analysis models:

- **D. Hadasik Model** [3, p.72-78,157-158]

$$Z_{HA} = 0.365425\ X_1 - 0.765526X_2 - 2.40435X_3 + 1.59079X_4 + 0.0023025X_5 - 0.0127826X_6 + 2.36261 \quad (1)$$

where

X_1 – current assets / current liabilities;
X_2 – (current assets - inventory) / current liabilities;
X_3 – liabilities / total assets;
X_4 – (current assets - short-term liabilities) / total liabilities;
X_5 – short-term receivables * 365 / net revenues from sale;
X_6 – inventory * 365 / net revenues from sale.

The company is considered to be threatened if the value is below the threshold of – 0,374345.

- **Hołdy Model** [5, p.307]

$$Z_H = 0.605 + 0.681X_1 - 0.0196X_2 + 0.157X_3 + 0.00969X_4 + 0.000672X_5 \quad (2)$$

where

X_1 – current assets / short-term liabilities;
X_2 – (total liabilities / total balance) * 100;
X_3 – total activity revenues / total assets average;
X_4 - (net profit [loss] / total annual assets) * 100;
X_5 – (annual short-term liabilities / value of goods and materials sold)*360.

The value Z_H below the threshold of –0.3 means high probability, Z_H in the range of <– 0.3, + 0.1> means undefined probability, and the value of Z_H above +0.1 means small probability of bankruptcy.

- **The "Poznański" Model** [4, p.38]

$$Z_{HCP} = 3.562X_1 + 1.588X_2 + 4.288X_3 + 6.719X_4 - 2.368 \quad (3)$$

where

X_1 – net profit / total assets;
X_2 – (current assets – inventory) / short-term liabilities;
X_3 – fixed capital / total assets;
X_4 – profit [loss] of sales / net revenues from sales.

The company is considered to be threatened if the value is below the threshold of 0.

- **D. Appenzeller and K. Szarzec Model** [7, p.108-109]

$$Z = 0.819X_1 + 2.567X_2 – 0.005X_3 – 0.0095X_4 + 0.0006X_5 – 0.556 \quad (4)$$

where

X_1 – current assets / short-term liabilities;
X_2 – profit [loss] on operating activities / net revenues from sales;
X_3 – (average inventory / net revenues from sales) * number of days;
X_4 – liabilities and provisions for liabilities / (profit [loss] on operating activities + amortisation and depreciation) * (12 / accounting period)
X_5 – turnover of due payments + turnover of inventory (on days)

The company is considered to be threatened if the value is below the threshold of 0.

- **B. Prusak Model** [10, p.23]

$$Z = 1.438X_1 + 0.188X_2 + 5.023X_3 – 1.871 \quad (5)$$

where

X_1 – (net profit [loss] + amortisation and depreciation) / total liabilities;
X_2 – operating expenses / short-term liabilities;
X_3 – profit [loss] on sales / total balance.

The company is considered to be threatened if the value Z is below the threshold of –0.295, the company is not threatened if Z > –0.295. The value of Z in the range of <–0.7, 0.2> means "gray area", which was introduced in order to better fit the model and reduce the number of wrongly classified observations.

- **D. Wierzba Model** [7, p.109-110]

$$Z = 3.26X_1 + 2.16X_2 + 0.3X_3 + 0.69X_4 \quad (6)$$

where:

X_1 – (profit [loss] on operating activities – amortisation and depreciation) / total assets;
X_2 – (profit [loss] on operating activities – amortisation and depreciation) / total sales;
X_3 – current assets / liabilities;
X_4 – working capital / total assets.

The company is considered to be threatened if the value is below the threshold of 0. Companies that have a good financial situation have a high Z value.

- **Z-Score Altman Model** (for companies trading outside of public circulation) [1, p. 237]

$$Z = 0.717X_1 + 0.847X_2 + 3.107X_3 + 0.420X_4 + 0.998X_5 \quad (7)$$

where

X_1 – net working capital / total assets;
X_2 – net profit / total assets;
X_3 – EBIT / total assets;
X_4 – accounting value of share capital / total capital value;
X_5 – turnover / total assets

The index value Z > 2.9 – safe area, Z in the range of <1.23; 2.9> – indefinite area, Z < 1,23 – area of financial difficulties.

3 Results of the empirical research

The verification of the effectiveness of the selected discriminant analysis models in predicting the risk of bankruptcies in the chosen businesses has showed significant differences between the models. Results of the respective companies are presented in Table 1. Indications of the poor financial conditions of the threatened companies are marked in dark-gray and named as "Bankrupt". Companies not at risk of bankruptcy are marked as "Healthy" without any highlighting color, and the companies that are "undefined" by the Z-Score Altman (7) Model and the companies located in the "gray zone" according to the B. Prusak (5) Model are marked in light-gray and named as "Gray Zone".

Tab. 1: *A collective list of models that predict the risk of bankruptcies of researched businesses in the years of 2005-2011.*

Business "A"								
		2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
1	**Model D. Hadasik**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
2	**Model A. Hołdy**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
3	**Model "poznański"**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
4	**Model D. Appenzeller i K. Szarzec**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
5	**Model B. Prusaka**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Gray Zone
6	**Model D. Wierzby**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
7	**Model Z Altmana**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
Business "B"								
		2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
1	**Model D. Hadasik**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
2	**Model A. Hołdy**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
3	**Model "poznański"**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
4	**Model D. Appenzeller i K. Szarzec**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
5	**Model B. Prusaka**	Gray Zone	Gray Zone	Bankrupt	Gray Zone	Gray Zone	Bankrupt	Bankrupt
6	**Model D. Wierzby**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
7	**Model Z Altmana**	Gray Zone	Gray Zone	Bankrupt	Healthy	Healthy	Gray Zone	Gray Zone
Business "C"								
		2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
1	**Model D. Hadasik**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
2	**Model A. Hołdy**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
3	**Model "poznański"**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
4	**Model D. Appenzeller i K. Szarzec**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
5	**Model B. Prusaka**	Gray Zone	Gray Zone	Healthy	Healthy	Healthy	Gray Zone	Gray Zone
6	**Model D. Wierzby**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
7	**Model Z Altmana**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
Business "D"								
		2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
1	**Model D. Hadasik**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
2	**Model A. Hołdy**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
3	**Model "poznański"**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
4	**Model D. Appenzeller i K. Szarzec**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
5	**Model B. Prusaka**	Gray Zone	Gray Zone	Gray Zone	Gray Zone	Gray Zone	Gray Zone	Healthy
6	**Model D. Wierzby**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
7	**Model Z Altmana**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
Business "E"								
		2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
1	**Model D. Hadasik**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
2	**Model A. Hołdy**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
3	**Model "poznański"**	Healthy	Healthy	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Healthy

4	**Model D. Appenzeller i K. Szarzec**	Healthy	Healthy	Healthy	Bankrupt	Bankrupt	Healthy	Healthy
5	**Model B. Prusaka**	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Bankrupt
6	**Model D. Wierzby**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
7	**Model Z Altmana**	Gray Zone	Gray Zone	Healthy	Gray Zone	Gray Zone	Healthy	Healthy
Business "F"								
		2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
1	**Model D. Hadasik**	Healthy	Healthy	Healthy	Healthy	No Data	No Data	No Data
2	**Model A. Hołdy**	Healthy	Healthy	Healthy	Healthy	No Data	No Data	No Data
3	**Model "poznański"**	Healthy	Healthy	Healthy	Healthy	No Data	No Data	No Data
4	**Model D. Appenzeller i K. Szarzec**	Healthy	Healthy	Healthy	Healthy	No Data	No Data	No Data
5	**Model B. Prusaka**	Healthy	Gray Zone	Gray Zone	Gray Zone	No Data	No Data	No Data
6	**Model D. Wierzby**	Healthy	Healthy	Healthy	Healthy	No Data	No Data	No Data
7	**Model Z Altmana**	Healthy	Healthy	Healthy	Healthy	No Data	No Data	No Data
Business "G"								
		2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
1	**Model D. Hadasik**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
2	**Model A. Hołdy**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
3	**Model "poznański"**	Bankrupt	Bankrupt	Bankrupt	Healthy	Healthy	Healthy	Bankrupt
4	**Model D. Appenzeller i K. Szarzec**	Bankrupt	Bankrupt	Healthy	Healthy	Healthy	Healthy	Bankrupt
5	**Model B. Prusaka**	Gray Zone	Gray Zone	Gray Zone	Gray Zone	Gray Zone	Bankrupt	Gray Zone
6	**Model D. Wierzby**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
7	**Model Z Altmana**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
Business "H"								
		2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
1	**Model D. Hadasik**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
2	**Model A. Hołdy**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
3	**Model "poznański"**	Healthy	Healthy	Healthy	Healthy	Healthy	Bankrupt	Bankrupt
4	**Model D. Appenzeller i K. Szarzec**	Healthy	Healthy	Healthy	Healthy	Healthy	Bankrupt	Healthy
5	**Model B. Prusaka**	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Bankrupt
6	**Model D. Wierzby**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
7	**Model Z Altmana**	Gray Zone	Gray Zone	Gray Zone	Gray Zone	Gray Zone	Gray Zone	Gray Zone
Business "I"								
		2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
1	**Model D. Hadasik**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
2	**Model A. Hołdy**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
3	**Model "poznański"**	Healthy	Healthy	Healthy	Healthy	Bankrupt	Bankrupt	Bankrupt
4	**Model D. Appenzeller i K. Szarzec**	Healthy	Healthy	Healthy	Healthy	Bankrupt	Bankrupt	Bankrupt
5	**Model B. Prusaka**	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Bankrupt
6	**Model D. Wierzby**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
7	**Model Z Altmana**	Gray Zone	Gray Zone	Gray Zone	Gray Zone	Gray Zone	Gray Zone	Gray Zone
Business "J"								
		2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
1	**Model D. Hadasik**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
2	**Model A. Hołdy**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
3	**Model "poznański"**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
4	**Model D. Appenzeller i K. Szarzec**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
5	**Model B. Prusaka**	Healthy	Healthy	Healthy	Healthy	Healthy	Gray Zone	Gray Zone
6	**Model D. Wierzby**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
7	**Model Z Altmana**	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy

Source: Own elaboration

The obtained results allow us to categorize the analyzed companies into two groups. The first group consists of companies whose bankruptcy risk has been identified by only one model – the Model B. Prusak (5) and only in the "gray area". This means that these companies are in

good financial condition and may be considered reliable business partners in the future. This group includes the companies A, C, D, F, J. All these companies within the analyzed period were characterized by a constant or rising increase in revenue and profit. There was also a dynamic increase in the value of assets, which may indicate that the companies' profit earned in the previous years was used in the reinvestment of their development. Even though the financial statements confirm the validity of the assessments made, we should remember to take all results with a grain of salt and make further and more precise analyses.

The negative indication of the B. Prusak Model (5) in the first group of companies may be due to the fact that the model is one of the newer models used for discriminant analysis. In addition, when this model was under development it achieved a very high percentage of effectiveness on both the learning and test sample (from 88.46% to 97.40%), which may indicate an appropriate selection of variables, and thus a high accuracy of results.

The second group are companies B, E, G, H, I. Their bad financial situation was repeatedly indicated by several models. In this group, the poor conditions of the analyzed companies were identified by the B. Prusak Model (5), the "Poznański" Model (3), D. Appenzeller and K. Szarzec Model (4) and Z-Score Altman Model (7). It should be noted that there is a great similarity between the evaluations of the B. Prusak (5) and Altman Z-Score Model (7). Companies identified as entities with a high risk of bankruptcy by the Model B. Prusak (5) are also found in the "undefined area" within the Z-Score model.

The bad financial situation of business entities from the second group is also confirmed by their published financial statements. Despite the frequent increase in the volume of sales during the research period, these companies recorded a negative financial result. The amount of accumulated debt was also at a critical level; it usually exceeded the safe debt level, reaching 93% in some cases (total liabilities / total assets). What is worrying is the cycle of debt repayment which exceeds 170 days past deadline in the most extreme of cases, but is normally maintained at 130 days; compared to others companies within the industry. The average is 60 days.

The results of this group should be considered and carefully checked. These assessments were accurate in proving the bankruptcy risk by the fact that business H declared bankruptcy in June 2013, and the other four were confirmed to have bad financial situations by economic reports. Businesses E and G have undergone restructuring and proposed a wider product range. Because of its bad financial situation, a few major suppliers stopped providing Business I with the option of buying goods by deferred payment. In addition, in the fall of 2013 the Euler Hermes company stopped providing credit limits to the company, which in subsequent periods may further exacerbate its financial problems since suppliers may be reluctant in providing deferred payment sales to an uninsured business entity.

Among the selected models, there were also models which results never pointed out the poor financial conditions of any of the researched companies. Models which belong to this group are: D. Hadasik Model (1), A. Hołda Model (2) and D. Wierzba Model (6). These models were created in the 90's during the time when Polish businesses were undergoing a radical economic transformation. The fact that these models did not indicate any threats has proven that they give erroneous results and are inappropriate for use in the modern market economy.

Conclusion

As the research analysis shows, not all discriminant analysis models provide the same results when it comes to the prediction of business bankruptcy. This may be because of the fact that bankruptcies are decisively influenced by external factors which are not taken into account in these models. Additionally, there were only seven models selected from a list of dozens of other models which would make it inappropriate to generalize the results. The precision of the verification may also be determined by the fact that some models were created based on research conducted in the years of 1990-2004, which would prove some models to be incompatible with the current economic reality.

The analysis shows that the bankruptcy models can only be used as an element of a broader analysis (eg, ratio analysis, legal analysis, economic intelligence), and not as the only indicator. The models provide a good foundation for the assessment of the financial condition based on the availability of data and ease of use. Every business should carry out a discriminant analysis in order to better choose the actions which would best suit its needs.

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PROVĚŘENÍ POUŽITELNOSTI MODELŮ DISKRIMINAČNÍ ANALÝZY K HODNOCENÍ RIZIKA ÚPADKU VELKOOBCHODNÍCH PODNIKŮ VE STAVEBNÍM ODVĚTVÍ

Správné posouzení finanční situace obchodních partnerů dává možnost zajistit zájmy podniku a často i předejít jeho úpadku. Včas zjištěné známky poukazující na špatné finanční zdraví obchodních partnerů a včasné učinění správných rozhodnutí může předejít finančním problémům společnosti. Tento příspěvek si klade za cíl najít odpověď na otázku, zda a v jaké míře klasické vícerozměrné modely diskriminační analýzy poukazují na riziko úpadku velkoobchodních podniků z oboru stavebnictví, které má v poslední době velké problémy způsobené řetězovou platební neschopností. Ze zpracované analýzy vyplývá, že použité modely lze aplikovat pouze jako jednu ze součástí širší analýzy zkoumaných podniků, nikoliv jako jediný ukazatel hodnocení obchodních partnerů.

VERIFIZIERUNG DER NÜTZLICHKEIT DER ANWENDUNG VON MODELLEN DER DISKRIMINANZANALYSE FÜR DIE BEWERTUNG DER INSOLVENZGEFAHR VON UNTERNEHMEN AUS DEM BEREICH DES GROßHANDELS IN DER BAUBRANCHE

Die richtige Beurteilung der Finanzlage der Zulieferer ermöglicht es, die Interessen des Unternehmens abzusichern und sogar oft vor einer Insolvenz zu schützen. Rechtzeitig wahrgenommene Anzeichen schlechter Finanzkonditionen der Kontrahenten sowie eine entsprechende Entscheidungsfindung können finanzielle Probleme des Unternehmens verhindern. Dieser Artikel soll die Frage beantworten, ob und in welchem Umfang die klassischen mehrdimensionalen Modelle der Diskriminanzanalyse die Insolvenzgefahr der Unternehmen aus dem Bereich des Großhandels in der Baubranche erkennen können, da diese Branche sich in der letzten Zeit durch enorme Probleme, die aufgrund von Zahlungsstockungen entstehen, auszeichnet. Die Analyse zeigt, dass Insolvenzmodelle nur als ein Bestandteil einer umfassenden Unternehmensanalyse eingesetzt werden können und nicht als einziger Bewertungsmaßstab der Kontrahenten dienen sollten.

WERYFIKACJA PRZYDATNOŚCI ZASTOSOWANIA MODELI ANALIZY DYSKRYMINACYJNEJ DO OCENY ZAGROŻENIA UPADŁOŚCI PRZEDSIĘBIORSTW Z SEKTORA HANDLU HURTOWEGO W BRANŻY BUDOWLANEJ

Właściwa ocena sytuacji finansowej kooperantów pozwala zabezpieczyć interesy firmy a często nawet zapobiec jej upadłości. Odpowiednio wcześnie dostrzeżone sygnały o złej kondycji finansowej kontrahentów i podjęcie na czas właściwych decyzji może zapobiec problemom finansowym przedsiębiorstwa. Celem artykułu jest odpowiedź na pytanie, czy i w jakim stopniu klasyczne wielowymiarowe modele analizy dyskryminacyjnej sygnalizują o zagrożeniu upadłości przedsiębiorstw z sektora handlu hurtowego branży budowlanej, która w ostatnim okresie ma bardzo duże problemy wynikające z zatorów płatniczych. Dokonana analiza pokazuje, że modele upadłościowe mogą być wykorzystywane jedynie jako jeden ze składników szerszej analizy badanych przedsiębiorstw, a nie jako jedyny miernik oceny kontrahentów.

Miscellanea

A CITY'S E-IMAGE ON THE BASIS OF SELECTED NEISSE EUROREGION CITIES

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Abstract

In the presented article the author refers to the dynamically developing modern information and communications technologies and their application by local authorities in order to improve and create their proper image. The purpose of the article is to define the term e-image of cities and also to introduce the premises, methods and benefits resulting from the use of the Internet regarding the term's construction. The accomplishment of the above mentioned aim is supported by the analysis of the e-image of selected Neisse Euroregion cities.

Introduction

At the moment, we witness a dynamic development of modern information and communications technologies in the world. The Internet has become the tool of everyday use for most of the Poles, and also one of the basic access tools to information and communication both in private and business life.

Access to the Internet and its use is common among the European Union member countries (EU 28). 79% of households have access to the Internet and 76 % have access to the broadband Internet[1]. 62% use the web regularly, every day or almost every day, and 10% declare they use it once a week. Referring to the use of the Internet in order to communicate with the government (*e-government*), 41% of the EU population declared benefiting from the Internet while interacting with public authorities[2] [26].

Owing to modern technology development, we are capable to benefit not only from the stationary Internet at work and at home, but also when being on the move.

The Internet has huge potential in developing the image of administrative units and subjects, including self-government units like voivodships, districts, municipalities and cities. Among its benefits, there are: omnipresent character, easy access, low costs [29, p. 56 in: 28, 42], and also effectiveness in reaching the target group, 24 hour accessibility, speed, and prestige of exploitation [3, pp. 115-116].

The Internet for the purposes of *public relations* activities is commonly used not only by business entities. Competition between cities and regions forces local authorities to look for the new solutions, which the Internet definitely offers.

In this article the author presents some premises regarding the use of the Internet in order to create the image of cities. Theoretical issues connected with defining the e-image and benefits resulting from it are also discussed. The theoretical analysis of social media is conducted and threats resulting from this media usage are emphasized. An analysis of the e-image of the selected Neisse Euroregion cities supports the accomplishment of the above mentioned aim.

[1] In 2007 55% and 42% respectively.
[2] Where 44% to fill in tax applications, ID applications (20%), social benefits (16%), recruitment process for higher education (9%).

1 The nature of city image

While defining the e-image concept one has to pay attention to each part of its definition. Therefore, letter "e" refers to electronic media like television, radio, the Internet. Following M. Łebkowski, one can list the following definitions: e-business, e-book, e-learning, e-service which are directly connected to the activities provided by the Internet [16, p. 14]. Analogically, in this article the author refers to e-image as a city's image created by the Internet.

The word image constitutes the second component of the discussed term. In literature one can come across various definitions of the term "image". This issue is the subject of consideration of different scientific disciplines, among others psychology, sociology, economics, marketing and management. The interdisciplinary character of this term provides not only for the deep analysis of this category, but also broadens the application area of concepts or solutions dedicated to it (in the context of self-governmental units' functioning) [1, in print].

According to Altkorn, each object, person, phenomenon, if one only pays attention to them, obtains a certain kind of image [2, p. 9]. E. Nawrocka defines image as an element of awareness. In her opinion it is the modification effect of registered information, experiences, opinions about a certain object (e.g. cities) in man's mind [17, p. 22].

From M. Florek's point of view, an image of a territorial unit can be defined as the sum of beliefs, definitions, opinions, feelings and impressions assumed by its addresses. The author focuses on the subjective character of this concept. In her opinion, its definition results from the features of the area identified and put together according to the intended proposals, into a in line with the subjective unit's feelings concerning certain space [7, pp. 94-95].

Depending on the addressees (tourists, inhabitants, investors) of a city image one can list many components exerting impact on it. These are, among others, enterprises and organizations located in the area, the policy of authorities regarding investors, local community, the level of social capital, tourist attractiveness, location, life quality of residents, city's appearance (cleanliness), authorities' communication with the residents, city website, etc. A. Raszkowski points out that mass media also have a big influence, including informal information given by others. He defines the city's image as the sum of subjective pictures concerning the perceived realities [22, p. 336].

A city image construction should be a long-term process, preferably preceded by the analysis and the plan of a city's strategic development, which aim at distinguishing a city among other competitors. It is really significant because a positive image can result in measurable benefits for the city's authorities in the form of: investments, tourists, housing attractiveness; increased number of social initiatives; effective public relations, support in negotiations with the central level authorities; as a promotion tool [12, p. 9], attractive location for young people to live, learn or work on a certain area, etc. It proves the dependence between a city's image creation and accomplishment of the future strategic aims.

Public relations represent a crucial concept applied in order to build a positive city image, defined as any activity aimed at promoting and/or protecting the image [14, p. 546], maintaining an agreement between an organization and a community [25, p.153], creating a positive opinion, building trust, providing true information, educating community, as well as establishing a dialog with different groups functioning in the environment [4, p. 280; 5, p. 61].

Through adequate activities in terms of public relations cities benefit from a number of instruments, i.e. the Internet, publications and printed materials, audiovisual aids, contacts with the press, the so-called media relations: press conferences, interviews on TV and radio,

press information, participation in tourism fairs, the organization of events (also charity ones), sponsoring or lobbing [1, in print].

As M. Tabernacka has observed, they do not have any extensive influence on content, and she also claims that they should benefit from opportunities created by cyberspace [27, p. 299], in order to create an e-image – a proper and desired one by the addresses of the picture created by the Internet. The quoted author calls the Internet "the medium of significant possibilities which makes it possible to create an image with various groups benefiting from it, and also to save money" [16, p. 5].

The Internet can also cause many image threats for cities. Its strengths are massive, fast and they act globally. Due to the features of Internet sites, a citizen can comment on the content and also make it available to everybody owing to e.g. social networks. Therefore, the authorities responsible for a city image should be aware that in times of technological development there are no difficulties to make a recording during the session of a city council and make it available instantaneously to an open audience of one of the social portals.

Summing up the above presented discussion of a city image, and also bearing in mind the rising number of the Internet users worldwide, one should emphasize the need to use modern promotion tools by cities in order to create a positive image in the Internet, defined in this article as e-image. Simultaneously it seems crucial to get strongly engaged in the identification and elimination of the threats resulting from a city's e-image.

2 Website as the tool of creating a city image

A website is often the first form of contact with a city. Therefore, in in order to build positive associations, it is important for this website to be professionally created. Not only the content itself, but also artwork, logotype, easiness to use and access to social media should encourage users to visit it and keep in touch with a city.

In this article the analysis of selected city e-images in the Neisse Euroregion will be provided in its final part. At this point the author would like to focus on legal issues connected with the access to public information. The Neisse Euroregion functions at the point of contact of three countries – Germany, the Czech Republic and Poland. Each of these countries has an obligation to provide their citizens with public information[3] [9]. As a result cities create websites (in Poland also the Bulletin of Public Information) as a certain kind of auto-promotion and based on the obligation to offer information to the public.

Currently, one can come across the statement that, "if it is impossible to google you, you do not exist", it refers in particular to business entities. The Internet promotion tools, i.e. banners, pop-ups, sponsored articles, press information, sponsored boxes, presence in other websites, newsletters, mailing lists – lead Internet users to the prepared service.

In the process of preparing a city's website one should answer the following questions: what is its purpose and how can it be measured? The aims of Internet services offered by cities and the methods of their measurement and accomplishment are presented in Table 1.

[3] In Poland this legal article is regulated by article 61 of the RP Constitution and the Act on Access to Public Information, in Germany this legal article is regulated by the Code of Administrative Procedure and the Act on Access to Public Information, in The Czech Republic the Charter of Fundamental Rights and Freedoms constitutes the basis for public information.

Tab. 1: *The aims of cities' WWW services*

The aim of services	Measures of their accomplishment
Image creation	Opinions about service, research on self-government's image
Informing	Number of users on self-government's website, an average visit time
Tasks accomplishment	Number of filled in applications concerning certain matters
Relations building	Number of the users registered to e-bulletins, quantity of downloaded RSS channels and the number of returning visitors
The Internet users integration (building a society)	Number of people active on discussion forums, placed on a city website, number of active portal users.

Source: [15]

A city website should be useful – functional and ergonomic. As L. Konieczka writes, web usability is continuously researched, which results in conclusions determining the ways for building websites. According to this research, city Internet services should be built in accordance with a few principles [13, pp. 306-307]. Such sites should:

- build a city's identity (include a logo in the top left corner, a slogan),
- include "the main menu" (localized in the horizontal form on the top of the page) and a navigation menu (localized in the vertical form on the left side), the fewer menu elements on the main site the better; a menu should be intuitive and its thematic division should not disorient the user,
- inform about the most important events in tab "news", which should be systematically updated.

The professionally prepared service is fundamental for success. As a result one can "sell" the city's values to potential tourists. It also helps to get to important information and documentation of future investors, and also to carry out the city information policy.

A city's www sites should include elements which would improve its services' functionality, such as service browser, site map, highlighting links, highlighting headlines, appropriate font, adequate length and width, and also a postulate, to help the visitor find the searched information after maximum three clicks [13, p. 307].

A correctly built city website plays an important role in the communication with the recipients. WWW site is the city's own medium. The officials decide about its content. On the one hand, it gives them full control, but on the other it also brings the risk of failure [10, p. 22].

The absence of any plan or strategy in terms of public relations, results in an unskilled construction of the city Internet services, which can lead to information chaos and, at the same time, image crisis. The content and the appearance of such type of sites, in the author's opinion, constitutes the result of authorities and officials' vision, who – while preparing the template of the city's services – do not do what their addressees expect, but act in accordance with their own interests or competences and sometimes even personal business. According to the above mentioned facts, one has to remember that building a city's Internet service, one should act in accordance with the principle that, in creating e-image one should assess all taken activities from the perspective of its e-client [20].

While creating a city's website one should take care not only of the content itself, but also of its colour scheme, (in accordance with the Visual Identification System), navigation and proper technology [24, p. 123].

The aim of the city websites is widely understood as communication and building relationships with these users who benefit from it. The global character of the Internet results in the fact that website visitors can get online at any time, from almost any place in the world and the task of www services is to provide such contact.

3 Social media as the tool for creating a city's image

Technological progress caused that currently websites are not the only medium making the contact with a city possible. The Internet provides cities with new solutions and communication tools. One of them are social media which have entered and remain the permanent component of public relations in many European cities. Their usage can contribute to the positive perception of cities and regions.

In order to define the concept of social media one should, as in the case of e-image, take into account each of these elements separately. According to the Bible of Social Media, *social* refers to the needs which people have to communicate with others. *Media* refers to technology applied for the purposes of this communication (e.g. video recordings, text messages, graphics etc.) [23, p. 4].

Social media constitute an inseparable element of modern media. Social media are defined as the media of social interactions [18, p. 339]. It is also worth mentioning that media development would not be possible without the changes leading towards creating the Internet of the new generation, described as "Web 2.0"[4] [11, pp. 72-73].

Social portals constitute a certain kind of special, specific variants of websites, which aim at concentrating people interested in a particular issue within a certain site (e.g. a product, a service, a company, a city) and creating for them an uncomplicated information exchange. Intensified communication is the main feature of social media [21, p.7], which should establish and sustain a dialog among these surrounding groups which benefit from social media [19, p. 13].

The primary aim of social media is to provide its addressees with access to content and knowledge and secondly to offer its users entertainment which guarantees time spent in an enjoyable way. The attribute of social media is that they are exposed to polemic, dialog, discussion and also exchange of opinions [1, in print].

Taking advantage of social portals by self-governments resulted in effective communication between cities and their target groups (inhabitants, tourists, investors) who can be easily reached with the message addressed directly to them. Observing city Internet sites the author claims that many of them were successful in accomplishing their information policy as a result of such solutions. Unfortunately, there are still self-governments which are not capable of benefiting from such potential and even if they are, their contribution is perceived as an imposed one.

Among the most popular social portals taken advantage of by self-governments are the following ones: Facebook, Twitter, YouTube, LinkedIn etc. At present, the most popular and the most often used medium is Facebook, which at the end of March 2014 had 1.276 billion

[4] The most important idea of „Web 2.0"concept is to perceive the Internet as the platform combining not just the Internet sites or servers (technical approach), but also people (social approach). The main aim of Web 2.0 is maximizing the number of people connected through the Internet tools). [11, pp. 72-73].

users worldwide. Holland is the EU leader regarding this media usage (65% users). Among the discussed countries Poland with its 42% users holds the first place to be followed by Germany 34% and the Czech Republic 25% social media users [30].

Statistics confirm that it is worth investing time and effort in creating a city's image in the media. This fact is taken advantage of by enterprises in the EU. According to Eurostat data, around 30 % enterprises use social media and 73% declare their usefulness in company image construction and their product launching on the market [8].

Communication by means of social media became one of the most significant elements of public relations strategy applied by many cities. These self-governments which apply such services in a reasonable way along with city PR strategy create an image of administration involved in the cooperation with local community. However, the ones doing it only to "be present because the competition uses it", build the image of self-government neither systematically nor are they interested in cooperation with the community.

Therefore, the cities willing to create their positive image should not treat social media only for the purposes of opening their own account and making some trainee, who does not have appropriate knowledge or experience [6, p. 55] responsible for it. No ongoing presence, content monitoring, current events update and encouraging dialog will not contribute towards an appropriate image construction.

Building a city's image open for communication with the community requires a lot of work, which the author would like to emphasize. Work to be done, i.e. creating, maintaining and updating the city's image requires a lot of effort and time. People responsible for communication should know the character of social media and present such interpersonal skills as: the ability to maintain contact with people, rich vocabulary or the easiness of functioning within the world of the Internet [1, in print].

Moreover, one should remember that anybody using a website should be provided with an easy access by placing the list of available media on the main site of a city's Internet service[5].

On the basis of the above mentioned e-image definitions and also the Internet tools used for its construction, the author presents the analysis of selected e-image of Neisse Euroregion cities later in the article.

4 The analysis of e-images of Neisse Euroregion cities.

In order to evaluate the e-image of selected cities the author carried out an assessment of these Neisse Euroregion cities' websites in terms of their usefulness and accessibility for social media. The cities were randomly selected (the details are presented in Table 2).

The conducted analysis illustrated that out of 6 official Internet services of cities only 2 qualified as clear ones. Lower assessment of the remaining ones resulted from overdeveloped graphics, colour, uneven graphical buttons or too dark background, the lack of connection between the main navigation menu and the side ones, which gives the effect of information chaos overwhelming a visitor.

[5] A good solution is to use social media icons on the main site of the Town office and all its sub-sites.

Tab. 2: *The assessment of websites usefulness and social media accessibility in selected Neisse Euroregion cities (in 2014)*

The analyses tools for e-image creation			**Selected Neisse Euroregion cities**					
			Germany		**The Czech Republic**		**Poland**	
			Bautzen	Görlitz	Liberec	Jablonec	Jelenia Góra	Bolesławiec
www site	Main site transparency	Good	√	√				
		Medium			√	√	√	√
		Poor						
	Graphics		minimalistic	developed (but not overwhelming)	developed, (seemingly overwhelming at first sight)	developed, (but not overwhelming)	developed, (seemingly overwhelming at first sight)	developed, (too dark background colour, graphic blocks of different size make an impression of chaos)
	Visual Identification System		applied	applied	no logotype	applied	applied	applied
	Loading easiness		good	good	good	good	good	good
	Website mobile version		absent	√	absent	absent	absent	absent
	Service application Mobile		√	absent	absent	absent	absent	absent
	Information for press		√	√	√	absent	absent	absent
	Website's legend		√	absent	√	√	absent	absent
	RSS		absent	absent	√	√	absent	√
	Facilities for the disabled		absent	absent	absent	absent	absent	yes
	Newsletter		√	√	absent	absent	absent	absent
	Language versions	English	√	√	√	√	√	√
		German			German	√	√	√
		Other ones	Polish Serbian and Czech	Polish	Polish	Polish	Czech	many others
Social media on the main site	Facebook		√	√	absent	absent	√	absent
	Twitter		√	√	absent	absent	√	absent
	You Tube		√		absent	absent	√	absent
	Other ones							
Remarks			**1** Information for press in a visible place (left top corner) **2** Clear site division for particular addressees– investors, tourists and residents **3** Thematically gradated news "social affairs", "spare time", "economics", "culture", "education".	**4** Information for press hidden in the navigation bar **5** Clear site division for particular addressees -, investors, tourists and residents **6** Clear division of subpages **7** No links of social media on the main site. Shifting possible only after entering subpages.	**8** Foreign-language sites in construction **9** In the tab for work there is a "video gallery" but there is no channel on You Tube **10** On an official city profile there is information about the city tourist portal, which is unavailable. In actualities there is information about a profile on Facebook.	**11** Thematic discussion forums **12** Overdeveloped main menu, no navigation menu, making the impression of information chaos	• The site introduced a facility for the disabled in the form of a larger font, which enlarges the font only of the letters on the menu bar • In language versions the main menu is not translated	• The site offers the content for the disabled • The main navigation bar and the side one are not connected thematically • The statistics of the number of visits is available • Facebook is available on subpages of the service.

Source: Author's compilation

One should pay attention to the Internet site of Bautzen, which, as the only one covered by the analysis, has a mobile site application which can be downloaded on a mobile phone.

All the analysed sites help foreigners to access information, including the possibility of being redirected to a particular language version of the service. Taking into account the location of analysed cities (Neisse Euroregion) the Internet sites were translated into Polish, German, Czech and also English.

The Internet service of Bolesławiec, as the only one, offered active functions for the disabled, giving the possibility of text enlargement and audio. A similar function was also attempted on the Jelenia Góra site, but unfortunately the function of text enlargement was only possible in the form of enlarging the font of side navigation menu names.

The presented analysis illustrates that cities are increasingly aware of the existence and significance of the modern Internet communications tools, such as social media or newsletters, and they enable users to access their services with the help of the social media icons on the main site (50% of the analysed cities).

The positive element of this analysis is the conclusion saying that the researched cities are more aware of their needs and have higher skills in creating their city's identity owing to the application of visual identification system. The fact that the graphics of 5 out of 6 analysed services included city logotypes should also be appreciated.

Summing up the discussion on city's e-image and referring to the research results of selected Euroregion cities, one can assume that the Internet, as an image medium, is noticed and used. However, it is still not used to its full potential and not always properly. The author finds the biggest mistakes in its applications in the absence of connections between building the Internet services and the needs of an e-client, as well as the lack of verification in what way the www site and the social portal will be perceived from the perspective of the target group.

Conclusion

The dynamic development of modern information and communications technologies and also the increasing number of the Internet users worldwide constitute a chance for cities which owing to their application have an opportunity to undertake a number of activities, resulting in their position, strengthening and attracting attention to them. In order to achieve this purpose, cities should be open to new e-image creating using new tools which are definitely offered by cyberspace. The application of Internet public relations tools aiming at e-image construction should be a permanent part of cities' development and promotion strategy.

A website, just like other elements creating a positive city image e.g. professional customer service, participation in tourist fairs, the organization of events, information materials printing, cooperation with the media etc., should be assigned an equally important role, because it often remains the first contact with a city.

Professionally prepared www service is an excellent way for a city's self-promotion. One can approach all groups of addressees important for a city, e.g. tourists, investors and residents. If it is properly connected with the social media, it can contribute to a positive perception of a city, where information is provided on-line, using clear language, where an e-client and a dialog with him/her, as well as his/her involvement in the discussion are important.

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E-IMAGE MĚSTA NA PŘÍKLADU VYBRANÝCH MĚST EUROREGIONU NISA

Tento článek pojednává o dynamicky se rozvíjejících moderních informačních a komunikačních technologiích a jejich využití místními samosprávami ke zlepšování účinnosti opatření v oblasti komunikace se zainteresovanými subjekty (stakeholders) a k vytváření příslušného image. Cílem tohoto příspěvku je snaha definovat pojem e-image města a také uvést předpoklady, způsoby a přínosy využívání internetu k jeho budování. Pro dosažení tohoto cíle je použita analýza e-image vybraných měst Euroregionu Nisa.

E-IMAGE DER STADT AM BEISPIEL DER AUSGEWÄHLTEN STÄDTE DER EUROREGION NEISSE

In dem vorliegenden Artikel befasst sich die Autorin mit den sich dynamisch entwickelnden modernen IT-Kommunikationstechnologien und der Art und Weise, wie sie durch lokale Selbstverwaltungen benutzt werden. Sie befasst sich auch mit der Verwendung dieser Technologien zur Verbesserung der Kommunikation mit den Interessenten und zur Imageschöpfung. Das Ziel dieses Artikels ist ein Versuch den Begriff "E-Image der Stadt" zu definieren und die Voraussetzungen, Möglichkeiten und Vorteile der Internetanwendung zur Imageschöpfung der Stadt darzustellen. Die Analyse vom E-Image betrifft ausgewählte Städte der Euroregion Neisse.

E-WIZERUNEK MIASTA NA PRZYKŁADZIE WYBRANYCH MIAST EUROREGIONU NYSA

W niniejszym artykule autorka nawiązuje do dynamicznie rozwijających się nowoczesnych technologii informacyjno-komunikacyjnych i ich wykorzystania przez samorządy lokalne do poprawy skuteczności działań w zakresie komunikowania się z interesariuszami i kreowania odpowiedniego wizerunku. Celem artykułu jest zatem próba zdefiniowania pojęcia e-wizerunku miasta, a także przedstawienia przesłanek, sposobów i korzyści wykorzystania Internetu do jego budowania. Realizację wyżej wymienionego celu wspomaga analiza e-wizerunku wybranych miast Euroregionu Nysa.

THE IMPLEMENTATION CIRCUMSTANCES OF THE REVERSE MORTGAGE CREDIT, AN INNOVATORY PRODUCT FOR THE OLD AGE SECURITY IN POLAND

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Abstract

The article attempts to approximate the mechanism of action of innovative products intended to protect people in their old age. There was also identified a pension for life and a reverse mortgage credit, which based on the capital located in an estate, give property owners the opportunity to convert this "frozen" capital into real funds.

Currently, the Polish society needs innovative solutions to the improvement of domestic budgets. In view of the lengthening of the average life expectancy of negative growth, the family model 2 plus 1, but also of the prospects for successful development of the Polish economy and the real estate market, security products for people in the time of their old age deserve widespread promotion.

Introduction

A progressive decrease in the birth rate with a collapse of the participatory pension scheme lead to searching for alternative financial implementations which could provide financial security of seniors.

Many attempts are taken to find the tools for the target implementation. Among them at the top there is a perpetuity (a pension for life) and the reverse mortgage, which can be treated as innovatory products made by financial engineering. In my article, I aim to reconstitute and conceptualise the reverse mortgage and point out its advantage over the perpetuity.

1 Theme of Innovation in the Financial Engineering

The term “innovation” comes from Latin “innovatis”, which means renewal and creating something new [12]. In economic studies, this term was involved, popularized and described by J.A. Schumpeter. An innovation was the introduction of a new product or a new sort of products, a new method of production, opening the new market, acquirement of a new resource and, implementation of the new organization of some industry, for example, creation of monopolies or breaking them [9, p.104]. According to Z. Pietrasiński, innovations are changes made intentionally by human beings (…) and based on replacement of current things by new ones, which are evaluated positively according to various criteria of progress [6, p. 10]. J. Pajestka states that it does not matter if a product is known in different places (…); an innovation is not only the thing, which is absolutely worldwide new, but a thing being new for that society [5, p. 179-180]. Every single innovation creates some new possibilities, but also provides restrictions and risks [12].

If we try to make a subject division of engineering – which introduces every innovation – we could distinguish the first one, classically defined as a physical engineering based on the laws of nature and science and physics, which is needed for construction matters; and the second type is the one connected with the social engineering, which is not connected to material as much as the first one, but it is associated with actions and based on laws of social development and culture.

Correspondingly, the product and effect of the first one are technical innovations, such as new resources and technologies- and for the second type there are social innovations.

Many institutions and social instruments, which seem to be obvious and inextricable parts of economic and social life, have been provided some day and have been seen as an innovation and an invention and even an artefact demanding the social acceptance [12]. As an example, I can introduce the invention of paper money, credits, the insurance system and so on.

Another form of social engineering is financial engineering. By contrast, financial engineering is commercial and it is a branch of modern finance, supplying the financial markets with necessary tools needed for forecasting and for modelling events. Wherefore the whole range of innovatory financial products is created (inter alia the reverse mortgage).

2 Reverse Mortgage as an Innovatory Bailout of the Old Age and an Alternative for a Pension

The reverse mortgage is one of the financial products which arouses interest and has become the subject of many discussions and analyses [1, p. 444]. Although it does not exist on the Polish financial market, due to the pending legislative work, some economic and demographic presumptions are noticeable, and consequently, this leads to the quick implementation of the issue of reverse mortgage. The largest impact on the progress in the reverse mortgage is caused by an increasing group of retired people whose pension packages come to a definitely lower level than their previous salary. The increasing number of pensioners is a result of the lengthening of life's duration and also of a period of decrease in the birth rate, which consequently brings a declining amount of the working-age population. That leads to a falling value of social-security contributions, affects negatively the capacity of the whole insurance and pension systems and it will be a factor responsible for a huge drop in the pension value.

The aging of population leads to financial changes in the social-security system. The effect is seen as a departure from the *pay-as-you-go* system for the new system: containing some capital reserves. However, it is worth to mention that the value of further pension rights is also based on entitlement to a retirement pension and on the average life's duration besides the capital. Those terms lead to the decrease in the replacement rate (proportion of a pension to the last - paid salary), which effects the increasing poverty among the old age people. Even developed countries struggle with that kind of problem of getting new financial resources for the old age pensioners. One of them can be a real estate.

In the old days, an estate in numerous families used to be a cashless way of financing in the old age by adult children (most often it was a dowry for the oldest daughter who nurtured the parents). According to many changes in the family structure (appearing of "nuclear families"), the real estate was a kind of a fee for the stranger as a way of payment for care in the old age period. An apartment could be given away as an inheritance or with a life contract. However, both were connected with a risk for each side of the contract. The testament could be changed without any notification. On the other hand, if there was a contract, the property was given away at the moment of signing. Therefore there was a high risk of moral gaming or even, in extreme cases, a crime could be committed. However, in the case of both there was an insolvency risk of individual people. Hence institutional resolutions were wanted. The reverse mortgage seems to be exactly one of such resolutions [7]. Those are financial products used in Europe and all over the world, which include both a loan or a mortgage and security in the old age (a kind of a pension system).

In Poland the *reverse mortgage* is seen as two different systems of capital conversion: the so-called selling (called also perpetuity), which is offered by mortgage funds, and a credit (a reverse mortgage credit) [1, p. 445].

Due to the fact that many commercials and advertisements appear very often and old people are tempted by their stories about an extra income, it is important to remember the necessity not to identify terms of the pension for life and the reverse mortgage (credit) as one thing. First of all, a perpetuity based on a life contract is generally named a reverse mortgage and it is an existing product. The reverse mortgage credit is a planned product. Moreover, there are some basic differences between their rules.

To sum up, the reverse mortgage is that kind of credit which we do not need to pay off during our e life. This product belongs to the family of products called equity release, which means they enable to change the dead capital of the estate into the financial capital. It can be used only by people with proprietary rights of the estate, or through co-partnership, perpetual usufruct or cooperative rights. The above mentioned ways of rights let the owners care about their properties by themselves and they lead to innovatory activities.

According to its name, the case of reverse mortgages does not force the client to pay any instalments to the bank; the bank pays the client regularly. The client can also reach the conclusion that it was not a good decision and in that case he is allowed to backtrack from the contract in 30 days. The bank will just demand the owner to keep the estate intact, in a good technical condition, - pay all taxes and insure the building. The customer is an owner till his or her death (or a co-owner in the case of marriage) if s/he complies with the terms and conditions of the contract. The bank will take the right of the property if the heirs do not pay off the credit with its interests and charges. The value of the estate will be determined by an assessment made by an adjuster and after an agreement reached with the heirs [15]. The reverse mortgage credits are characterized by the fact that the decision and its value are depending on the LTV factor (in general, the older the person is, the easier it is to get the credit and the LTV amount is higher). The decision does not depend on creditworthiness, but on the age, predicted length of life, value of the estate and the interest rate [1, p. 447].

The perpetuity is different from the reverse mortgage credit in the moment of the transfer of the ownership. First of all, in the mortgage register the owner is the contracted person, which means that the heirs have no possibility to get the estate back. They can only buy it paying the price of timber. The perpetuity, which is a selling kind of a reverse mortgage, is controlled by the laws of the Civil Code [13] and it is based on the life contract.

For the security of the concerned, the Ministry of Finance allows the credit promised only for financial institutions monitored by the KNF. The assumptions of legislation were changed after 2010. In 2012 the department of the Deputy Prime Minister Pawlak demanded monitoring of rules for both the reverse mortgage credit and perpetuity by using the same legislation. It was not accepted by the Ministry of Finance.

In Table 1 both proposals are shown, which can be compared with the resolutions of the mortgage funds (the last column). The data include the primary differences between the reverse mortgage credit and a pension for life. A pensioner who decides to sign the contract for the pension with any mortgage fund will immediately give his or her property rights to the fund and will get the pension for life. They will still need to make all utility payments. In such a case the heirs will not have any opportunity to get the estate. In the case of the reverse mortgage credit the pensioner stays the owner of the estate for all life, he or she will make the utility payments, but the heir will be able to regain the property.

Tab. 1: *The Assumptions for the Act of Reverse Mortgage Credit*

Assumptions	**The Ministry of Finance project (reverse mortgage credit)**	**The Ministry of Economy project (amended pension for life)**	**Current pensions for life**
Transfer of property rights	A year after a client's death	at the moment of signing the contract	at the moment of signing the contract
LTV rate (proportion of the sum of estimated payments and the value of the real estate)	no limits, LTV connected to the customer's age (the older ones get the higher payments)	not mentioned	no strict terms the elderly can find higher payments, (virtually LTV is 30 - 40%)
Term of payments	according to the contract (for example 15 years)	life	life
Requirement for an institution's taking of the estate	bank status or branch of credit institution	status CO or PLC., equity higher than 50.000 €, KNF permission	no requirement
Monitoring of KNF	yes	no	no
Possibility of paying off the credit by the heirs	Up to 12 months after the senior's death	no	no
Elderly's duties	the same for all: property insurance, property held in good condition, all utility payments	not mentioned	various, basic conditions are: property held in good condition, all utility payments

Source: A. Prajsnar, Odwrócona hipoteka potrzebna od zaraz, http://www.portfel.pl

The reverse mortgage credit is a safer product than the pension for life. The main advantage is that the property right remains with the elderly person till his or her death, and there are some possible activities which can be done by the heirs. Furthermore, the heirs can get the difference between the value of the property and the amount of the credit (only if the difference is positive). However, when the pensioner does not have any relatives, the surplus will be given to the Treasury. Moreover, the reverse mortgage credit will be used by a professional subject, monitored and supported in a financial way, which should be extremely important for the would-be pensioner, because it can assure permanence of the benefit.

During the legislative drafting, the assumptions shown in Table 1 were changed. In mid-October 2013 some new assumptions were created. The novelty introduced was the fact that the bank should be obliged to give the customer an info-sheet about the reverse mortgage credit not later than seven days before signing the contract. It was created as an additional security which should allow the seniors to think the issue over. Each bank must use the same form for the info-sheet including descriptions of the credit, fees and some information about the rights and duties of the customer. It allows the client to compare different offers. Also the age of customers was changed. Previously it was 60 years, but in effect of consultation the limit was withdrawn. A prospective legislation will have influence on:

- natural persons,
- heirs,
- banks, foreign banks and financial institutions performing cross-border activities,
- adjusters,
- Financial Services Authority,
- Court of General Jurisdiction,
- solicitors.

The legislation involves the above mentioned subjects and it will define their functions. The natural persons and banks will be both sides of the contract. The heirs can take part in reckoning the amount of the credit and they are allowed to pay it off or participate in it. An interest of the adjusters will be mandatory in the property valuation. The Financial Supervision Commission performing supervisory functions over their respective credit facilities will be obliged to identify the prudential requirements for them. The increase in the number of cases dealt with by the courts and specifically by the departments of civil and land registers will be clearly visible. Notaries will be obliged to notify the credit institution in the event of transfer of the property by the borrower to a third party, which will be provided under the contract, securing a mortgage.

The aim of the draft law is to provide the beneficiaries, namely the elderly, with a legal act which comprehensively regulates the service and crediting institutions to provide effective redress mechanisms [16].

3 Demographic and Economic Conditions of the Introduction of Reverse Mortgage Credits

On the Polish market there is a need of introducing a reverse mortgage credit as soon as possible. It is being prompted by the economic and demographic factors - which gradually but more quickly alter the structure of the Polish population. According to E. Rosset, the transformation in the age structure of the population means that "the whole organization of society and all working social systems are smaller or greater transformations" [8, p. 25].

The development of new medical technologies and diagnostic methods have improved the health conditions of the Poles. As a result, a decrease of the death rate increases the average life expectancy. Extending the lifespan and the low fertility rates contribute to the change of the population structure. The number of people in the retirement age, becomes an additional burden for the state budget. This causes an increase in the government expenditures on health care, but primarily it leads to an increase in spending of the older people in relation to aging. Aging is a natural fact, the next stage of human life. While aging is a process, there is no universally accepted and applicable boundary of aging and the old age. The beginning of the old age shall be contractually 60-65 years of age. The "old age" means that a person has exceeded 75 years of age; people who have crossed 90 years of age are considered to be long-lived. However, biologically we start to age after 40 years of age [10, p. 147]. In literature authors cite various forms of names to determine aging, which are shown in Table 2.

Tab. 2: *The Forms of Aging*

THE FORMS OF AGING		
Fortunate aging	**Casual aging**	**Pathological aging**
process without any diseases and no causes for life limits	associated with minor limitations in everyday life	accelerated by disease

Source: Own elaboration

The third kind, the pathological aging is the most expensive one. People suffering from this type of aging are those who require a constant care from their relatives or rely on help from centres for care and treatment. In addition to physical health problems, they require continuously administered medication, rehabilitation equipment, dressing materials, etc. Also the list of reimbursed drugs is changing yearly for most people. However, these changes are unfavourable; they ultimately generate more and higher costs of drugs and medical supplies. Therefore for the oldest people having a modest household budget is not sufficient to be able to finance their needs of aging. As geriatricians estimate, every third Pole after 75 years of age is not able to perform all types of personal and household jobs or live on their own [10, p. 147]. Population aging is one of the most important economic, social and demographic changes. The population of the elderly people is increasing, because of the increase in life expectancy and declining of birth rates.

The decline in fertility is a phenomenon characteristic of modern societies. Among others, this involves the process of modernization, changes in values, changes in the role of women in the society, access to contraception and access to the education system and the labour market. In Poland in 2007, the fertility rate was 1.21, which was among the lowest ones in the EU-27 (currently it hovers around 1.3-1.4). The Eurostat report published in August 2008 warns that in 2060 Poland will have the highest proportion of people over 65 years in the European Union: 36.2% (in 2006 it was 13.5%).

In combination with the strong emigration of young people and the lack of immigration, this situation will lead to strong population declines and unfavourable structural changes. An extremely important factor for the actual loss in population of Poland became the emigration to Western Europe after 2004. According to the census of 2011 (CSO 2012) the number of Polish emigrants abroad over the year was 1.5 million, which means that the population currently lived in Poland is already less than 37 million. The same data indicate that 200 thousand. Polish residents of foreign countries are mostly children under 14 years of age, it points to the fact settlement migrations of entire families [4, p. 1].

In Poland, the citizens' living conditions are varied. The old people do not belong to the beneficiaries of the Polish political transformation as in their case there is an accumulation of various dimensions of negative factors determining the overall quality of the life index. The lowest quality of life is characterized mainly for social categories such as pensioners, widowed, single, divorced, older and poorly educated [2, p. 345-355].

Among households of the elderly there is a predominance of the single and double, consisting solely of a single generation. The CBOS research in 2007 shows that 38% of the people over 60 years lived alone and 36% with another older person. 15% of the respondents were living in the same household with their children, and also with their grandchildren or other people - 11%. In 2009, 66% of respondents of the same research centre declared a preference for an apartment in their own house, and occasionally they enlisted their preference for the help of family or friends [14, p.3].

The income situation of the older people indicates the level and structure of expenditure. It is crucial to meet the basic needs, such as food and housing fees. According to the self-assessment subjects in the most disadvantaged pensioners find themselves, 85% of households felt it difficult to make ends meet. In addition, the farm pensioners had the worst assessment of their own situation; 42.4% of pensioners and perceived their situation as bad or very bad. Older people have little opportunity to improve their living conditions. According to the Central Statistical Office in the second quarter of 2011, the activity rate for people aged 60-65 years and over was 6.6%. It is true to say that, although the financial situation of the

elderly tends to take up gainful employment, the regulation and social pressure rather their labour market to eliminate the poverty [3, p. 335].

Because of that Poland needs to adapt to the requirements of the European Union. Another reason is the poor state of the public finances followed by inter alia, the increase in the cost of maintaining the property. It is affected by an increase in all fees and taxes levied by the state or the compulsory levies, such as increasing taxes on perpetual usufruct of land, property taxes, the increase of the price of insurance policies and prices supplied by the media. This situation adversely affects the life situation of the elderly, and causes the shrinking of financial resources available at their disposal.

The decline in fertility rates, emigration and the new model of the nuclear family will have an impact on the increase in the number of people who remain without heirs. The next result is just that it will be no person to give the property. Such a situation will touch the people, who have a right to the property on the one hand it will be easier to decide what to do with their conduct, on the other hand may be even forced to make a decision about the use of capital accumulated in real estate due to the inability to maintain an adequate standard of life. These factors affect the development of the reverse mortgage credit.

Dissemination of a reverse mortgage is also associated with the number of completions of modern and attractively located apartments or houses. In the future, these properties will be more desirable from the point of view of the banks as a collateral option for reverse mortgages than, for example, a property in an older building or flats in blocks of flats. In practice, the easier it will lead them in the direction of rotation of the property [1, p. 447].

The housing structure according to the ownership relations in Poland noted between 2007 and 2009 also leads to optimistic evaluations about the future of this financial product. The data presented in Table 3 show that 64% of the homes in 2007 belonged to individuals. However, in 2009 this share increased to 70%. Over the two years, 989 thousand homes whose owners were individuals were added to the previous amount.

Tab. 3: *Dwellings by Ownership Relations in 2007 and 2009 (in thousands) a As of 31.12*

Specification	**2007**	**2009**
Housing Associations	3,148	2,583
Municipalities	1,157	1,063
Establishments	158	132
Treasury	65	57
TBS	68	79
Natural Person	8,398	9,387
TOTAL	**12,994**	**13,302**

Source: Small Polish Statistical Yearbook 2012, Central Statistical Office, p. 231

It should also be noted that it is the individuals who constitute the largest share in the flats by property relations in general and that this share is growing. Next to the natural persons in the structure of the ownership of the dwellings is the amount owned by housing cooperatives. Members of their cooperative ownership rights to the premises can also benefit from the offer of an inverted mortgage. Such an ownership structure positively confirms transactions concluded in the reverse mortgage credit.

Conclusion

As shown in the preceding paragraphs of the article, the reverse mortgage is an alternative to a functioning annuity. And although both products are targeted at the older people owning

property and designed to improve their financial situation during their “autumn of life”, they treat property rights in a completely different way.

The reverse mortgage is an innovation of our time, a product of financial engineering, which is a form of social engineering. It is a kind of “invention”, which will require social acceptance. Once deployed, it will ensure the safety of both parties to the transaction. This protection is effective, because it will be governed by the provisions of the Banking Law, and thus supervised by the Financial Supervision Commission. Both the moment of transfer of the property as well as the safety considerations situate this product above the annuity.

Currently, in the absence of regulation in the form of the law for the reverse mortgage there was established a niche, on the Polish market, which saw the entrepreneur (for instance the Mortgage Funds) However, these state institutions should offer a product that will be safe, guaranteed, and will not lead to any abuse and enter the market with products which are in demanded.

As a Vice-President of the Association of Polish Banks, the attorney Jerzy Bańka says “activities carried out by existing in our market funds mortgage is at the “border of the law”. The product called the credit or annuity mortgage granted by these funds is based on the regulations contained in the Civil Code, relating to a contract for life. A person who has entered into such an agreement with the fund only receives a pension, without real support and help” [11, p. 162].

There is a possibility that, in spite of the owned land registration by the short time the bankruptcy comes to the institution responsible for the payment of annuity. That’s why “... reverse mortgage can be an important source to supplement the household budget of retirees due to the level of legal security of this transaction from the point of view of the elderly” [11, p. 163].

Currently, there is a “good ground” for the introduction of the product of the mortgage due to demographic developments, namely the aging population. Demographic reports show that the number of people over 65 is increasing together with, the average life expectancy and the wave of emigration while the fertility rate is decreasing. A longer life is a consequence of the general improvement of living conditions and medical care, increased health, improved safety and changed lifestyle leading to a more health-promoting way of living. On the one hand, the longer life is a reason to be happy, but at the same time there is the problem of solvency and the amount of future pension benefits. Declining fertility and progressive emigration only worsen the situation. In addition, the rising cost of living compared to the indexed pension, reduces the financial resources the elderly have at their disposal.

There is also a point that the reversed mortgage or annuity slightly improve the material lot of retirees who actually decide on this “business”. Under such opinions retirees should therefore consider other ways to supplement their budgets, such as moving to smaller or cheaper flats and then locating the excess funds in the deposit Rentier [15]. But mentally it is not easy, because there is a widespread belief of "you can´t teach an old dog new tricks", because of the fact that, this form improves theirs household finances in the form of changes in real estate for smaller or cheaper, decides to rather little older.

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PODMÍNKY ZAVÁDĚNÍ INOVATIVNÍHO PRODUKTU - OBRÁCENÁ HYPOTÉKA NA ZABEZPEČENÍ VE STÁŘÍ V POLSKU

V příspěvku se autorka snaží přiblížit mechanismus působení inovačních produktů na zajištění stáří. Byl identifikován doživotní důchod a „obrácená“ hypotéka, které jsou založeny na kapitálu alokovaném do nemovitostí a které poskytují majitelům nemovitostí možnost konvertovat takto „zmrazený“ kapitál na reálné finanční prostředky. V současné době polská společnost potřebuje inovativní řešení, která podpoří rozpočty domácností. S ohledem na prodlužující se průměrnou délku života, záporný přirozený přírůstek, model rodiny 2 plus 1, ale také výhledy úspěšného rozvoje polské ekonomiky, včetně trhu nemovitostí, si produkty na zajištění stáří zaslouží širokou propagaci.

BEDINGUNGEN FÜR DIE EINFÜHRUNG INNOVATIVER PRODUKT - DAS INVERTIERTE HYPOTHEKENKREDIT FÜR SICHERHEIT IM ALTER IN POLEN

Im Artikel wurde versucht, die Wirkung von innovativen Produkten für die Sicherung des Alters näher zu bringen. Es wurden die lebenslange Rente sowie das invertierte Hypothekenkredit identifiziert, die auf dem in der Liegenschaft angelegten Kapital basierend den Eigentümern der Liegenschaft die Möglichkeit geben, das „eingefrorene“ Kapital in reale Geldmittel zu wechseln. Zurzeit braucht die polnische Gesellschaft innovative Lösungen, die der Aufbesserung häuslicher Budgets dienen. Hinsichtlich der Verlängerung der durchschnittlicher Lebensdauer, des Geburtenrückgangs, des 2+1 – Familienmodels sowie auch günstiger Entwicklungsperspektiven für die polnische Wirtschaft, darunter auch des Immobilienmarktes, verdienen Produkte, die Menschen für das Alter sichern, weit und breit gefördert zu werden.

UWARUNKOWANIA IMPLEMENTACJI INNOWACYJNEGO PRODUKTU – ODWRÓCONEGO KREDYTU HIPOTECZNEGO DLA ZABEZPIECZENIA STAROŚCI W POLSCE

W artykule podjęto próbę przybliżenia mechanizmu działania innowacyjnych produktów służących zabezpieczeniu starości. Dokonano zidentyfikowania renty dożywotniej oraz odwróconego kredytu hipotecznego, które bazując na kapitale ulokowanym w nieruchomości, dają właścicielom nieruchomości możliwość zamiany owego „zamrożonego” kapitału w realne środki finansowe. Obecnie polskie społeczeństwo potrzebuje innowacyjnych rozwiązań służących podbudowaniu domowych budżetów. W obliczu wydłużania się przeciętnego trwania życia, ujemnego przyrostu naturalnego, modelu rodziny 2 plus 1 ale też pomyślnych perspektyw rozwoju polskiej gospodarki a w tym rynku nieruchomości, produkty zabezpieczające ludzi na czas starości zasługują na szerokie propagowanie.

CONCENTRATION OF THE ICT INDUSTRY IN THE CZECH REPUBLIC, GERMANY AND POLAND

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Abstract

Information and communication technologies sector (ICT) is an important motor for innovation, growth and employment in the modern economy. At the same time, it is one of the fastest growing worldwide industries. ICT companies tend to concentrate in specific geographic regions in order to achieve higher profits and the overall effect of their clustering. High concentration of ICT makes the region more attractive and can foster its economic growth. Germany is one of the leaders in terms of innovation and promotion in Europe, but the Czech Republic and Poland are developing fast. The goal of this article is to compare concentration of the ICT industry representation, to identify regions highly specialized in this sector, as well as recognize potential ICT clusters in the Czech Republic, Germany and Poland.

Introduction

Information and communication technologies sector (ICT) is an important motor for innovation, growth and employment in the modern economy. At the same time, it is one of the fastest growing worldwide industries. According to an OECD definition, the ICT sector is a combination of manufacturing and service industries that capture, transmit, and display data and information electronically. ICT embraces information technology (combined industries of hardware and office machines, data processing equipment and data communications equipment) plus telecommunications (end-users of communications equipment and key systems, carrier services, cellular mobile radio infrastructure, transmission and other network equipment). [4] The arguably most important technological innovations of the past decade were initiated by ICT. According to United Nations, countries with well-developed, innovative and competitive ICT sectors achieve better productivity and growth rates than those with underdeveloped sectors. The European Commission estimates that ICT contributed with approximately 40% to the increase of productivity in the European Union in recent years and, thus, was the single most important source of productivity growth. This important role has encouraged many countries to place ICT at the heart of their economic policies. [10]

ICT companies tend to concentrate in specific geographic regions in order to achieve higher profits and the overall effect of their clustering. Michael Porter was the first one, who introduced the concept of clusters in the economic context. He defined a cluster as geographic concentrations of interconnected companies, including manufacturers, service providers, specialized suppliers and associated institutions (government agencies, universities, non-governmental organizations) in a particular field, that compete but also collaborate. [8] The advantages of clusters are many, some of them consisting of the following: more facile access to resources; reduced financial, time and transport costs; easier transfer of information; innovation creation; sharing of best practices; new business formation; a larger pool of talent and skilled labour; more opportunities for reaching to more customers; a higher level of efficiency and productivity within a cluster. [2] Clusters can be classified by the type of product or services they provide. There are clusters in tourism, in apparel, in textiles, in biotechnology, in automotive, in ICT, and many more. [7] The largest ICT clusters in Europe

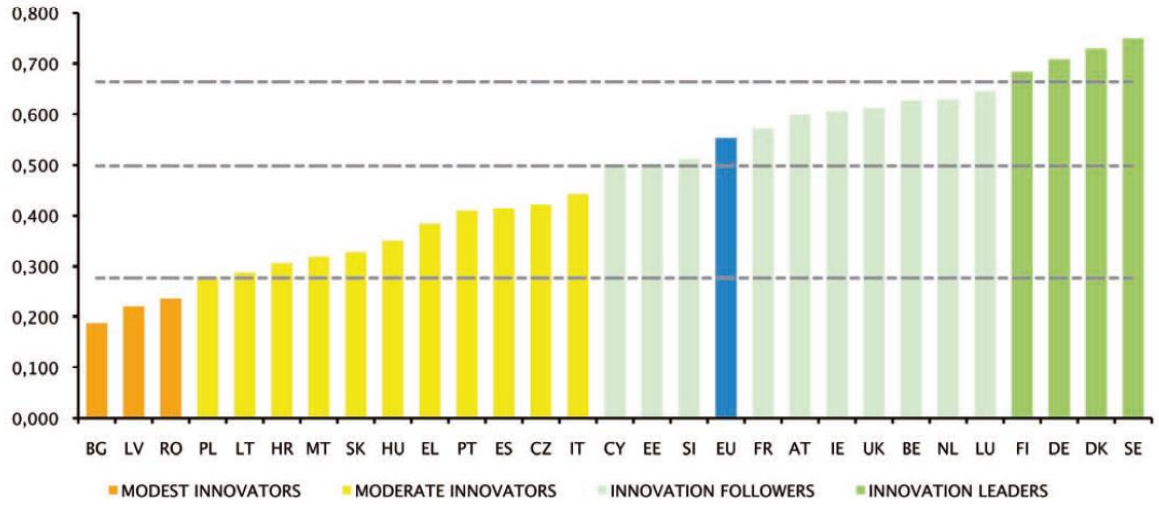
(by employment) are in the following regions: Île-de-France (France); Lazio, Lombardy (Italy); Comunidad de Madrid (Spain); Copenhagen (Denmark); Inner London; Berkshire, Buckinghamshire and Oxfordshire (United Kingdom); Darmstadt, Oberbayern (Germany) and Stockholm (Sweden). [1] Referring to Poland and the Czech Republic, there are a number of cluster initiatives. The examples are INTERIZON Polish ICT Cluster, Eastern Cluster ICT, Mazovia Cluster ICT, ICT Central Poland Cluster, and many more.

High concentration of ICT makes the region more attractive. ICT industry attracts more investment, more capital, highly skilled workers and fosters economic growth of the region. The goal of this article is to compare concentration of the ICT industry representation and to identify regions highly specialized in this sector in the Czech Republic, Germany and Poland. This analysis could be useful for:

- government in order to stimulate regional development,
- investors looking for attractive location for their businesses,
- businesses with high demand for ICT services,
- people searching for a job in the ICT sector,
- cluster policy makers in order to initiate and/or support cluster development.

1 Innovation Performance and IT Competitiveness of the Czech Republic, Germany and Poland

According to the European Comisson Report "Innovation Union Scoreboard 2014", Germany, Finland, Denmark and Sweden are leaders in terms of innovation and promotion in the European Union. A summary picture of innovation performance is provided by the Summary Innovation Index, a composite indicator obtained by an appropriate aggregation of 25 indicators (e.g. R&D expenditure in the public sector as a percentage of GDP, small and medium enterprises introducing product or process innovations as a percentage of SMEs, license and patent revenues from abroad as a percentage of GDP, medium and high-tech product exports as a percentage total product exports). [5] Figure 1 shows the performance results for the 27 EU Member States.



Note: Average performance is measured using a composite indicator building on data for 25 indicators going from a lowest possible performance of 0 to a maximum possible performance of 1.

Source: [5]

Fig. 1: *European Union Member States' Innovation Performance*

The performance of Sweden, Denmark, Germany and Finland is well above that of the EU27. These countries are the 'Innovation leaders'. The Czech Republic and Poland are classified as the "Moderate innovator." Nevertheless, the Czech Republic occupies a much higher position in this ranking than Poland.

The IT Industry Competitiveness Index created by the Economist Intelligence Unit compares 66 countries on the extent to which they are capable of supporting a strong IT production sector. The Index consists of 26 indicators (e.g. desktop and laptop computers per 100 people; the gross government expenditure on R&D per capita; the number of new domestic IT patent applications filed by residents each year, as a percentage of total patent applications; government spending on IT hardware, software and services per capita). The United States tops the global IT competiveness ranking of 2011. The USA are followed by Finland, Singapore and Sweden. Germany occupies the 15th position in the ranking, the Czech Republic is at the 27th and Poland at the 30th. [3]

2 Methodology

The most often used quantitative method of clusters examination is a location quotient (LQ). Formula (1) for computing location quotients can be written as [6]:

$$LQ = \frac{RE\ in\ Industry\ in\ Year\ T}{Total\ RE\ in\ Year\ T} \Big/ \frac{NE\ in\ Industry\ in\ Year\ T}{Total\ NE\ in\ Year\ T} \quad (1)$$

where

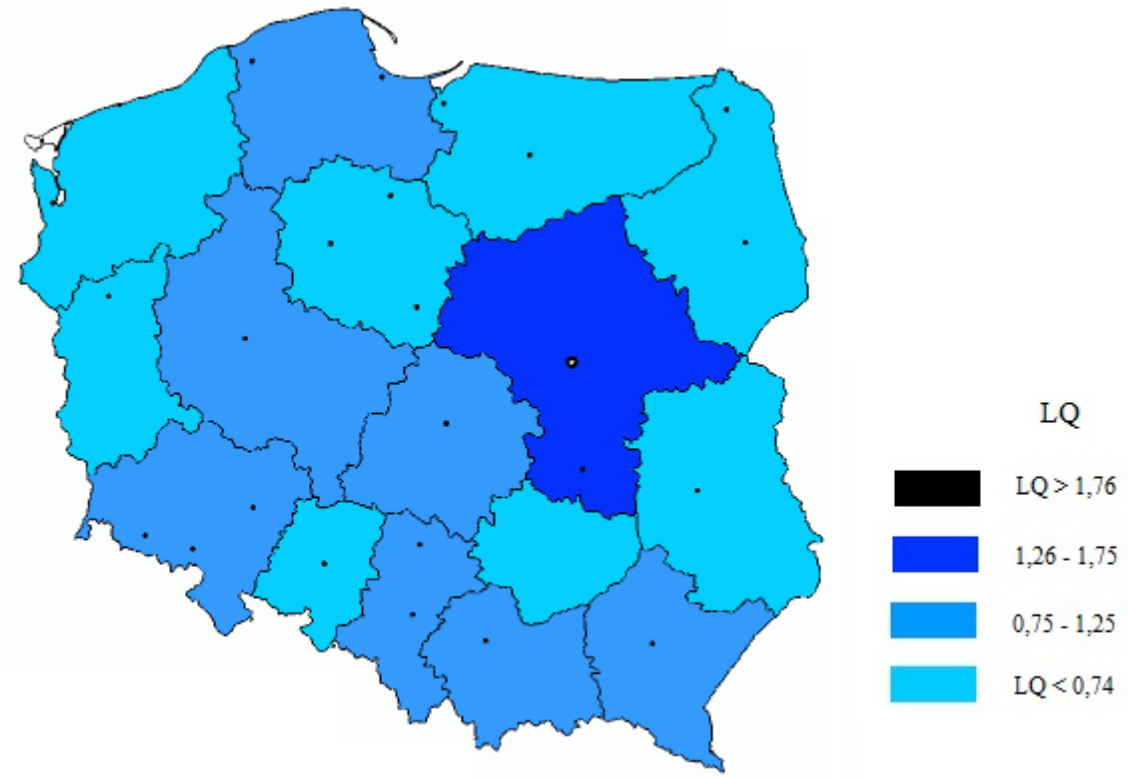
LQ is *Location Quotient*,
RE is *Regional Employment*, and
NE is *National Employment*.

It is assumed that the base year is identical in all of the above variables.

The location quotient compares the regional share of economic activity in a particular industry to the national share of economic activity in the same industry. The result reveals the degree of regional specialization in each industry. If the location quotient for a particular industry is between 0 and 1, the region is less specialized than the nation. A location quotient of one (1.0) means the region has the same proportion of economic activity in the sector as does the nation. Location quotients greater than 1 reveal a greater specialization of the industry in the local economy than in the national economy. It is assumed that location quotients greater than 1.25 reveal the specialization of the region in a particular industry. Also, observing location quotients over time shows if an industry is becoming more or less specialized in the region. [9]

3 Concentration of ICT Industry in Poland

The concentration of the ICT industry in Poland was measured using both a location quotient based on the number of enterprises from the section J "Information and communication" according to the Polish Classification of Activity 2007 and the total number of enterprises in the national economy. The data come from 2013 (the latest available data in the Central Statistical Office of Poland). The results are presented at a regional level (Figure 2) and a district level (Table 1).



Source: Own work based on regional statistics from Central Statistical Office of Poland <http://stat.gov.pl/bdl/> [accessed 2014-06-02]

Fig. 2: *Concentration of ICT industry in Poland (regional level)*

Tab. 1: *Concentration of ICT industry in Poland (district level)*

	District	**Voivodeship**	**LQ**
1.	Warszawa	Mazowieckie	2.50
2.	Wrocław	Dolnośląskie	1.80
3.	Poznań	Wielkopolskie	1.74
4.	Piaseczyński	Mazowieckie	1.73
5.	Kraków	Małopolskie	1.71
6.	Rzeszów	Podkarpackie	1.59
7.	Katowice	Śląskie	1.50
8.	Grodziski	Mazowieckie	1.47
9.	Gdańsk	Pomorskie	1.44
10.	Pruszkowski	Mazowieckie	1.43
11.	Legionowski	Mazowieckie	1.42
12.	Gliwice	Śląskie	1.41
13.	Wrocławski	Dolnośląskie	1.33
14.	Otwocki	Mazowieckie	1.28
15.	Sopot	Pomorskie	1.28
16.	Gdynia	Pomorskie	1.28

Source: Own work based on regional statistics from the Central Statistical Office of Poland <http://stat.gov.pl/bdl/> [accessed 2014-06-02]

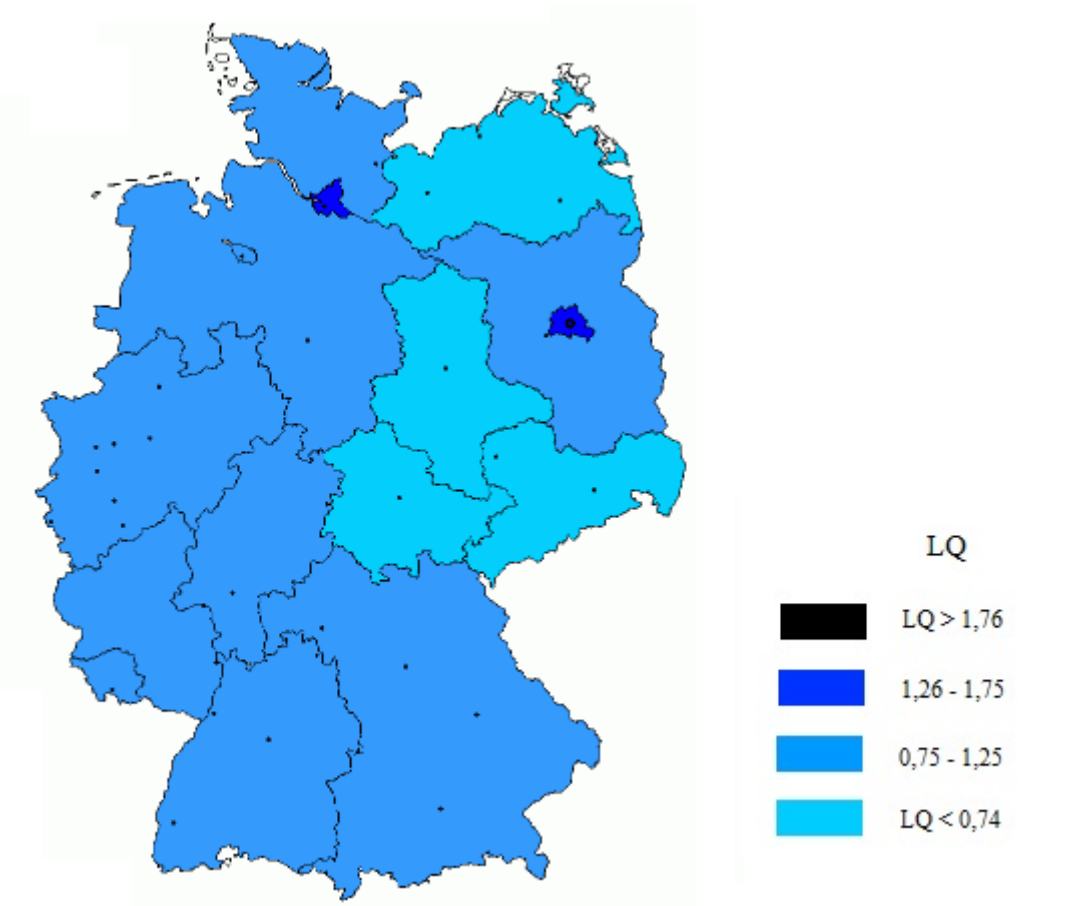
The highest concentration of enterprises in the sector of information and communication technologies in Poland is observed in mazowieckie voivodeship (Mazovia Province) (LQ = 1.74). The higher level of specialization of the ICT industry in the local economy than in the

national economy was revealed only in one more area – małopolskie voivodeship (Lesser Poland Voivodeship) (LQ = 1.02). The regions with the lowest levels of concentration of ICT companies are: opolskie voivodeship (Opole Province) (LQ = 0.65), świętokrzyskie voivodeship (Holy Cross Province) (LQ = 0.65), lubuskie voivodeship (Lubusz Province) (LQ = 0.62) and warmińsko – mazurskie voivodeship (Wamia-Masuria Province) (LQ = 0.58).

According to the research results the greatest specialization of the ICT industry in Poland was revealed for the Capital City of Warsaw with adjacent districts (piaseczyński district, grodziski district, pruszkowski district, legionowski district, and otwocki district). The areas with a high degree of specialization in the ICT sector were also identified in the biggest Polish cities: Wrocław (dolnośląskie voivodeship), Poznań (wielkopolskie voivodeship), and Kraków (małopolskie voivodeship).

4 Concentration of ICT Industry in Germany

The concentration of the ICT industry in Germany was measured with the use of both the location quotient based on the number of enterprises from the section J "Information and communication" according to the German Company Register – System 95 and the total number of enterprises in the national economy. The data come from 2011 (the latest available data in the Federal Statistical Office of Germany). The results are presented at a regional level (Figure 3) and a district level (Table 2).



Source: Own work based on regional statistics from the Federal Statistical Office of Germany <http://www.regionalstatistik.de/> [accessed 2014-06-02]

Fig. 3: *Concentration of ICT industry in Germany (district level)*

The most specialized regions in the ICT sector in Germany are Hamburg (LQ = 1.74) and Berlin (LQ = 1.63). The higher level of specialization of the ICT industry in the local economy than in the national economy was revealed in four more states: Hessen (LQ = 1.22), Bremen (LQ = 1.13), Bayern (LQ = 1.09), and Nordrhein-Westfalen (LQ = 1.07). There is observed a significant difference in the level of the concentration of the ICT companies between the western and eastern parts of Germany. States like Sachsen, Thüringen, Sachsen – Anhalt, and Mecklenburg-Vorpommern are much less specialized than the nation.

Tab. 2: *Concentration of ICT industry in Germany (district level)*

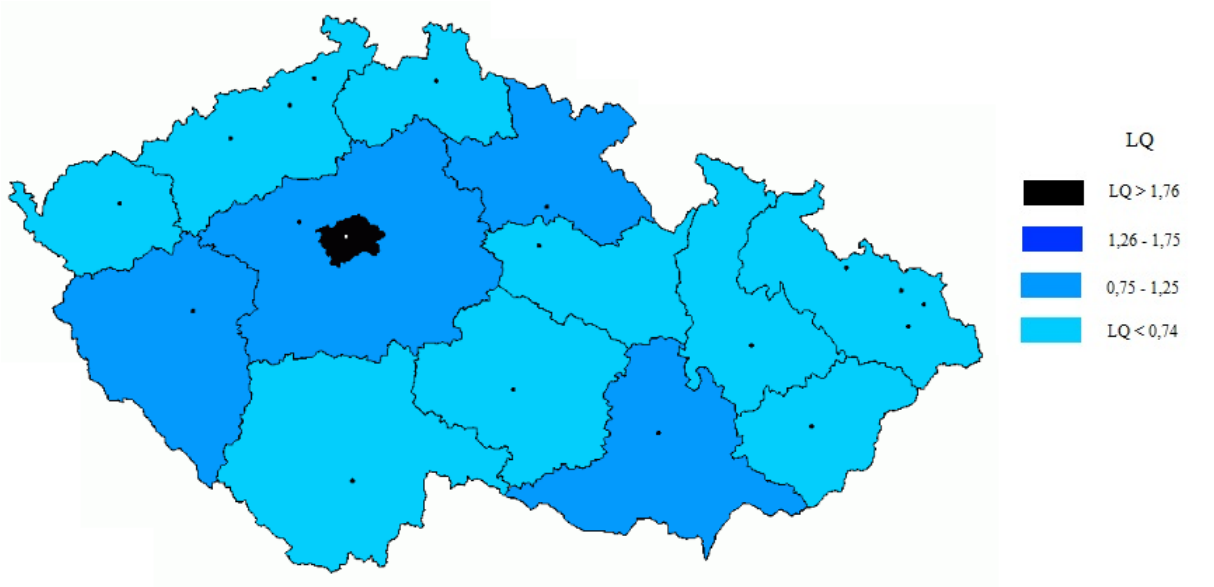
	District	**State**	**LQ**
1.	Darmstadt	Hessen	2.22
2.	München	Bayern	2.17
3.	Bonn	Nordrhein-Westfalen	1.95
4.	Köln	Nordrhein-Westfalen	1.92
5.	Karlsruhe	Baden-Württemberg	1.86
6.	Main-Taunus	Hessen	1.80
7.	Mainz	Rheinland-Pfalz	1.76
8.	Hamburg	Hamburg	1.74
9.	Frankfurt am Main	Hessen	1.71
10.	Potsdam	Brandenburg	1.71
11.	Aachen	Nordrhein-Westfalen	1.64
12.	Hochtaunus	Hessen	1.64
13.	Berlin	Berlin	1.63
14.	Starnberg	Bayern	1.61
15.	Ebersberg	Bayern	1.61
16.	Erlangen	Bayern	1.56
17.	Fürstenfeldbruck	Bayern	1.56
18.	Stuttgart	Baden-Württemberg	1.53

Source: Source: own work based on regional statistics from the Federal Statistical Office of Germany <http://www.regionalstatistik.de/> [accessed 2014-06-02]

(Table 2 presents only those districts for which the location quotient is greater than 1.5) According to the research results German's main ICT hubs are in the following districts: Darmstadt, Main-Taunus district, Frankfurt am Main, Hochtaunus district (State of Hessen), München, Starnberg, Ebersberg (State of Bayern), Bonn, Köln, Aachen (State of Nordrhein-Westfalen), Karlsruhe (State of Baden-Württemberg), Mainz (State of Rheinland-Pfalz), Hamburg (State of Hamburg), Potsdam (State of Brandenburg), and Berlin (State of Berlin). In these areas the concentration of the ICT companies is the highest in Germany.

5 Concentration of ICT Industry in the Czech Republic

The concentration of the ICT industry in the Czech Republic was measured using both the location quotient based on the number of employed in section "Information and communication" according to the CZ – NACE (Statistical Classification of Economic Activities in the Czech Republic) and the total employed in the national economy. The data come from 2012 (the latest available data in the Czech Statistical Office). The results are presented at a regional level (Figure 4). Research at a district level was not possible (proper data were not available).



Source: own work based on regional statistics from the Czech Statistical Office <http://www.czso.cz/> [accessed 2014-06-02]

Fig. 4: *Concentration of ICT industry in the Czech Republic (regional level)*

The highest concentration of enterprises from the ICT sector in the Czech Republic is found in the Capital City of Prague (LQ = 2.68 – which represents a much higher level of specialization in comparison to Hamburg and Berlin and is quite similar to the level of the Capital City of Warsaw). The higher level of specialization of the ICT industry in the local economy than in the national economy was revealed in two more regions: Jihomoravský (South Moravian) Region (LQ = 1.18) and Středočeský (Central Bohemia) Region (LQ = 1.11). Regions with the lowest level of the concentration of the ICT companies are: Zlín Region (LQ = 0.46), Ústí Region (LQ = 0.39), and Karlovy Vary Region (LQ = 0.37).

Conclusion

The ICT sector is highly concentrated spatially in the Czech Republic, Germany and Poland. According to the research results, the highest concentration of ICT industry in the Czech Republic and Poland is found in the capital cities (Prague, Warsaw) and their surroundings. Highly specialized in the ICT sector are also the biggest Polish cities of Wrocław, Poznań, and Kraków (research at the district level was not possible in the Czech Republic). The main German ICT hubs are in Darmstadt, München, Bonn, Köln, and Karlsruhe. In this country there is observed a significant difference in the level of the concentration of the ICT companies between the western and eastern parts.

The above-mentioned regions are potential cluster regions. Analysis indicated the relative presence of the ICT industry in the local region. However, in order to truly identify clusters it is necessary to conduct a qualitative analysis.

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Mgr. Piotr Szwinta

KONCENTRACE ODVĚTVÍ ICT V ČESKÉ REPUBLICE, NĚMECKU A POLSKU

Informační a komunikační technologie (IKT, ICT) jsou důležité pro inovaci, růst a zaměstnanost v moderní ekonomice. Zároveň jsou jedním z nejrychleji rostoucích odvětví průmyslu po celém světě. Společnosti v odvětví ICT mají tendenci soustředit se na konkrétní oblasti za účelem získání ekonomických výhod a posílení konkurenční převahy. Vysoká koncentrace IKT dělá region atraktivnější a může podpořit jeho hospodářský růst. Německo je evropským lídrem ve vývoji a prosazování inovací. Rovněž Polsko a Česká republika se snaží jít touto cestou. Cílem tohoto článku je porovnat úroveň koncentrace společností z odvětví ICT a identifikovat regiony zaměřující se na toto ekonomické odvětví v České republice, Německu a Polsku.

KONZENTRATION DER IKT-INDUSTRIE IN TSCHECHIEN, DEUTSCHLAND UND POLEN

Die Informations- und Kommunikationstechnik (IKT) ist eine wichtige Quelle der Innovation. Wachstum und Beschäftigung in der modernen Wirtschaft. IKT gehört zu den am schnellsten wachsenden Branchen der Welt. Die IKT-Unternehmen ballen sich regional aufgrund gemeinsamer günstiger Standortfaktoren, Regionen, die sich auf IKT spezialisieren. sind attraktiver für Investoren und beeinflussen Wirtschaftswachstum. Innerhalb der EU hat Deutschland sich in die Spitzenposition der innovativsten Länder vorgekämpft. Polen und Tschechien wollen den Abstand verringern. Ziel des Artikels ist es, die Regionen, die sich auf IKT spezialisieren, zu identifizieren und die Konzentration der IKT-Industrie in Tschechien, Deutschland und Polen zu vergleichen.

KONCENTRACJA SEKTORA TELEINFORMATYCZNEGO W REPUBLICE CZESKIEJ, NIEMCZECH I W POLSCE

Sektor teleinformatyczny (ICT) jest kluczowym źródłem innowacji, wzrostu i zatrudnienia we współczesnej gospodarce. Przedsiębiorstwa sektora ICT wykazują tendencję do koncentrowania się na ściśle określonych obszarach w celu uzyskania korzyści ekonomicznych i wzmocnieniu przewagi konkurencyjnej. Regiony o wysokiej koncentracji firm z tego sektora są bardziej atrakcyjne dla inwestorów i mają kluczowe znaczenie dla wzrostu gospodarczego. Niemcy należą do europejskich liderów w zakresie tworzenia i promowania innowacji, również Polska i Czechy starają się podążać tą ścieżką. Celem artykułu jest porównanie poziomu koncentracji przedsiębiorstw sektora ICT oraz zidentyfikowanie regionów specjalizujących się w tej gałęzi gospodarki w Republice Czeskiej, Niemczech i w Polsce.

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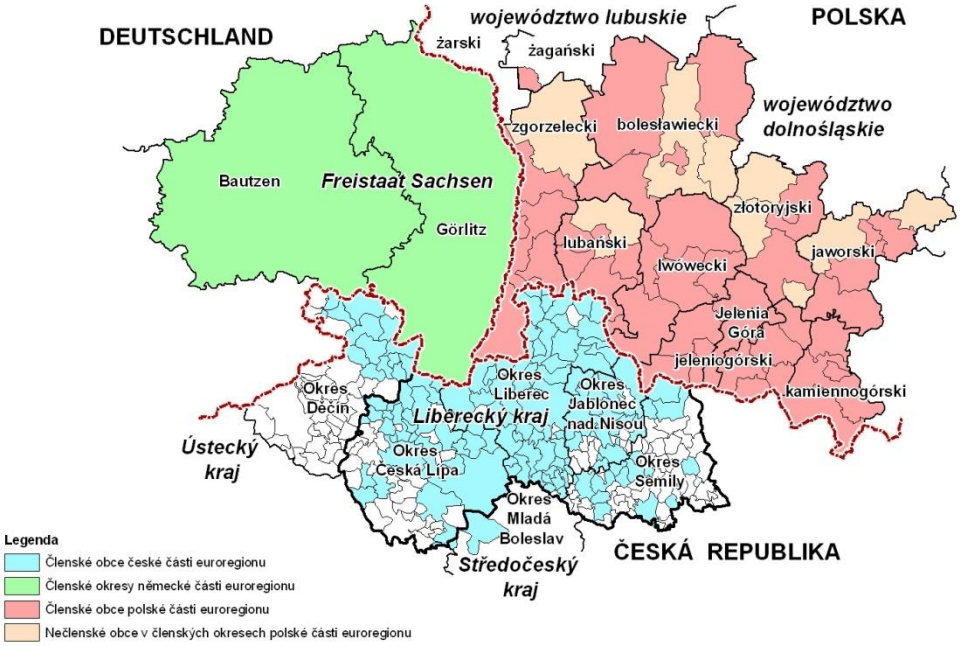

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