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Codes of Ethics and the Economic Results of Companies

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Abstract

The goal of this paper is to determine how widespread the presence of a code of ethics is and the possible relationship between the presence of a code of ethics in Czech companies and the positive economic results of those companies over the last five years. The number of companies that are introducing ethical management continues to grow globally, including in the Czech Republic. A code of ethics is a tool with which to determine the ethical infrastructure of a company, as well as manage it. However, expert opinions on the possible economic impact of ethical management differ considerably. A statistical analysis of the results obtained from a questionnaire survey conducted among a sample of 297 companies showed that the presence of a code of ethics, or a lack thereof, has no demonstrable impact on the economic results of a company regardless of its size.

Keywords: Code of ethics, economic impact, prosperity, management, company, ethical.

Introduction

A code of ethics is the basic, traditional and most widely used tool for the ethical management of a company (Farrell, Cobbin and Farrell, 2002). According to Caha and Urban (2017), the advantages of having a code of ethics are that it: modifies behaviour by providing possible instructions and examples of how to behave; solves conflict situations; defines acceptable and unacceptable behaviours thereby clarifying company policy; positively influences employee's awareness of their sense of place and identity with regards to the company, and of the support they receive (codes of ethics force employees to think about their roles and obligations towards the company and/or its customers, whilst making employees feel safe and protected); improves a company's reputation with its customers and the general public; helps solve disputable questions with regards to the introduction of innovations; keeps managers in check by preventing them from abusing their positions in relation to other employees; helps to reveal illegal activities and transactions; prevents superiors from requiring subordinates to behave inappropriately. Mazák (2010) states similar reasons for organisations to create and apply a code of ethics:

it defines the limits of desirable behaviour for company employees as well as entities outside the organisation; it eases decision making by unambiguously specifying company principles; it may be a criterion on which basis an organisation can be assessed externally; it is an undertaking to adhere to a set of principles which improves the credibility of a company. It should be noted at this point that codes of ethics are not strict rules and laws, but only manuals, which can also work counterproductively if undue pressure is brought to bear on organisations and employees to apply them. A code of ethics does not therefore only represent a tool of management or autoregulation within an organisation, it also contributes to improving the credibility of a particular entity in the eyes of its stakeholders.

The importance of a code of ethics in current company practice is also related to its capacity to strengthen a company's ability to manage information (Weller 1988). Examples of ethical questions that might arise are: What can managers expect from the employees with regards to the non-disclosure of confidential information if an employee decides to leave a company and start working elsewhere? What information is owned by a company and what know-how is owned by an employee? Should an employee know that their activities will be monitored under certain circumstances? Does the collection of data on an employee violate their right to privacy? Should systems liable to a breach of data protection be controlled? What are the responsibilities of a manager and an organisation with regards to data protection? Another problem within this context is the increasing use of social networks by employees for communication purposes, both on company profiles and on private accounts.

Companies are increasingly becoming aware of the fact that improper communications through social media can have serious consequences for their reputation and their image in the eyes of the general public. In fact, a digital footprint is permanent. There are therefore fully legitimate reasons why companies are stepping up their efforts to set principles and rules for employees with regards to such communications. At present, two models are being applied in practice: a company prepares a special document containing adjustments to the rules of communication with regards to social networks; or a company integrates new rules on communications on social networks for their employees into an existing code of ethics. Irrespective of which model a company decides to apply, it is imperative that they act promptly and do not postpone implementing effective measures. Failure to do so may result in numerous labour disputes.

Globalisation and the existence of global companies also raises numerous issues with regards to the preparation of global codes of ethics. This is primarily due to intercultural differences in business ethics on how to effectively solve ethical dilemmas. This therefore requires the building of a consensus around the setting up of "global standards" (McLeod, Payne and Everet, 2016).

According to Caha and Urban (2017b), the key instruments of ethical management, to which codes of ethics belong, are:

Ethical leadership - leading by example every day throughout working hours. The behaviour of company officials should conform with each other. Potentially unethical behaviour by company management leads to the degradation of the ethical behaviour of its employees. Low cost and authenticity, or genuineness and credibility in the approach to business ethics are some of the advantages of ethical leadership as an organisational management tool. It is also gives a clear signal about the credibility of the ethical declarations of an organisation.

Use of whistleblowing - this means the active notification of a particular unfair practice that takes place within the workplace. Employees are usually among the first to learn about unfair practices and can point them out. An employee may however face various dilemmas in such a situation, in particular with regards to the question of whether they should be disloyal to their colleague(s), line manager or employer, thereby putting their own position at risk, or whether it is more important to protect the public interest. Whistleblowing therefore requires an arrangement to be in place, usually integrated in an organisation's code of ethics, which includes an undertaking not to sanction in any way the person that provides the information on the unethical behaviour. Whistleblowing is therefore one of the most important tools for making disclosures and preventing fraudulent and corruptive practices in public administration and in private companies. Such disclosures can lead to the saving or recovery of substantial public funds, and prevent the loss of life. The contribution of whistleblowers to the prevention of corruption is undisputable, however the credibility of the policy depends wholly on the precondition that no sanctions are imposed on or retaliatory measures taken against the person making the disclosure. The credibility of this tool is therefore higher if the code of ethics of an organisation contains guarantees that the organisation supports an environment in which employees are not afraid to report potential fears and problems, that it does not tolerate any kind of retaliatory measures against anyone who in good faith reports an alleged breach of obligations or provides any information in relation to an investigation of an alleged breach. These guarantees should also ensure that the organisation will investigate all cases of potential retaliatory measures taken against anyone who reports incorrect behaviour and punish those employees that do so.

Education and training of employees and managers – education in the field of ethical behaviour should unify the opinions of all employees on the importance of ethics in everyday work and teach effective communication supporting openness and confidence inside a company. The following is an example of ethical management within a construction company and the consistent application of the tool. The construction company decided that all new employees must attend training on the principles that govern the company's code of ethics and the observance thereof, no later than three months after the commencement of their employment. Furthermore, all the employees should be trained in ethical behaviour at least once every two years. The company maintains exact records on the completed training sessions, including lists of the employees who participated. After each course the employees must confirm that they

attended the course, that they understand the code of ethics and that they agree that they will behave in an appropriate way within their activities as employees of the company.

Reporting the risk of a breach of ethics rules - this practice pursues similar goals to whistleblowing, but does so in a slightly different way. It is based on the obligation of managers and employees to provide the line manager or an appointed company officer with timely and relevant information about a situation in which there is a risk of a breach of the ethics rules. The reporting of such situations can be combined with a preliminary risk assessment and accompanying action plan. Such situations include events which might either tarnish the brand name of the company (business ethics, the environment, safety, health), or lead to a breach of legal obligations e.g. a deadly injury or another serious accident, pollution of the environment, serious environmental accident, etc.

Internal ethics committee – such committees are subordinate to an organisation's management and consist of its managers and employees. It usually includes the company lawyer, human resource manager and an experienced operational manager. The areas of responsibility of an ethics committee include the provision of counsel on ethics issues, the investigation of alleged breaches of the code of ethics, and the making of recommendations to management.

Ethics audit – this is a systematic evaluation of the ethics programme within a company and the verification of its ethical standards.

Corporate social responsibility, corporate governance and compliance management – the code of ethics of an organisation is closely related to other management tools which include ethics, in particular those systems and tools utilised to implement a company's strategies with regards to corporate social responsibility, corporate governance and compliance management (the system for monitoring and assessing whether a company adheres to certain internal and external rules regarding its business operations). In some cases the sources for the code of ethics also include the concept of the sustainable development of society or of a particular company.

Codes of ethics form a systemic framework for a company's ethical infrastructure and for the application of an integrated system of ethical management (Seknička and Putnová, 2016). The term "code of ethics" (code of conduct) is understood to be a clearly elaborated set of standards and regulations that defines and modifies relations between members of a certain community (Rolný, 2007).

A code of ethics defines in detail the moral principles of a company and their application to company practice (Murphy, 1998). The purpose of a code of ethics and similar documents is to cultivate a particular company environment and culture. According to Remišová (2011), a code of ethics should not be perceived as a legal document. In fact, a code by its very definition points out the intention to behave ethically in all the above mentioned aspects and to respect the current social and legal standards. A code of ethics should be comprehensible, communicable, specific, up-to-date and enforceable.

According to Ho (2010), a code of ethics only has a positive influence on the ethical behaviour of employees if it is presented in the right and appropriate way. Numerous factors play an important role in this process, including the overall orientation of the company, an employees' field of work, etc. Singh (2011), for example, recommends that codes of ethics should be evaluated and revised every two years, whereby all company employees should be informed of any changes during a training session. New employees should also be familiarised with the code of ethics, namely prior to the commencement of their employment.

However, codes of ethics are also subject to criticism. Their poor efficacy, poor enforceability, formalism and high level of generality are particularly reproached, as is the fact that the behaviour of individuals is more or less determined by the values they acquire during childhood (Putnová and Seknička, 2007). The question as to what extent a code of ethics is useful for small companies and small entrepreneurs with a fixed organisational culture that works mainly on the basis of informal relations, is also disputable (Čaník and Čaníková, 2006). Some companies may see the only advantage of creating a code of ethics as the improvement in their image in the eyes of customers and the general public. The fact that employees do not know the code of ethics well enough, which leads to its violation, is another problem (Ho, 2010).

A code of ethics is also not necessarily accompanied by an improvement in company ethics. Several empirical studies have revealed that codes of ethics give companies a negligible advantage, if any advantage at all. Research conducted by McKendall, DeMarr and Jones-Rikkens (2002) is an example of one of these studies. In their research, Kaptein and Schwartz (2008) also concluded that the efficacy of codes of ethics was relatively low. Nevertheless, despite the mixed results of studies into the efficacy of codes of ethics in companies, it is possible to observe that well-functioning codes provide a high potential for improvements in overall business and company culture. Čaha and Urban (2017b) deal with the main principles of the contents, creation and enforcement of codes of ethics in organisations, the extent to which this management tool is used by Czech companies, including differences in its usage in different types of organisations, the frequency of its evaluation and subsequently make suggestions for changes.

A global survey conducted by KPMG (2008) points to the worldwide trend for increasing numbers of companies to define and implement a code of ethics. The research showed that in 2008 the proportion of companies with a code of ethics stood at 86%. It is clear from the above that in recent years a code of ethics has become a standard basic tool for ethics programmes within large and renowned companies. This is also backed up by an informal survey conducted by IBE in 2012, which showed that a code of ethics was implemented by 92% of those companies with the highest market capitalisation based in Great Britain whose shares are traded on the London Stock Exchange (IBE, 2012). The IBE survey also reported that in 2012, 73% of all companies had a code of ethics. The CGMA (2015) conducted a survey the overall results of which showed that the proportion of companies with a code of ethics stood at 82% (and among large companies 93%). In 2016, according to a worldwide survey conducted by PwC, the largest of its kind, in which 6,337

companies from 115 countries participated (including 79 prominent companies from the Czech Republic), revealed that on average 82% of companies had a formally established code of ethics (PricewaterhouseCoopers, 2016).

One of the latest surveys was conducted in 2016 by Dow Jones and Metricstream (2016) and showed that 96% of the 330 questioned companies had a code of ethics. The aforementioned surveys indicate the growing trend towards the introduction of codes of ethics in business practice. However, it is important to highlight that not all these surveys are compatible. In reality, the results depend on numerous factors, in particular on the structure of the respondents. Whilst a higher proportion of large US based companies have codes of ethics, this proportion is smaller for small and medium-sized companies and companies operating in Asia. It is clear that only global surveys with large numbers of respondents from all business sectors and companies of different sizes will therefore provide the relevant information required. Unfortunately, such surveys are difficult to realise.

According to a survey conducted by the Association of Chartered Certified Accountants (ACCA), one in five managers or accountants in the Czech Republic has had to deal with a serious ethical dilemma in their work. This only confirms the necessity of introducing effective ethical management tools (Transparency International – Czech Republic 2015). Džbáňková (2003) concluded, on the basis of her smaller less representative survey conducted in 2002, in which 60 representatives participated from middle and top management in companies operating in Prague and Central Bohemia, that 35% of the questioned companies had a code of ethics in place and 22% were considering drafting and implementing one. In contrast, Transparency International – Czech Republic, in conjunction with the Economic University in Prague, conducted a very representative survey in 2005, which was repeated in 2006. The surveys sought to determine the degree to which codes of ethics were applied in companies that operated on the Czech market. The conclusion was that in the second half of 2005 only 59 companies (i.e. 10.3%) of the 574 questioned had a code of ethics in place. This situation was similar when the survey was repeated in the first half of 2006, whereby only 104 companies (i.e. 8.4%) of the 1,240 in the sample set had a code of ethics in place. The survey also proved that the larger the company the greater the chance a code of ethics existed. Dytrt et al. (2011) state that in 2011, less than 15% of domestic companies had a code of ethics in place. In a more recent survey conducted by Transparency International in 2013, the results showed that this percentage had increased to 46% of domestic companies. However, this compares to the world average of 74% (Transparency International – Czech Republic 2015). According to the respondents of a questionnaire survey conducted in 2015, the results of which were processed by the Financial and Economic Institute, 68% of companies had a code of ethics, but only 23% of companies saw the code of ethics as a binding set of rules (Finanční a ekonomický institut, 2015). According to the previously mentioned PwC survey, in which 6,337 organisations from 115 countries participated, 86% of the 79 prominent Czech companies questioned had a formally established code of ethics. However, the low

number and the size of the companies involved belies reality (Global Economic Crime Survey 2016 – Report for the Czech Republic 2016).

Despite these results, the number of companies in the Czech Republic that are establishing a code of ethics is gradually growing, although the numbers remain well below the global average (which is higher than 70%). In the Czech Republic, the presence of a code of ethics tends to be limited to larger companies and public institutions. Smaller companies are still only exploring their options with regards to this ethical management tool.

The application of ethical management principles is a long-term intention, which does not usually lead to an immediate effect. When creating a code of ethics a company must take into account that significant efforts will be required to make the staff understand the principles maintained therein (Erwin, 2011). In some cases, having to deal with ethical issues may generate unwillingness among some employees to cooperate. Under such circumstances it is necessary to create a motivational system which encourages the involvement of employees in the creation and the application of a code of ethics.

Materials and Methods

In order to fulfil the set goal of the contribution, quantitative research was carried out on the basis of an electronic questionnaire survey conducted between June 2016 and August 2016. The aim of the survey was to obtain a statistically representative cross-sectional data set on small, medium-sized and large companies. In total, questionnaires were sent/given to 710 targeted companies selected from random industries. In total, 297 responses were received, which is equivalent to a response rate of 41.83%. The analysis of the survey results set out to verify the hypothesis that the presence of a code of ethics in a company has no influence on its economic prosperity. Unfortunately, the representativeness of the data is limited because the analysis only focuses on three categories of company size (see Table 1). The differences between the categories of company size are evaluated using the standard, unpaired, two-tailed statistical Chi-square test of relative frequency differences. R statistical software was used for the relationship tests and the calculation of the interval estimates. All the statistical tests and calculations of interval estimates were performed at a confidence level of 95% (i.e. at a significance level of 0.05).

The initial survey was subsequently followed up with a second electronic questionnaire, the results of which are not included in this paper due to ongoing data processing. The second data set will be used to analyse companies in more detail at a later date.

Table 1. Absolute numbers and relative frequencies according to company size

Company size	Number	Frequency in %
Small/micro-companies	110	37.0%
Medium-sized companies	103	34.7%
Large companies	84	28.3%
Total	297	100.0%

Source: Author

It is important to note at this point that there is a potential systemic and confounding bias in the design of the survey because the outcome of the categorical variable is self-evaluated. Another issue is the overrepresentation of active companies because failing companies are less likely and willing to provide true information. In response to this, further research will be conducted into the financial situation of companies. In this way, more precise differences between various categories of companies can be analysed.

For the analysis, three categories of companies were identified, namely large companies (≥ 250 employees), medium-sized companies (50 – 249 employees), and small and micro-companies (< 50 employees). The purpose of the analysis was to determine how widespread the presence of a code of ethics is and the possible relationship between the presence of a code of ethics in Czech companies and the positive economic results of those companies over the last five years. Within the sample dataset, there were several companies that gave no response to the question “Does your company have a code of ethics?” It was decided to assign the answer “No, we do not miss it” to these cases on the basis of the assumption that omitting to answer the question automatically shows that the company does not have a code of ethics. In addition, our interest was only in whether a company does or does not have a code of ethics. As a result, it was decided, for this analysis, to combine the number of responses for “No, we do not miss it” and “No, we miss it” into one group “No”.

As part of the analysis of the relationship between the presence of a code of ethics and a company's profit or loss, it was necessary to discount five companies which failed to declare whether their economic results were positive, balanced or negative. In these cases, it was not possible to automatically assign any other option.

Results

Table 2. Presence of a code of ethics according to company size

	Does the company have a code of ethics?	
	Yes (no.)/frequency (%)	No (no.)/frequency (%)
Small/micro-companies	15 13.6%	95 86.4%
Medium-sized companies	31 30.1%	72 69.9%
Large companies	54 64.3%	30 35.7%
Total	100 100.0%	197 100.0%

Source: Author

The testing of the hypothesis: “*The presence of a code of ethics has no impact on the economic results of a company*”, was conducted separately for each category of company size. The proportions for the profitable companies are highlighted in bold in the relevant tables. A two-selection test was subsequently carried out on the identity of the two proportions to determine whether the statistical difference in the proportions for profitable companies was dependent on the presence of or lack of a code of ethics.

Table 3. Code of ethics in large companies and economic results

Code of ethics	Economic results			Two-selection test	
	Balanced	Positive	Negative	Z - test	0.8499
Yes	0.130	0.796	0.074	p - value	0.3954
No	0.133	0.867	0.000	Interval	(-0.0919; 0.2327)

Source: Author

Note: 84 observations

As the p-value is higher than the significance level of 0.05, the test shows that the difference in the proportion of profitable companies in the group with or without a code of ethics is statistically insignificant. The presence of a code of ethics therefore does not affect the economic results of large companies (see Table 3).

Table 4. Code of ethics in medium-sized companies and economic results

Code of ethics	Economic results			Two-selection test	
	Balanced	Positive	Negative	Z - test	0.2233
Yes	0.226	0.742	0.032	p - value	0.8232
No	0.162	0.721	0.118	Interval	(-0.2087; 0.1660)

Source: Author

Note: 99 observations

The p-value is once again higher than the significance level of 0.05. The difference in the proportion of profitable companies in the group with or without a code of ethics is also statistically insignificant. The presence of a code of ethics therefore does not affect the economic results of medium-sized companies either (see Table 4).

Table 5. Code of ethics in small/micro-companies and economic results

Code of ethics	Economic results			Two-selection test	
	Balanced	Positive	Negative	Z - test	0.3881
Yes	0.267	0.600	0.133	p - value	0.6979
No	0.274	0.652	0.074	Interval	(-0.2131; 0.3184)

Source: Author

Note: 110 observations

In this case, the p-value is also higher than the significance level of 0.05. Once again, the difference in the proportion of profitable companies in the group with or without a code of ethics is statistically insignificant. The presence of a code of ethics therefore does not affect the economic results of small/micro-companies either (see Table 5).

Discussion

Even though the results of the research showed that the presence of a code of ethics has no demonstrable impact on the economic results of a company, this has not discouraged or hindered the increasing trend for companies to introduce ethical management, which

reflects the positive impact companies believe it brings to their company culture and public image.

Further research should focus on the differences between groups of companies based on technical efficiency, labour productivity, research and development expenditures, and profitability. Also MANOVA would shed some light on the potential relationships between economic results, company size and the presence of a code of ethics. Non-financial performance variables like employee satisfaction should also be taken into consideration. These variables can contribute to a better understanding of the total performance evaluation of ethical culture within companies.

Conclusion

The goal of this paper was to determine how widespread the presence of a code of ethics is and the possible relationship between the presence of a code of ethics in Czech companies and the positive economic results of those companies over the last five years. The aim of the electronic questionnaire survey that was conducted to achieve this goal was to obtain a statistically representative cross-sectional data set on small, medium-sized and large companies. The testing of the hypothesis: "The presence of a code of ethics has no impact on the economic results of a company", was conducted separately for each category of company size. The statistical tests performed on the basis of the results of the questionnaire survey showed that the presence of or lack of a code of ethics has no demonstrable influence on the economic results of a company, irrespective of their size.

Nevertheless, the conducted research is unique and involves a relatively large sample set which introduces new findings to the field of ethical management.

Despite the results of this study, it is possible to claim that well-functioning codes provide a high potential for improvements in overall business and company culture.

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Dependence of Brand Loyalty on Customer Relationship Management

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Abstract

Customer relationship management (CRM) is growing in importance due to the challenging business environment facing organisations around the world. CRM includes employees, business processes and technologies to maximise customer loyalty and, as a result, business profitability. This paper focuses on CRM as a tool with which to strengthen brand loyalty. The aim of the research was to verify the positive impact of CRM on customer loyalty, respectively brand loyalty for a Slovak company, i.e. to determine whether there is a statistically significant relationship between customer relationship management and brand loyalty. This was achieved through the application of the Chi-square test of independence and subsequent correspondence analysis. The analysis of the research results confirmed that the more loyal a customer is to a brand, the more important the CRM activities of the company are with regards to addressing, acquiring and retaining them, as are their activities for achieving customer satisfaction and the determination of customer priorities.

Keywords: Customer Relationship Management, brand loyalty.

Introduction

Customer Relationship Management (CRM) is an interactive process designed to achieve an optimal balance between corporate investment and customer satisfaction. The optimal balance is determined as that point where both parties achieve maximum profit (Storbacka and Lehtinen 2002). CRM is a set of tools that promotes marketing, sales, and customer service within a company. A prerequisite for supporting these tools is perfect customer knowledge that guarantees the delivery of the product or service at the right

time and in the right place (Wessling 2003). CRM includes employees, business processes and technologies (information systems and information and communication technologies) to maximise customer loyalty and, as a result, business profitability. It is an integral part of corporate strategy and is becoming an integral part of corporate culture, too (Černý 2003). The goal of CRM is to build business relationship strategies that cultivate these relationships and therefore increase their value and profitability (Lošťáková, 2009). The fundamental objective of CRM is to create a long-term strategic partnership that provides added value to all stakeholders (Storbacka and Lehtinen 2002). Currently, there are a number of technical tools that enable and support CRM to provide information, analyses and communication, regardless of the overall business strategy.

In other words, the goal of CRM is to describe customer relationships in a sufficiently detailed manner so that direct sellers can offer products that induce customers to buy them. Fundamental success in trading is a reflection of the quality of the relationships. A company must create a desire and give the impression that the product they are offering is something special. The goals of CRM are to: maintain current customers and increase their loyalty; acquire new customers; increase customer satisfaction; determine the priorities of customers; increase profitability of the product portfolio; increase market share; increase sales; increase profit margins; successfully manage the marketing process (Kozák 2008). Strong and lasting relationships between a customer and a seller form the cornerstone of long-term profitability. According to Mitchell (2003), only a customer-oriented business can acquire loyal customers over time, and with it achieve higher profitability.

Loyalty can be viewed as a synonym for allegiance or devotion. If the concept is seen from a sociological point of view, it can be expressed as the allegiance or devotion of someone towards a particular person or an impersonal organisation. Another insight is that loyalty is voluntary in nature, that is, the person who proves their loyalty does so of their own free will and choice. At the same time, however, this generally interacts with the emotional dimension that narrows this choice (Maříková et al. 1996). For the needs of customer loyalty research, the definition needs to be more detailed. At a very general level, customer loyalty is a sense of commitment or affection for a company - its employees, products or services (Jones and Sasser 1995). According to Kim et al. (2009), loyalty can broadly be defined as the customer's positive attitude and devotion to a retailer, resulting in repeated buying behaviour. Nenadal (2001) defines loyalty as the behaviour of a customer in relation to its market implications in terms of repeated orders and positive references in the neighbourhood. Lošťáková (2007) states that loyalty is dependent on the level of customer satisfaction, the degree to which this is maintained and the willingness to recommend products or services to other people.

Many authors deal with loyalty in connection with brands. Brand loyalty has been a central structure of marketing for almost a century, yet this research topic is still actual and relevant. Brand loyalty is a complex construct, which leads to many definitions that are often very different. Pelsmacker et al. (2003) suggest that loyalty is a mentally positive correlation or relationship between a customer and a brand. Reischeld (1996) defines

loyalty as the long-term preference for a brand or firm based on the maximum satisfaction with the provided value and the positive expectations of the customer for the future. Jacoby and Kyner (1973) defined brand loyalty with six conditions, *videlicet* (1) biased (i.e., non-random), (2) behavioural response (i.e. purchase), (3) expressed over time, (4) by some decision-making unit, (5) with respect to one or more alternative brands out of a set of such brands, and (6) is a function of psychological (decision-making evaluative) processes. The American Marketing Association defines brand loyalty as a situation in which a consumer generally buys the same manufacturer originated product or service repeatedly over time rather than buying from multiple suppliers within the category, or the degree to which a consumer consistently purchases the same brand within a product class (Moisescu 2006). Aaker (1991) suggests that brand loyalty reflects the likelihood that a customer will switch to another brand, especially if a brand makes changes to its price, product function, communication, or distribution channels. Brand loyalty is also defined as a measure of consumer loyalty to a particular brand as expressed by repeat purchases, regardless of the market pressure generated by competing brands. When consumers commit to a brand, they make repeated purchases over time. Brand loyalty is the result of consumer behaviour and is influenced by personal preferences. Faithful customers consistently buy the products of their preferred brands, regardless of convenience or price. Brand loyalty is a key goal and the result of successful marketing programmes, business initiatives and product development efforts. The core of every successful brand is the core of loyal customers. They understand the brand better, buy more often and recommend the brand to others. Roy (2011), referring to Aaker, states that brand loyalty reflects the extent to which a customer is willing and able to switch from one brand to another. Tuominen (1999) defines brand loyalty as a positive attitude towards a brand, which leads to the consistent purchasing of the brand over time. It is the result of knowing the consumer that only one brand can satisfy its needs. One of the newest definitions of brand loyalty comes from Chegini (2010) who describes it in terms of theory, guidance leadership and positive behaviour, including repurchase, support and offer to purchase, which may influence a new potential customer.

Various typologies of customer loyalty are given for consideration in scientific literature (Aaker 2003; Gibbons 2012; Dick and Basu 1994; Jones and Sasser 1995; Kotler and Keller 2013; Lizbetinová 2017; Moisescu 2006; Reichheld, 2003; Schuller, 2014; Worthington, 2010). Reichheld and Teal (2001) argue that classical methods of measuring loyalty and subsequent segmentation are unnecessarily complicated. They present a new idea, namely that just one question is enough to measure customer loyalty. That question relates to the willingness of a customer to recommend a brand to other people. From the results of this one question, it is possible to simply and efficiently generate a single number (as the authors say "The one number you need to grow."), from which you derive the current state of brand loyalty. Reichheld (2003) argues that this is also an effective measurement for testing both the rational and emotional dimensions of a customer.

Material and Methods

Based on the analysis of secondary data on the research topic, it can be assumed that customer relationship management and brand loyalty are dependent. In order to confirm this hypothesis on the basis of primary data, we conducted empirical research into the influence of customer relationship management on customer loyalty, respectively brand loyalty for a Slovak company. At the time of the research, this anonymous company did not have a CRM strategy or programme in place. For the purposes of this research, data collection took place in the form of a questionnaire survey. The questionnaire was developed and distributed online. The expectation was that the research results would confirm the positive influence of CRM on customer loyalty to the brand of the company. Based on the research problem identified in the first phase of the research, a method for selecting a suitable sample, sample size and appropriate survey tools was established. We defined the customers of the analysed enterprise as the suitable sample. So we had to use the stratified sampling method. The size of the research sample was determined on the basis of a formula determined by Chráska in accordance with Nowak (2007):

$$n = \frac{t_{\alpha}^2 \times p(1 - p)}{d^2}$$

where n is the minimum number of respondents, t_{α} is the critical value of the normal distribution, p is the likely sample proportion, expressed as a decimal, and d is the confidence interval, expressed as a decimal. The confidence level was set at 95%. The critical value of the normal distribution at confidence level $\alpha = 0.05$ was 1.96. This is based on the fact that 95% of the area of the normal distribution is within 1.96 standard deviations of the mean. For those cases where the likely sample proportion was not known, p was set at 50%. The confidence interval was set at 7%. The confidence level and confidence interval were set by the management of the company. They considered them to be sufficient. Knowing that the surveyed company has 1,000 regular customers, and in order to avoid potential problems with the return rate of questionnaires, the confidence and interval levels were set at the higher level accordingly. On this basis, it was determined that 164 completed surveys would suffice. In total, 196 were obtained.

Based on the research problem, it was necessary to determine the level of brand loyalty. On the basis of secondary data, it was decided to determine this variable by asking the straightforward question posed by Reichheld and Teal (2003), namely "How likely are you to recommend us (our brand) to a friend or colleague? Respondents were required to answer using an 11-point scale (0 – 10), where 0 indicated "not likely at all" and 10 "extremely likely". According to the obtained values, respondents were divided into 3 basic groups: promoters (indicated 9 or 10 on the scale); passives (indicated 7 or 8 on the scale); and detractors (indicated 0-6 on the scale).

The impact of the CRM activities of the company were subsequently investigated. The data was obtained by posing the following questions: Are you influenced by the activities of the company with regards to addressing and acquiring customers? Are you influenced by the activities of the company with regards to retaining customers? Are you influenced by

the activities of the company with regards to achieving customer satisfaction? Are you influenced by the activities of the company with regards to determining the priorities of customers? Respondents were asked to choose from the following options: strongly agree (SA); agree (A); neither disagree nor agree (NDNA); disagree (D); strongly disagree (SD). It should be noted that the questions were developed on the basis of the defined objectives for a CRM system according to Kozak (2008).

The respondent's responses were used to statistically test and confirm or refute the hypotheses that were set, that is, with regards to the positive influence of customer relationship management on customer loyalty, respectively brand loyalty. Statistical hypothesis testing is one of the most important statistical inference procedures. The role of statistical inference is to decide on the basis of information on the available choices whether to accept or reject certain hypotheses with respect to the basic sample set. In order to do so, we proceeded in accordance with the methodology of statistical hypothesis testing, which consists of the following steps: Formulation of the null hypothesis (H_0); Formulation of the alternative hypothesis (H_1); Determination of the level of significance (α); Calculation of test statistics and probability; and Conclusion (Rimarčík 2007).

The goal of most statistical tests is to evaluate the relationship between variables. The null hypothesis expresses the independence of those variables. However, in the majority of cases we want to prove the validity of the alternative hypothesis, which expresses the actual relationship between the variables. The validity of the alternative hypothesis is proven indirectly by showing that the null hypothesis is incorrect and the alternative (the only remaining one) is correct. The null and alternative hypotheses must be mutually exclusive. The level of significance (α) is the probability of the first type error, which occurs when the null hypothesis is rejected even though it actually holds true, that is, we come to the conclusion that there is and there is not a relationship between the variables. The significance level is traditionally set at between 1% and 10%. For this research, the significance level was set at 0.05, which corresponds to a confidence interval of 95%. A confidence level of 95% is sufficient for conjoined analysis because it belongs to the set of multivariate methods and also combines data on preferences to a greater extent than standard methods. The test statistic is calculated from the sample set. It has an appropriate probability distribution based on the validity of the null hypothesis. Because the primary data in this research is of a nominal nature, the test statistic is a Chi-square test of independence. The p-value is the probability that the test statistic, assuming the veracity of the null hypothesis, achieves a value that is at least equal to the value calculated from the sample set. The p-value is the probability that the relationship found in the sample is only a consequence of chance. The p-value is the lowest value of the significance level that leads to the rejection of the null hypothesis. The smaller the p-value is, the more likely the null hypothesis is not true and should be rejected. If the p-value is so low that the statement is valid (the null hypothesis is rejected) at the significance level of 0.01 as well, it can be assumed that there is a statistically significant relationship between the observed variables. To calculate the test statistic for the hypothesis, IBM SPSS Statistics software was used. This software also calculates the correlation coefficient. In this case,

because the nominal variables are being examined in the number of $3+ \times 2+$, it was appropriate to investigate the strength of the dependence between the variables using Cramer's V measure of association. Cramer's V is the most common strength test with which to test data when a significant Chi-square result has been obtained. If the calculated p-value is less than the determined significance level, the null hypothesis is rejected (thus the alternative hypothesis is accepted). The conclusion is that the difference found in the sample set is too large to be reasonably considered as random, so it is statistically significant. If the p-value is equal to or greater than the established significance level, the difference found in the sample is not statistically significant and the null hypothesis is not rejected (Rimarčík 2007; Durica and Svabova 2015; McHugh 2013).

Correspondence analysis is a multivariate graphical technique designed to explore relationships among categorical variables. When the study variables of interest are categorical, correspondence analysis is an appropriate technique to explore the relationships amongst variable response categories and can play a complementary role in analysing data (Sourial et al. 2010). This method therefore lends itself well to marketing surveys that explore customer preferences and attitudes, and which seek to assess brand attractiveness. Examining the internal structure of the variables only makes sense if there is a dependency between the observed characters (factors). The use of correspondence analysis must therefore be preceded by the testing of hypotheses on the independence of the observed characters (Král' et al. 2009).

As previously stated, our research was aimed at determining the relationships between the level of brand loyalty and the activities of the anonymous company with regards to addressing and acquiring customers, their retention, the achievement of customer satisfaction and the determination of customer priorities.

Results

Hypothesis A – Level of Brand Loyalty/Addressing and Acquiring Customers

H0: There is not a significant relationship between the level of brand loyalty and the impact of the activities of the company with regards to addressing and acquiring customers.

H1: There is a significant relationship between the level of brand loyalty and the impact of the activities of the company with regards to addressing and acquiring customers.

The calculated test statistics are presented in Table 1.

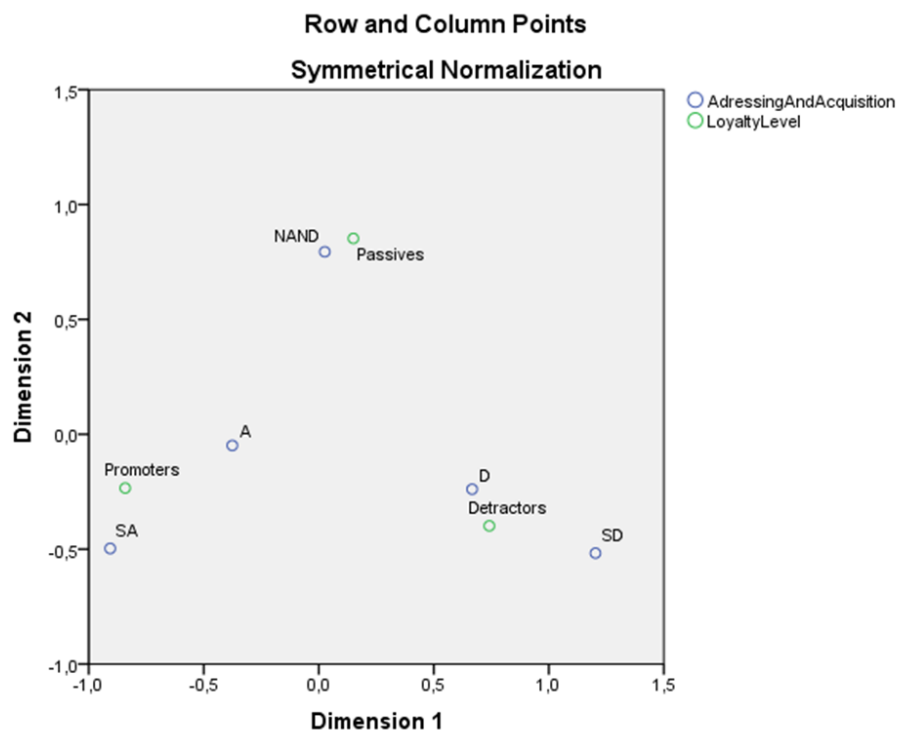
Table 1: Chi-Square test results for Hypothesis A

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-square	57.185a	8	0.000
No. of valid responses	196		

Source: Authors according to SPSS

Based on the comparison of the significance level with the p-value (Asymptotic Significance), the null hypothesis was rejected and the alternative hypothesis confirmed, i.e. there is a statistically significant relationship between the variables examined. The intensity of the dependence of the variables according to Cramer's V (0.382) indicates a moderate dependency. Based on the existence of dependence between the variables, it made sense to examine the internal structure of the contingency table by conducting a correspondence analysis. The data were processed using IBM SPSS Statistics software, the results of which are presented in Figure 1.

Figure 1: Correspondence map - level of brand loyalty/approach and acquisition



Source: Authors according to SPSS

Hypothesis B - Level of Brand Loyalty/Customer Retention

H0: There is not a significant relationship between the level of brand loyalty and the impact of the activities of the company with regards to customer retention.

H1: There is a significant relationship between the level of brand loyalty and the impact of the activities of the company with regards to customer retention.

The calculated test statistics are presented in Table 2.

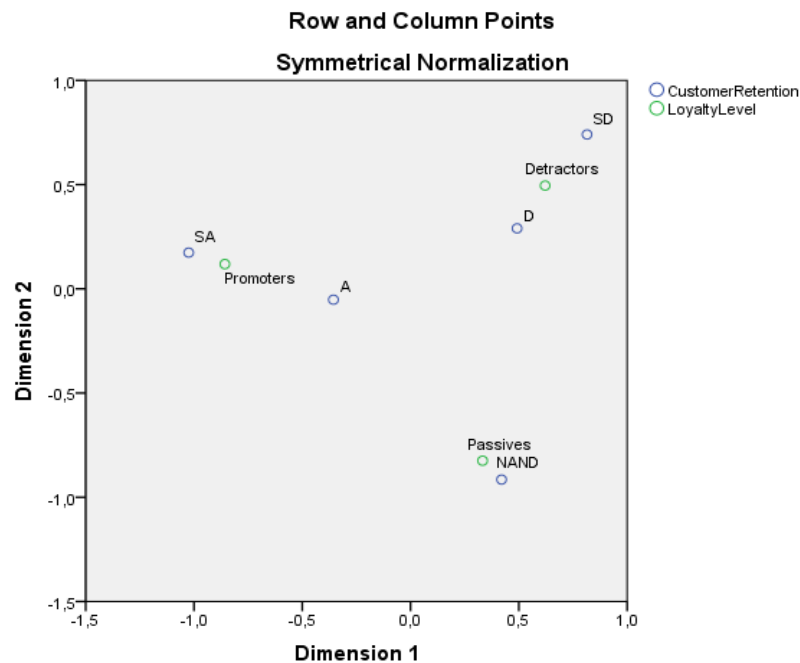
Table 2: Chi-square test results for Hypothesis B

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-square	53.071a	8	0.000
No. of valid responses	196		

Source: Authors according to SPSS

Based on the comparison of the significance level with the p-value (Asymptotic Significance), the null hypothesis was rejected and the alternative hypothesis confirmed, i.e. there is a statistically significant relationship between the variables examined. The intensity of the dependence of the variables according to Cramer's V (0.368) indicates a moderate dependency. Based on the existence of dependence between the variables, it made sense to examine the internal structure of the contingency table by conducting a correspondence analysis. The data were processed using IBM SPSS Statistics software, the results of which are presented in Figure 2.

Figure 2: Correspondence map - level of brand loyalty/customer retention



Source: Authors according to SPSS

Hypothesis C – Level of Brand Loyalty/Customer Satisfaction

H0: There is not a significant relationship between the level of brand loyalty and the impact of the activities of the company with regards to customer satisfaction.

H1: There is a significant relationship between the level of brand loyalty and the impact of the activities of the company with regards to customer satisfaction.

The calculated test statistics are presented in Table 3.

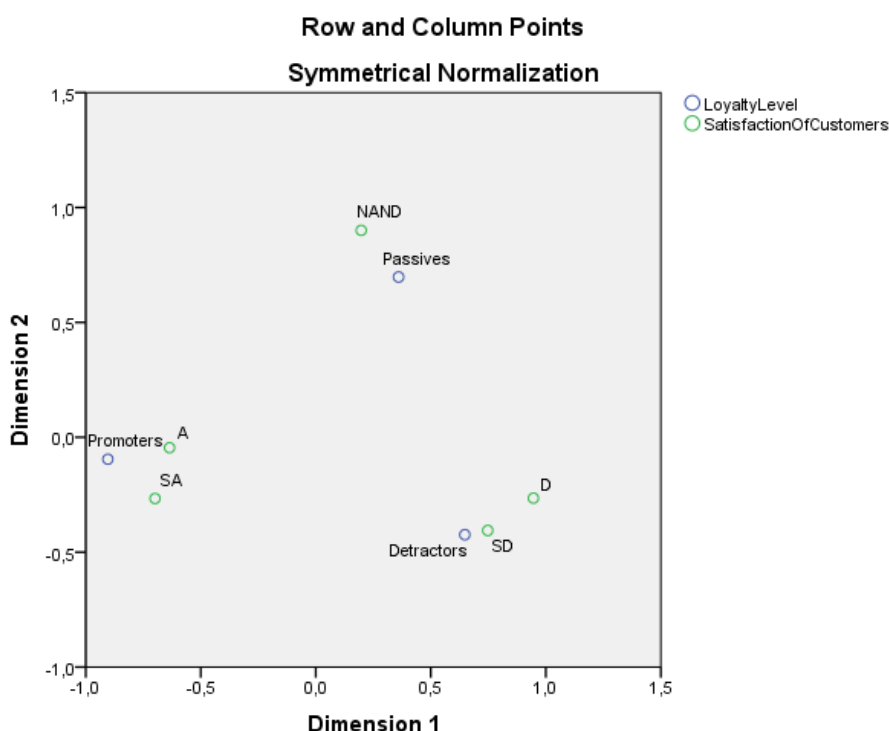
Table 3: Chi-square test results for Hypothesis C

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-square	54.349a	8	0.000
No. of valid responses	196		

Source: Authors according to SPSS

Based on the comparison of the significance level with the p-value (Asymptotic Significance), the null hypothesis was rejected and the alternative hypothesis confirmed, i.e. there is a statistically significant relationship between the variables examined. The intensity of the dependence of the variables according to Cramer's V (0.372) indicates a moderate dependency. Based on the existence of dependence between the variables, it made sense to examine the internal structure of the contingency table by conducting a correspondence analysis. The data were processed using IBM SPSS Statistics software, the results of which are presented in Figure 3.

Figure 3: Correspondence map – level of brand loyalty/customer satisfaction



Source: Authors according to SPSS

Hypothesis D – Level of Brand Loyalty/Customer Priorities

H0: There is not a significant relationship between the level of brand loyalty and the impact of the activities of the company with regards to the determination of customer priorities.

H1: There is a significant relationship between the level of brand loyalty and the impact of the activities of the company with regards to the determination of customer priorities.

The calculated test statistics are presented in Table 4.

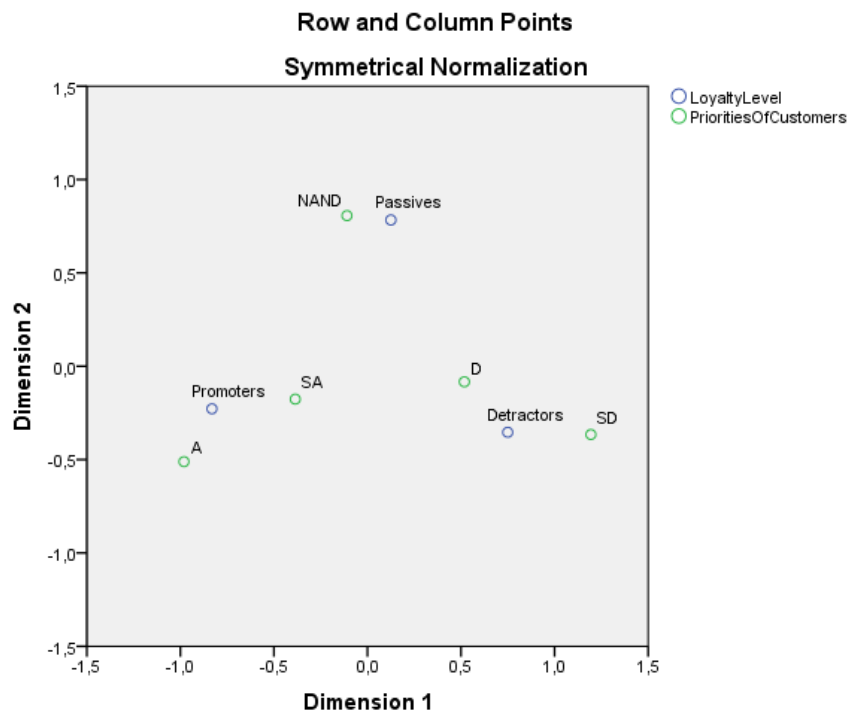
Table 4: Chi-square test results for Hypothesis D

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	52.195 ^a	8	0.000
No. of valid responses	196		

Source: Authors according to SPSS

Based on the comparison of the significance level with the p-value (Asymptotic Significance), the null hypothesis was rejected and the alternative hypothesis confirmed, i.e. there is a statistically significant relationship between the variables examined. The intensity of the dependence of the variables according to Cramer's V (0.365) indicates a moderate dependency. Based on the existence of dependence between the variables, it made sense to examine the internal structure of the contingency table by conducting a correspondence analysis. The data were processed using IBM SPSS Statistics software, the results of which are presented in Figure 4.

Figure 4: Correspondence map – level of brand loyalty/customer priorities



Source: Authors according to SPSS

Discussion

The analysis of the research results confirmed that the more loyal a customer is to a brand, the more important the CRM activities of the company are with regards to addressing, acquiring and retaining them, as are their activities for achieving customer satisfaction and the determination of customer priorities. This is proved by the fact that the p-values for all the tested hypotheses were so low that the null hypotheses were rejected at the significance level of 0.01 as well. On this basis, it can be assumed that there is a statistically significant relationship between the observed variables. The subsequent correspondence

analysis revealed that the most loyal customers (promoters) of the company predominantly strongly agree or agree with the statement that they are influenced by the activities of the company with regards to addressing, acquiring and retaining them, as are their activities for achieving customer satisfaction and the determination of customer priorities, i.e. activities defined as objectives of CRM. In direct contrast to this, the least loyal customers (detractors) of the company predominantly disagree and strongly disagree with the same statement. In summary, it can be concluded that more loyal customers are more influenced by company activities defined as objectives of CRM.

This therefore implies that customer relationship management indeed has a positive impact on customer brand loyalty for companies. Similar findings were also confirmed in other research. Lawson-Body and Limay (2004) analysed the impact of customer relationship management on customer loyalty and found that customer-oriented partnerships and the personalisation of services had a direct impact on customer loyalty. This means that an effective CRM strategy increases the customer's social and behavioural commitment. Amin (2011) found that engagement and dedication to customer requirements and needs increases customer loyalty. Seyyed Javadin, in accordance with Mohammadpour (2014), concluded that the main factors influencing customer loyalty include customer relationship management in the form of manpower, processes and technology and that all these factors had a significant effect on customer loyalty in his study. Further research confirms that a significant relationship has been observed between customer relationship management and customer loyalty. Accordingly, it can be said that emphasis has to be placed on customer relationship management (Kocoglu and Kirmaci 2012). The results of another statistical analysis show that customer relationship management not only has an influence on customer satisfaction, but also on customer loyalty (Khedkar 2015). Customer loyalty can be achieved through the successful implementation of a CRM strategy and programme. An effective customer relationship management strategy is positively linked to customer loyalty. CRM helps organisations to build long-term relationships with their customers (Kamrul and Rahman 2015). As a result, emphasis, once again must be placed on customer relationship management. It is suggested that companies should invest in relationship building and customer intimacy with loyal customers because it will in turn lead to even greater loyalty (Ndubisi 2004). Businesses that develop business relationships with customers through frequent product and service adjustments will have a high customer engagement rate and will win their loyalty (Weberova 2016). If an organisation truly wants to create a group of loyal customers, it must use a CRM marketing strategy that leads to a personal dialogue with each of its clients. In this way, they can slowly recognise them and start using their feedback to provide the best products and specific services for each one.

Conclusion

This article looked at the influence of customer relationship management on customer and brand loyalty with regards to the anonymous company at the heart of the research. Customer relationship management can be considered to be an important tool for the

competitiveness of businesses. This is because the strengthening of the relationships with customers by delivering higher customer value and the application of differentiated approaches to them can change the relationship to the benefit of both sides and therefore increase the potential for maintaining customer loyalty. This conclusion is mainly based on theoretical knowledge and secondary research data. However, this was also confirmed by the results of our research, which revealed that the most loyal customers of the company predominantly strongly agree or agree with the statement that they are influenced by the activities of the company with regards to addressing, acquiring and retaining them, as are their activities for achieving customer satisfaction and the determination of customer priorities, i.e. activities defined as objectives of CRM. On the basis of the research results, the importance and benefits of customer relationship management in relation to brand loyalty were highlighted, all of which form the theoretical and practical basis (reasons) for the potential implementation of a CRM strategy and programme within an enterprise.

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Factors Influencing Employee Turnover and Personnel Stability in Hotels in Slovakia

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Abstract

The development of tourism and hotel management depends on the ability of managers to recruit qualified employees, create an appropriate working environment and retain employees. The main issue for managers is to determine how to stabilise personnel numbers and reduce employee turnover. The main aim of this paper is therefore to identify the key factors that affect employee turnover and personnel stability in Slovak hotels. The research was conducted in selected hotels operating in Slovakia. The results revealed that poor career prospects and non-transparent and unfair remuneration have the greatest impact on employee turnover and personnel stability. It was also shown that personnel stability is mostly influenced by an appropriate corporate culture and personal recognition.

Key words: Employee turnover, hotel, personnel stability, employees.

Introduction

A hotel is a difficult and complex organism that consists of a whole range of activities and processes. Employees represent the most important resource for the existence and development of this organism. Within this context, human resources management is a challenging process, the results of which depend on the prosperity, progress and success of a hotel. The importance and the role of employees in the work process has been discussed in a wide variety of contexts, but clear evidence of their true value is the situation in hotels that lack the right people. The situation becomes even more complicated when the need for competent, loyal and efficient employees is more urgent. In both cases, the implications for hotel management should not only be an impulse for reflection, but also for improving the range and the depth of the system of work with people.

Hotels are demanding places in terms of human resources and their success is related to the quality of employee performance, which in turn is influenced by corporate culture. Only those employees that directly contribute to the satisfaction of customers tend to find personal satisfaction in their work in a hotel. Strong and effective managements realise that it is therefore essential to support the performance of such employees if they are to stabilise personnel numbers and employee turnover.

According to Vetráková, et al. (2011, p. 15), the human resources of an enterprise are those employees who activate and use the other resources of the enterprise - material, financial and informational - to achieve the set goals. Employees become a part of an enterprise's resource base if a certain part of their human potential, as owners of human capital, is provided to the employer and is engaged in the work process. In so doing, their human capital becomes part of the intellectual capital of the enterprise.

The individuals that form the labour force are directly linked to the existence and functioning of an enterprise. People create businesses, they are part of them, but they are also their customers, and therefore form an indivisible component thereof. From the point of view of human resources management, an important aspect emerges: If there are difficulties in an enterprise, their origin should be sought mostly in the problems of individual employees or in the human relationships that exist between them (Bajžíková et al. 2011, p. 7).

Every hotel is special and specific. For the people employed in a hotel, one common rule applies, namely that its success is linked to the quality of their performance. High employee turnover does not contribute to the growth of performance and improvements in the quality of the services provided. It is therefore important in every process of human resources management to look for ways to increase personnel stability, in particular of those employees who are willing to approach their tasks with enthusiasm and who are interested in self-improvement and personal development.

The aim of this paper is therefore to identify the key factors that affect employee turnover and personnel stability in independent hotels and chain hotels operating in Slovakia.

Materials and Methods

Analysis of the results of the questionnaire survey - identification data

A questionnaire survey was conducted among hotels in Slovakia. According to the Slovak Tourist Agency, 635 hotels were registered in Slovakia in 2016 (www.sacr.sk 2016). One and two star hotels were excluded from the questionnaire survey because of the greater chance of the presence of combined work positions and the lower requirements for the quality of the services provided. The number of remaining hotels in Slovakia with three or more stars was 429. In total, managers of 250 hotels were approached, which resulted in 128 respondents willing to participate (48 managers and 80 hotel staff). This represents a return rate of 51%. The questionnaire was designed for two groups of employees, namely managers and other members of staff.

By evaluating the results of the responses to the questionnaire survey, it was possible to identify the general causes of employee turnover and what tools are used by hotels in Slovakia to stabilise personnel numbers in relation to hotel type (chain hotel vs. independent hotel).

The questions in the questionnaire for both managers and employees primarily focused on issues such as satisfaction with wages and a range of employee benefits, the causes of employee turnover, the average length of employment, the reasons for the termination of employment, and the factors that influence personnel stability. At the end of the questionnaire, respondents were asked to fill in basic identification data. The questionnaire contained a combination of open and closed questions, with the use of a Likert scale. The questionnaire for managers was more extensive than that for the other members of staff because it contained more detailed questions regarding the indicators and monitoring of employee turnover and personnel stability.

The survey was completed by 48 managers, of which 36 were male and 12 female. The largest group of managers were 26 to 35 years of age. In addition, 80 other members of staff, working in positions such as receptionist, cook, waiter, housekeeper, etc. also participated in the survey. Of this group, 35 were male and 45 female. The largest group of employees were 36 to 45 years of age.

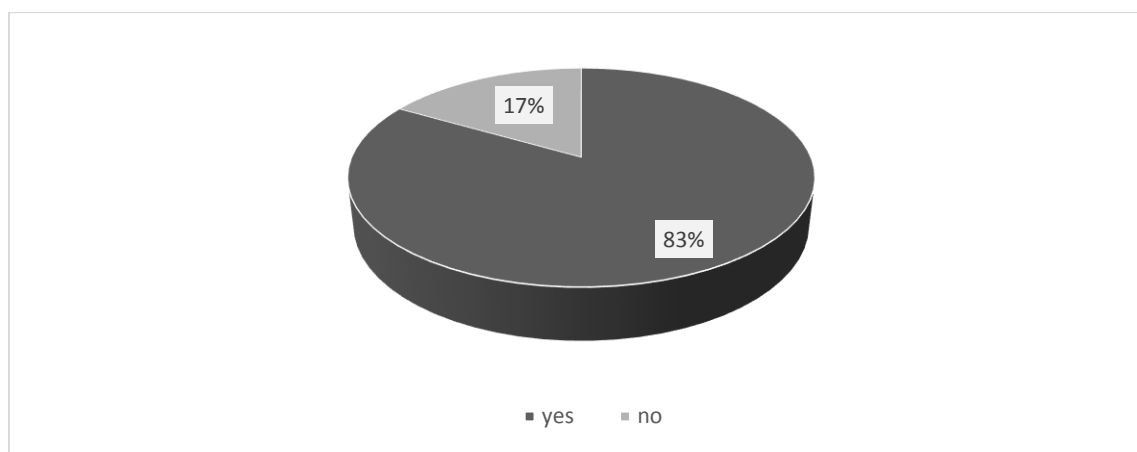
The identification questions sought to establish in what type of hotel, resp. category of hotel, the respondents worked in. In total, 75% of respondents stated that they worked in an independent hotel and 25% in chain hotels. With regards to the category of hotel, almost half of the respondents stated that they worked in conference oriented hotels, approximately 20% in wellness hotels, approximately 15% in mountain hotels and 3% in boutique hotels. Almost 16% of respondents stated that they worked in a different category of hotel to that identified in the questionnaire options. In all cases, this concerned historical hotels. The survey was completed by approximately 82% of staff and managers of four star hotels. The remaining 18% were employees and managers of three and five star hotels

The most frequent benefits provided by the participating hotels were: motivational remuneration system; company mobile; tablet; laptop; company car; tickets to cultural events; free hotel wellness centre for family members; discounted wellness treatments; teambuilding activities; vouchers for work clothes; the possibility to stay at partner hotels; discounts for celebrations; weddings; discounts for consumptions at individual resorts; and/or parking in the hotel garage. Chain hotels also included learning opportunities in other hotels within the chain. Another significant benefit was the option for relatives to stay in the hotel once a year (on the condition that the employee has been working on the basis of a permanent contract for at least half a year).

Analysis of the results of the questionnaire survey - analysis of employee turnover and factors that influence personnel stability

In the questionnaire for managers, they were asked whether they monitored the reasons for employee turnover. The question was dichotomous, i.e. managers could answer "yes" or "no." The results are presented in Figure 1.

Figure 1: Question: Do you monitor the reasons for employee turnover in your hotel?



Source: Authors 2018

A total of 83% of managers answered this question positively. In such cases, the managers were subsequently asked to identify which indicator(s) linked to employee turnover they monitor. The managers were presented with pre-determined options, whilst being given the freedom to mark several of them. The main indicator they monitored was the reason for the termination of employment from both the side of the employer and the employee. The length of employment of an employee and the number of employees dismissed during each month of the year were also monitored. Among the lesser important indicators were the number of new recruits and stable employees separately, as well as combined within the current year. For a complete evaluation of the question, see Figure 2.

Figure 2: Question: Which indicators do you use to monitor employee turnover?

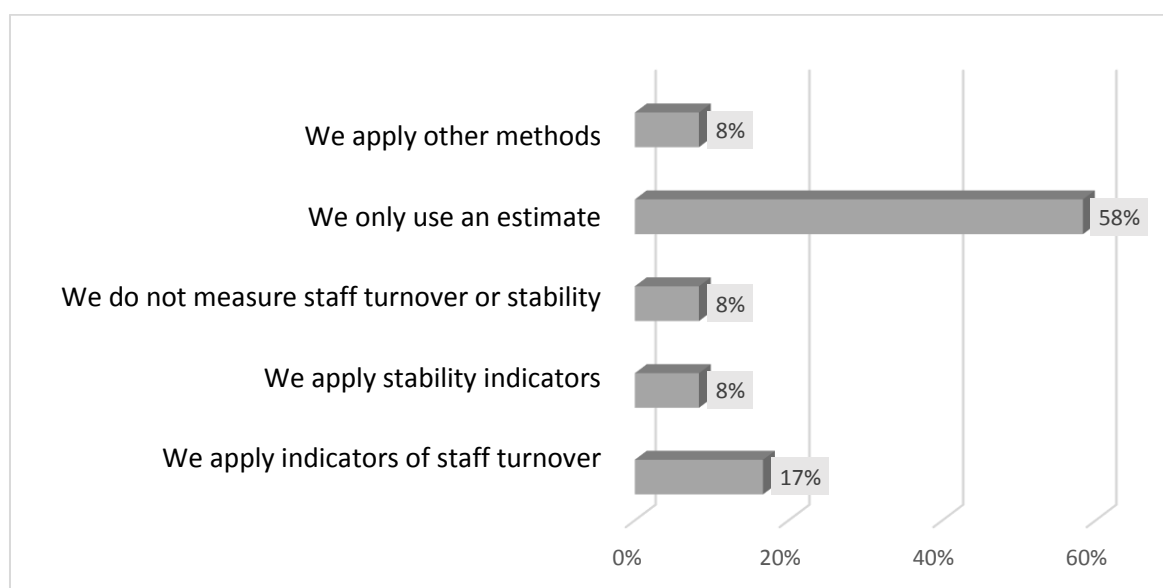


Source: Authors 2018

The results presented in Figure 2 reveal that managers are more interested in monitoring the reasons why employees terminate their work contract than in quantitative indicators such as the numbers of newly recruited employees, dismissed employees, or the percentage of employees who left the hotel in a given year.

The next question in the manager's questionnaire focused on finding out whether and to what degree managers apply quantitative measures to monitor employee turnover and personnel stability in the hotel they operate in. The results are presented in Figure 3 below.

Figure 3: Question: Which quantitative measures do you apply to monitor employee turnover and personnel stability?

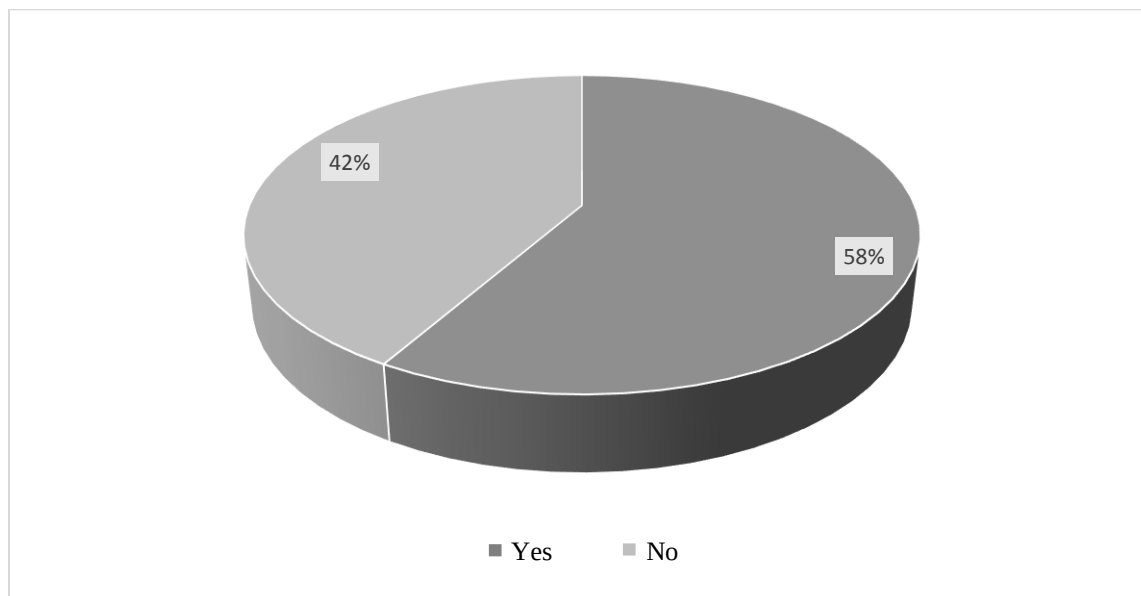


Source: Authors 2018

Of the total number of managers that responded, more than half (58%) only use estimation to determine the rate of employee turnover and the level of personnel stability. The rate of employee turnover is monitored only by 17% of the managers, with only 8% monitoring the level of personnel stability. A further 8% of managers either do not apply quantitative measures at all or use other means to assess the total number of employees leaving the hotel. In these cases, they state that they are particularly interested in the reasons why an employee leaves. This is confirmed by the results attained through the responses to the previous question.

The next question sought to determine whether managers are able to put a figure on the percentage of employee turnover in the hotel they operate in. The results are presented in Figure 4 below.

Figure 4: Question: Can you put a figure on the percentage of employee turnover in your hotel?



Source: Authors 2018

As previously stated, only 17% of the managers monitor the rate of employee turnover, and 58% of managers (28 in absolute numbers) use an estimate. The interest here was in how many of the managers in these two groups combined could put a figure on the percentage of employee turnover in the hotel they operate in. Once again, more than half of managers (58%) were able to give a percentage, whereby values ranged from 10% to 20%. Those managers that could not give a percentage stated that their staffing levels were stable and that the number of departing employees during the year was minimal

The positions of chef de cuisine, sous-chef, and all upper positions in the financial, business and management departments were identified as the most stable positions within hotels. In terms of leaving, the most problematic categories of employees were those with lower levels of education, such as waiters, kitchen porters, dishwashers or housekeepers.

The results of the survey show that there are differences in perception between employees and managers with regards to the significance and the importance of the factors that influence employee turnover. This fact was verified through the use of SPSS statistical software and the application of the Mann-Whitney test. The test revealed that the most significant differences in perception relate to the importance attached to work and personal (professional) reasons. In both cases a significance level $\alpha < 0.05$ was achieved. The results are presented in Figure 5.

Figure 5: Results of Mann-Whitney test

Mann-Whitney Test				
Ranks				
	group	N	Mean Rank	Sum of Ranks
OT12_prac	1	48	54,29	2606,00
	2	80	70,63	5650,00
	Total	128		
OT12_osob	1	48	50,33	2416,00
	2	80	73,00	5840,00
	Total	128		
OT12_organ	1	48	61,58	2956,00
	2	80	66,25	5300,00
	Total	128		
OT12_rodina	1	48	60,54	2906,00
	2	80	66,88	5350,00
	Total	128		
Test Statistics ^a				
	OT12_prac	OT12_osob	OT12_organ	OT12_rodina
Mann-Whitney U	1430,000	1240,000	1780,000	1730,000
Wilcoxon W	2606,000	2416,000	2956,000	2906,000
Z	-2,422	-3,372	-,694	-,945
Asymp. Sig. (2-tailed)	,015	,001	,488	,345

a. Grouping Variable: group

Source: Authors using SPSS statistical software 2018

The differences in perception between managers and employees with regards to the importance of work and personal (professional) reasons are presented, among other factors, in Table 1.

Table 1: Reasons for employee turnover - managers vs. employees

Reason	Managers	Employees
Work	- Inappropriate and demanding work schedule - Difficult and hard work	- Dissatisfaction with working conditions - Difficult and hard work - Inappropriate working conditions - Inappropriate work schedule
Personal (professional)	- Better offer from another company / hotel - Prospect of a better job abroad	- Poor career prospects - Lack of opportunities for self-realisation - Prospect of a better job abroad
Organisational	- Low wage - Insufficient motivation from hotel owners	- Non-transparent and unfair remuneration - Low wage - Lack of feedback on performance and the behaviour of managers
Family	- Health problems	- Health problems

Source: Authors 2018

Although managers believe that recognition is one of the most important factors influencing personnel stability, employees disagree and state that career development and personal growth are more important. These and other differences between managers and employees are presented in Table 2 below.

Table 2: Factors influencing personnel stability - managers vs. employees

	Managers	Employees
Factors	- Recognition - Appropriate corporate culture - Transparent remuneration	- Career development and personal growth - Possibility of increased wages during career - Recognition - Transparent and fair remuneration

Source: Authors 2018

As part of the analysis of the research results, confirmation was sought of the link between the personal and professional development of employees and the level of personnel stability in hotels. The calculated Spearman coefficients confirmed the dependence of the two variables and the appropriateness of the corporate culture. The Spearman coefficient results are presented in Figure 6.

Figure 6: Results of Spearman's coefficient calculations

		Correlations											
Spearman's rho	OT9	OT9		OT7a1		OT7a2		OT7a3		OT7a4		OT7a5	
		Correlation Coefficient	Sig. (2-tailed)	Correlation Coefficient	Sig. (2-tailed)	Correlation Coefficient	Sig. (2-tailed)	Correlation Coefficient	Sig. (2-tailed)	Correlation Coefficient	Sig. (2-tailed)	Correlation Coefficient	Sig. (2-tailed)
		1,000		,128	,256	-,148	,189	,489	,022	-,123	,276	-,135	,231
			80		80		80		80		80		80
			80		80		80		80		80		80
	OT7a1	,128	,256	1,000		,027	,815	,061	,475	-,063	,509	,414	,235
			80		80		80		80		80		80
			80		80		80		80		80		80
	OT7a2	-,148	,189	,027	,815	1,000		,116	,308	-,136	,231	,496	,136
			80		80		80		80		80		80
			80		80		80		80		80		80
	OT7a3	,489	,022	,061	,475	,116	,308	1,000		-,214	,241	,219	,244
			80		80		80		80		80		80
			80		80		80		80		80		80
	OT7a4	-,123	,276	-,063	,509	-,136	,231	-,214	,241	1,000		-,189	,344
			80		80		80		80		80		80
			80		80		80		80		80		80
	OT7a5	-,135	,231	,414	,235	,496	,136	-,189	,344	-,310	,333	1,000	
			80		80		80		80		80		80
			80		80		80		80		80		80
	OT7a6	,438	,000	,414	,000	,496	,000	,219	,344	,769	,258	,258	1,000
			80		80		80		80		80		80
			80		80		80		80		80		80
	OT7a7	,082	,469	,235	,035	,136	,231	,244	,333	,314	,258	,130	,130
			80		80		80		80		80		80
			80		80		80		80		80		80
	OT7a8	,125	,268	,449	,000	,514	,000	,214	-,358	,334	,769	,130	,130
			80		80		80		80		80		80
			80		80		80		80		80		80
	OT7a9	-,114	,314	-,096	,395	,636	,000	,063	-,339	,313	,487	,262	,485
			80		80		80		80		80		80
			80		80		80		80		80		80
	OT7a10	,000	1,000	-,302	,007	,433	,000	,000	,183	-,075	,354	,000	,379
			80		80		80		80		80		80
			80		80		80		80		80		80
	OT7a11	-,140	,214	,107	,343	-,250	,025	-,179	,878	-,061	-,353	,163	-,444
			80		80		80		80		80		80
			80		80		80		80		80		80
	OT7a12												
			80		80		80		80		80		80
			80		80		80		80		80		80

**. Correlation is significant at the 0.01 level (2-tailed).*. Correlation is significant at the 0.05 level (2-tailed).

Source: Authors using SPSS statistical software 2018

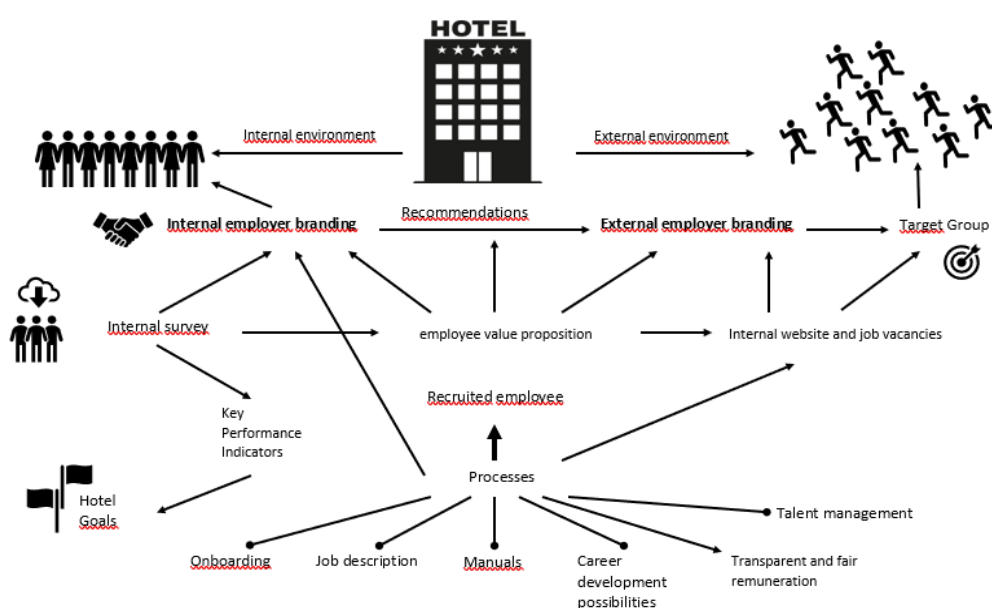
Our analysis also sought to verify the strength of the correlation, if any, between the age of employees and their wages, and their influence on personnel stability. Spearman coefficient calculations confirmed the dependency of personnel stability on age, but not on average gross monthly wage. On the basis of these findings, it can be stated that the age of employees has a greater influence on personnel stability than their average gross monthly wage. With older employees the level of personnel stability is greater. Spearman coefficient calculations also confirmed that systems for stabilising personnel numbers are applied more in chain hotels than in independent hotels.

Discussion and Conclusion

One of the outputs of the conducted survey was a proposed system for the stabilisation of personnel numbers in chain hotels and independent hotels operating in Slovakia. On the basis of our detailed analysis, it was possible to identify problem areas and to subsequently formulate recommendations and solutions for tackling them.

The proposed system for creating personnel stability can be viewed as a modern human resources management strategy, a strategy that clearly recognises that qualified, efficient and reliable employees are one of the most important resources of a hotel and are key to its success. If a hotel wants to retain such employees, it is necessary to know their needs and values, the situation on the labour market, the working environment and the working life they can offer them. The stabilisation of personnel numbers represents a long-term and continuous process of increasing the attractiveness of the employer, the exploration of the job (dis)satisfaction of employees, and the search for solutions that reconcile the expectations of employees with the needs and goals of the employer.

Figure 7: Proposed system for creating personnel stability



Source: Authors 2018

The results from the conducted survey show that chain hotels have developed systems in place in the form of internal documents to promote greater personnel stability. It is for this reason that the proposed system for personnel stability, as presented in this paper, is more oriented towards independent hotels. It should be noted that personnel stability is a process that is always affected by the staff of a hotel.

The proposed system for creating personnel stability contains key elements, including employer branding - the creation of unique/key values of the employer: (a) target group definition; (b) defined job advertisement as a marketing tool; (c) defined search and recruitment channels; (d) transparent remuneration system; (e) elimination of factors that influence the termination of employment; and (f) defined career development options for employees (including for existing personnel).

The value, importance and role of people in the work process is beyond question. As stated by Vetráková (2017), working with people in the work process, i.e. with human resources, is a significant and important activity in the entire management system of a hotel.

In the rapidly changing market environment, it is imperative that hotels know where their competitive advantage lies and what form(s) this takes. In tourism businesses, human capital is a basic prerequisite for their success. Mikoláš (2005) suggests that there is a new dimension to a company's competitiveness, one that involves an interdisciplinary view and which is very closely connected with the intangible value of an enterprise. The overall market value of an enterprise is not only financial, but also intellectual capital, the core of which is human capital. Human capital is therefore an irreplaceable asset for every enterprise.

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Innovative Method for Assessing the Quality of Special Wood Products during the Production Process

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Abstract

Innovations in the assortment of special wood products made by small manufacturers, and not by major manufacturers in terms of quality and environmental credentials, enables them to compete successfully on the market. For the final phase of the production process, these products require a precisely chosen surface finishing treatment.

The purpose of wood treatment is to protect a specific adherend against the adverse effects of external influences, as well as mechanical, chemical and biological damage. The requirements for the quality of the surface treatment are dependent on the function and purpose of a particular product.

At present, beyond surface characteristics, there are no other evaluation criteria that take into account the diverse morphological characteristics of wood, e.g. reflectance as a result of the surface reaction of wood to the application of different types and layers of coatings.

The research presented in this article focuses on determining the most important qualitative criteria with regards to the surface treatment of special wood products (by assessing the morphological characteristics of the wood's surface by means of an experimental optical laser) during the production process of these products, which are produced by a limited number of small manufacturers, are produced in an environmentally friendly way, and are competitive and sustainable.

Keywords: qualitative criteria, production process, innovative optical laser

Introduction

At present, the issue of the impact of environmentally friendly technologies is still relevant. Within this context, it is necessary to build an optimal production chain, one that is effective, but environmentally friendly, yet economically efficient, competitive and sustainable in the market, and which delivers products according to customer demands as a result of innovative production processes (Brashaw 2009; Lindermann et al. 2013, Ružinská 2015b, 2018b).

The production process, as the main activity of a production company, directly influences the efficiency of a business and the ability of its products to compete under competitive market conditions (Caha 2017; Grewal 2008; Synek et al. 2007; Vochozka et al. 2011, 2015; Lindermann et al. 2013). This relies on the minimisation, respectively optimisation of inputs and the maximisation of outputs.

For small producers in these markets to supply customers with desirable products requires a lot of effort and innovation. Their success in markets dominated by large manufacturers depends on the uniqueness of their products, effective management of quality, environmental credentials, and the requirements of customers (Grewal 2008; Guerrero et al. 2017; Lindermann et al. 2013; Sujová et al. 2015).

The innovativeness of special wood products is determined by the identification of all the decisive factors in the production management process. The most important factor is the preparation of the substrate, i.e. wood for subsequent surface treatment. Of similar importance is the selection of the desired product quality criteria. However, although relevant qualitative criteria exist for a wide range of products, such as furniture or construction materials, this does not apply to special wood products (sports articles, toys, jewellery, music instruments, gift items, etc.) (Kalendová 2004; Kúdela and Liptáková 2005; Jabłoński et al. 2009; Sedliačik et al. 2013; Zhong et al., 2013; Badida et al. 2016; Seabra et al. 2017; Ružinská 2018a).

The aim of the research presented in this article was therefore to empirically determine the most important qualitative criteria for the evaluation of the surface finishing treatment of special wood products. The focus was on the application of our own experimental method (optical laser) for assessing the surface characteristics of wood. This is considered important because it is the surface of the wood and its subsequent surface treatment that determines all its other important properties (physico-mechanical, chemical, resistance, thermodynamic and specific) during its lifetime and under the conditions of use by consumers.

Quality management during surface treatment of special wood products

The definition of quality within the framework of quality management usually changes in line with changes in production processes and the conditions in which products are made. It should (also) be taken into consideration that customer demands change over time, which suggests that quality does not remain unchanged (Synek et al. 2007).

Every product has its own qualitative characteristics, i.e. relevant product features that serve to describe its quality. These features should form the properties of products that significantly meet the demands of consumers and positively affect their satisfaction. These include: usability, functionality and performance, equipment, reliability, compliance with standards, durability, ecological credentials, and design (Sedliačik et al. 2013; Sujová et al. 2015; Ružinská 2018a).

For good quality management it is important to understand what quality criteria are essential, to determine the methods for measuring and testing them, and, where appropriate, to find alternatives and understand the relationships between them. It is only in this way that the quality of the products produced by manufacturers will meet consumer's requirements (Vochozka et al. 2011, 2015; Lindermann et al. 2013).

For this research, the product-oriented quality management approach was applied, whereby the definition of quality is indicative of both accuracy and measurability; current principles of quality management during the surface treatment of wood products were also taken into consideration (Ružinská et al. 2014 a, b, 2015 a, b, 2018 a, b).

Product-oriented definitions are based on whether a product has the properties as prescribed in the accompanying technical documentation. Any increase in the level of a particular product parameter is understood to reflect an increase in its quality. However, quality defined in this way leads to quality assurance activities that are purely focused on technical control. This is evidenced by the many key standards or mandatory methods for assessing the primary (mechanical, physical, chemical, resistance, ecological, hygienic, specific) characteristics of surface treated wood products (Kalendová et al. 2004; Kúdela and Liptáková 2005; Ružinská 2014a, 2018a, b; Sain et al. 2006; Salmén et al. 2014; Zhong et al. 2013).

These standardised qualitative criteria only apply to defined groups of wood products (furniture, building and carpentry, woodworking products), but do not exist for special wood products.

An indispensable part of protecting wood products is the surface finish, which can extend the life of wood and highlight its natural beauty. It is important that the method and type of surface treatment be determined correctly. Wood is a "living material" with natural beauty, which can be accentuated by the appropriate surface finish, but which can see its utility value fall and lifetime shortened with an inappropriate one (Sedliačik et al. 2013; Madhoushi et al. 2017).

The primary goal of wood treatment is to protect a specific adherend against the adverse effects of external influences, as well as mechanical, chemical and biological damage. An important aspect of this is the need to increase the aesthetic appearance of wood products in their final form and the need to preserve all of its other quality characteristics (mechanical, physical-chemical, ecological, biological, resistant and specific). After all, the sale of wood products depends on this and a lack of disturbing defects (Kalendová et al. 2004; Berenjan et al. 2012; Ružinská 2014a, 2018a, b; Zhong et al. 2013).

The properties of wood primarily affect the surface treatment of the wood. However, the influence of the chemical composition of the type of coatings used is also significant, as are other factors that influence the interaction between the wood and the coatings during their application and/or curing (Seabra et al. 2017; Zhong et al. 2013; Salmén et al. 2014).

Wood can be characterised as a homogeneous, porous-capillary, limited swelling colloid. The porous character of wood is the result of its morphological properties. Wood is an extensive capillary system with cavities. The different morphology of the wood surface and its various properties in individual anatomical directions is based on the knowledge of a specific adherend (wood) having a heterogeneous, anisotropic polymeric composition (Sain et al. 2006; Zhong et al. 2013; Madhoushi et al. 2017).

The differences in the surface roughness (as an important morphological characteristic) of wood in different anatomical directions, which is an important factor during the surface treatment process, are also taken into account in the resulting qualitative properties of surface finishing (Kúdela and Liptáková 2005; Boruszewski et al. 2012; Salmén et al. 2014; Zhong et al. 2013; Salmén 2014; Ružinská 2018a).

The requirements for the quality of the surface treatment are dependent on the function and purpose of a particular product. In addition to assessing the characteristics of the appearance of different types of coatings, it is important to know the geometry of the wood, especially its surface roughness, because it is at this interface where the interaction takes place between the substrate and the applied coating (Kúdela and Liptáková 2005; Brashaw 2009; Zhong et al. 2013; Salmén 2014; Ružinská 2014a, 2015a, 2018a).

At present, beyond surface characteristics, there are no other evaluation criteria that take into account the diverse morphological characteristics of wood (e.g. reflectance as a result of the surface reaction of wood to the application of coatings). Such criteria would help to clarify the interactions between wood and coatings because this interface conditions the success and appearance of the resulting special wood products.

Materials and Methods

Proposed primary quality characteristics for the surface treatment of special wood products

This research focuses on the application of an experimental method (optical laser) for the assessment of the surface characteristics of wood, since it is the surface of the wood and its subsequent surface treatment that determines all its other important properties (physico-mechanical, chemical, resistance, thermodynamic and specific) during its lifetime and under the conditions of use by consumers.

The assessment of the quality of the surface treatments is based on a comprehensive set of criteria, including those in previously published research in the field (Ružinská 2014a, b; 2015a, b; 2018a, b).

Experimental optical laser method for quality assessment of surface treatment of special wood products

The *optical laser method* is an alternative, non-destructive method for assessing the surface quality of wood as a specific adherend. The method involves the evaluation of the intensity of reflected radiation from a test body during surface treatment processes. The intensity of the reflected radiation (in lux units) is quantitatively measured from the surface of the test samples after the application of each individual coating in order to determine the changes in surface quality during each stage of the surface treatment process (Ružinská 2018a).

Helium-laser (He-Ne) radiation was directed at different angles (20°, 40° and 60°) to the anatomical directions (perpendicular and parallel) of the wood fibres. The method was applied to test samples that were treated with different coating systems based on natural and industrial oils and waxes. The results are presented in Table 2.

The proposed method was applied to wood products (sports articles, toys, jewelry, music instruments, gifts, etc.) classified as special. It is intended to complement findings (standardised under profilometric methods) on the morphological characteristics of wood during production processes in terms of its impact on the qualitative changes in special wood products, with a view to improving the efficiency of technological production operations.

Materials

The research on the surface treatments presented here is based on the application of environmentally friendly coatings to special wood products.

In total, 7 types of coating systems based on natural and industrial oils and waxes were used for the surface treatment of beech wood samples. The oil and wax based coatings did not contain VOCs (volatile organic compounds), which are present as additives in most commercially available coatings, and which are classified as hazardous for the health (Roffael et al. 2012; Berenjan et al. 2012; Ružinská 2015a, b).

The different coating systems applied are listed in Table 1.

Table 1: Identification and description of coating systems

Coating system	Description of coating system
WO-1	Oil wax
WO-2	Industrial wax
WO-3	Special oil wax
A1	Modified wax
A2	Modified wax + PUR water soluble lacquer
OL	Natural flaxseed oil with waxes
AR	Water dispersion with wax

Source: Author

Results and Discussion

Primary quality characteristics of surface treatments of special wood products

The assessment of the quality of the surface treatments is based on a comprehensive set of criteria, including those in previously published research in the field (Ružinská et al. 2014a, b; 2015 a, b; 2018a).

For this research, the following qualitative criteria are considered to be key to the assessment of the coatings applied to special wood products during surface treatment processes (see Figure 1):

- Properties of the coatings:
 - chemical composition of the film-forming components
- Properties of the wood as an adherend:
 - morphological properties of the wood
 - chemical composition of the wood
 - internal and external wood surface
 - physical and mechanical properties of the wood
- Interaction of wood and coatings:
 - wetting of wood surface
 - penetration of coatings into the structure of the wood
 - phase interface during application and drying (curing).

The morphological properties of wood as an adherend is one of the most important factors influencing the quality of wood surface treatments. Special attention was therefore paid to this qualitative characteristic. The proposed non-destructive experimental laser method provided complementary data on the changes in the profile characteristics of special wood products during surface treatment processes. This not only gave valuable insights into the morphological (profileometric) characteristics of adherence (surface roughness), but also into the optical characteristics of the surface treatments (gloss measurement, coating defect identification) (Ružinská 2015a; 2018a).

The results presented in Table 2 and Figures 2-4 show that the intensity of the reflected narrow beam of laser radiation (He-Ne) not only depends on the quality of the type and layer of coating, but also on the interaction with the substrate (wood) and the anatomical direction (perpendicular and parallel to the direction of the wood fibres).

The beam of the He-Ne lasers behaved in response to the test samples as follows:

For test samples with non-milled surfaces there was a diffuse reflection, as a result of which the intensity of the reflected radiation to the ultrasonic sensing device was low. In contrast, milled test samples contributed to a reduction in surface roughness, which resulted in an increase in the amount of reflected radiation from the substrate.

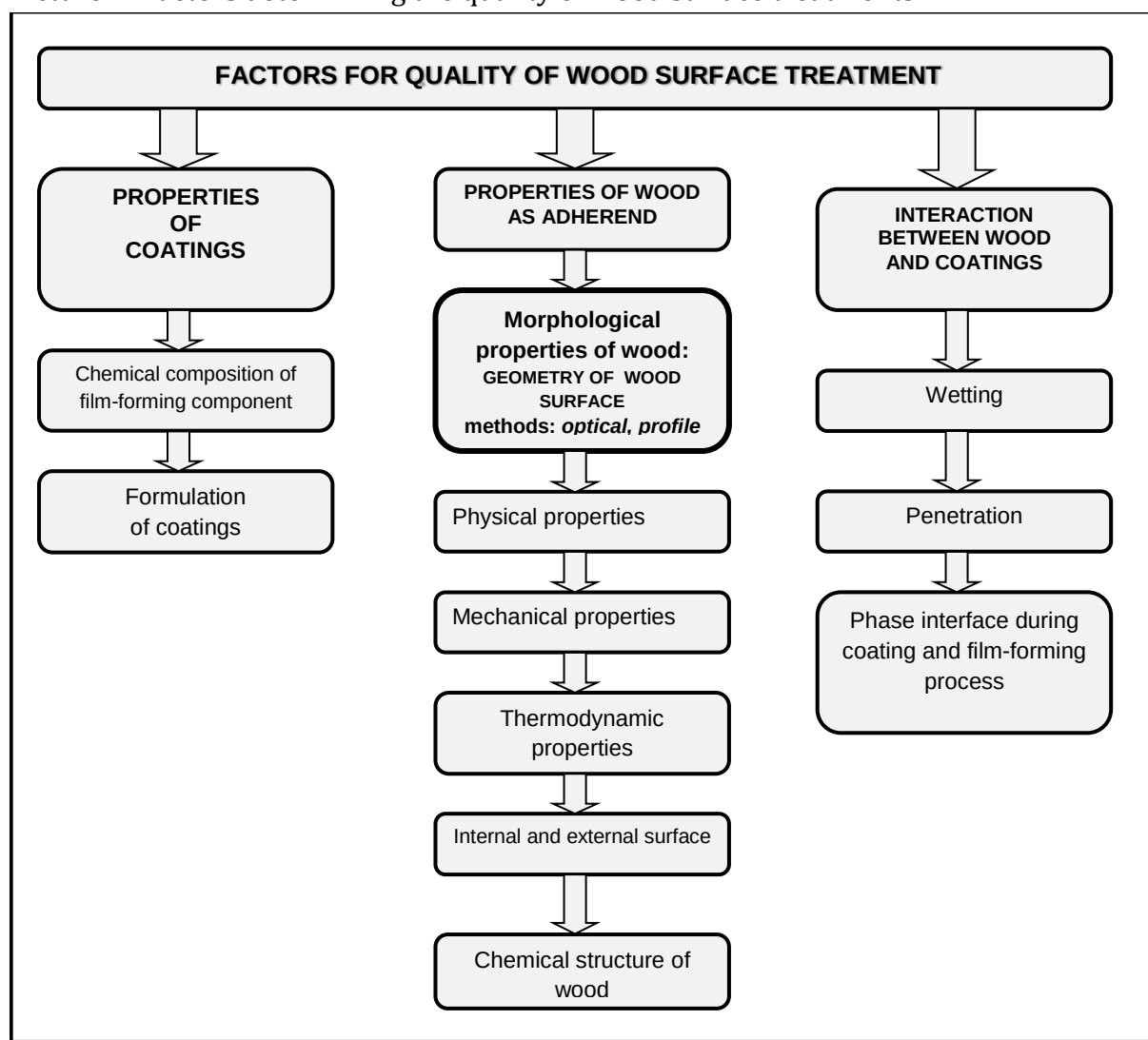
The application of the first coat caused an increase in the amount of reflected radiation from the test samples, which can in all probability be put down to the fact that it acts like a mirror. In contrast, pre-treatment of the wood prior to the application of the first coat caused a reduction in the amount of reflected radiation from the test samples. This is

possibly due to the disruption of the integrity of the coating layer, as reflected in the decrease in the experimentally evaluated characteristics.

The second layer of coating can be considered final from the point of view of the applied coating system. From this it can be deduced that the second layer of coating is the final one.

Pre-treatment prior to the application of the second and third coat resulted in a decrease in the values of the measured characteristics. This is probably due to the complex process of reflection of the beams from both the substrate and the layers of coatings.

Picture 1: Factors determining the quality of wood surface treatments



Source: Ružinská 2018a

The evaluated reflection values for the third coat showed a slight increase in the observed property compared to the values recorded after the application of the second coat. This implies that three layers of oil- and wax-based coatings are necessary from the viewpoint of wood geometry, which was subsequently confirmed by the comprehensive results with regards to the physical, mechanical, chemical, optical, appearance, resistance and

thermodynamic and thermal properties of the surface treatment (Ružinská 2014b; 2015a; 2018a).

The results of the statistical evaluation of the observed characteristics and influences revealed that: i) the anatomical direction of the surfaces of the test samples is statistically significant at the selected interval levels (see Table 2 and Figure 2); ii) the interactions between the layers of coatings for each of the coating systems is less significant; iii) the least significant impact is the influence of the coatings on the reflectance values of the surfaces of the test samples (see Figure 3 and 4).

After analysing the most important factors influencing the quality of the surface treatments of special wood products, it was determined that the main evaluation criterion is the morphological characteristics of the substrate and that this should be monitored during the surface treatment of these products.

For the evaluation of the monitored morphological characteristics, an experimental, non-destructive, optical laser (He-Ne laser) was used. The measured results were subjected to a statistical evaluation. The reflectance results, according to surface geometry, angle settings (20°, 40° and 60 °) and selected variables are presented in Table 2.

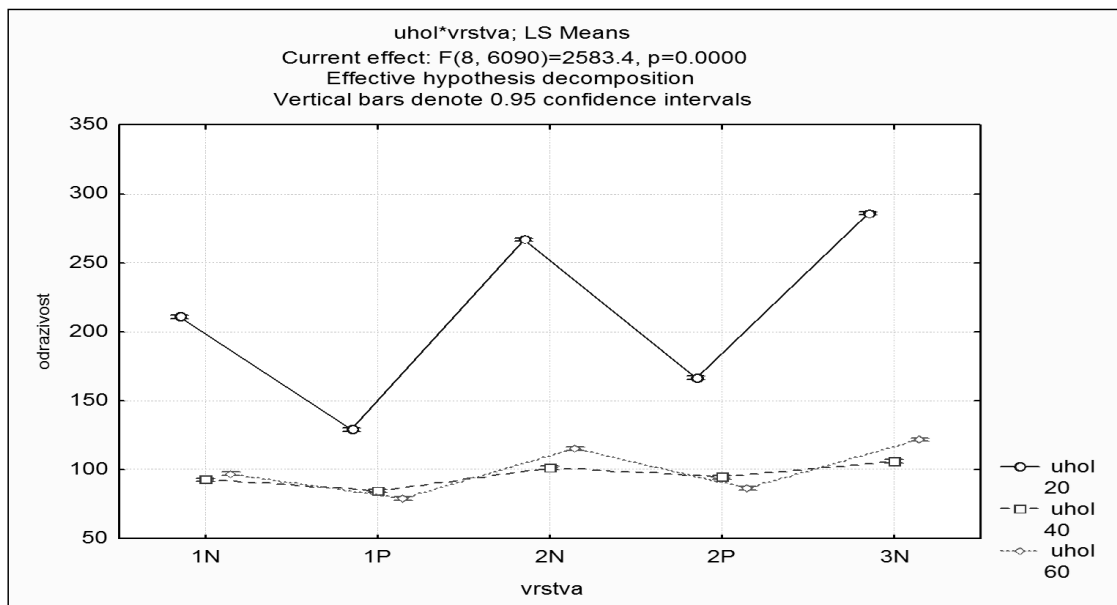
Table 2: Statistical evaluation of the mean reflectance values

Description of variable	SS	Degr. of freedom	MS	F	p
INTERCEPT	116099237	1	116099237	738162	0.000
angle	18241654	2	9120827	57990	0.000
direction	348966	1	348966	2219	0.000
coat	5283710	6	880618	5599	0.000
layer	4754055	4	1188514	7557	0.000
angle*direction	172098	2	86049	547	0.000
angle*coat	4544299	12	378692	2408	0.000
direction*coat	92897	6	15483	98	0.000
angle*layer	3250593	8	406324	2583	0.000
direction*layer	5026	4	1256	8	0.000
coat*layer	991544	24	41314	263	0.000
angle*direction*coat	94598	12	7883	50	0.000
angle*direction*layer	14120	8	1765	11	0.000
angle*coat*layer	1303557	48	27157	173	0.000
direction*coat*layer	49499	24	2062	13	0.000
angle*direction*coat*layer	114513	48	2386	15	0.000
ERROR	957845	6090	157		

Notes: SS - squared sum of deviations caused by the variable, its interaction and random factors; Degr. of Freedom - degrees of freedom (interaction of factors with regards to the dispersion of random factors); MS - scatter caused by the variable, its interaction and random factors; F – F-test; p - significance levels in the F-test.

Source: Author

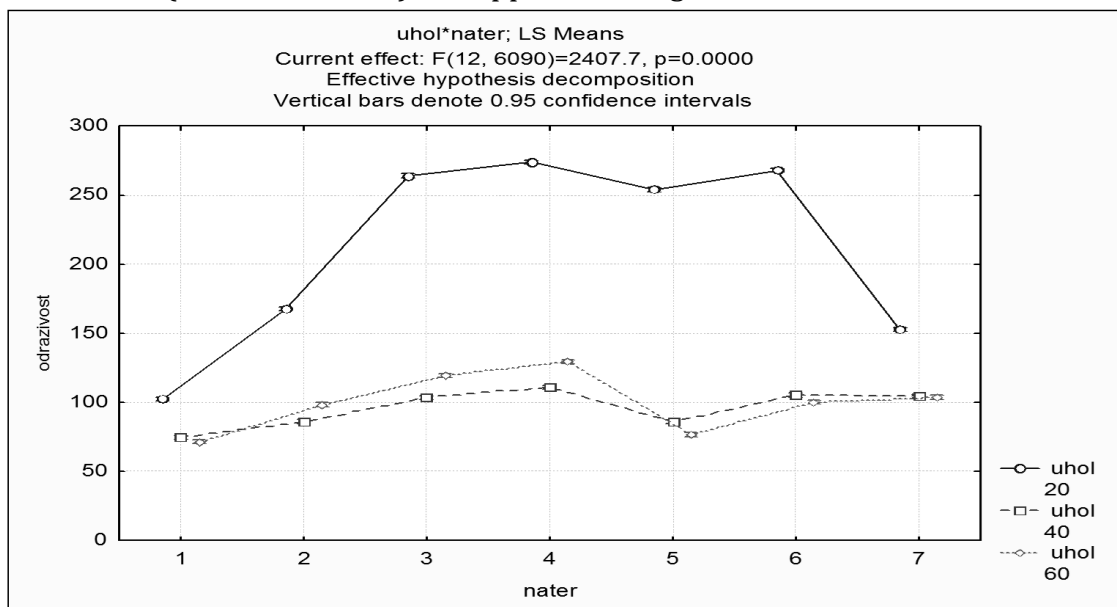
Figure 1: 95% confidence interval for mean reflectance values [lux] for angle of interaction (20°, 40° and 60°) and coat (layer)



(Notes: 1N – first coat, 1P – milling of first coat, 2N – second coat, 2P – milling of second coat, 3N – third coat; odrazivost' – reflectance; vrstva – coat (layer); uhol – angle 20°, 40° and 60°).

Source: Author

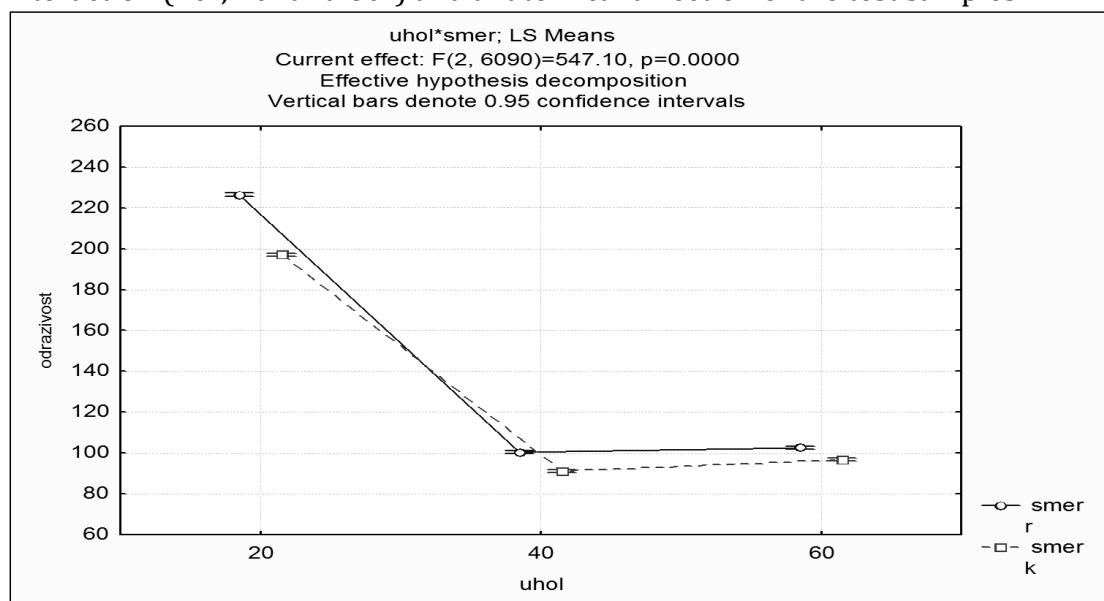
Figure 2: 95% confidence interval for mean reflectance values [lux] for angle of interaction (20°, 40° and 60°) and applied coatings



(Notes: Coatings: 1 – OS; 2 – ID; 3 – HW; 4 – OL; 5 – AK; 6 – AKV; 7 – AR; odrazivost' – reflectance; náter – coating (type); uhol – angle 20°, 40° and 60°)

Source: Author

Figure 3: 95% confidence interval for mean reflectance values [lux] for angle of interaction (20°, 40° and 60°) and anatomical direction of the test samples



(Notes: odrazivost' – reflectance; uhol – angle 20°, 40° and 60°, smer r – parallel to the direction of the wood fibres, smer k – perpendicular to the direction of the wood fibres)

Source: Author

Conclusion

The research focused on determining the most important qualitative criteria with regards to the surface treatment of special wood products (by assessing the morphological characteristics of the wood's surface by means of an experimental optical laser) during the production process of these products, which are produced by a limited number of small manufacturers, are produced in an environmentally friendly way, and are competitive and sustainable.

The research focused on the application of an experimental method (optical laser) for the assessment of the surface characteristics of wood, since it is the surface of the wood and its subsequent surface treatment that determines all its other important properties (physico-mechanical, chemical, resistance, thermodynamic and specific) during its lifetime and under the conditions of use by consumers. Based on the proposed experimental laser method, it was possible to determine the optimal number of coating layers for each coating system and to monitor the qualitative characteristics of the wood during the individual stages of the surface treatment process.

The results can be considered as an innovative application of laser radiation in the study of coatings during surface treatment, in particular with regards to the monitoring of changes in the characteristics of various wood substrates in terms of their surface properties and important qualitative indicators.

The evaluation of the results generated through the use of this alternative laser method confirmed the results of surface roughness evaluations according to the standard profile

method (Ružinská, 2015a; 2018a), but provided more detailed and comprehensive knowledge of the surface properties of the substrate (wood), whilst enabling a relatively rapid and objective evaluation of its quality during surface treatment processes.

The proposed criteria and innovative monitoring method for determining the quality of coatings for special wood products should contribute to speeding up the evaluation and objectification of quality in practice.

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Functioning of Ukrainian Phraseological Neologisms in Russian Political Media Discourse

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Abstract

Russian and Ukrainian political media discourse, despite complex relations between countries, is a part of single information space. As a result, phraseological innovations arising from one of its segments quickly become the property of another. Borrowing a certain neophraseme is possible due to the relevance of the denotations for the political and socio-cultural situation of the country, whose language is borrowed from. Functioning of a phraseological unit in a new environment (in a different segment of media discourse) is subject to certain regularities relating to both form (phrasemes can be translated or transliterated), and the semantics of phraseological unit. There are three possible alternatives: the neophraseme can preserve both the form and the meaning; it can keep the form, but change the meaning; or it can change the form, but keep the meaning. The choice of an alternative is determined by both linguistic and extralinguistic factors.

Keywords: phraseologism – phraseological neologism – neophraseme – political media discourse – semantics of phraseologism.

Introduction

Despite the fact that Russia and Ukraine are in rather complicated relations, the Russian and Ukrainian political media discourse is closely interrelated. This is facilitated by the fact that the Russian language is spoken almost by the entire population of Ukraine, and the Ukrainian language, closely related to Russian, is understandable to the inhabitants of Russia without need for translation. The conflict between the countries, historically closely connected with each other, causes intensified mutual attention – all significant processes or events occurring in one country become important informational occasions in the media of the other. One of the consequences of the foregoing is the exchange of new phraseological units arising in Russian or Ukrainian political media discourse. Acceptance of

neophrasemes is firstly connected with the relevance for the borrowing of a phenomenon, event or process, which is denoted by phraseological units. As V. Mokienko rightly points out, fixing of a phraseological unit, its movement from the periphery to the very center of literary use depends on many objective and subjective factors. Nevertheless, it is precisely the “journalistic” test that is now the first and, apparently, the most important stage of such language selection. After all, journalistic discourse reveals and fixes the main qualities of phraseological units – their expressiveness and characterization (Mokienko 2016, p.14). The cognitive processing of an event, sociocultural, communicative, pragmatic and linguistic information takes place in the media discourse (Alefirenko 2016, p. 51). It reflects the most significant social conflicts. At the same time, the media discourse, combining the informing, influencing and ideological functions, does not exactly reflecting the reality, how it interprets, assesses, comments, sets a certain ideological background and regulates public opinion (Antonova 2017, p.12).

In the study, the author relies on works that explore general trends in the modern phraseology development (Alefirenko 2016; Steyer 2015; Gray and Bieber 2015), the phraseological subsystem of language (V. Melikyan, A. Melikyan and Dzyubenko 2017), communicative functions of phraseological units (Dobrovolsky 2016), the phrasemes semiosis (Alefirenko 2015), the language policy (Mokienko 2015), bilingual practice in Ukraine (Nedashkivska 2015), the media image of the Ukrainian crisis in the world media (Bushev 2016), the linguistic specificity of the political media discourse (Sivenkova 2016; Gazizov and Nagovitsyna 2017), lexical processes in Russian political discourse (Belov 2016), peculiarities of the phraseological units functioning in the media discourse (Kablukov 2016). Despite the close attention of researchers given to the phraseological components of the political media discourse, the issue of penetration and features of Ukrainian neophrasemes functioning in the language of Russian media remains not fully studied. Now, there are no studies on the ways of borrowing Ukrainian phraseological neologisms by the Russian media discourse. In this regard, the purpose of this study is to:

1. Analyze the variants for borrowing Ukrainian phraseological neologisms by Russian media discourse in terms of form and semantics.
2. Determine the reasons for choosing a specific variant of borrowing.
3. Identify factors that contribute to the penetration of phraseological innovation from one segment of the political media discourse to another one.

Studying the patterns of implementing of Ukrainian neophrasems in Russian political media discourse will help to contribute to a comprehensive analysis of the mechanisms of interaction between the Ukrainian and Russian languages.

Notion of phraseological neologism

As the notion of “phraseological neologism” in modern linguistics is not sufficiently clear, the author relies on a broad approach to understanding phraseology as a relatively stable, reproducible, expressive combination of lexemes, which has (as a rule) a holistic meaning, as proposed by V. Mokienko (Mokienko 1989, 5). According to this approach,

neophraseology includes winged phrases (usually statements made by politicians or public figures), Internet memes and other stable set phrases, even when they are paremias. The exception is transformed phraseological units (phraseological modifications), even if they have several textual implementations.

Material and Methods

The material for the study was the political texts of Internet media in Russia and Ukraine over the past five years (Ukrainian media were analyzed both in Ukrainian and in Russian). The data collection process was as follows: at the first stage, the content of Russian media was studied using the keyword "Ukraine" by web pages analyzing method, with the result that Ukrainian phraseological units that were popular in the Russian media discourse were found; at the second stage, using the same method, all cases of the use of these phraseological units in the Ukrainian media were analyzed. The study provides examples of 19 Ukrainian Internet mass media and 13 Russian ones. It is important to note that among them there are both national media (Russian "Комсомольская правда", "РИА Новости", "Взгляд", Ukrainian "Сегодня", "Вести", "Обозреватель", "Стана.ua") and regional (for example, the Russian edition "Голос Севастополя" and the Ukrainian "НА Харьков"). In the research, a descriptive method for studying the functioning of phraseological neologisms and their characteristics, a comparative method for comparing the use of neophrasemes in Russian and Ukrainian media discourse, and a component analysis for investigating the semantics of phraseological units were used. The cognitive-discursive approach was also important for research.

Results and discussion

Before the events of 2014 (a revolution in Ukraine and subsequent crisis in relations between the two countries), Russia and Ukraine were in the same information space: the most popular media (primarily television channels) in Ukraine were Russian. Phraseological neologisms that arose in Russian political media discourse as an important component of the media language were actively borrowed by the Ukrainian segment. For example, the famous statement of the first president of the Russian Federation B. Yeltsin "Я устал, я ухожу" (I'm tired, I'm leaving), which was made in 2000, is still actively used by Ukrainian media in the most diverse contexts (concerning different situations and phenomena): Путин: я устал, я ухожу. Вот мой преемник! (*Putin: I'm tired, I'm leaving. Here is my successor!*) (Newsonline24.com.ua, 2016); Я устал, я ухожу: как решиться на увольнение, когда больше нет сил оставаться (*I'm tired, I'm leaving: how to decide on the dismissal, when there is no more strength left*) (Work.ua 2017); Я устал, я ухожу: Шулявский мост в Киеве закроют на 1,5 года (*I'm tired, I'm leaving: Shulyavsky bridge in Kiev will be closed for 1.5 years*) (Украина 2018). It should be noted that Ukrainian political neophrasemes until 2014 were little known in Russian media discourse. So, the legendary statement of the first Ukrainian president L. Kravchuk "Маємо те, що маємо" ("We have that we have"), describing the complex socio-political situation in which Ukraine was after independence, was used in the Russian media only to characterize the Ukrainian politician:

“Имеем, что имеем”: 80-летие первого президента Украины Леонида Кравчука широко отпразднуют на государственном уровне (*“We have what we have”: The 80th anniversary of Ukraine's first president Leonid Kravchuk will be widely celebrated at the state level*) (Новая газета 2013). Let's pay attention to the fact that the aphorism is given in the translation into Russian.

After 2014 (the revolution in Ukraine and crisis in Russian-Ukrainian relations), the situation changed radically. Ukraine moved from the periphery of Russian interests to its center – the Ukrainian issue became topical not only in the news, but also in a variety of political talk shows. In addition, a large number of Ukrainian politicians, political scientists, journalists and bloggers who were in opposition to the new Kiev government, immigrated to Russia. These factors influenced the activity of borrowing Ukrainian neophrasemes and the ways of their transfer into Russian-language texts. Before, only translation was used; now many phrases are often transliterated, as the Russian audience understands them without need for translation.

The phraseological unit functioning in a new environment (in a different segment of the media discourse) is subject to certain regularities relating to both form (phrasemes can be translated or transliterated) and semantic. It should also be noted that the same phraseologism is often used by Russian and Ukrainian media discourse segments with different connotations. Analysis of Ukrainian and Russian media material showed that there are three possible variants for borrowing Ukrainian phraseological neologisms by Russian media discourse.

In the first case, phraseologism preserves both form and meaning. As examples, we can quote the words of the Kiev mayor Vitali Klitschko. So, once making a statement, he urged the people of Kiev to prepare not for winter, but for the ground (in Russian *зима* and *земля*). The statement immediately turned into a popular phraseologism with the semantics “to get ready for death”. Neophraseme is actively used in the same form and with the same semantics in both Russian and Ukrainian media. Ukraine media: *Денишом Кадыров в Госдуме посоветовал Зеленскому “готовиться к земле”* (*Deputy Kadyrov in the State Duma advised Zelensky “to prepare for the ground”*) (Обозреватель 2014), *Реформа медицины: пора готовиться к земле!* (*Medicine reform: it's time to get ready for the ground!*) (From-ua, 2016), *Нужно готовиться к земле: Гройсман объяснил обвал цен на Украине ростом экономики* (*We need to prepare for the ground: Groysman explained the collapse of prices in Ukraine by economic growth*) (НА Харьков 2017), *Кличко давно призывал готовиться к земле* (*Klitschko long ago called for preparing for the ground*) (Народный корреспондент 2017). Russian mass media: *Зато честно: Кличко призвал киевлян готовиться к “земле”* (*But honestly: Klitschko urged the people of Kiev to prepare for the ground*) (Pravda.ru 2014), *Правильно “готовиться к земле”: в Венгрии рыли могилы на скорость* (*Correctly “prepare for the ground”: in Hungary, burial graves for speed*) (Rusnext.ru 2016), *Пентагон “готовится к земле” в Сирии* (*The Pentagon “prepares for ground” in Syria*) (Русская весна 2017). In one of the television shows, Vitali Klitschko allowed himself the unfortunate wording: “А сегодня в завтрашний день не все могут смотреть. Вернее, смотреть могут не только лишь все, мало кто может это

делать” (And today not everyone can look at tomorrow. To be more precise, not only can everyone look at it, but few can do it), after which the phraseologism “to look at tomorrow” with the meaning “to assume yourself as a skilful forecaster without any reason to do that” has appeared. Neophraseme is used by Russian media: *Кличко посмотрел в завтрашний день Трампа* (*Klitschko looked at tomorrow's Trump*) (Дни. ру 2016).

A vivid example of this variant is also the phraseologism “the Kremlin’s hand”, meaning “Russia’s interference in the affairs of Ukraine”. Ukrainian media: *Везде “рука Кремля”: стало известно, как власти Украины подыгрывают Путину* (*Everywhere the “Kremlin’s hand”: it became known how the authorities of Ukraine play up to Putin*) (Апостроф 2018), *Рука Кремля: военный эксперт сравнил “убийство” Бабченко и отравление Скрипаля* (*The Kremlin’s hand: the military expert compared “Babchenko’s murder” and the poisoning of Skripal*) (Обозреватель 2018), *Яценюк считает, что “Стену” дискредитирует “рука Кремля”* (*Yatseniuk believes that “the Kremlin’s hand” discredits “The Wall”*) (Страна. ua 2018), *Ромські погроми. Рука Кремля чи домашня ксенофобія?* (*Roma massacres. The Kremlin’s Hand or Home Xenophobia?*) (Главком 2018), *Кириленко рассказал о длинной кремлевской руке с бутылкой* (*Kirilenko told about a long Kremlin’s hand with a bottle*) (Вести 2018). Russian media: *И тут рука Кремля: генпрокуратура Украины заподозрила в публикации “списка 47” Россию* (*And here is the Kremlin’s hand: the Prosecutor General’s Office of Ukraine suspected Russia in the publication of the “list of 47”*) (Rusnext.ru 2018), *Рука Кремля: на Украине ответили на обвинения американских СМИ в предательстве* (*The Kremlin’s hand: in Ukraine they responded to accusations of American media in betrayal*) (Русская весна 2018), *Вездесущая “рука Кремля” в Украине* (*The Omnipresent “Kremlin’s hand” in Ukraine*) (РИА Новости 2018), *Нападение на венгров: в Киеве увидели руку Кремля, а в Москве – “неможные руки” Киева* (*Attack on the Hungarians: in Kiev they saw the Kremlin’s hand, and in Moscow – the “weak hands” of Kiev*) (Bigmir.net 2018). The popularity of any phraseologism is conditioned by its unconditional relevance – Russia’s aggressive intervention in the affairs of Ukraine is one of the main theses of the Ukrainian political agenda. In addition, the phrase is universal, because equally spelled and almost equally pronounced in both Russian and Ukrainian.

In 2018, Ukrainian political phraseology replenished the vocabulary with one more unit, which has the same meaning as the “the Kremlin’s hand”, but more expressive – “tentacles of the Russian world / Moscow”. Vladimir Vyatrovich, the head of the Ukrainian National Memory Institute, was the first to introduce it, then the president of Ukraine Petro Poroshenko repeated it several times: *Вятрович: Кремль использует Высоцкого и Цоя как “щупальца русского мира”* (*Vyatrovich: The Kremlin uses Vysotsky and Tsoi as the “tentacles of the Russian world”*) (Сегодня 2018), *В’ятрович: Такі щупальця “руського мира”, як булгакови, висоцькі і цої, в руках Кремля не менш небезпечні, ніж совок і московська церква* (*Vyatrovich: Such tentacles of the “Russian world” as Bulgakov, Vysotsky and Tsoi, in the hands of the Kremlin are no less dangerous than the Moscow church*) (Гордон. ua 2018), *“Щупальці Москви міцно проникли в соцмережі”: Кремль готується до нової маніпулятивної кампанії – Порошенко* (*“The tentacles of Moscow firmly penetrated the social network”: The Kremlin prepares for a new manipulative campaign – Poroshenko*) (5.ua 2018), *Порошенко про автокефалію: ми обрубемо щупальця Москви,*

час настав (*Poroshenko about autocephaly: we cut the tentacles of Moscow, the time has come*) (Обозреватель 2018), Порошенко пообіцяв не втручатися у справи церкви, але й "обрубати щупальця" агресора (*Poroshenko promised not to interfere in the affairs of the church, but to "cut the tentacles" of the aggressor*) (BBC 2018). The phraseologism is aimed at dehumanizing the opponent: if "the Kremlin's hand" implies anthropomorphism, then "tentacles of Moscow" represents the zoomorphism of a political opponent. The reaction of the Russian media did not take long to appear: Порошенко напугали "щупальця Москви" (*Poroshenko scared of the tentacles of Moscow*) (Взгляд 2018), Порошенко нашел "щупальце Москвы" (*Poroshenko found the "tentacle of Moscow"*) (Комсомольская правда 2018), Порошенко увидел "щупальця Москвы" в выборах на Украине (*Poroshenko saw the "tentacles of Moscow" in the elections in Ukraine*) (Lenta.ru 2018). The emergence of a new phraseologism is largely due to the fact that the phrase "the Kremlin's hand" (which Ukrainian politicians perceived absolutely in everything, reaching the point of absurdity) acquired an ironic shade even in the Ukrainian media discourse: Надежда Савченко: У властей Украины один ответ – "рука Кремля" (*Nadezhda Savchenko: The authorities of Ukraine have one answer – "the Kremlin's hand"*) (Deutsche Welle 2018). In connection with this, a new, more expressive analogue of phraseologism was required. It should be noted that the phraseology of the "tentacles of Moscow" was created in analogy with the phrase "tentacle of mafia". In the studies of the metaphor in the Russian media discourse Yu Fedeneva draws attention to the image of an octopus, all-pervading, predatory animal capable of sucking blood out of its victim (Fedeneva 1999, p. 346). E. Stoyanova notes that the popularity of this image is due to the success of the TV series of European cinematographers that was on the screens in the USSR at the end of the 1980s about the Sicilian mafia and corruption, embracing the highest power, like the octopus. (Stoyanova 2013, p. 76).

It is also necessary to add that these phraseological units are extended political metaphors that are known not only in the above form, but also in others (for example, "рука Вашингтона", "рука Берлина", "рука ЦРУ" etc.).

The second variant of the phraseological unit transition from Ukrainian into the Russian political media discourse presupposes the preservation of the form, but a change in the meaning. An example is the famous aphorism "Ukraine is not Russia", authored by the second president of Ukraine, L. Kuchma. In Ukrainian media, phraseologism is used with the semantics "Ukraine is different from Russia for the better": *Чому Україна – не Росія: Бутусов пояснив на прикладі трагедії в Кемерово* (*Why Ukraine is not Russia: Butusov explained in the example of the tragedy in Kemerovo*) (Сьогодні 2018) – according to the author, Ukraine is more united, "Україна – не Росія": Бабченко показав основні различия ... (*"Ukraine is not Russia": Babchenko showed the main differences ...*) (Факты и комментарии 2018) – according to the author, Ukraine is freer. In Russian media, the expression has the opposite semantics: "Ukraine is different from Russia for the worse": *Чому Росія не Україна* (*Why Russia is not Ukraine*) ((Україна.ру 2018), "Україна" – не Росія, "Україна" – це хвороба" (*"Ukraine" is not Russia, "Ukraine" is a disease*) (Золотой лев 2016) – according to the authors, in modern Russia color revolutions are

impossible, *Украина – не Россия (Ukraine is not Russia)* (Голос Севастополя 2018) – according to the author, Russia is among world powers, and Ukraine is a poor province.

The third variant assumes that Ukrainian phraseological neologism in the Russian media discourse changes its form, but preserves the semantics. In this case, of the form change refers to the translation into Russian. As an illustrative example, we can quote the phraseologism “Ці руки нічого не крали” (“These hands did not steal anything”) which is used in an ironic sense and has the opposite meaning to the author's assertion, as Viktor Yushchenko's government was remembered for the large scale of corruption. Examples from the Ukrainian media: “Ці руки нічого не крали”. *І не ремонтували?* (“These hands did not steal anything”. And did not repair?) (Високий замок 2015), “Ці руки нічого не крали”? *Как Ющенко с сыном проворачивают мошеннические схемы* (“These hands did not steal anything”? As Yushchenko and his son are turning fraudulent schemes) (Укроп 2018), *Володимир Гройсман або “Ці руки нічого не крали-2”* (Volodymyr Groisman or “These hands did not steal anything-2”) (Голос 2018), *Ці руки нічого не крали: Аваков пообещал отправить сына в суд* (These hands did not steal anything: Avakov promised to send his son to court) (Ділова столиця 2017). As the examples above show, the phraseologism in the Ukrainian media discourse is used in relation to various politicians. In Russian media, the phrase is translated and serves exclusively to characterize V. Yushchenko: “*Эти руки ничего не крали*”: *Из всех экс-президентов Украины содержание из бюджета получает только Ющенко* (“These hands did not steal anything”: Only Yushchenko gets the budget from all the ex-presidents of Ukraine) (Rusnext.ru 2018).

Currently, the third variant is not productive. Now in the Russian media we often meet macaronic texts, in which Ukrainian lexemes and phrases are given in a transliterated form. As an example, we can quote a fragment of the article by journalist of “Komsomolskaya Pravda” A. Grishin “Ukrainian users of the network ridiculed Klimkin for his pants on his arrival in Avdeevka” (Ukrainian lexemes and phrasemes are highlighted):

*Странный наряд министра иностранных дел **незалежной** вызвал смех и недоумение. (...) В общем, все как обычно – **шукайте гроши, панове! Бо Украина еще не вмерла**. А ведь все разгадывается гораздо проще – над костюмами и Климкина, и Порошенко явно поработала “рука Кремля”* (Комсомольская правда 2018).

The strange dress of the Minister of Foreign Affairs of an independent country caused laughter and bewilderment. (...) In general, everything as usual – look for money, gentlemen! Because Ukraine has not yet died. But everything is solved much easier – over the costumes and Klimkin, and Poroshenko has clearly worked “the Kremlin's hand”.

The use of the Ukrainian lexeme “незалежна” and the expressions “шукайте гроши, панове!”, “Украина еще не вмерла” in the Russian text suggests that the media audience understands them even without translation. Moreover, if they were translated into Russian, the text would lose much of its expressiveness. The use of Ukrainian phrase also increases the text's emotiveness and evaluation, allows to implement the impact function more fully, which is the main objective of the political media discourse.

Conclusion

The active penetration of Ukrainian phraseological neologisms into Russian media discourse is due, first of all, to the fact that the conflict with Ukraine has become one of the most important events in political life of Russia.

Analysis of the Ukrainian phraseological neologisms use in Russian political media discourse allows us to draw certain conclusions. The phraseologism form is preserved in cases where: 1) the phraseologism was originally used in Russian (“готовиться к земле”, “смотреть в завтрашний день”); 2) differences in spelling and pronunciation of Ukrainian and Russian variants are minimal (“Україна не Росія” and «Украина не Россия”, “щупальця Москви” and “щупальца Москвы”) or none at all (“рука Кремля” is equally spelled in both languages); 3) translation of phraseologism from Ukrainian into Russian leads to significant losses in the expressiveness of the journalistic text (“Маємо те, що маємо” and “Имеем, что имеем”, “Ці руки нічого не крали” and “Эти руки ничего не крали”). Translation of Ukrainian phraseological units is carried out only in the case when it is necessary to convey only the meaning of the statement, regardless of the changes in its expressiveness (“We have what we have” and “These hands did not steal anything”). Translation leads to the loss of an element of exoticism, attribution to Ukrainian realities (as in the case of the translation of the word “пан” as “господин”). Therefore, currently the most popular variant for the transfer of Ukrainian phraseological neologisms is transliteration.

In Russian media discourse, Ukrainian neophrasemes retain their semantics when there is a consensus on audiences that are opposed to each other in relation to the denotations of phraseologism (“to prepare for the ground”, “to look at tomorrow”). The meanings are reversed when the attitudes towards the denotations are fundamentally different (“Ukraine is not Russia” in the meaning of “Ukraine is better” and in the meaning “Ukraine is worse”).

The choice of one of the three variants is determined by both linguistic and extralinguistic factors.

The Ukrainian political neophrasemes borrowing is firstly related to the relevance for media discourse borrowing of the phenomenon, event or process that phraseological units designate. Those Ukrainian phraseological neologisms that either characterize the phenomena universal for both countries, or brightly convey the specificity of Ukrainian political life in the aspect of its influence on Russia's policy, fall in the Russian media discourse and are fixed in it.

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Applying the Options Framework to a Value-based Model of the Firm

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Abstract

This paper develops the value-based model of a firm from a conventional accounting-based approach to one that acknowledges individuals' human capital and firms' competences as fundamental creators of value. Both have distinctive characteristics, but may be integrated from the perspective of their holders through various contracts, which then constitute contractual assets enhancing a firm's capital. Product ownership constitutes another vital component of value determination and is one of the reasons firms enhance its value, either by taking protective action, or by designing hard-to-replicate strategies.

This paper addresses a current issue and presents potential means by which to determine firms' strategies in highly competitive business environments driven primarily by innovations, as well as for the design of appropriate types and terms of contracts. In its reasoning, the paper is exceptional by aggregating the findings of firm theory with those of modern financial theory, proposing real and embedded options within an appropriate quantitative framework.

Keywords: business valuation, human capital, strategy, options theory

Introduction

Conventional valuation methods originated in times when firms directed most of their capital investments into tangible means of production, such as machines, equipment and real estate, as premised by Babcock (1932) or Williams (1938). The value of a business therefore broadly corresponded to the intrinsic value of its tangible assets. However, since the mid-20th century, theoreticians as well as practitioners have started to acknowledge the gap between the traditional intrinsic value-based perspective and the fact that growing numbers of successful firms have made substantial investments in intangibles by means of research and development, registering trademarks, acquiring market share or

developing human resources. A historical outline of this development has been provided by Rubinstein (2006) and Carson (2011).

The potential magnitude and diversity of this gap can be illustrated by comparing the book and market values of several large companies in different markets according to recently audited reports (see Table 1). The results clearly suggest that there is a need to employ new approaches in both academia and practice.

Table 1: Book values and market capitalisations of selected firms

Company	Exchange	Book Value	Market Value	Mkt/Bk
General Electric Co. ⁽¹⁾	NYSE	\$75.8 bil	\$272.7 bil	3.6
Deere & Co. ⁽²⁾	NYSE	\$6.5 bil	\$27.7 bil	4.3
Citigroup Inc. ⁽¹⁾	NYSE	\$225.1 bil	\$166.0 bil	0.7
Microsoft Corp. ⁽³⁾	Nasdaq	\$72.0 bil	\$385.1 bil	5.3
Volkswagen AG ⁽¹⁾	Xetra	€184.9 bil	€67.9 bil	0.4
Nestlé AG ⁽¹⁾	SIX	SFr66.0 bil	SFr228.1 bil	3.5
ČEZ, a.s. ⁽¹⁾	BCPP	Kč261.4 bil	Kč229.7 bil	0.9

Source: Vlachý (2018, p. 19); ⁽¹⁾As of fiscal year ending on 31-12-2016; ⁽²⁾ditto 31-10-2016; ⁽³⁾ditto 30-6-2016.

Penrose (1959) initiated pioneering work in the domain of firm theory with her resource-based perspective. In contrast to her predecessors, influenced primarily by Schumpeter (1912), rather than looking at the external environmental effects, she focused on an organization's internal environment, resources and skills, highlighting the creation of value within a firm, rather than its redistribution. In the late 1980s, this line of reasoning became one of the factors contributing to the development of the concept of the targeted creation of comparative advantage and its protection in order to draw entrepreneurial rent, as demonstrated by Hodgson (1988) and Barney (1991).

Another important highlight relates to the key competences proposition, as formulated by Hamel and Prahalad (1994). These are capabilities that are essential for the implementation of strategies facilitating the discovery of potentially valuable courses of knowledge that fill in existing gaps. Ghoshal et al. (1999) introduced a broader and deeper insight into the value of people as an essential component of firms' resources by highlighting the importance of management skills.

In parallel, Kogut and Zander (1992) developed their knowledge-based theory of the firm, claiming that the primary resource is actually people's capabilities. This ultimately supports the concept of a "learning firm" (Lundvall and Johnson, 1994), evoking the impression of a collective, rather than individual learning process.

Summarily, all of these frameworks have led to a general understanding that factors such as business licences, development potential or know how are qualitatively important.

However, as argued by Ortiz (2006), Saaty (2009) or Wang et al. (2014), in actual decision-making, such intuitive reasoning is a poor substitute for a robust valuation model that enables the comparison of alternative opportunities for the allocation of scarce resources.

Last but not least, as explained by Anderson et al. (2014) or Birdi et al. (2016), there is a clear conceptual benefit to separating an individual's generation of new ideas from the implementation of those ideas, which is even more critical whenever decisions need to be made in respect to valuation, contracting or transaction pricing.

The objective of this paper is to therefore define the position and role of assets representing a particular form of knowledge within the framework of a structured value-based model of the firm, and coupling that role with the personal endowment, development and contracting decisions of an individual. It is innovative in integrating financial theory with the theory of the firm, providing a sound theoretical contextualisation in an area which has commonly been based mainly on heuristic approaches.

It will be shown that the factor, commonly designated as human capital, constitutes a particular source of value, manifest in a firm's intangible assets. This combines managerial, technical and economical perspectives and may constitute a useful lead in strategic decision-making, as well as various types of contracting. Real options are proposed as the preferred means of quantitative analysis.

Relating Contractual Assets and Human Capital

The theory of the firm does not primarily focus on which types of assets should be attributed primarily to individuals, or to firms. In the following discussion, a point is therefore made of consistently distinguishing between human capital as an attribute of individuals and competences constituting part of a firm's intangible assets, while capabilities constitute a bundling of resources (which can be generated by firms as well as individuals), which only becomes a competence upon attaining a competitive advantage (Sirmon, Hirt and Ireland, 2007).

Moreover, besides competences, sometimes designated as knowledge assets, intangibles also include contractual assets, whose value is determined by the existence of a contract, be it private, public, written or implicit, and its enforcement potential (Vlachý, 2010). Contractual assets therefore include intellectual property (patents, licenses, copyright, trade secrets, trademarks, software), as well as various kinds of commercial, employment and other contracts.

This framework is illustrated in Table 2, which presents a conventional accounting view (in particular regarding the specification of intangibles), and compares the perspectives of firms as well as individuals.

Table 2: Conventional structure of assets

Firm		Individual
Financial assets		Financial assets
Tangible assets		Tangible assets
Intangible assets	Contractual assets	Contractual assets
	Knowledge assets (competences)	Human capital

Source: Author

Note that financial assets and tangible assets can be owned (by endowment or acquisition) by either, i.e. firms as well as individuals may be parties to contracts constituting value.

However, when considering overall value, it is much more practical to adopt a framework that fully utilises the comprehensive notion of contracts, as illustrated in Table 3.

Table 3: Alternative structure of assets

Firm		Individual
Tangible assets		Tangible assets
Contractual assets	Rights to tangible assets	Human capital
	Rights to the product of human capital	Contractual assets (rights to tangible assets, opportunities and the product of human capital)
	Rights to opportunities	
Strategy (portfolio of tangible and contractual assets)		Strategy (portfolio of tangible and contractual assets, and human capital)

Source: Adapted from Vlachý (2009)

Essentially, such a structure distinguishes between the fundamental concepts of asset ownership and rights, each of which has distinct characteristics.

While tangible assets can possibly become a firm's or individual's ownership, as well as the subject of rights, this is normally not the case for human capital, at least since the abolition of slavery (Lindgren 1995). Another person, physical or legal, can only become the holder of rights on its product. Furthermore, tangible assets and human capital constitute goods, while contractual assets are derivatives, i.e. contracts representing particular rights and obligations (on aggregate, they may therefore have a negative value). Contractual rights can be derived from goods (such as a contract to sell a commodity, lease land or employ human capital), but also from future opportunities.

Under this framework, it becomes redundant to specifically characterise knowledge assets because, clearly, any intangibles arise only due to the utilisation of human capital. This is the case even when individuals or firms cannot actually acquire and use them, which

would make them contractual assets. Effectively, these are the factors that Porter (1985) called complementors, constituting capability synergies that cannot be easily replicated by competitors, therefore strengthening a firm's market position.

This remaining part of intangible value, if any, represents a competitive advantage due to an incapability of the competition to replicate a particular combination of resources, which is usually temporary. Nevertheless, the fundamental reason for such an incapability would still constitute a particular contractual right, information asymmetry (sometimes enjoying the protection of a trade secret), or the scarceness of an essential resource in such a combination.

Generally speaking, such a competitive advantage is brought about by the unique - systematically or incidentally created - combination of resources contracted by a firm (to some extent, the same competitive advantage can be developed by individuals), which may be called strategy, whereby its value is determined by the current state of the market. Notably, that value can be negative, as well as positive, because portfolios of contracts include obligations and, under certain circumstances, these can reduce a firm's value by more than the worth of the rights being held.

Incidentally, it also becomes unnecessary to characterise financial assets because, under this framework, they are nothing but contractual entitlements to goods, be they scarce (gold or some other assets), or less so (political assurance).

A firm's value therefore consists of tangible assets, contractual assets (some of which derive directly from the product of human capital) and their particular combination, i.e. strategy, whose design also ensues from the application of human capital. We may therefore conclude that a firm's value eminently derives from contracted human capital in various forms (such as employment contracts, managers, entrepreneur-owners, consultants) and that an appropriate structure for such contracts (i.e. strategy) constitutes a key parameter for business success.

Using the Options Framework for Valuation

Applying Options to Value Contracts and Opportunities

The financial assessment of business situations that are characterised by the utilisation of opportunities that arise from changes in the external environment, and which become matched with particular competences, can be facilitated by using the options framework, in particular embedded and real options (Vlachý 2018, pp. 78-81). As explained by Dixit and Pindyck (1994), real options may be used for the assessment of capital budgeting decisions, featuring an element of uncertainty, irreversibility and flexibility. In contrast to the regular assumption of general risk aversion, real options assume an active response to uncertainty.

Conventional financial analysis, using the net present value criterion, stipulates that any capital budgeting decision can either be completely reversible, or completely irreversible

over the life of the project or asset. In the real world this is not realistic, and the decision-maker usually has some discretion regarding future choice, with the uncertainty decreasing over time. In other words, we speak about the process of the gradual accumulation of knowledge and experience, i.e. learning (Payzan-LeNestour and Bossaerts 2011). Combined in a portfolio with embedded contractual options, real options therefore constitute the essence of a firm's strategy, which applies continuous flexibility in response to newly acquired knowledge (Luehrman 1998).

Once real options are related to firms' strategies, it becomes quite intuitive to translate this framework to the concept of knowledge and learning. Kogut and Kulatilaka (2001) applied options to firms' competences, claiming (p. 3) that "A real option is the investment in physical assets, human competence, and organisational capabilities that provide the opportunity to respond to future contingent events." As an example, they quoted an investment into a loss-making distribution network in a developing country, which brought with it an improved understanding of the local environment, therefore facilitating rapid business expansion once the economy started to grow.

Competences within a firm include individual knowledge and the capabilities of its managers and staff (i.e. contracted human capital), as well as social relations ensuing from the firm's procedures, management processes and communication and cultural norms. This enables Pandza et al. (2003) to conclude that in general, the building up of competences is analogous to the application of real options to strategy because a firm's competences, similarly to its resources, create future opportunities. Berg and Kaše (2005) endeavour to value human capital accordingly by applying an option-based model to the assessment of human resources management policy.

The earliest applications of real options, pioneered by Myers (1984) and Brennan and Schwartz (1985), tended to focus on problems with a clear analogy to financial options, facilitating their valuation using known analytical methods, such as variants of the Black-Scholes model. This requires, among other constraints, exclusive ownership of future opportunities by the option holder, which may be due to legal or regulatory factors hindering competitors' entry (mining or broadcasting rights, patent or trademark protection), as well as temporary economic barriers.

More recently, researchers have started addressing situations where the value of real options may be actively impacted by the behaviour of competitors. Typically, an investment delay with such shared (competitive) options may substantially reduce future incomes due to competitors' entry into the industry. The value of various strategies can then be assessed using game theory, as shown by Smit and Trigeorgis (2004).

Applying Options to Value the Product of Human Capital

The most obvious case of an individual utilising their capabilities (i.e. human capital) to generate future incomes arises when they become an entrepreneur, taking decisions on their own account and at their own risk. In a broader sense, however, they also take

entrepreneurial decisions when they become employed or acquire an equity stake in a company; the incomes resulting from their decisions then only become subject to a particular type of contract.

In fact, individuals take entrepreneurial decisions even when making choices that - from the perspective of their actual capabilities - do not maximise future incomes (such as when a nuclear scientist uses their personal savings to spend the remainder of their life travelling and studying exotic insects); such a choice can be assessed based on opportunity costs. All such scenarios are part of an individual's strategy with regards to human capital, as noted in Table 3.

Human capital has several specific features. An individual's capabilities may be indigenous (which is an analogy to the endowment of goods commonly considered in macroeconomic analysis); it is possible to develop them through investment (for example, in education), and they determine opportunities for future incomes or other gains. Capabilities, once acquired, become irrevocable, which makes investments in human capital risky in terms of its change in value due to external environmental changes. Capabilities therefore constitute real options and investments in human capital can be considered purchases of real options.

For all intents and purposes, such an option is proprietary, in some cases, however, it is possible to transfer the rights to its pay-outs. The forms of such transfer may include employment contracts or partnership deeds. Nevertheless, in contrast to tangible assets, there is no ownership title, but rather a bilateral contractual arrangement, where the holders of capabilities have their own rights, including that of leaving a firm or deciding whether to invest in their own capabilities. Such rights, similar to firms' rights, therefore always constitute a set of embedded options.

It is important to note here that the transfer of rights to the options' pay-outs need not always be completely voluntary from the holder's point of view. One typical example involves income tax, as explained in a similar context by Vlachý (2007).

The Value of Discovering Options

The most valuable component of human capital is its capability to discover new real options because this is the one option that is, in comparative terms, the least competitive. This is what most people would describe as creative capabilities in the broadest sense, and contrasts with the highly competitive commodity component of human capital ("manpower"), which is essentially a substitute for tangible assets (such an assumption is made by Becker 1975).

In some specific, and rather unique cases, as with inventors or artists, the product of their creative activity constitutes a contractual asset, which can be sold outright. In this context, Tunaru et al. (2005) consider professional sports clubs, whose own value derives from the ownership of negotiable rights on individual athletes.

Notwithstanding all other things, valuation principally depends on whether the real option can be exercised by the particular individual, who therefore retains its protected ownership, or whether its discovery or publication makes the option publicly available, i.e. shared. The discoverer is then often left with the only choice of associating with a stronger partner, such as a firm, capable of taking the necessary steps to safeguard the value of the option, at the cost of forsaking part of its pay-outs. This explains why many capable individuals work as employees, even though ostensibly at a disadvantage from the perspective of profit sharing.

Finally, some options can be discovered only by teams of capable individuals, or using tangible assets not available to the individuals themselves. This may relate to research laboratories for scientists, but also large firms when the capabilities are borne by managers. This creates incentives to retain such groups of individuals, or their particular pairings with the tangible assets.

Conclusion

Option analysis, which on the one hand describes contractual relationships (embedded options), and on the other hand intangible assets (real options), all constituting products of human capital, may be used for the optimisation of contracting. From the perspective of a firm, it indicates that different forms and terms of contracts must be used for different ways of using human capital.

The most valuable product of human capital relates to the discovery of real options, which also determines the value of investment in human capital. However, the principal's actual behaviour will be determined by the extent to which their options are owned or shared. Provided there is an ownership potential, the person will be strongly motivated to invest in their capabilities, not only with regards to the options' time to expiry, but also with regards to the uncertainty of future incomes, in analogy to financial options.

In contrast, when the options are typically shared, as with commodity labour or scientific research, which is published rather than patented, value is enhanced by comparative advantages (unique skills) and early market entry. Higher incomes from real options then tend to be realised by individuals with capabilities acquired at an earlier stage, for example, by getting their training or education at an earlier age, or skipping non-essential phases (note the successful entrepreneurs who did not graduate in order to develop their businesses). In such cases, the value of the options need not be determined primarily by future uncertainty, but by sunk costs. There is also a much greater role for firms to enhance the value of an individual's human capital product developing strategies that may be hard to replicate.

A similar line of reasoning can be taken in regard to public policies. In the first case, when the options are mostly owned, it can be shown that any government policies aimed at mitigating uncertainty, including a generous social security system, industrial interventions or pro-active education capacity planning, may have a detrimental effect on

an individual's investment in their own human capital. Any subsidies supporting the development of human capital can therefore be perceived as a net rent appropriated to individuals, who were granted real options (for example through tuition waiver). In the second, where shared options prevail, the outcome is similar, however, the rent is allocated primarily to firms that take advantage of an increased supply of skilled workforce, which diminishes the incentive to share in the product, either through profit-sharing or by investing in the development of human capital themselves.

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Multi-criteria Comparison of Savings Accounts on the Czech Market

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Abstract

Even though interest rates have fallen and the profitability of savings accounts has declined, the range of savings accounts on offer on the Czech market remains relatively broad due to their popularity, especially among conservative banking clients. The choice of account is not usually only affected by interest rates, but also by other factors, such as the minimum deposit, minimum balance, cash withdrawals, the possibility to open and operate online, various bank fees, etc. The purpose of this article is to compare the savings accounts on offer in the years 2013 and 2018 in the Czech Republic through selected multi-criteria evaluation of alternatives methods and according to different clients' requirements. The main aim is not only to assess whether the focus of the banks is on a certain type of client (versatility or non-universality of the account parameters), but also to assess the development and changes in the range of products on offer in the given years.

Keywords: savings accounts, Czech market, comparison, multi-criteria evaluation.

Introduction

Saving can be characterised as an activity where a person or family sets aside some of their income with the intention of using it at a later date. Due to inflation, money kept at home gradually decreases in value. It is therefore preferable to use one of the currently available bank accounts; savings accounts, savings books or term deposits, or to invest in stock bonds or mutual funds. Unlike the various investment options, saving is not risky and there is no need to worry about any financial loss(es). However, when interest rates are lower than the level of inflation, the value of the deposited money may decrease. There are several studies that compare savings accounts'. Loke and Sherraden (2006) compared

children savings accounts in 5 countries based on 6 main factors. They concluded that it is not only the savings accounts' parameters but also the promotion, levels of inclusiveness, participation, and savings in the various schemes that increased interest among parents saving money for their children. In the analysis, Shoven and Sialm (1999) use an optimization model for the situation when the investor maximizes expected utility at the time of retirement by choosing an optimal portfolio using tax-deferred and conventional savings accounts – their results show that the conventional savings accounts are not entirely preferred by the high-income and risk-tolerant individuals but more by low-income and risk-averse people. An analysis of the situation among poor households in Nepal produced similar results (Prina 2013). The main finding was that poor households saved more when given access to basic savings accounts with no fees. The analysis of the savings accounts in Chile via regression model proved that access to a fully liquid savings account can help individuals (especially those on low-incomes) improve consumption smoothing in the face of economic shocks.

Comparisons of the savings accounts in the Czech Republic are usually conducted by students writing their Bachelor thesis (for example Bílá 2014; Ducarová 2014; Ligmajerová 2013 or Mocharová 2018). On the one hand, it seems to be easy for the students to find real data (mainly on the web pages of the banks), whilst on the other, the information and prices change every year. Making such comparisons may be viewed as an easy task because of the various online calculators (for example Mesec.cz 2018 or Usetreno.cz 2018) that exist. However, such comparisons are usually limited to comparisons of savings accounts according to the interest rates. In the rare cases where such comparisons include other parameters, they are, unfortunately, not always up-to-date.

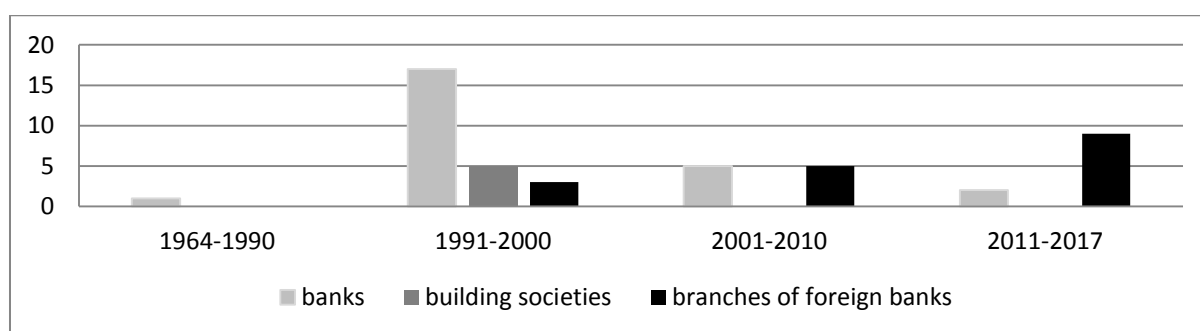
A few years ago, savings accounts were very popular in the Czech Republic because interest rates were relatively high. This encouraged consumers to deposit money rather than to borrow from banks. With the gradual fall in interest rates, which currently are up to or around 1% for savings accounts, and not much higher for term deposits, the situation has changed. Today, savings accounts offer minimal appreciation, with little hope for a growth in rates (Ligmajerová 2013). The low interest rates have stimulated the demand for consumer loans rather than saving for worse times. With more than CZK 1 trillion deposited in Czech bank accounts, banks have sufficient funds to deal with this demand and have little interest in attracting new deposits. As a result, they do not need to raise interest rates on savings accounts (Ligmajerová 2013). Despite this unfavourable situation, it is better to deposit money into savings accounts than current accounts.

Since account selection does not have to depend solely on the interest rate, the analysis presented in this paper seeks to compare a range of savings account on offer in the years 2013 and 2018 based on several criteria. The criteria were selected based on information provided by banks online or provided by bank staff personally (data was collected by students and used for example in Mocharová 2018). For this comparison, multi-criteria evaluation of alternatives methods are used.

Czech banking sector and savings accounts

Banks, especially commercial banks, are specific business entities operating in a regulated competitive environment (Banerjee and Duflo 2011). The competition in this sector on the Czech market is big. According to the Czech National Bank, 47 banks and foreign branches of banks were registered at the end of March 2018 (CNB 2018). Most of these were established after the Velvet Revolution in the period 1991-2000 (not only commercial banks, but also building societies and the first branches of foreign banks). Another “boom” occurred in the period 2007-2011 with the emergence of new “low-cost banks” (mBank, Citibank, Fio banka, Air bank – see Figure 1). These banks mainly operate online and offer nearly all their products without any bank charges. According to data for 2016 (Mesec.cz 2018), a number of these low-cost banks made it into the Top 10 on the basis of client numbers, although the value of the loans and deposits they held fell well short of those held by the traditional banks such as ČS, ČSOB and KB (see Table 1).

Figure 1: Number of banks according to date of establishment



Source: CNB 2018

Table 1: Top 10 banks in 2016 according to client numbers

Bank	Number of clients (in thousands)	Assets (in CZK billions)	Loans (in CZK billions)	Deposits (in CZK billions)
ČS	4,707	1,066	577	786
ČSOB	2,803	1,085	618	752
KB	1,654	922	595	699
Moneta	970	139	109	116
Fio banka	670	80	13	77
mBank	630	not known	20	34
Air bank	515	83	32	78
Raiffeisen bank	500	318	214	227
Unicredit bank	350	635	367	371
Equa bank	250	44	31	40

Source: Brans, Vinkce and Mareschal 1986, Mesec.cz 2018

Savings accounts can be described as “deposits on demand characterised by unlimited disposability, high deposit rates and low fees for maintenance and account operations” (Banerjee and Duflo 2011). These accounts usually combine the features of current

accounts and the terms of long-term deposits. These terms target the most common types of customers, i.e. those who prefer higher returns and those who prefer higher liquidity. The main benefits of savings accounts include quick access to money, easy transfer between current and savings accounts, and the fact that all deposits in savings accounts are legally insured for up to EUR 100,000 per person. The disadvantages of savings accounts are:

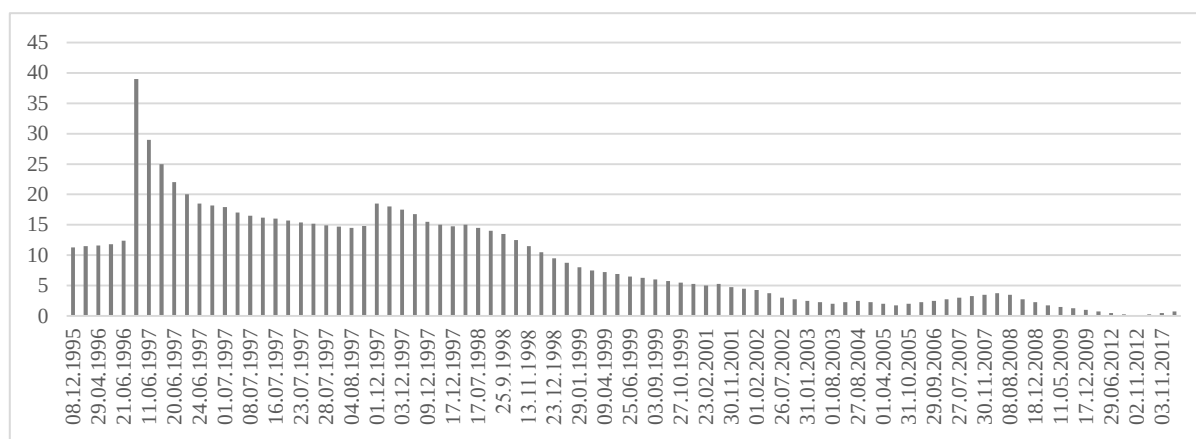
- very low yield, no savings account at current interest rate will cover inflation;
- they cannot be used to make payments (this is only possible from a current account);
- the money deposited in them appreciates slower than under other investment products (building society savings, time deposits, money market funds);
- they are subject to so-called "interest rate uncertainty" (the interest rate is determined by the bank based on the development of the financial markets, competition and the policy of the Czech National Bank);
- the number of permitted transaction accounts is limited;
- there is no possibility to make direct ATM withdrawals;
- the interest earned on savings is taxed at 15%.

The main criterion for choosing a savings account is the interest rate, which currently ranges from 0.1 to 1.1%. However, other criteria and conditions set by banks are also important. In the majority of cases, these include:

- fees - for account management and administration, etc.;
- minimum deposit requirement - some banks require a minimum deposit of up to CZK 5,000;
- minimum balance requirement - some banks require a minimum balance of up to CZK 10,000;
- interest rate bands – the interest rate is determined by the amount of the deposit (some banks decrease the rate of interest rate as the account balance increases, i.e. the more money you have on your savings account, the lower the interest rate). The highest interest rate is for amounts up to CZK 200,000, with the interest rate for higher sums decreasing accordingly.

Some banks pay out interest by forcing customers to set up a current account, which they must actively use. For example, clients need to make at least five card payments per month, etc. The range of savings accounts on offer and the terms are constantly changing. The interest rate on savings accounts is not fixed, but is determined by the banks, which set it on the basis of the current state of the money market, or on the repo rate set by the Czech National Bank. Figure 2 illustrates the development of the repo rate over a long period of time, and which is directly reflected in the announced interest rates on savings accounts. The trend among the low-cost banks is to offer savings accounts with low or no fee because high fees discourage their use – especially among people on lower incomes (Banerjee and Duflo 2011).

Figure 2: Two-week repo rates as set by the Czech National Bank



Source: CNB 2018

Material and Methods

In this paper, we compare savings accounts as alternatives offered to customers by Czech banks in the years 2013 and 2018 from the customer's point of view. The aim of the analysis was to select the most suitable savings account according to pre-selected criteria. Data was taken from the web pages of the banks (as in Ligmajerová 2013 and Mocharová 2018) and also from the web accounts comparator (Loke and Sherraden 2006). This problem can be solved by using several multi-criteria evaluations of alternative (MCEA) methods. In accordance with similar analyses of bank or building society accounts (Bílá 2014, Hwang and Yoon 1981 and Kuncová, Sekničková and Kánová 2015), the same or similar methods, such as WSA, TOPSIS and PROMETHEE II, were also applied, including non-dominance analysis and the conjunctive method.

Material

According to the data selection, in 2013, there were 21 alternatives offered by 17 banks, and in 2018, 23 alternatives offered by 15 banks. For each of the pre-selected criteria, it was necessary to assign a weight. For the comparison, the weight vectors for two different types of clients were used. For Client Type 1, criteria C1-C4 (fees and not required current account) are the most important, with equal weights allocated to each, followed by C6, C10 and C11, also with equal weights allocated to each. For Client Type 2, the most important criterion is C1 with 50% importance, followed by C2 and C4. All the weights are presented in Table 2.

Table 2: Criteria weights for the two selected types of clients

Criterion/ Client Type	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
Client Type 1	0.133	0.133	0.133	0.133	0.046	0.099	0.02	0.02	0.02	0.099	0.099	0.066
Client Type 2	0.50	0.15	0.05	0.10	0.02	0.05	0.02	0.02	0.02	0.03	0.02	0.02

Source: Authors

The comparison is based on 12 pre-selected criteria that describe all the main factors of the savings accounts that are published by the banks. These are:

1. Interest rate – usually the most important factor for clients (this criterion should be maximised).
2. Transaction fees - charges associated with the transfer of money between accounts (this criterion should be minimised).
3. Current account – a necessity to have a bank account in the given bank – these are allocated binary values, either 0 or 1, where 0 means no current account is necessary (this criterion should be minimised).
4. Current account fees - maintenance fees that are necessary to pay for the current account (this criterion should be minimised).
5. Standing orders – the possibility to set up a standing order – 0/1 value representing no/yes respectively (this criterion should be maximised).
6. Online creation – the possibility to set up the savings account online -0/1 value representing no/yes respectively (this criterion should be maximised).
7. Frequency interest is credited – the more frequent the interest is credited, the more the resulting amount increases for the client. In most cases, interest is accrued monthly. As the criterion is expressed by the annual frequency interest is credited, it should be maximised.
8. Interest bands – this criterion is only of interest to clients if they want to put more money into their account and are wondering if a limit is set for the account – 0/1 values were allocated, where 1 is the better case for the client (this criterion should be maximised).
9. Fixed rate – this rate is usually a bonus rate added to the basic rate of interest – 0/1 value allocated (this criterion should be maximised).
10. Minimum deposit requirement – minimum amount of money that must be deposited into the account (this criterion should be minimised).
11. Minimum balance – minimum amount of money that must always be in the account (this criterion should be minimized).
12. Cash withdrawal option – the possibility to withdraw money from an ATM.

Methods

For the comparison of the accounts it is possible to use various methods, such as statistical methods, econometric models, data envelopment analysis (DEA) models, or multi-criteria decision making (MCDM) models, especially the multi-criteria evaluation of alternatives (MCEA), which is sometimes referred to as the multi-attribute decision-making method (MADM). The theory of the multi-criteria evaluation of alternatives offers many different methods for solving this kind of problem, such as conjunctive and disjunctive methods, WSA, TOPSIS, ELECTRE, PROMETHEE, VIKOR, AHP, etc. (Fiala 2006, Figueira, Greco and Ehrgott 2005 and Prina 2013). The selection of the method is influenced by the aim of the decision because some methods are only able to find good (or acceptable) and bad (non-acceptable) alternatives, whereas the aim might be to find the winner, i.e. the best

alternative out of the compared ones with respect to the selected criteria, or to find the preferential order of the alternatives. As stated in Prina 2013, the question “Which method is the best for a given problem” is usually more difficult to answer. It is for this reason that more methods are applied in this article in order to finally decide which one is more appropriate for the selected case. In accordance with similar articles (Bílá 2014; Hwang and Yoon 1981), it was decided to use several MCEA methods for the comparison, in particular the conjunctive, WSA, TOPSIS and PROMETHEE II methods supplemented by non-dominance analysis. For the majority of the calculations, the SANNA add-in application was used.

The multi-criteria evaluation of alternatives (MCEA) model focuses on problems with discrete decision spaces with a predetermined set of alternatives representing the different choices of action available to the decision maker (Prina 2013). It contains a list of p alternatives $A = \{a_1, a_2, \dots, a_p\}$, a list of k criteria $F = \{f_1, f_2, \dots, f_k\}$ and an evaluation of the alternatives according to each criterion in the criteria matrix. For some methods, additional information like aspiration levels, criteria order or criteria weights are necessary (Fiala 2006; Figueira, Greco and Ehrgott 2005).

The conjunctive method is a basic method for which it is necessary to determine the required values of each criterion. The decision-maker must set their requirements for each criterion $f_i, i=1, 2, \dots, k$ accordingly. Afterwards, the alternatives which fulfil all of these requirements are selected as the good ones. This method does not use weights and does not create a final order of alternatives. It only separates the alternatives into acceptable and non-acceptable (Fiala 2006).

The WSA (Weighted Sum Approach) sorts the alternatives based on the values of their utility functions, which in this case are assumed to be linear. It requires weights to be allocated to the criteria. The higher the utility value, the better the alternative is Prina (2013). When applying this method, the first step is to normalise the values of each criterion. The aim of this step is to abolish the influence of different units and different scales. The normalised values for each criterion range on a scale from 0 to 1 and indicate the percentage of the maximum or minimum value (depending on the type of criterion, which may be either maximising, i.e. higher values are preferred, or minimising, i.e. lower values are preferred). The formula for the normalisation of the maximization criterion type is:

$$r_{ij} = \frac{y_{ij} - D_j}{H_j - D_j} \quad (1)$$

where y_{ij} is the value of the alternative i in criterion j , D_j is the minimal value of the criterion j and H_j is the maximal value of the criterion j . In case of the minimization criterion type the formula is:

$$r_{ij} = \frac{H_j - y_{ij}}{H_j - D_j} \quad (2)$$

In the second step, the final utility $u(a_i)$ value for each alternative a_i is calculated using the criteria weights v_j :

$$u(a_i) = \sum_{j=1}^k r_{ij} \cdot v_j \quad (3)$$

The TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) method ranks the alternatives using the relative index of the distance of the alternatives from the ideal and non-ideal alternative. The higher the relative index of distance, the better the alternative is. The user only needs to supply information on the weights to be allocated to each criterion (Lai and Liu 1994). The required input information includes decision matrix Y with information about all the selected alternatives $a_1, \dots, a_p$ according to all the criteria $f_1, \dots, f_k$ and weight vector v for these criteria. This decision-making approach can be summarised in the following steps (detailed description of steps and notation in Hwang and Yoon 1981; Lai and Liu 1994):

- normalisation of the decision matrix according to the Euclidean metric:

$$r_{ij} = \frac{y_{ij}}{\sqrt{\sum_{i=1}^p y_{ij}^2}}, \quad \forall i = 1, K, p, \quad j = 1, K, k, \quad (4)$$

- calculation of the weighted decision matrix $W = (w_{ij}) = v_j \cdot r_{ij}$, and from the weighted decision matrix W the identification of the vectors for the hypothetical ideal H and basal D alternatives for each criterion

$$H_j = \max_i (w_{ij}), \quad \text{pro } j=1,2,\dots,k \quad (5)$$

$$D_j = \min_i (w_{ij}), \quad \text{pro } j=1,2,\dots,k \quad (6)$$

- measurement of the Euclidean distance for every alternative to the ideal and to the basal alternatives for each criterion:

$$d_i^+ = \sqrt{\sum_{j=1}^n (w_{ij} - H_j)^2} \quad \text{and} \quad d_i^- = \sqrt{\sum_{j=1}^n (w_{ij} - D_j)^2}, \quad \forall i = 1, K, p, \quad (7)$$

- determination of the relative ratio of each alternatives distance to the basal alternative:

$$c_i = \frac{d_i^-}{d_i^+ + d_i^-}, \quad \forall i = 1, K, p, \quad (8)$$

- ranking of the alternatives according to the maximising ratio c_i .

The PROMETHEE II method belongs to the PROMETHEE (Preference Ranking Organisation METHod for Enrichment Evaluations) methods which use a pairwise comparison of alternatives and a preference function attached to each criterion, as well as weights describing their relative importance. The PROMETHEE II method is able to create a complete ranking of alternatives. A detailed description can be found in Fiala 2006; Figueira, Greco and Ehrgott 2005. The decision-maker must specify the type of preference function for each criterion. Usually 6 types of generalised criteria are used

(Brans, Vinkce and Mareschal 1986) depending on the differences between the values of two compared alternatives and on the preference function. Based on the given data for this analysis only usual preference function (where any positive difference of alternatives is considered) was applied on all criteria. Difference d between two alternatives a and b , and for the usual criterion function $H(d)$, was related to preference P as follows:

$$H(d) = \begin{cases} P(a, b) = 0 & \text{if } d = 0 \\ P(a, b) = 1 & \text{if } d \neq 0 \end{cases} \quad (9)$$

The formula (9) describes these situations: aPb = alternative a is better than alternative b ; bPa = alternative b is better than alternative a . After the creation of the 0/1 preference matrices for each criterion j , each matrix is multiplied by the weight of the criterion, and then all the matrices are summarised. The final score for each alternative is given by the sum of the values in the alternative's row minus the sum of the values in the alternative's column. The higher the score, the better the position the alternative commands.

Results and Discussion

The analysis and comparison based on the 12 pre-selected criteria was based on 21 savings accounts from 2013 and 23 savings accounts from 2018. First of all, non-dominance testing was applied, whereby the dominated alternative is the alternative for which another alternative with better values for at least one criterion and no worse values in all other criteria exists. The dominated alternative cannot therefore be taken as the best alternative and cannot be the winner for any weight vector. From this point of view, this analysis is very important in situations where only one winner is being sought. In 2013, 10 alternatives out of 21 were dominated, whereas in 2018, up to 19 of the 23 alternatives were dominated. From this point of view, we may conclude that the situation on the market would seem to have changed, i.e. that in 2018, compared to 2013, it should be easier for customers to find the best savings account based on the 12 criteria. The problem usually lies in the fact that customers do not possess all the data they need, whereby the more alternatives they have, the more complicated the dominance testing becomes. As a result of which, the non-dominated alternatives are not so visible in the data matrix. This lack of information may therefore result in investors inadvertently choosing the dominated (worse) alternative over the better one.

The next part of the analysis focused on applying the conjunctive method, for which the requirements (or so-called aspiration levels) should be set for each criterion. In this case, it was assumed that customers prefer zero fees (as concluded in other analyses Prina 2013; Shoven and Sialm 1999), a zero minimum deposit requirement, a zero minimum balance and a preference for the creation of the account online. Other criteria can be of any value. For this analysis, criteria weights are still not required. The results are presented in Table 3. For the year 2013, only 3 alternatives fulfilled all the requirements, whereas for 2018 there is the only one non-dominated alternative (No. 1 – Air Bank) suitable for the set aspiration levels, whereby the other alternative (No. 10 – ING Bank) is dominated by this alternative. All alternatives in 2013 come from the set of non-

dominated alternatives. The results reveal the main trend, i.e. interest rates (criterion C1) are falling. The maximum interest rate on offer in 2013 was 2.1% by Zuno Bank (Zuno Bank withdrew from the market in 2016 - high rates and a low proportion of sold loans resulted in losses over five years). In 2018, the maximum interest rate on offer was (in January 2018) 1.1% on the Moneta Money Bank Gold savings account – but this non-dominated account has a current account fee of CZK 149. The mBank eMax account was not selected in 2018 because the bank set a transaction fee of CZK 29. In addition, the interest rate went down to 0.01%. The average interest rate in 2013 for all 21 accounts was 1.125%, and in 2018 only 0.386%. The other visible trend is the settings of the interest bands (higher amount of money saved results in lower interest rate for the amount up to the band) and fixed rate bonuses. For 2018, other non-dominated accounts (No. 9-Fio Banka, No. 17-Moneta Money Bank, No. 20-Sberbank) were not selected because of positive fees, positive minimum deposit and/or balance requirement.

The last part of the analysis focused on the selection of the best savings account according to the 12 criteria and with respect to the weights allocated according to the two selected client types using the WSA, TOPSIS and PROMETHEE II methods. The results are presented in Table 4.

Table 3: Results of the conjunctive method

Account No., bank (year) / Criterion	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
type	max	min	min	min	max	max	max	max	max	min	min	max
1. Air Bank (2013)	1.8	0	0	0	0	1	12	0	0	0	0	0
12. ING Bank (2013)	1.5	0	0	0	1	1	4	0	0	0	0	0
15. mBank eMax (2013)	0.4	0	0	0	0	1	12	0	0	0	0	1
1. Air Bank (2018)	1	0	0	0	0	1	12	1	1	0	0	1
10. ING Bank (2018)	0.5	0	0	0	0	1	12	1	0	0	0	0

Source: Authors

Table 4: Results of the three methods for Client Type 1 and 2
(the first three places and the number of the alternative are shown)

Year	2013						2018					
Results	Client Type 1			Client Type 2			Client Type 1			Client Type 2		
Rank	1	2	3	1	2	3	1	2	3	1	2	3
TOPSIS	19	2	7	21	1	7	20	1	10	1	17	20
WSA	19	2	7	21	1	7	20	1	9	1	20	17
PROMETHEE II	1	19	7	21	1	7	1	20	10	1	20	17

Source: Authors

Table 5: Best savings accounts according to the results of the selected MCEA methods

Account No./Bank (Year)/Criterion	C1	C2	C3	C4	C5	C6	C7	C8	C9	C1 0	C1 1	C12
type	max	min	min	min	max	max	max	max	max	min	min	max
1. Air Bank (2013)	1.8	0	0	0	0	1	12	0	0	0	0	0
2. Axa Bank (2013)	1.5	19	0	0	1	1	12	1	0	0	0	1
7. Equa Bank (2013)	1.8	9	0	0	0	1	12	0	0	0	0	1
19. UniCredit Bank (2013)	1.73	18	0	0	1	1	4	1	0	0	0	1
21. Zuno Bank S+ (2013)	2.1	0	1	0	0	1	12	1	1	0	0	0
1. Air Bank (2018)	1	0	0	0	0	1	12	1	1	0	0	1
9. Fio Banka (2018)	0.15	0	0	0	1	1	12	0	0	100	100	1
10. ING Bank (2018)	0.5	0	0	0	0	1	12	1	0	0	0	0
17. Moneta Money Bank (2018)	1.1	0	1	149	0	0	12	1	1	0	0	1
20. Sberbank (2018)	0.83	5	0	0	1	1	12	1	1	0	0	1

Source: Authors

It can be concluded that the results of all methods are similar, in particular for Client Type 2 where in 2013 the top three accounts had the highest interest rates (No. 21 Zuno bank - interest rate 2.1%; No. 1 Air Bank - interest rate 1.8%; No. 7 Equa Bank – interest rate 1.8%). Under Client Type 1, a lower weight was allocated to the C1 (interest rate) criterion, which is why the results are different – the winner is No. 19 (UniCredit Bank) or No. 1 (Air Bank). There are differences in the results from the PROMETHEE and other two methods which are caused by the large number of dominated accounts, as well as by the differences in the methods applied.

As is evident in Table 5, No. 1 is better than No. 19 for the C1, C2 and C7 criteria, which means that it is better by 28%, while No. 19 is better for the C5, C8 and C9 criteria, which is better by only 13%. According to the positive preferences under PROMETHEE II, the winner should be No. 19, followed by No. 7. However, with regards to the negative preferences, No. 1 has better results and that is why it wins overall. All the alternatives in the top were non-dominated for the year 2013. The results for 2018 are also similar for all the methods. The PROMETHEE II results for Client Type 1 changes the final order a little, but for Client Type 2 the winner is the same. Here, the best solution for Client Type 2 does not have the highest interest rate (C1) as is the case for 2013, but the second highest. No. 17 has the highest interest rate, but a high current account fee (C4). No. 20 (Sberbank) has the third highest interest rate, similar to No. 1, but is better with regards to standing orders (C5). As Client Type 1 is not so sensitive to interest rates, No. 20 could be better than No. 1 (subject to how much money is in the account because the interest rate difference of 0.17% could be important for higher amounts).

Conclusions

The current situation in the savings accounts market is worse than in the year 2013. Although the number and range of accounts on offer is a little higher, the interest rates are lower and many of the accounts are dominated. The analysis showed that clients who choose a savings account mainly based on the interest rate, in particular where it concerns low-cost banks, can expect changes in the parameters after a few years or possibly the failure of the bank. Zuno Bank disappeared after just five years, and LBBW Bank was transformed into Expobank. At the same time, Bank Creditas, which grew out of the credit union, entered the sector. Deposits are legally insured up to EUR 100,000, but any change is uncomfortable for a client who expects stability from their bank. That is why it is necessary to consider other parameters when choosing a savings accounts. With interest rates as low as they currently are, the rate of appreciation is not the most important criterion, it is rather the total value of the service that the relationship with the service provider brings that is. According to KPMG, customer experience depends on six pillars: specifically, personalisation, integrity, expectation, problem solving, time and effort and empathy. Clients are sensitively to these parameters and take them into account when choosing savings accounts.

Money interventions by the CNB against the Czech Crown resulted in a noticeable fall in interest rates on savings accounts. Prior to the commencement of the exchange rate interventions rates were typically above 1% p.a., now only a few banks offer up to 0.5%, but subject to conditions. As other criteria are becoming more important, it might be useful to use mathematical methods for multi-criteria comparisons to find the best offer for a given client. According to our results, it is evident that a lot of products offered by banks are dominated, which means they are worse in all criteria than some of the other products. As clients usually do not see all data together, they are not able to identify this fact and that is why they potentially risk choosing a worse product. This implies that non-dominance testing can decrease the number of products that should be compared and shows only the good ones. The application of other multi-criteria evaluation of alternatives methods afterwards may be very helpful in making the final decision because the clients can express their needs through criteria weights. However, the main problem does not lie in ignorance of information or the frequent changes to it, but in the lack of clarity with regards to the products (for a particular client) banks create and which do not match the officially published data (part of the parameters is usually better, but this fact is not easy to verify). Based on the above analysis, it is recommended that clients should primarily seek out available data and apply some multi-criteria comparison methods before they seek contact with a bank (or before the selection of a savings account online). In this way, the client can compare the offers on the market so that they are not solely dependent on a choice of bank that may not always be the best for them.

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Financing Innovation, Neo-Schumpeterian Theory and the Reduction of Regional Disparities in the European Union

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Abstract

The paper analyses at the European Union's support policy for research, development and innovation and the financial instruments used to implement this policy. The impact of the policy is analysed within the context of economical, territorial and social cohesion and the reduction of regional disparities. The aim of the paper is to highlight the influence of neo-Schumpeterian innovation theory on the formation of EU innovation policy and regional innovation strategies after the year 2000. The analysis revealed that pursuant to the conclusions of this theory, new financial instruments to support the competitiveness of and innovation in small and medium-sized enterprises can contribute to solving regional disparities. The paper also highlights the new intermediary institutions and agencies that were established in the European Union after the year 2000 and the role they play in the transfer of research results to the business sector in order to support innovation.

Keywords: financing innovation, European Union, neo-Schumpeterian innovation theory, regional disparities

Introduction

The origins of EU support policies for research, development and innovation, and cohesion, go all the way back to the signing of the Treaty of Rome in 1957. In the initial stage of its implementation, cohesion policy only focused on individual structural problems in the member states of the European Community. Regional disparities were not considered an important problem for the further political and economic integration of the member states participating in the European project. The support policy for research, development and innovation was also mostly only a part of the policies of the

individual member states. Its links to other EU policies, in particular with regards to the reduction of regional disparities, cannot be found until after 1973. The economic crisis of 1973 resulted in a change of view and the realisation of the need for a coordinated response. There was a need for innovation in regionally affected industries, especially within heavy industries and the energy sector, even in those member states that did not feel the full impact of the crisis at that time (Baldwin and Wyplosz 2012). The first signs of a coordinated common regional policy and the emergence of common support policies for research, development and innovation came in 1974 in the form of the European Regional Development Fund, the focus of which was to solve regional disparities and structural problems in crisis affected regions (Dostálová and Jiříček 2012). During the period 1983-2000, financial instruments were developed to support the research, development and innovation policy. Just like the financial instruments of the structural and regional policies of that time, they tended to be multi-annual programmes linked to the financial framework of the European Union. Archibugi and Filippetti (2011) describe the impact of innovation performance in Europe on the convergence of regions after the crisis and the influence of creating national innovation systems. Audretsch and Link (2012) define the amount of utility for public policy through commercial innovations. The theoretical concept that economic growth is driven by the creative role of small and medium-sized enterprises was applied within the European Union's strategies for solving regional disparities (Granieri and Renda 2012). It is only after 2000, and within the context of the Lisbon Treaty and the Europe 2020 strategy, that it is possible to speak of a higher degree of linking between the support policy for research, development and innovation and the EU's cohesion policy (Wamser, Nam and Schoenberg 2013). The issue of innovation policy and its relation to the divergence or the convergence of EU regions after the economic and financial crisis of 2008-2009 is described by Izsak and Radošević (2017).

Materials and Methods

The aim of the paper is to determine how, beyond the endogenous growth theories focused on internal sources of regional development, Aghion and Howitt's neo-Schumpeterian growth theory, based on innovation as a growth factor, influenced a change in the approach to solving regional disparities. The analysis includes a comparison of fundamental theoretical concepts from the field of economics and Schumpeterian innovation theory and specifies their contribution to the EU's long-term innovation policy. With regards to individual EU financial frameworks, reference is made to financial programmes that were/are instrumental for the support of research, development and innovation in the entrepreneurial sphere. For the analysis, aggregate data were used according to:

a) individual EU financial framework periods:

- 1973-1999 - annual or multi-annual programmes based on exogenous growth theories,

- 2000–2006; 2007–2013; and 2014–2020 – shift from endogenous growth theories to neo-Schumpeterian growth theory based on innovation for solving regional disparities.

b) the area/field the financial instruments targeted:

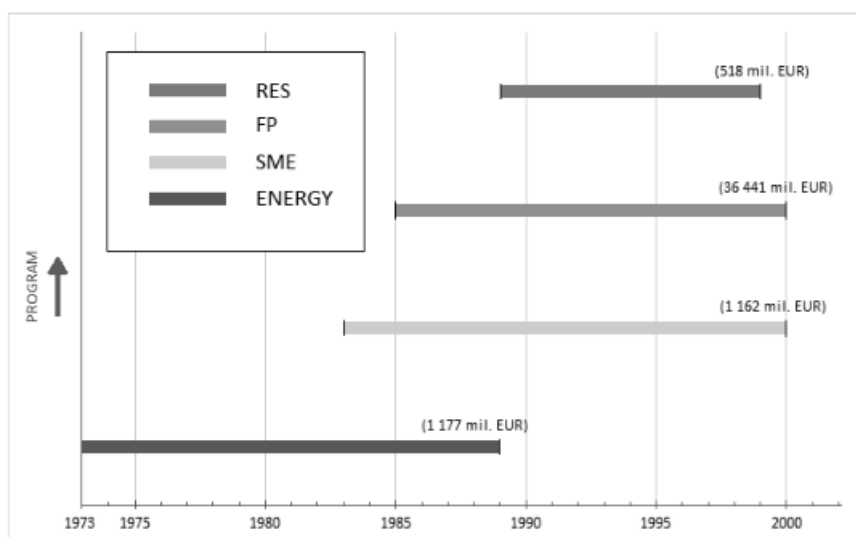
- technological innovation in the commercial sphere,
- innovation in energy production,
- research programmes.

Results

Financing of EU innovation policy and reduction of regional disparities in the period 1973-2000

The concept and financing of the policy for research, development and innovation and the creation of the financial tools to support it were a reflection and a reaction to the situation after the world economic crisis. The crisis led to the emergence of regional disparities in the, up to then, relatively homogenous regions of the six founding member states of the European Economic Community. From the perspective of postulates of the exogenous economic growth theories that prevailed at that time, namely Keynesian theory, investment in innovation in heavy industries and traditional energy production was considered crucial to eliminate regional disparities. As a result, the financial instruments that emerged were oriented towards supporting research, development and innovation in these sectors. These included, for example, *HYDROCARB*, *ENSALT*, *LIGASF* and *ENDEMO*. The predecessor of the research programmes was the COST programme, which focused on supporting the formal cooperation between research institutions within the EEC (Babjaková et al. 2014). The onset of the technological revolution in the area of new materials and computing led, in 1984, to the emergence of new joint multi-annual programmes called *Framework Programmes*. The objective of these programmes was to support research institutions. The impact of new economic theories based on the influence of technological capital (Romer's endogenous growth model) (Romer 1990) was reflected in an essentially different view of dealing with regional disparities. As a result of focusing on these very factors of economic growth, EU innovation policy began to take shape. Figure 1 shows the time sequence with regards to the implementation of the individual financial instruments of the policy, including the sums of money spent until 2000, whereby ENERGY indicates the support for traditional energy production, FP the support for research institutions, SME the support for small and medium-sized enterprises, and RES the support for renewable sources of energy.

Figure 1: EU financial instruments for support of research, development and innovation (1973-2000)



Source: Adapted from Babjaková et al. 2014

Neo-Schumpeterian growth theory and its influence on dealing with regional disparities for the period 2000-2020

Aghion and Howitt's theory of innovation as a growth factor, which was first published in 1994 and revised in 2005, is based on Schumpeter's theory of creative destruction (*Theorie der wirtschaftlichen Entwicklung*) published in 1912. It assumes that individual innovations are significant enough to affect the entire economy. Their theory has its roots in the likes of Lucas' neo-institutional growth theory published in 1988 and Romer's endogenous growth theory published in 1990. Aghion and Howitt build on Romer's concept of three economic sectors (Romer 1990), namely the research, intermediate and manufacturing sectors, which participate in the investment process that leads to economic growth. Aghion and Howitt's innovation theory had a theoretical influence on research into the role of the innovation process on the convergence of the European region. Cooke (2001) states that the future will require the widespread evolution of public innovation support systems along with stronger institutional and organisational support from the private sector. Fagerberg (2003) similarly deals with Schumpeter's influence on new innovation theory. The empirical findings presented by Fritsch and Slavtchev (2008) suggest that the transfer of knowledge from the private sector, as well as from universities and other public research institutions, has a positive effect on the efficiency of private sector research and development, which in turn supports regional development. The synthesis between Schumpeterian and neo-Keynesian approaches to innovation is presented by Dosi, Fagiolo and Roventini (2010). The neo-Schumpeterian model presented by Aghion and Howitt defines a period

between two successive innovations, whereby the duration of each period is stochastic. The model distinguishes between two effects. The first effect is that of creative destruction, whereby the payoff for the research conducted in the period is the prospect of monopoly rents during the next period, and whereby the rents only last until the next innovation occurs. The second effect is the general equilibrium effect that works through the wages of skilled labour, which can either be engaged for research or manufacturing activities. The functional relationship between two successive periods of research has a unique fixed point, which defines a stationary equilibrium. The stationary equilibrium is reflected in balanced growth, i.e. the allocation of skilled labour between research and manufacturing activities remains unchanged with every innovation.

The expected utility (U) from innovations (as an expression of social welfare) is defined as:

$$U = \int_0^{\infty} e^{-r\tau} \sum_{t=0}^{\infty} \Pi(t, \tau) A_t F(N - n) d\tau$$

(1)

Where:

r = constant rate of preference of time, e.g. interest rate;

τ = continuous time in innovation process;

t = denotes the interval starting with the t^{th} innovation (with $\tau = 0$ in the case of $t = 0$) and ending just before the $t+1$ innovation;

A = parameter indicating the productivity of the intermediate (innovation) output;

N = fixed flow of skilled labour between the manufacturing and research sectors;

n = flow of skilled labour used in research;

$\Pi(t, \tau)$ = probability that there will be exactly t innovations until time τ .

Equation (1) suggests that the socially optimal level of research maximises utility (Aghion and Howitt, 1994). This conclusion can also be applied to utility created in a particular region. The aforementioned relationship indicates that utility newly generated in this way depends on several factors:

1. The length of the period between two technological innovations.
2. The probability that innovations will occur in the given region: the authors consider Poisson probability distribution that shows the number of occurrences of innovation phenomena in a certain interval, and which occur independently of one another.

3. The number of research institutions carrying out research focused on entrepreneurial innovation and residing in the region or contributing to the region, as well as the value of the achieved output in the form of cashflow.
4. The number of intermediary organisations in the region or contributing to the region (on the basis of application research, specialised agencies, or development centres owned by entrepreneurs-innovators), which transfer the results of research in applicable form to enterprises, as well as the value of the achieved output in the form of cashflow.
5. The parameter that characterises the level of technological development in the region.
6. The interest rate as time preference of the utility (a lower interest rate increases the utility of innovation because it reduces the costs of borrowing the capital required to fund innovation).

When analysing the EU's innovation policy (see for example Granieri and Renda, 2012), it can be said that Aghion and Howitt's neo-Schumpeterian model is reflected in it in the following ways:

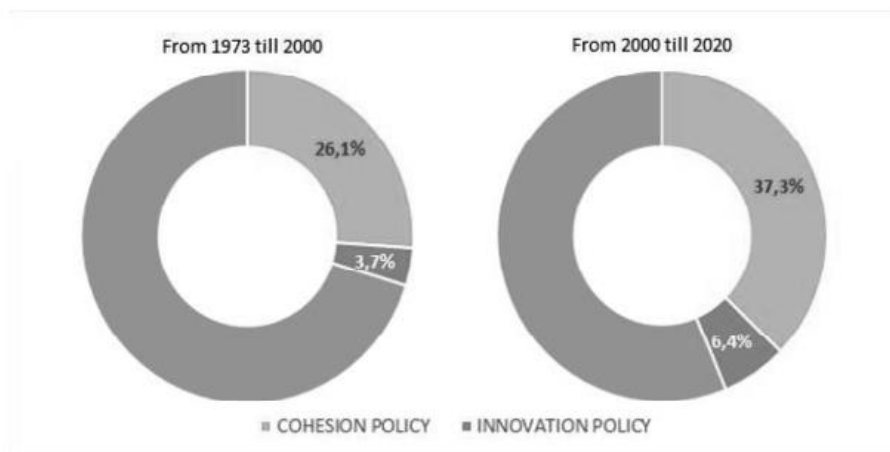
- a) through the incorporation of the foundations of the new support policy for research, development and innovation in primary European law – in the Treaty of Amsterdam of 1996, Article XVIII;
- b) through the elaboration of long-term innovation strategies as part of the Lisbon Strategy of 2000 and the Europe 2020 strategy of 2010;
- c) through the emergence of medium-term plans focused on research, development and innovation – the first were the *Action Plan for Innovation in Europe*, which was established as early as 1996, and *ETAP (Environmental Technologies Action Plan)* in 2006;
- d) through the financing of multi-annual programmes through the EU budget in support of research, development and innovation - *Framework Programmes, MAP, CIP, COSME*, etc.;
- e) through the establishment of and extension of subsidies to special institutions that support EU policies in the field of research and innovation for SMEs - *EACI (Executive Agency for Competitiveness and Innovation)* in 2007, and *EASME (Executive Agency for Small and Medium-sized Enterprises)* since 2014;
- f) through the linking of regional objectives in terms of concepts, cohesion and innovation policies - *Regional Innovation Strategies (RIS)*, which came into effect in 2000 (Henderson, 2000), and most recently *RIS3 (Regional Strategy for Smart*

Specialisation) for the period 2014–2020, and the creation of the conceptual triple-helix model;

- g) through the inclusion in operational programmes, as part of EU cohesion policy, of the objectives and activities that support innovation in the SME segment in supported convergence regions, with the aim of reducing regional disparities.

Aghion and Howitt's concept of innovation-based growth has since been incorporated into theories related to regional science, and applied to practical measures for the endogenous development of regions with the aim of reducing regional disparities. This can be seen, for example, in the work of Lundvall (2010) on the role of innovation in learning regions.

Figure 2: Share of financing for support of research, development and innovation in the EU financial frameworks for the periods before and after 2000.



Source: Adapted from European Commission 2014b

Figure 2 shows the development of the share of finances from the financial frameworks of the EU distributed towards the support of research, development and innovation in the periods before and after 2000. This watershed marks a crucial change in EU innovation policy, which was triggered on the grounds of the Lisbon Strategy. For comparative purposes, the share of EU cohesion (prior to 2007 - structural and regional) policy costs is also stated. Based on the neo-Schumpeterian theory's fundamental postulate that the innovation holder is a private entrepreneur and on the neo-institutional economic findings on the fundamental influence of institutions on economic growth, several significant contact points appeared for the linking of the EU's cohesion and innovation policies.

Discussion

From the perspective of the application of endogenous growth theories, the use of financial instruments to support innovation in small and medium-sized enterprises is highly important for reducing regional disparities. According to Aghion and Howitt's theory, which deals with the role of innovation in economic growth, such instruments do so by supporting the competitiveness of small and medium-sized enterprises. For the period 1998-2002, as part of the 5th Framework Programme, research and innovation in SMEs was financially supported to the tune of ECU 359 million under the *Innovation/SME* programme. After 2000, the financial support for research and development in SMEs was gradually separated from technological innovation support. In the 6th Framework Programme (2002–2006) the financing for research support was increased, whereby *specific activities covering a wider field of research in SMEs and cooperation* had a budget of ECU 1.3 billion. In addition, for the period 2001–2005, a specialised community programme *MAP (Multi-annual Programme for SMEs)* was newly established. This programme included modern financial instruments for the support of SMEs, such as start-up support (*ETP Start-up Scheme*), guarantee facilities (*SME Guarantee Facility*), and a special innovation fund (*Seed Capital Action*). For the financial framework period 2007–2013, the *Competitiveness and Innovation Programme (CIP)* was established. Its sub-programme, the *EIP (Entrepreneurship Innovation Programme)*, focused on supporting technological innovation in SMEs and had a budget of EUR 2.2 billion (Babjaková et al. 2014). In 2007–2013, the cohesion policy was already directly linked to private sources with the aim to finance innovation in SMEs through multiple sources. In addition to community programmes supporting innovation, the modern financial engineering instruments *JEREMIE* (European Commission 2014d) and *JASMINE* (European Commission 2014c) were established; they were financed under EU cohesion policy. The European Commission coordinated the JEREMIE initiative with the EIB and the European Investment Fund (European Commission 2014d). For the current financial framework period, the EU established *COSME (Competitiveness of Enterprises and Small and Medium-sized Enterprises)* to support innovation in SMEs. For the period 2014–2020, a budget of EUR 2.3 billion has been allocated for the programme's implementation (European Commission 2014a). The research activities in SMEs are financed separately through the *HORIZON 2020* community programme, which is a financial instrument under the EU policy. For this purpose, an *Industrial Leadership* pillar was set up with a budget of EUR 17 billion (Babjaková et al. 2014).

Conclusion

The neo-Schumpeterian approach to dealing with regional disparities means using the innovation potential of entrepreneurs to stimulate utility growth in a region. In a narrower sense, it is the use of economic growth factors from the implementation of innovations, or in a broader sense, the use of social capital as a contributor to the growth of utility through interactions between entrepreneurs, the general public and scientific research sectors within the so-called triple-helix model. The aim of European Union

policy after 2000 has been to achieve synergy in its cohesion policy and its support policy for research, development and innovation. The priority is to transfer the results of research, development and innovation to small and medium-sized enterprises because of their essential role in regional development. When comparing the period before 2000, when the influence of economic theories focused on exogenously conceived growth prevailed in EU strategies, it is evident that there has been a substantial increase in the concentration of European Union funds spent on financing this priority. This is reflected in the establishment of new institutions and agencies to support and mediate the transfer of scientific research results to stimulate innovation as assumed under Aghion and Howitt's neo-Schumpeterian growth theory. Although the neo-Schumpeterian innovation theory does not deal with the form of financial support for innovation at the entrepreneurial level, the analysis of the EU's regional and innovation policies in this paper clearly shows the importance of a system of public support, especially for SMEs. Due to the conservativeness of the banking system, this segment could not fully fund its innovation activities and contribute to regional development without financial support from EU funds.

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Sharing Economy Regulation in the Czech Republic: the Theoretical Framework of Analysis

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Abstract

Sharing economy is currently one of the main phenomena, primarily in the context of developing Smart Cities and smart economy. The most well-known examples of sharing economy have been in the fields of accommodation and car sharing. However, the possibilities of sharing economy are much larger. The quick development of sharing economy soon encountered the restrictions of traditional regulatory frameworks of national economies and decision-making processes of municipalities and cities, which were not ready for this phenomenon. This resulted in massive protests of traditional economy branches that request that the regulatory measures do not change - these were often implemented before the invention of the internet or the development of IT technologies. Politicians have had similar reactions, without effectively solving problems connected to the commencement of sharing economies. The paper focuses on defining the term sharing economy and on the possibilities of a new regulatory environment that would be governed by the principles of the so-called better regulation. The text defines clear criteria how to evaluate sharing economy and how to correctly estimate its potential for the development of cities, municipalities, and national economies.

Keywords: sharing economy, regulation, Czech Republic, Public Policy.

Introduction

Although the topic of collaborative (sharing) economy is very popular, the collaborative economy itself has got a quite small market share in both the EU and the Czech Republic. This is probably the main reason why it isn't regulated as much as other sectors. However, it is growing rapidly and in specific branches of economy, traditional business models

must deal with a competition based on new, “unknown” pillars – online platforms, mobile applications, sharing of knowledge and business without borders. According to the European Commission, the collaborative economy generated gross revenue in the EU around 28 billion € in 2015. Revenues in the EU in five key sectors almost doubled compared with the previous year and are set to continue expanding robustly. (EC 2016) Some experts estimate that the collaborative economy could generate additional 160-572 billion € in the EU economy in a close future. Nevertheless, this future cannot do without transparent and stable regulatory conditions. The management of all these new opportunities will be very challenging because it is new phenomenon and the agreement of all involved interest groups in this area is nowhere near. The biggest challenge will be finding a solution that is fair and efficient and implementing it into current state of economy. Some interest groups are already asking for a bit of fairness regarding the problematics of services provided by P2P (peer-to-peer) platforms. It is important to balance between fairness and effectiveness. Some say instead of regulating the collaborative economy, we should deregulate the traditional economy to make the conditions for all participants equal. However, the arguments reflecting a broad research of economic theory are missing. Therefore, we are going to determinate the most urgent problems as market accessibility, taxation, employment in the area of collaborative economy, also quantify and qualify their impacts and and suggest a complex theoretical environment for sharing economy regulation.(Pildes and Sunstein 2005)

A phenomenon of sharing economy is usually represented by car-sharing (e.g. Uber), accommodation (e.g. AirBnB) and crowdfunding (e.g. Kickstarter). These services always existed, but they weren't usually picked in the past due to high searching costs and this is probably why they were often overlooked even though they were cheaper or in other ways more suitable alternative. The problem of high search costs was solved by modern technologies such as GPS, high speed internet, social networks and mobile applications.

In the past, people used to say “you are what you wear” but “you are what you can access” (Belk 2014). It is much more suitable in today's era. The collaborative economy brings disruptive innovations in this matter and its scale is as big as a discovery of a video for broadcasting industry. This revolution produces a whole new sector filled with new possibilities. The possibilities are connected with lowering the transaction costs, using capital that lays idle, new matchmaking systems between customers and providers and many more. This leads to higher effectiveness in the end, which is beneficial to whole society as it can solve other seemingly unrelated problems. These platforms could also lower the costs of public sector, since most of the platforms have their own self-regulation system, which lowers the need for regulation and consumers' protection – these standard regulations are rather costly. Therefore, the regulation of sharing economy should follow an existing state of digital development.

The fact that sharing economy is a major challenge for decision-makers could be proven by protests against it. The current state of collaborative economy in the Czech Republic is quite stormy. There have been several protests against P2P platforms and collaborative economy itself. Taxi drivers did most of the protesting as they feel that Uber and other

P2P platforms providing car-sharing/carpooling services are not respecting legislative rules of the game. One example for all is the protest that was held in Prague where the Taxi drivers, protesting against Uber among other things, blocked 2 out of 3 traffic lanes in one of the most important traffic artery for eight hours (Bun 2016). Another pressing matter is that subjects providing accommodation have to pay certain fees to municipality for providing such services and there is a suspicion that people using P2P platforms such as Airbnb are not doing so. There is no evidence for this claim but the municipality of Prague is already investigating this matter (Černý 2017).

We suppose the pressure on regulators will be even bigger. Estimates of the size of collaborative economy in the Czech Republic vary, but generally we can say that current state is around 0,1 % GDP and is expected to rise to 0,5 % GDP in 2020 (Bostl 2016). The problem is that such estimations can't be accurate, because there is no proper generally acknowledged definition of what the collaborative economy is, so it is impossible to measure it. Anyway, the legal framework regarding collaborative economy in the Czech Republic is very vague. There are no special regulations regarding collaborative economy yet. We can't expect that it is going to change in close future. So far only rigid general rules, laws and regulations e.g. Trade Act, Income Tax Act, Road Transport Act, etc. are applied on collaborative economy, which leaves many parts of the system uncovered. We can't expect that the situation is going to change in close future because of the election cycle, however, the new government serving 2017-2021 will have to upgrade the legislation according to collaborative economy requirements. As far as individuals (voters) like sharing, politicians must follow this fact.

Moreover, sharing economy regulation has a significant behavioural aspect. Human behavior tends to be heavily context dependent - we buy more things when we are hungry, we use alternative (even though more dangerous) means of transport after a major plane crash or we prefer rebates over deductibles. In last 30 years, these violations of expected utility are being addressed by the behavioral economics. This contemporary branch of economics - interested in the nature of human decision making and judgment - connects insights from economics, psychology, cognitive science and evolutionary biology. The cornerstone of this field is a program of heuristics and biases by a Nobelist Daniel Kahneman and Amos Tversky. A heuristic (or a rule-of-thumb) reduces the complex tasks of decision making to simpler judgmental operation (Tversky and Kahneman 1974).

However, any reduction of task complexity almost inevitably leads to errors in decision-making (Allais 1953). Facing limited information processing time and ability, brains of hominids were equipped with function-specific mechanisms with special design for solving problems such as mating, problems of food choice, predator avoidance and social exchange (Haselton, Nettle a Andrews 2015). Given the brief modern period, the same mechanics is used in solving more complex tasks than what they were designed for. This is probably the reason for why the decisions are prone to breakdown in systematic ways (Haselton, Nettle a Andrews 2015). As long as both sides of markets are composed of predictably irrational individuals who systematically fail in acquiring, processing and

evaluating information, cognitive biases might be viewed simply as a fourth type of market failure (Bennett et al. 2010). Like in a case of the other three causes of the market failure (market power, information asymmetry and externalities), also this failure needs to be somehow fixed to secure an efficient market.

Adam Oliver suggests that by appealing to the cognitive affects and processes that people employ when making automatic decisions, we might expect that behavioural economic-informed interventions will have more effect than interventions that are otherwise informed (Oliver 2013). In line with this statement, the United Kingdom BIT - Behavioural Insights Team (aka. "the Nudge Unit") has pioneered an increasing trend in the mainstream application of behavioral economics insights into public policy making. In recent years, leading countries across the globe have started running their own "nudge units". The growing interest in the importance of behavioral economics in the public sector is also obvious from activities of the European Union which has established its own 'Foresight and Behavioural Insights Unit' or of the United States which has established 'Social and Behavioral Sciences Team'. Unfortunately, this progress seen in other countries has not been matched in Czech Republic which is somewhat lacking in the development and application of these new trends.

The basic method for delivery of well-designed behaviorally informed public policies is an experimental approach. The core idea is that all policies should be first tested in controlled conditions and only then - if proved functional - put to work. By 'controlled conditions' we usually mean between-subjects experimental studies in form of a laboratory experiment or a field experiment. These studies are based on asking subjects to evaluate either real or hypothetical prospects that are manipulated by the investigator while using either real or hypothetical rewards and costs can be used (money, health, level of comfort or discomfort). Participants of experimental studies are usually divided into two (or more) groups where one group does not face any treatment and the other does. The treatment is usually a measure or set of measures by which a proposed policy aims to modify the behaviour of subjects (Wilkinson and Klaes, 2012). To better demonstrate the idea, we present a few examples.

Material and Methods

Hypotheses:

It is very important to be aware of a fact that overregulating this sector will take away all the positive things that it can bring to the whole society. Therefore, we can test several hypotheses for a formulation of concluding recommendations:

- Definition of collaborative economy: What is and what isn't part of the collaborative economy and what are the key factors for determining it? The definition is rather based on a way of service provided rather than on a type of service provided.

- **Legislation:** A new legislative framework should include the collaborative economy and it should keep in mind that it is an evolving, flexible new sector with no real space for rigid regulations could cause severe damage.
- **Transparency:** The most serious problem for consumers is an ambiguity of conditions for providing services. Online platforms and real-time trackable services provide better conditions for limiting information asymmetry between supply side of the market and demand side of the market than rigid laws, which are very administratively very costly to enforce.
- **Taxation:** Every individual follow opportunity how to control own money. By making paying taxes and social security obligation more simple, easy and possibly online, P2P platforms provide very efficient conditions for tax obligation fulfillment.
- **Behavioral aspect:** When regulation sharing economy, some aspects from behavioral economics could be used on both supply and demand side. This approach could bring Pareto efficient moves in the society.

Methodology

Since we were trying to examine the legal framework of collaborative economy in the Czech Republic, we need a lot of data about the problem. We will do interviews with members of involved parties and a thorough research of the Czech legal framework in this area. After we transform this data into information, we evaluate possible adjustments of the legal framework. We used cost-benefit analysis and regulatory impact assessment to evaluate possible regulatory policies.

Regulatory Impact Assessment (RIA) is an efficient method of policy analysis which is intended to assist policymakers in the design, implementation and monitoring of improvements to regulatory systems, by providing a methodology for assessing the likely consequences of proposed regulation and the actual consequences of existing regulations. A modern government, however, has to ensure a balance between the legislative activity at the state level and the efficient operation of local governments, communities and settlement. The process of Regulatory Impact Assessment in the Czech Republic adheres to the Guidelines for Regulatory Impact Assessment (RIA). (Baldwin 2010; Jacobs 2006).

Identification of all new, large-scale impacts in areas of the state budget and other public budgets, administrative burden for public authorities and economic and legal relations between public authorities and private entities is defined as the main task of the Regulatory Impact Assessment process. Genuinely, the process of Regulatory Impact Assessment affects decision-making with nationwide and regional effectiveness, which helps to understand the current situation and possible outcome of proposed legislative change. Then we can decide whether to regulate, deregulate or better regulate and predict the resulting effect – the EU15 aims to stimulate debate on regulatory policy and how to do it better, to bring about real reform that improves lives.(Alonso, Clifton and Díaz-Fuentes 2015)

The main approach used in the process of impact assessment is an analysis of costs and benefits – Cost & Benefit Analysis (CBA). This universal method is used to evaluate project proposals spilling over into the public sector. It compares positive effects (benefits) on one side and negative effects (costs) on the other. In general, the recommended procedure is an essential element of the impacts analysis on actors, the quantification of the impacts and their conversion to a common comparative basis, ideally financial unit. Based on this procedure, it is possible to extend the CBA by other economic, mathematical or econometric tools such as net present value, discounting formulas, regression analysis, scenario analysis and probit/logit model, etc. This allows a comparison of non-financial benefits to the financial statements and to compare the broader social benefits with the zero option (no action). Implementation of the local CBA element into decision-making of state and local government bodies produces enormous research potential. (Hahn and Tetlock 2008).

Criteria:

The paper is proposed to meet a key goal, i.e. to design a regulatory framework for both central and local authorities regulating sharing economy (Weatherill 2007). The framework follows up these points:

- **Market access requirement:** Sharing platforms' creation and operation are not regulated because they are merely the "notice-boards", where producers and consumers meet. The only exception are the crowdfunding/collaborative finance platforms, which are regulated and supervised by the Czech National Bank. Collaborative finance platforms have to acquire same licenses as traditional investment platforms and they also have to fulfill other requirements such as regular reporting, regular trainings and they must comply with several others strict laws. The main topic is not the regulation of platforms, but the regulation of the actual service providers (e.g. Uber drivers). The biggest disputes in the Czech Republic are in the taxi service and car-sharing/carpooling area. Where taxi drivers provide the service under Road Transport Act and a taxi concession. To become a taxi driver, one has to take 4 steps: obtain a taxi driver's ID, pass a taxi driver's exam, register the car as a taxi and acquire a Trade license in form of taxi concession. The car of a taxi driver must be marked and equipped with a taximeter. Municipality of Prague also applies a maximum price cap (1€/km) on top of all that. Carpooling is defined as a contract based on Civil Code. The nature of carpooling is that the driver satisfies his own needs e.g. driving to work and another individual just shares the cost with the driver. In other words, carpooling isn't a profit-seeking activity but a cost-sharing activity. The mentioned dispute is about legality of such service. Uber pop defines itself as a carpooling and consequently they don't fulfill the same obligations as taxi drivers do (mentioned above) even though they provide very similar service. Representatives of traditional industries are trying to make it sound like a serious problem, but rather than problem it is a glitch in a legal system. The dispute can go on forever, if the

legislative framework doesn't change. The project should analyze this issue, use best practices and make recommendation for regulators. (Adelle 2012)

- Consumers' protection: Even though it might seem that this area will be problematic, the opposite is true. The legislation in most cases treats the customer to customer service C2C interactions as the business to customer service B2C interactions, where the provider of service is considered as B (business). All the rules and laws regarding the Czech or EU policy in terms of protection of users are mostly applicable. Details are often specified in contracts (e.g. cancelation policy). Huge perk of collaborative economy in terms of protection of users is self-control, self-regulation and user-based ratings, which significantly lowers the transaction costs of verifying counterparties and improves the safety of both the provider and the consumer. The project will cover this area.
- Employment: There are no available data regarding the influence of collaborative economy on employment and we can assume that collaborative platforms have created new opportunities for economic activity, i.e. the overall effect is rather positive. However, there are almost no employees of P2P platforms in the Czech Republic. The cooperation is mostly based on contracts, which means that the platform and the providers (e.g. Uber drivers) are in a partnership agreement. The project team will deal with this point and include economics effect into project conclusions.
- Tax obligation: The whole sector of collaborative economy is very complex and therefore very difficult to control, which causes the problems with taxation and tax evasion. This can become tricky, because entities that don't pay taxes have an advantage and they are pushing out those who pay taxes, which makes the impact on the state budget more significant. Difficulties pile up in situation mentioned earlier. There is a blurry line between carpooling and taxi service, which means that the situation around paying taxes is unclear. The tax obligation is transferred to the service providers (e.g. Uber driver) and they should, according to tax experts, pay income tax. The providers also get the services from platforms from abroad (e.g. Uber – Netherlands), "therefore they should pay value added tax from the commissions, similarly to people who advertise through Google AdWords." (4Liberty Review 2016).

Conclusion

Sharing economy has been becoming an essential topic in public policy in the Czech Republic (Peterka, Soběhart and Jílková 2018). Sadly, municipalities, as well as state institutions, still choose to implement restrictions and bans which causes higher prices, dissatisfied customers, and costs connected to poorly calibrated regulations. The Czech academic environment has also not been paying enough attention to the sharing economy topic; Czech scientists rather reflect on events presented in Czech press without producing their own analyses or solution propositions. Mainstream media and politics are controlled by powerful interest groups (cab drivers, hotel owners) who demand bans and

the enforcement of the current policy, which does not reflect the change in user preferences and new challenges in connection to the sharing economy. An institutional framework has not been created yet in the Czech Republic, which would make it possible to discuss not only new challenges in the area of sharing economy but also the need for revising the current regulatory framework which by itself causes more issues than effective solutions. This paper aims to introduce a theoretical framework which would be a base for creating an effective regulatory set of rules for the actions of key players on the sharing economy market.

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The Thermidorian Reaction and the Fate of Jacobins

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Abstract

The article will focus on existence of the Jacobins and their influence in France after 28th July 1794, including the fate of their supporters, ex-Terrorists, sans-culottes and Jacobin clubs. It will mainly focus on two aspects: excluding the Jacobins from political and social life in Thermidorian France (July 1794 – October 1795). The text will successively discuss the Conventional purges, removal of sans-culottes from provincial political arenas and their social isolation, issues with poor distributing of rations and consequent uprisings, dissolving of the Jacobin clubs across the country, mass releasing of alleged suspects and at the same time imprisoning political enemies, subsequent prison massacres, installing new supporters of the regime and overall institutional changes in new, cleansed France.

Key words: Jacobins, Thermidorian Reaction, Convention, French Revolution, 1794.

Introduction

The execution of Maximilien Robespierre is probably the most famous scene of the French Revolution. But this act, in which much more people were executed, was *not* in fact the end. Same atrocities and cruelties had occurred in a period following the execution of the most prominent Jacobins and not many authors incline to tell this story. Fortunately, there are some exceptions that are worth mentioning.

Since this article will mainly focus on political and social life from which the Jacobins were excluded, the political history and social history are the main methods used for this work. There are only few major figures dealing with this era: while republican Jules Michelet ended the Revolution with Robespierre's execution, the liberalism of Adolphe Thiers ventured far beyond July 1794 and was accompanied by Alphonse Aulard's republican and anticlerical view on the bourgeois class in the course of the Reaction. The more leftist and social view on low-classes is provided by Louis Blanc whose narration pays attention to situation in the départements and the Jacobin clubs themselves.

Mette Harder's insight to Conventional functioning and purges that followed deserves a special notion. Furthermore, with Laura Mason's exquisite works and with Stephen Miller's and Noah Shusterman's fresh approaches to old challenges we have a chance to look at the social stratification: how sans-culottes, a low-class, were repressed until being slowly dissipated among others and replaced by wealthier supporters of the regime. Constitutional details provided by Jean-Baptiste Duvergier and Michael Kennedy's exhaustive look at the Jacobin clubs and their circulars complete the view of the atmosphere of a direct Thermidorian Reaction for decrees disadvantaging the Jacobins and their supporters while favouring well-to-do citizens showed the true potential of a new, purged and cleansed Convention – to find scapegoats, eliminate political enemies and distract France from real struggles.

When French had found out they didn't need a repressive regime because they were winning against enemy, the Jacobin era must have come to an end. The so-called *coup d'état* deprived twenty-two prominent Jacobins – including infamous Maximilien de Robespierre, Louis de Saint-Just and Georges Couthon – of their rule over France. The day after, on 10 Thermidor Year II or 28th July 1794, the power in country shifted to extremists who "*feared of retreating from the Terror*", to moderates who wanted to "*foster that retreat*" and to disgraced deputies who "*hoped to protect themselves*" (Mason 2013, p. 315).

The following period of 15 months had been in hands of "*corrupted politicians, people without scruples and means*" (Furet 1996, p. 225) who were even further regicides and took part in previous terrorist actions. France was governed by the Committee of Public Safety, leading figures were Jean-Baptiste Tallien and Paul Barras who had both gained an immense power and influence in the country. Tallien's wife Thérèse was the main figure in organizing "balls for victims" and salons, Louis-Marie Fréron was considered as the chief of journalists.

A new era of Thermidorians – also called *Perpétuels* for they survived both the Girondin purge in May – June 1793 and that of June 1794 – put an end to the Laws of Maximum and of 22 Prairial. Furthermore, they eliminated the Revolutionary tribunal (Shusterman 2014, p. 235). Their rule was, however, a "*victory of mediocrity over talent*" (Shusterman 2014, p. 237) and the reign was famed for an aforementioned "*corruption, extravagance and revenge*" (Mason 2015, p. 1). The victorious men "*advanced the Montagnard project of a consolidated state while, paradoxically, destroyed the Mountain itself*" (Mason 2013, p. 314) and were cautious in not inviting royalists or Jacobins to seize control (Connelly 2006, p. 68).

News concerning the fall of the triumvirate reached the surroundings of Paris on 29th or 30th July, southern cities and villages were informed between 3rd and 5th August (Kennedy 1989, p. 309), a week later. When the Medusa's head was cut off there were still thousands of parts that needed to be dealt with. As Mary Miller says, the Jacobin volcano was in 1793 "*bursting passions set ablaze by the sudden appearance of a great Republic*" but for Thermidorians in autumn 1794 they represented dangerous, overzealous revolutionaries

who could ignite the fragile Republic (Miller 2011, p. 162). That's why Jacobins were the first on the list.

As Mette Harder claims, the *coup's* purge of the triumvirate was followed by purge of another ninety-nine partisans (Harder 2015, p. 34) from outside the Convention who were guillotined with their leaders. It is unrealistic to think that with the end of the Terror all the violence and murders would have suddenly stopped. Thermidorians not only expelled and arrested the Incorruptible's closest allies, but also former members of the previous government, majority of remaining Montagnard and Jacobin deputies and finally several right-leaning members (Harder 2015, p. 35).

Endangered were of course the Terrorists themselves for "*the ex-prisoners thirsted for vengeance against them*" (Kennedy 1989, p. 313). Some of them, like artful Joseph Fouché, could have washed off their allegiance to Robespierre but most of them couldn't. Jean-Baptiste Carrier, infamous representant on mission in Nantes, was executed in December. Bertrand Barère, Jacques Billaud-Varenne, Collot d'Herbois and Marc Vadier were accused of being the right hand of Robespierre and were in April 1795 deported to French Guyana (Shusterman 2014, p. 236; Harder, 2015, pp. 37–38). On the contrary, the Girondins, such as Jean-Baptiste Louvet, Maximin Isnard or Jean Lanjuinais, had been reinstated in their positions again and families of purged deputies were paid state pensions (Shusterman 2014, pp. 236–237; Harder 2015, p. 41).

Jean-Baptiste Carrier's trial is worth mentioning. Indignation of the people broke out after 9 Thermidor when 133 citizens of Nantes described his "*republican marriages*" in which he had tied up a naked man with a naked woman and drowned them together. He had been arrested and nearly freed like Robespierre, but Carrier in the end stood before the tribunal. In his final speech, he declared that "*everyone is guilty here, up to the bell of the president*" (Thiers 1839, pp. 370–374). The general panic developed and Carrier was quickly, with his fellows of the Nantes' revolutionary committee, sent to death.

Not only Jacobins, but also their supporters sans-culottes needed to be swept away. Sans-culottes referred to a miserable group of labourers who wore short trousers (*culottes*) to differentiate themselves from non-working nobles with long trousers. A new social group had emerged against them – four or five hundred of the rich gilded youth "*flaunted their wealth, insulted sans-culottes and attacked ex-Terrorists*" (Connelly 2006, p. 68; Mason 2013, p. 318; Palmer 2014, pp. 531–532) while also physically attacking the Parisian Jacobin club and beating up people inside the building (Shusterman 2014, p. 237). The sans-culottes in municipalities were – altogether with merchants, artisans and petty property owners – replaced by former nobles, federalists and affluent landowners (Miller 2008, p. 244). For example in Languedoc's municipal councils landlords, jurists or lawyers had replaced the artisans and shopkeepers (Miller 2008, pp. 245–247).

Furthermore, the Convention "*purged 81 legislators and incarcerated them,*" it "*deported two former members to a prison colony in French Guyana, sent to death 6 deputies*" and "*drove at least five into suicide*" (Harder 2015, p. 35). Harder summarizes that 230 of 749 deputies of the Convention were arrested throughout years 1793 and 1795 and points out

that all purges were motivated to "*favor the public opinion in expelling unpopular members*" (Harder 2015, pp. 36, 43). Stephen Miller agrees and rightly states that the "restored" Thermidorian Convention in no case stopped purging its unsuitable members and was even more active than its Jacobin predecessor (Miller 2008, p. 28).

On the other hand, the new Convention differed from previous one in permitting religious opinions, but it forbade showing it in public assemblies. That's why the people of northern Seine-Inférieure shifted from celebrating the *fêtes décadaires* on workdays to celebrate them on Sundays in church (Sirich 1954, p. 335). When the citizens of eastern region of Côte d'Or were deprived of singing Masses and vespers in the church, the people rose up and summoned others to sing it by themselves. Similar accident happened in south-eastern region of Isère: women had marched to home of the national agent and "*forced him to hand over the keys of the church in order that Mass could be said*" (Sirich 1954, p. 335).

The new government soon regretted abolishing the Maximum. Since the Law was establishing price controls for "*items like meat, writing paper or workers' wage*" (Shusterman 2014, p. 196), price of bread was continually growing and workers couldn't afford buying it – especially when the *assignats* were "floating" and therefore became worthless (Connelly 2006, p. 69). In addition, a terrible winter that "*froze the Seine and suspended grain transports*" made inflation possible so the working class was starving while "*high society danced on the tomb of Jacobin austerity*" (Mason 2013, p. 319). When the Maximum was violated in the départements, 4 persons were arrested or the local committee with gendarmerie made an expedition to certain commune which had "*refused to satisfy requisitions*" (Sirich 1954, p. 334).

The suspension of the Jacobin clubs

Once the Convention had made sure it got rid of sans-culottes and was controlling all citizens who would deliver its power to distant places in France, it focused on popular clubs and public life. Jacobin clubs split in two groups: (1) one was strictly against the Convention depriving country of the "lawful" ruler while (2) the second "*felicitated the Convention on saving the fatherland again*" (Kennedy 1989, p. 310). Knowing that it will be their turn to be beaten up, discredited or possibly killed like they were organizing, the Jacobins began to either turn their coats or act like they serve the country no matter who was in power.

There were some clubs, however, who opposed the overall upheaval. The Chambéry club in Savoy warned about "*moderates wanting to substitute 'indulgence' and sowing troubles in the departments*" (Kennedy 1989, p. 314) while the Marseille club was against "*freeing of the aristocrats and the persecution of patriots*" (Kennedy 1989, p. 314). However, neither of them could have not withstood the reaction and were successively dissolved on 24th August and 21th September 1794 (Aulard 1910, p. 230; Kennedy 1989, pp. 320–321).

The most radical was Dijon club – it declared incarceration of those who were pointed out as suspects plus it wanted to remove priests and nobles from public offices (Kennedy

1989, p. 315). It went even further – it had imprisoned all voyagers or habitants *"who had signed on the list that would bring the emmigrants into the city"* (Thiers 1839, p. 333). Local representative on mission had commonly chose twenty to thirty moderate members, installed them in a certain Jacobin club and instructed his fellows to purge the remaining radical Jacobins (Thiers 1839, p. 333). The Dijon purge culminated on 31st October (Kennedy 1989, p. 342) and the society club in Paris lost one of her most loyal supporter.

The Jacobins' fate at Lyon and Marseille was similar. Since they were *"chased in municipalities and provinces, they retired to the Jacobin club"* (Thiers 1839, p. 334). There was a chance they would form another society so they needed to be eliminated. Lyon's orators were attacking the Convention decrees concerning freeing imprisoned "suspects" and therefore were dissolved by the representant on mission. Marseille had witnessed gathering of a considerable group of people that surrounded the room of two representants and *"with saber and gun in hand"* demanded liberty for incarcerated Jacobin patriots. Present gendarmes thought the representants guilty and helped the mob to suffocate and kill the two men (Thiers 1839, p. 334). Jacobins at Toulouse had organized riots, too, but were soon imprisoned (Thiers 1839, p. 335).

Similar activities had occurred in numerous clubs and committees where Jacobins still held power but the clubs' lives were slowly evaporating. Although these remote clubs still existed, they were prohibited from *"associating with one another or engaging further in local politics"* so they simply lost their purpose and ceased to exist in the summer of 1795 (Mason 2013, p. 318) when they were dissolved.

The Parisian mother club stood alone and was purified. Two days after the *coup* the *"aristocrats had rushed to publish that the Jacobins were closed and would not be reopened"* (Aulard 1897, p. 295) which occurred at the turn of the month – on 31th July there was the last session, the club reopened on 3rd August. Presiding Louis Legendre had appealed to some Jacobins' consciences and threatened to *"grab the keys, leave them to the National Convention and keep the club closed"* until only true Jacobins come back because the club will be *"forever closed for conspirators"* (Aulard 1897, p. 297).

Jacobins were completely expelled from all areas and were called *"cannibals, partisans, accomplices and successors of Robespierre"* (Thiers 1839, p. 335). Pointless were their shouts against Thermidorians destroying their nation, against *"the aristocracy and the moderantism raising a daring head"* (Thiers 1839, p. 336). They didn't show up neither in theatres nor in salons and were excluded from all public life with their wives, mockingly called the *"furies of the guillotine"* (Thiers 1839, p. 342) for they had surrounded the scaffold throughout the Revolution.

However, Jacobins' doom was near. Bourdon de l'Oise cried that the popular societies consisted of *"men who were choosing only themselves, like monkeys,"* that the representation which rules together with the Convention *"sits at the Jacobin's club"* and therefore it must be dealt with (Thiers 1839, p. 354). The session of 22 Brumaire, or 12th November, sealed their fate – the four Committees charged one of the Jacobin to read out their motives why the Parisian club should be dissolved: the popular societies didn't

govern anything and they weren't deliberating no issues, their public functions were prohibited and – maybe the most important of all – none society was superior or had more power than other society (Aulard 1897, pp. 674, 680–681).

Talking about not having two different attitudes in the Convention, the representatives were requested to punish the Jacobins because *"if there are two parties, the Republic isn't united and neither is the Convention"* (Aulard 1897, p. 675). For maintaining the public tranquility their removal was essential even though it was not political, but *"it's necessary for the people's safety, so I support it"* said Ernest Duquesnoy (Aulard 1897, p. 676). The first article of 21 Brumaire, or 11th November, declared the Society of Jacobins suspended, its building transformed into a storehouse for weapons and its keys be given to the Committee of the General Security (Aulard 1897, pp. 677, 680).

Situation in departements

The second civil war in the south was slowly evolving although royalists, émigrés and the clergy weren't endorsed by the regime. In the department of Ariège members of the revolutionary army humiliated the priests and wealthy citizens and tried to *"inspire fear in the local population"* (Aulard, 1911, p. 96; Miller 2008, p. 249). They had continued with Jacobins' politics – cleansing local administrations and installing real patriots were supported by the Convention for it was looking for *"demeanour, dedication and ability to manipulate assemblies"* (Miller 2008, p. 250) that perfectly fit those militant people. We can then assume that these erstwhile soldiers had served for the same purpose as in 1793 and the first half of 1794: as a reaching hand of the government, they were useful tool to eliminate enemies far from the capital and those citizens who would dare to oppose the then course of the Revolution. The centralization was still on the agenda.

The atmosphere of omnipresent fear declared by the Law of Suspects in September 1793 was swept away by the law from 5th August: massive releasing of "suspects" affected towns with populations less than twelve hundred (Duvergier 1845, p. 216) and local clubs were forced to free even more prisoners because they were *"excellent patriots"* (Aulard 1897, p. 308). Some of those "patriots" were – by annulling preceding laws – welcomed back in Paris and 17 dismissed people were given three hundred livres each. Many French had been either freed of their accusation or released from prisons whereas most of the then members of municipalities were arrested and imprisoned (Aulard, 1911, p. 412; Duvergier 1845, pp. 238–241, 245–246, 248 and 265–266).

The clubs had also been ordered to let supporters of the Girondins and the Girondins themselves out and to fill prisons with political enemies and scapegoats. No wonder that prison massacres soon occurred. One of them, in southern Gard department, was justified that *"nothing has been spared to assure these execrable crimes a scandalous and reprehensible impunity"* (Miller 2008, p. 248), while the other one was filled with terrorists who had been disarmed and their *"weapons handed over to the good citizens summoned to assure the execution of the law"* (Sirich 1954, p. 338).

A quiet destroying of less-earning social groups suddenly evolved in départements. Despite the sans-culottes' dismal financial situation – or maybe because of it – new local administrators deliberately allowed inflation and declined to fix prices which resulted in many petty-bourgeois quickly sinking into groups of merchants or day labourers. Furthermore, many overlooked professions (e.g. clerks, farmers) wanted an esteemed position so much they *"accused one another of debauchery, sexual perversity and unspeakable acts of cruelty"* (Miller 2008, p. 251–252).

After the main nerve of the Jacobin era had been in turmoil and later cut off, jacobinism survived and was present all over the country. Members of the Committees of Public Safety, General Security and Revolutionary committees were considered as conspirators so the institutions were to be reorganized. According to the law of 24th August 1794, its articles *"suppressed all committees save those in district capitals"* and in *"communes of more than eight thousands inhabitants"* and chose people who were eligible to write and read (Sirich 1954, p. 329) by which the law eliminated low-class people.

Provincial revolutionary committees had been closely cooperating with communes of certain districts and the communes' agents ought to *"report all information that would tend to trouble public order or delay the progress of the revolution"* (Sirich 1954, p. 330). Suspects were then questioned and given a copy of the charges against them. What is surprising, citizens were not eager, in many cases, to join the infamous committees – some of the committees threatened the citizens (whom they had named before) to accept the positions otherwise they would be *"regarded as suspect and treated as such"* (Sirich 1954, p. 331).

Concerning the committees' organization, they always consisted of 12 people. In most cases half of the citizens were chosen from the city and half from the country, some committees included members of the previous terrorist committees (Sirich 1954, p. 331). Duties of each organization were as follows: overseeing the food supply, the public property, the armed forces and the political situation with public opinion (Sirich 1954 p. 332). The government had in no time entrusted them with overseeing hurt soldiers, who returned home, to be sent back to the army right after they recover: the committees' warrants had arrested *"eight delinquent soldiers,"* they *"failed to locate three and discovered one to be dead"* (Sirich 1954, p. 333).

The thorniest issue has been the question of murdering and nearly exterminating all supporters of previous regime. The most threatened were Jacobins, Montagnards, erstwhile terrorists and simply all citizens who contributed and helped to maintain the Terror. The members of revolutionary committees all around country had begun to *"investigate the acts of their Jacobin predecessors"* and denounced their colleagues who were either taken revenge on or were cleansed (Sirich 1954, p. 337). New committees had not only arrested betrayers but also their wives. The Dijon committee arrested a vinegar manufacturer who had declared that Robespierre was a *"brave man"* and had insulted the local representative on mission (Sirich 1954, p. 337). Many raids into small villages and

combing inns, suspicious houses and surrounding forests soon followed (Aulard 1912, p. 728; Sirich 1954, p. 337).

Horrors of 1793 in the south, especially in Lyon and Nantes, had fomented reversed horrors on those who had participated in republican marriages, drowning people or organizing "infernal columns", raids sent to Vendée to slaughter people. The civil war continued no matter who was battling: Jacobins, Montagnards, royalists or *émigrés* still represented one nation and thousands of dead were only to prove that the Republic, as transformed as it was, was still bolstering pointless murders just to take the focus off country's internal problems.

The slaughters of 1793 had consequently "*driven peasants into guerrilla bands*" (Connelly 2006, p. 72) known as *Chouans* (Aulard, 1911, p. 338). General Lazare Hoche soon suppressed the Vendée uprising and even concluded a peace with their leader François de Charette in February 1795 (Connelly 2006, p. 72). Discords were, however, not solved and more united group named *Companion of Jehu* has been from April 1795 massacring Jacobins in the Vendée region. Although the exact number of dead couldn't be specified, it is believed that several hundreds victims succumbed to royalists' blades (Aulard 1897, 1911; Blanc 1870; Thiers 1839).

When the British had supported the royal cause in France and helped 4 500 *émigrés* to land in the north, royalists with help of 15 000 Chouan reinforcements tried to turn the tide of battle. More than 8 000 of them were captured, 748 of *émigrés* sent to death (Connelly, 2016, pp. 72–73) and a considerable amount of them freed. However this act of mercy didn't win Tallien more respect than he had at the time and his reign was coming to an end. Paul Barras replaced him in October 1795 and royalists once more believed they could seize the Convention. But they were proved wrong when young Brigadier General Napoleon Bonaparte blew their masses up and helped to establish a new regime that ended the Revolution.

Conclusion

Historians describe with enthusiasm Robespierre's fall and the aftermath of his execution. However they have mostly studied only the *closest* aftermath and the whole period of 15 months of an unstabled regime wasn't thoroughly examined. The aim of this article was to clarify the Jacobin's fate after they lost power and how they were hunted and eliminated not only from political, but also from cultural and social life alike.

A new era of Thermidorians, an odd alliance of moderate and indecisive group of representants, took care of liquidating all pro-Jacobin and pro-Montagnard citizens. They began with their colleagues: up to 90 representants had been purged from the Convention, imprisoned or deported from France. This included infamous ex-Terrorists like Jean-Baptiste Carrier or Jacques-Billaud Varenne. We found out that remaining men cleansed their ranks to favor the public opinion but somehow neglected to remove also Jean-Baptiste Tallien and Paul Barras who were the right hand of Robespierre and voted for him every month to stay in the Committee of Public Safety.

Tallien husbands became a driving force of the Reaction. While her spouse was dealing with Jacobins in a more cruel way, Thérèse Tallien was organizing "balls for victims", theatres and salons from which Jacobins were expelled. Their expulsion was completed by a chief journalist Louis-Marie Fréron who had publicly accused Jacobins of their crimes and even listed their names in his newspapers *Orateur du Peuple* to hunt them down.

The leaders knew they could not completely eliminate Jacobins from functioning until they destroy their nests, clubs all around the country. The staunchest were those of Dijon, Marseille and Lyon. The Dijon club had managed to preserve its Jacobins and to intimidate others as well as the Lyon's. The Marseille club went even further and killed two representants of the Convention while demanding freedom for arrested Jacobins. Since the clubs were closely cooperating with revolutionary committees, both institutions were slowly suspended, reorganized and clubs completely dissolved in 1795.

Once the Parisian headquarters of the Jacobins was gone, it was sans-culottes' turn to be repressed. In Paris, they had been attacked by the gilded youth, children of wealthy citizens, whereas in départements they were disadvantaged and their ranks were expanding for well-to-do citizens sank among them because of inflation. Sans-culottes were replaced by wealthier people and many of them were imprisoned. Furthermore, cruel winter of 1794/1795 and high prices had caused dissatisfaction and a shortage of bread which resulted in uprisings that were drown in blood because the Thermidorians considered them as Jacobins' actions.

As soon as the main threats were eliminated, various citizens took care of remaining Jacobins and ex-Terrorists by themselves without a notion from the Convention. Decrees freed alleged suspects and incarcerated the Jacobins with their supporters which resulted in cruel prison massacres– surviving citizens had no mercy with their erstwhile local rulers and mass murders occurred at many places across France. If they hadn't found a supporter of the Jacobin regime, they killed scapegoats instead.

Although the Thermidorians had dissociated themselves from the Jacobin era, we could see a continuation in its steps. The Thermidorians had excluded ex-Jacobins from the Convention like Montagnards did with the Girondins. Fréron presented regime's opinions like Jean-Paul Marat did. The Jacobins were split in deciding whether to join the moderates or to stay loyal to jacobinism – as citizens, whose families' members diminished due to wilfulnesses of the representants on mission, didn't differentiate between a Jacobin or a non-Jacobin, the matter of faction wasn't really important.

The regime tried to remove its connection to the previous era and by choosing victims it was only a matter of time when citizens will take up arms and will do the dirty job for the Convention that was as unstable as the French's emotions. The purged Convention hadn't however changed and used the citizens' rage, caused by the representants' incompetence to distribute rations, to eliminate its enemies and distract the people from real difficulties.

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Does a Label Have a Taste? Available Information and their Effect on the Perceived Quality of Wine by Czech Students

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Abstract

This paper discusses information input and its influence on the consumer decision process. Authors conducted an experiment to determine, whether the information available to consumers have the potential to influence how they perceive product quality and as a result, influence the output of the consumer decision process as well. The assumption was verified by conducting qualitative research – a wine tasting experiment. The aim of this paper is to bring attention to the presence of irrational consumer behavior in a situation, where the authors deliberately seek to influence consumers' sensory evaluation of product quality by providing them with certain information.

Keywords: Consumer behavior, irrationality, quality perception, information, wine.

Introduction

Marketing experts are passing around a tale, a story, which actually happened (Mueller 2014). The events took place in New Jersey. Joe Lentini went out after work to have a steak with his colleagues. The four men also wanted to have some wine with their meal, so Joe asked a waitress to recommend him one of a good quality. She pointed to one bottle in the wine list. Joe asked about the price of the wine, and the waitress answered that the wine cost 37,50 \$, an amount, which Joe was willing to pay for a bottle of good quality wine.

After tasting the wine, Joe nodded in approval and let the waitress serve it to others as well. He said later that the wine tasted well. "It wasn't great, and it wasn't bad either, it

was OK," he said. The problem arose upon delivery of a bill, which was for more than 4,000 \$. The wine did cost 3,750 \$. It was Screaming Eagle from California, an exclusive cult wine, one of the most expensive wines in the world (Beverland 2004).

A consumer, who is aware of drinking expensive wine, can enjoy and appreciate it adequately (Ashenfelter 2008), (Capehart 2015). But what about a consumer, who is drinking expensive wine while thinking it is actually a common wine in the average price range? How much would this consumer appreciate the wine? And what will consumer behavior be like, if the consumer is strongly convinced that the cheap wine he or she is drinking is actually an exclusive one?

Authors conducted a small experiment-based study, the aim of which was to bring attention to the influence of marketing communication, or more precisely product information on consumer preferences or changes these preferences may undergo. Moreover, available product information is fundamental for a consumer (Lecocq and Visser 2006). Provided that consumer is regarded as an economic entity, the information is the basic foundation for rational behavior (Zavodný and Kozák 2013).

Rational behavior is then defined as personal opinions and behavior based on logical and objective analysis of all information available (Durlauf and Blume 2008). A human being, who behaves rationally is a presumption, which traditional economy is based upon (Simon 1955). This rationality does not manifest itself in the form of correctly chosen goals, but in the way, these goals are being reached (Koukolík 2010).

Herbert Simon (1982) disagreed with the traditional view on a rational individual. Instead, he proposed the theory of bounded rationality. According to this theory, people do not decide based on principles of rational choice theory, they rather seek a solution, which is satisfactory in the particular given situation.

Coming across irrational behavior is common. The thought process is considered irrational when it leads to conclusion or decision, which is not the best one according to evidence and with regard to time available for the thought process (Koukolík and Drtilová 2008). Possible causes of irrationality are numerous and can be divided into several groups: first-impression error, social reasons, stereotypes, organization reasons, traps, wrong usage of rewards and punishments, emotions and flaws in the thought process.

Some of the causes mentioned above of irrationality can play a major part in the case of poor judgment of a product. The factors, which can influence a consumer, are primarily as follows: availability error, emotional and social issues and cognitive thinking errors in thought process (Sutherland 1992). Authors conducted a small experiment-based study with a small group of volunteers. This study aimed to demonstrate, whether product information can influence the consumer's sensory perception of the product. The results of this study also refer to a possibility to influence consumer's rationality.

Methods and Data

Irrationality in consumer behavior was observed during an experiment – conducted a wine tasting. This experiment aimed to obtain data and based on the evaluation of these data either prove or disprove research assumption as follows:

a) Primary research assumption: Consumer's sensory evaluation of product quality is influenced by information provided. b) Secondary research assumption: Consumers, who prefer wine to other alcoholic beverages, are less likely to be influenced than those, who favor other alcoholic beverages.

Four different bottles of the same wine type were chosen for the experiment. The type was a dry white wine Chardonnay. The price range was the same for all bottles, from 100 CZK (4 €) to 130 CZK (5 €).

However, the information about wines given to research participants differed. All wines were poured to identical unmarked bottles. Two of them were presented as a standard, average wines and two of them were presented as exclusive wines.

Each wine was introduced and subsequently tasted. At the end, after having tasted the last wine, research participants were asked to fill in a short questionnaire. The questionnaire consisted of two parts. The first part focused on wines the participants tasted: overall impression, flavor, and bouquet, whether they would purchase it or not, and how much they would be willing to spend on it. The second part focused on the participants themselves: whether they consider themselves wine experts, how often they drink wine, what alcoholic beverage they prefer and additional questions about age and sex.

During the experiment, all wines were served in same unmarked generic wine bottles. Nevertheless, two bottles were introduced as if they contained better wine than the other two. The main aim was to observe, whether provided product information will influence the final evaluation of products. All wines were poured from the same, unmarked bottle in order for participants not to create an opinion based on the appearance of the bottle or label and, above all, in order to prevent any participants from recognizing the presented product and therefore reveal the truth about the falsity of provided information.

Then, the wine tasting was replicated with the same wines but different participants in order to verify the results. The difference was that this time, the wines were not only poured from unmarked bottles but also, none of them was introduced with any information.

Results

The experiment was conducted in February 2016. The final number of participants was 23,11 of them were men and 12 were women. Their age ranged from 19 to 24 years. Only university students were chosen in order to ensure the homogeneity of the group. Some of them were invited personally to participate; some of them answered an invitation posted on the social network website Facebook.

Questionnaires consisted of two parts. In the first part, respondents evaluated the wines they tasted. The second part was more general and asked for information about the participants themselves especially on their attitude towards wine and its consumption. As the results showed, no one considered itself as a wine expert. On the other hand, 43,5% of respondents reported consumption of a glass of wine more than once a week.

After having tasted the samples, the participants evaluated each wine individually. First, they evaluated the overall impression and then separately flavor and bouquet. A scale of 1 to 5 was used for the evaluation, where rating 1 represented the best possible evaluation and rating 5 represented the worst possible evaluation.

The following question inquired, whether the respondent would or would not purchase a bottle of the wine they had just tasted, either for themselves or for someone else (this addition was intended for those who normally do not drink wine and thus would not probably purchase a whole bottle for themselves). The last question of the first part of the questionnaire regarded the amount, which would the respondent be willing to pay for a bottle of wine he or she had evaluated.

Wine n. 1

The wine tasting was initiated with a bottle of wine from Vínó Valtice, a dry white 2014 Chardonnay with an alcohol content of 12,5 %. The wine was introduced as one of average quality, made in the Czech Republic (while according to label, the wine was made in Republic of South Africa). Further description of this wine matched the one on its original label. This bottle was purchased in a chain store Albert and cost 129,90 CZK (5 €) on the day of purchase. However during its introduction, the wine was introduced as being cheaper, its price being 89 CZK (3,30 €).

This wine took third place in all categories (i.e. overall impression, flavor, and bouquet) in the scale evaluation. On average, its bouquet received rating 3,04, and the flavor was perceived more favorably with rating 2,61, while the overall impression received rating 2,74.

Out of 23 respondents, 17 would purchase the wine (all positive answers like “yes”, “probably” and “definitely” were taken into account) and they would be willing to pay 97 CZK (3,60 €) on average for it. This price is higher by 8 CZK (0,30 €) than the one which was stated during the introduction of the wine (one person of the aforementioned 17 did not state any price; therefore the answer was not included in the average price). Nine respondents stated that they would pay a higher price than the one stated during the introduction, their answers ranged from 100 CZK (3,70 €) to 150 CZK (5,55 €). This wine was the only case when respondents state they would be willing to pay more than the actual price, or more precisely more, than the price stated during the introduction of the wine.

Wine n. 2

The second dry white Chardonnay was a Czech wine from Velké Bílovice, the year 2015, with an alcohol content of 11 %. This bottle was purchased in a chain store Billa and cost 119,90 CZK (4,40 €) on the day of purchase. During its introduction, the wine was introduced as being slightly cheaper, its price being 105 CZK (3,90 €).

This Chardonnay was evaluated as the worst wine among those presented during the experiment. It took the last place in all categories; however, it cannot be labeled as complete “garbage”, since its overall impression received average rating 3, which is exactly in the middle of the evaluation scale. Average rating of its flavor was 3,13 and average rating of its bouquet was 3,26.

Out of 23 participants, 14 would buy a bottle of the wine n. 2, including those who answered “yes” but also those who answered “maybe”. Only 13 respondents stated a price, for which they would be willing to purchase the wine. On average, this price was 86 CZK (3,18 €). That is the lowest price participants were willing to pay for any of wines they tasted, and it is 19 CZK (0,70 €) below the price, which was mentioned during the introduction of this wine.

Wine n. 3

By introducing the third wine, an imaginary line of relatively cheap wines was crossed towards the exclusive ones. In reality, wine n. 3 was a dry white 2014 Chardonnay from Habánské sklepy in the Czech Republic. Its alcohol content was 11,5 % and the bottle cost 109,90 CZK (4 €) in a chain store Albert on the day of purchase. This bottle was presented as a French wine from a wine-producing region Bourgogne under a sumptuous name Mercurey „Clos Rochette“ Domaine Faiveley, the year 2013. The participants were told, that a bottle of this wine (0,75 liters) cost 519 CZK (19,2 €). During the introduction, some information was following the original label of the bottle (like color), but it was also combined with information about Mercurey „Clos Rochette,” to make the wine more interesting and attractive.

The third wine sample took better place on the evaluation scale than the previous two, and overall it took the second place out of all wines presented. Its flavor received average rating 2,48, and its bouquet received slightly better rating 2,39 and an average rating of the overall impression was 2,30.

This wine received a better rating than the previous two. Also, the price participants would be willing to pay for it grew significantly. An average acceptable price for a bottle of Mercurey „Clos Rochette“ was 185 CZK (6,85 €) and 20 participants would be willing to buy it, including one response “probably” and one “maybe”. One respondent did not state any price and therefore was not included in the calculation of the average price. Despite the fact, that the acceptable price rose significantly with this wine, it was still much lower than the price we claimed this wine to have during the introduction.

Wine n. 4

The fourth bottle was purchased in a chain store Albert for 129,90 CZK (4,8 €). This wine was a dry white Chardonnay from the Czech Republic as well, this time from Chateau Bzenec. Its alcohol content was 11,5 %. However, at the wine tasting, it was presented as a very exclusive Italian wine 2013 Kreuth Chardonnay Riserva from Kellerei Terlan winery, which usually costs around 579 CZK (21,40 €). The description of the wine was adjusted to make it more attractive to the audience.

The wine tasting culminated with this wine, which took the best place out of all four. It was the only one to receive a better average rating than 2 on the evaluation scale. On average, its overall impression received rating 1,91 and its flavor received rating 1,87. The bouquet of this wine received a slightly less favorable rating - 2,17 on average.

Out of all participants, 20 would be willing to buy this “exclusive” wine, the same amount as in the case of wine n. 3. Out of these 20, only one hesitated and answered “probably.” Once again, one participant did not state any price; the rest would be willing to pay 224 CZK (8,30 €) on average for it. Consequently, this wine is the one evaluated best, concerning how much participants would be willing to pay for it.

Tab. 1: Wine tasting results summary – The experimental group

Wine number	Real price in CZK (€)	Price introduced at wine tasting	Price perceived by participants	Average rating on evaluation scale	N. of participants who would buy (max 23)
1	129,90 (5 €)	89 (3,30 €)	100-150 (3,70-5,55 €)	2,8	17
2	119,90 (4,40 €)	105 (3,90 €)	86 (3,18 €)	3,13	14
3	109,90 (4 €)	519 (19,2 €)	185 (6,85 €)	2,39	20
4	129,90 (4,8 €)	579 (21,4 €)	224 (8,30 €)	1,99	20

Source: Authors

Primary research assumption was as follows: „consumer’s sensory evaluation of product quality is influenced by information provided.” Wines which were claimed to be exclusive during the wine tasting received better average rating than those introduced as ordinary. Samples of wine n.3 and wine n.4 were evaluated more favorably than the previous two. For example, the rating “1” was given four times to wine n. 1 and not at all to wine n. 2, whereas the wine n. 3 received the rating “1” thirteen times and the wine n. 4 twenty-four times.

The number of participants who would be willing to buy a bottle did not vary significantly for each particular wine; nevertheless, it was higher with wines n. 3 and n. 4 than with the previous two. The difference was much more significant concerning price, which would

be the participants willing to pay. For wine n. 1 and 2, the perceived price was quite low - 97 (3,60 €) and 86 CZK (3,18 €) respectively and did not differ much from prices stated during the introduction of these wines - 89 CZK (3,30 €) and 105 CZK (3,90 €) respectively. Moreover the perceived price of wine n. 1 and wine n. 2 did not reach their actual price, which was 130 CZK (5 €) for wine n.1 and 120 CZK (4,40 €) for wine n.2.

On the other hand, the wines presented as exclusive were more valuable for participants. The real price of wines n. 3 and 4 was 110 CZK (4 €) and 130 CZK (4,8 €) respectively, but participants would be willing to pay 185 CZK (6,85 €) and 224 CZK (8,30 €) for them. These amounts did not by far reach the prices stated during the introduction - 519 CZK (19,2 €) and 579 CZK (21,40 €), however, this could have been caused by the fact, that all of the participants were students, whose budget is often limited and probably would not allow them to buy such an expensive bottle of wine. Only one of the participants claimed to be willing to pay 500 CZK (18,52 €) for each of the wines presented as exclusive. The same amount did not appear in any of the other questionnaires, no matter how positive was their overall evaluation of each particular wine.

The findings mentioned above show that consumers (participant of the experiment), who perceived and evaluated the certain product (wine) were influenced by provided information. The wines introduced as exclusive were perceived better than the other two, despite the fact, that the real price range and wine type was the same for every wine at the tasting. *The primary research assumption (a) can be marked as proved.*

The secondary research assumption (b) was more specific and said: "Consumers, who prefer wine to other alcoholic beverages, are less likely to be influenced than those, who favor other alcoholic beverages." Out of twenty-three participants, nine stated to prefer wine to other alcoholic beverages.

Overall, the wines were evaluated as follows: wine n.4, wine n.3, wine n. 1 and wine n. 2 (ordered from the one evaluated as the best to the one evaluated as the worst). If we take into consideration only those participants, who stated to prefer wine, the order remains the same; the only change is in category "flavor", where the third and the fourth place are switched. The wine n.2 received better evaluation than wine n.1 on the evaluation scale, but their ratings differed only by 0,11.

Concerning the average amounts participants would be willing to pay for each wine, the difference between the results of all participants and of those who prefer wine, is not very significant either. The results were 97 CZK (3,60 €), 86 CZK (3,18 €), 185 CZK (6,85 €) and 224 CZK (8,30 €) when considering all participants and 96 CZK (3,55 €), 80 CZK (2,96 €), 207 CZK (7,66 €) and 247 CZK (9,14 €), when considering only those who prefer wine. Participants who prefer wine to other alcoholic beverages evaluated the "ordinary" wines with lower amounts than the "exclusive" ones. They would be even willing to pay more money for the "exclusive" wines when compared to all participants on average.

The participants who prefer wine did not almost influence the order, in which were the wines placed in, and the amount they would be willing to pay did not differ significantly

with “ordinary” wines while being even higher with the “exclusive” ones. *Therefore, the secondary research assumption (b) must be marked as disproved.*

Control group

As mentioned above, the wine tasting was replicated in order to verify its results. The control group also consisted of 23 participants. Unlike the experimental group, these participants were not provided with any information about the wines they tasted. The aim was to find out, whether the control group would perceive and evaluate the wines differently, then the experimental group.

Wine n. 1

Wine n.1 took the third place in all categories (overall impression, flavor and bouquet) when evaluated by the experimental group. The control group evaluated it much better, and it took the first place. However, unlike the winner of experimental wine tasting (wine n. 4), the winner of the control wine tasting (wine n. 1) did not surpass rating 2 on the evaluation scale. The average rating of its overall impression and flavor was 2 and its bouquet received rating 2,29. The majority of participants (22 out of 23) would purchase this wine, the amount they would be willing to pay for a bottle ranged from 70 CZK (2,59 €) to 200 CZK (7,40 €). The average amount was 105 CZK (3,89 €).

Wine n. 2

The wine n. 2 took the last place when evaluated by the experimental group, and it remained in this position when evaluated by the control group. Moreover, its rating worsened in categories of overall impression and flavor. The former received rating 3 with the experimental group and 3,73 with the control group, the latter received rating 3,13 with the experimental group and 3,67 with the control group. The bouquet received better rating 2,43 with the control group and took second place in this category.

Only five participants would purchase a bottle of the wine n. 2 and would be willing to spend 95 CZK (3,52 €) on it. This amount is similar to the other wines.

Wine n. 3

This wine was introduced as exclusive during the experimental wine tasting and took second place in all categories. The control group, who did not receive any information about it, evaluated it worse. The overall impression and flavor of this wine received average rating 2,73 and 2,60 respectively and this wine took the third place in those categories. Concerning a bouquet, it took the last place with average rating 2,87.

Wine n.3 did not; however, fare badly concerning the other part of the evaluation. Fourteen out of twenty-three respondents would purchase it and would be willing to pay 94 CZK (3,48 €) on average for it.

Wine n. 4

This wine was also introduced as an exclusive during the experimental wine tasting and took the first place, based on its rating on evaluation scale (it received ratings 1,91; 1,87

and 2,17). While evaluated by the control group, the ratings it received were much worse. Its overall impression received rating 2,40 and its flavor received rating 2,47 and wine n.4 took the second place in those categories – only one place below the previous tasting, but the ratings are significantly worse. Wine n. 4 received even worse rating 2,73 concerning its bouquet and took the third place in this category.

Seventeen participants would purchase a bottle of this wine and on average would be willing to spend 93 CZK (3,44 €) on it.

Tab. 2: Wine tasting results summary – control group

Wine number	Price perceived by participants	Place in evaluation	Average rating on evaluation scale	N. of participants who would buy (max 23)
1	105 (389 €)	1	2,09	22
2	95 (3,52 €)	4	3,27	5
3	94 (3,48 €)	3	2,73	14
4	93 (3,44 €)	2	2,53	17

Source: Authors

Discussion

The wine n. 3 and the wine n. 4 were introduced as exclusive at the first wine tasting. As mentioned above, the wine n. 4 received rating “1” the most with the experimental group. It received this rating twenty-four times. This amount represents 34,78 % of all ratings this wine received.

The participants of the second wine tasting were much more restrained when rating these two wines. The wine n. 4 received rating “1” only three times, which is 4,44% of all ratings this wine received.

There was almost no difference between the amounts participants would be willing to spend on individual wines at the control wine tasting. It is important to note, that only five participants would be willing to buy the wine n. 2. This does not, however, change the fact that the participants would be willing to pay relatively similar amounts for individual wines when having no information about them. The situation was completely different at the first wine tasting. The experimental group was willing to pay larger amounts for wines they believed to be exclusive and expensive.

Tab. 3: Wine tasting results – comparison of experimental and control groups

	Wine n. 1		Wine n. 2		Wine n. 3		Wine n. 4	
	Experi- mental	Control	Experi- mental	Control	Experi- mental	Control	Experi- mental	Control
Flavor	2,61	2	3,13	3,67	2,48	2,60	1,87	2,47
Bouquet	3,04	2,29	3,26	2,43	2,39	2,87	2,17	2,73
Overall impression	2,74	2	3	3,73	2,30	2,73	1,91	2,40
Average rating from all three categories	2,8	2,09	3,13	3,27	2,39	2,73	1,99	2,53

Source: Authors

In order to answer the question given in the paper title, we measured the differences between the results related to the overall quality of the wine. We needed to verify our assumption that the given information could change the perceived quality of the wine. In this respect, the data related to the taste of each wine had to be measured for both the primary and control group. It was necessary to identify whether there were significant differences between the two groups of respondents. For statistical evaluation of this question, it was necessary to define two hypotheses. One zero hypothesis - H_0 : "*There are no differences between the perception of the taste of the wines examined in both groups of respondents.*" and the alternative hypothesis - H_A : "*There are differences between the perception of the taste of the examined wines in both groups of respondents.*" Hypotheses were tested by using unpaired two-sample t-tests for each of the four wines separately. The results are presented in the table below.

Tab. 4: t-Test: Two-Sample Assuming Unequal Variances

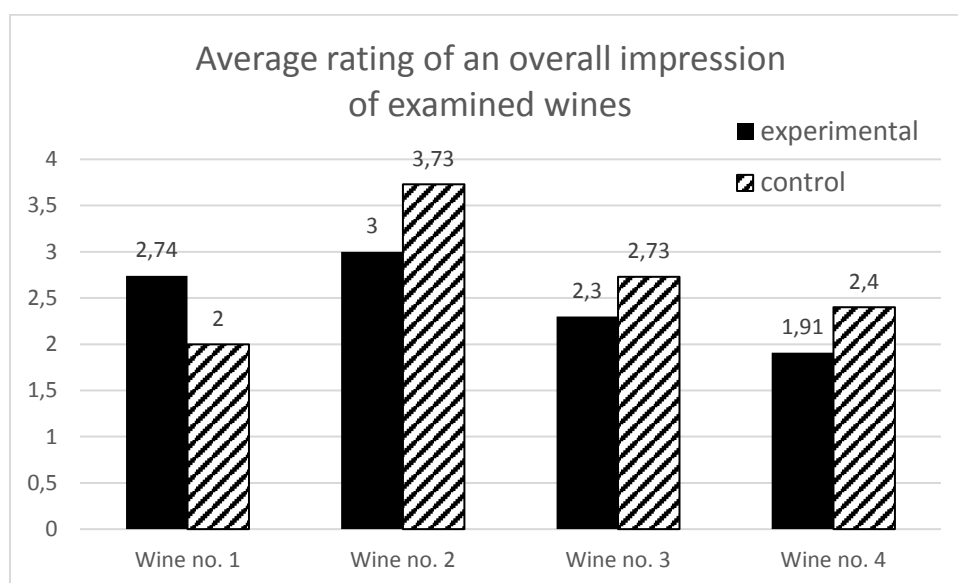
	Wine no. 1		Wine no. 2		Wine no. 3		Wine no. 4	
	Variable 1	Variable 2	Variable 2	Variable 1	Variable 2	Variable 1	Variable 1	Variable 2
Mean	2,79710	2,02899	3,50725	3,13044	3,05797	2,39130	1,98551	2,52174
Variance	0,57312	0,29205	0,65525	0,32060	0,85507	0,78437	0,56039	0,24067
Observations	23	23	23	23	23	23	23	23
Hyp. Mean Diff.	0		0		0		0	
df	40		39		44		38	
t Stat	3,96040		1,82935		2,49704		-2,8733	
P(T<=t) one-tail	0,00015		0,03750		0,00817		0,00331	
t Critical one-tail	1,68385		1,68488		1,68023		1,68595	
P(T<=t) two-tail	0,00030		0,07500		0,01634		0,00661	
t Critical two-tail	2,02108		2,02269		2,01537		2,02439	
Decision	p < 0.05		p < 0.05		p < 0.05		p < 0.05	
	Reject H_0		Reject H_0		Reject H_0		Reject H_0	

Source: Authors

However, firstly it was necessary to determine whether the data has a normal distribution. For this purpose, the F-test of the equality of two variances has been used. Its results showed unequal variances of measured data for each type of examined wines. In this regards, the two-sample t-Test assuming unequal variances has been used.

Since the $P < 0.05$ in all four cases, it was possible to reject the null hypothesis (H_0) and accept the alternative hypothesis (H_A). Thus, it can be stated, that there were statistically significant differences in wine quality perception between the group of respondents influenced by given information and the group tasting wine without any related product information. In other words, the given product information has changed the way how the respondents perceived the quality of the tested wines.

Figure 1: Average rating of an overall impression of examined wines



Source: Authors

The results of the control group show that the evaluation is given by participants who were provided with information about the wines, whether true or not (experimental group) differs significantly from the evaluation given by participants, who were not provided with any information about the wines and rated them solely on the basis of their sensory perception (control group). Therefore, *the primary research assumption (a) „Consumer’s sensory evaluation of product quality is influenced by information provided.”* remains proved.

Observed results are at least interesting. However, it is necessary to draw attention to the limits of the experiment. The main limitation is given by the structure of the research sample. Since the students are often used in research mostly because of the sample homogeneity (Peterson, 2001), as well as because of the practical considerations such as time and cost efficiency (Beltramini 1983), their answers can vary tremendously from "non-student" population. What's more, effect sizes derived from college student subjects frequently differ from those derived from nonstudent subjects both directionally and in magnitude (Peterson 2001). As there must be exercised increased caution when

attempting to extend any relationship found using college student subjects to a "non-student" population, a generalization of our results would be inappropriate.

Also, another limitation is given by the way how the product information were distributed. The information about individual wines was presented verbally to the participants. The personality of a presenter has a significant impact on the face-to-face part of marketing communication, and this impact must be taken into consideration concerning this experiment as well. Further research would show, whether a written text would influence the participants in the same way. Furthermore, it would be desirable to repeat the experiment on different types of respondent groups to be able to make reliable general conclusions.

Conclusion

Despite the limitations as mentioned above, this research is an interesting insight into the impact information has on the wine market. The extent of the impact of marketing communication on consumer preferences is a topic, which has been discussed on a long-term basis. The research results can help to form a better marketing communication mix in relation to both integrated marketing communications (Reid et al. 2001) and wine selling.

From the scientific point of view, the research results, regardless of the need of replication, expand and specify the existing theoretical knowledge in the fields of consumer behavior rationality and impact of information on consumer preferences. It can be assumed, that to recognize a good wine could be difficult for an average consumer and the research results would be thus applicable to a narrow group of product types. However, parallels are easy to find, for example with common products like coffee or tea. A parallel situation could also be a case, when a new product enters the market or when consumers are just familiarizing with some product. It is safe to assume, that in this case, the information input would have a significant impact on the consumer as well.

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The Size of Government in Empirical Research: A Case Study from the Czech Republic

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Abstract

The aim of this paper is to discuss the substance of macroeconomic aggregates that are commonly used in empirical research to express the size of government. Although public sector aggregates normally provide a basis for the assessment of the size of government, there are broader aggregates that capture the scope of government more realistically. This paper presents the relevant statistical concepts, the current state of methodology, as well as discusses the degree of instability in existing methodology and its effect on the robustness of empirical research findings and recommendations. In addition, this paper, on the basis of currently available data, demonstrates the extent of the differences between these statistical concepts in terms of monetary values as well as numbers of employees. The results not only show that the size of government is much larger than estimated, but that it can also have far-reaching consequences for both economic policy and economic research.

Keywords: size of government, public sector, national accounts, total revenues, total expenditures.

Introduction

Research into how to determine the optimal size of government through analyses of macroeconomic aggregates has become one of the major topics of economic research and political economy. Researchers focus, *inter alia*, on the impact of government on economic growth, the economic cycle, unemployment and/or the rate of inflation¹. The majority try to provide answers to questions such as what is the optimal size of government compatible with the highest possible rate of sustainable economic growth accompanied by high utilisation of the labour force and a low rate of inflation. When investigating the macroeconomic causal relations just mentioned, aggregates as provided by the national accounting model are customarily exploited and analysed.

Although all macroeconomic aggregates could be critically examined, our primary focus is on the ways in which the size of government is or can be expressed, as well as the robustness of the relevant definitions underlying these measurements. This is of great importance because the substance of aggregates, as well as the lack of a clear-cut definition in the methodology, usually goes unnoticed by researchers who use macroeconomic aggregates in their work. It therefore comes as no surprise that adjectives such as “public”, “government” or even “state” are generally considered to have a similar or even the same meaning. However, from the statistical point of view there are substantial differences² that imply differentiating explanatory power. Simply put, the central issue is which (public) institutions should be counted as being part of government and therefore contributing to its size, and which should not.

Macroeconomic models such as national accounts or Government Finance Statistics (GFS) provide relevant data for all of these levels of aggregation (public/government/state). It is subsequently up to a researcher to decide which data to use for empirical examination. Currently, researchers customarily reach for government sector data (government) and use it as a proxy for the size of government. One serious objection can be raised against this approach. As will be shown later, the government sector constitutes only a part of the entire public sector. As a result, data for this sector to a certain extent underestimates the overall hold of government over an economy. This implies that using data for the public sector as a whole can put the size of government in a very different perspective.

On the top of this, relevant definitions of the public or government sector are not deep-seated; they are the subjects of continuous methodological changes bringing frequent revisions. This is, of course, a serious matter, since instability and uncertainty regarding the adequacy of the definitions naturally determines the reliability of quantifications (Morgenstern, 1963) and hence the robustness of the conclusions of empirical analyses. To demonstrate the differences quantitatively, we will use the national accounts data for the Czech Republic to show uncertainties embedded in the macroeconomic aggregates.

¹ An in-depth overview of scientific works on the topic can be found in, for example, Zimčík (2016), Chobanov and Mladenova (2009) or Bergh and Henrekson (2011).

² Rybacek and Vebrova (2018)

Use of data in empirical research

It is informative to first take a brief look at the use of macroeconomic aggregates in economic research and some of the conclusions drawn. Government size is often estimated on the basis of the final consumption of government institutions, i.e. the transactions in final products by government institutions. Using the ratio between the final consumption of government institutions and GDP, Barro (1989) concluded that the optimal government size is 25% of GDP. On the basis of the same approach, Günalp and Dincer (2005) found the optimal size of government to be 17.3% of GDP, whereas Chobanov and Mladenova (2008) found it to be 10.4%. Among the many others expressing the size of government in the same way, we can refer to the works of Landau (1983) and Cameron (1982).

An even wider range of empirical studies utilise total revenues or total expenditures to express the size of a government, which – especially due to the inclusion of transfers – represent a wider concept than that of final consumption. Gwartney, Lawson and Holcombe (1998), who found a negative relationship between the size of government and economic growth, used total government expenditure in terms of GDP as a proxy for the size of government. Similarly, Garrett and Rhine (2006), Altunc and Aydin (2013), Alfonso and Furceri (2010), Bergh and Karlsson (2010) and Marlow (1983) analysed data on total expenditures or total revenues of governments. As the government sector is predominantly financed by taxes or quasi-taxes, total tax revenues can only replace the aggregate of total revenues in exceptional cases. This is the case in Fölster and Henreksson (2001), Colombier (2009) and Agell-Ohlsson-Thoursie (2006).

Due to the scope of the research carried out in this area, we can provide only a partial listing of the studies addressing these questions. Still, this brief overview tellingly illustrates not only the intensity of the use of national accounts aggregates, but also the heterogeneity of the expression of the size of government. For our further discussion, it is however important to emphasise the fact that all of the aforementioned indicators are built on the same population of institutions, which are identified by the national accounting methodology under the adjective “government”.

Statistical concepts

Statistical systems work with several concepts that are meant to describe economic behaviour and the size of the public sector. The narrowest concept, which any discussion on the size of the public sector must take into account, is the notion of the State. On a statistical level it covers entities known as organisational bodies of the state. Historically, these are institutions with a monopolistic right to apply legitimate force (Weber, 1984), which can obtain finances based on the taxation of their subordinated citizens. The revenues and expenditures of these units go directly through the state budget, with their final balance affecting the balance sheet of the State.

With the growth in the past few decades in the number of institutions derived from the state, the population of state organisations became insufficient to capture the true size of the public sector (Sennholz, 1987). A shift towards the network-based securing of public services and property (Goldsmith and Eggers, 2004) via institutions derived from the state necessitated a wider definition thereof to be translated into the concept of the government sector; the government sector now therefore includes all so-called public non-market producers³.

Under the current methodology, the creators of manuals make a step further by defining the so-called public sector. This macroeconomic entity captures not only government units, i.e. institutions grouped in the government sector, but also public institutions supposedly operating on a market-oriented basis, as well as the central bank, which, by definition, constitutes a separate subsector of the financial entity. The reason for the methodological delineation of the public sector is that it supposedly better reflects the actual impact of the government on the economy⁴.

The delineation of the public sector and its relation to the government institutions sector is illustrated in the following diagram:

Figure 1: Structure of the public sector in national accounts

Non-financial corporations	Financial institutions	Government institutions	Non-profit institutions serving households	Households
Public	Public	Public	Private	Private
Private	Private			

Source: ESA2010

As the diagram shows, the public sector represents the widest level of aggregation of public entities and covers both the government institutions sector, whose aggregates primarily serve as the input for empirical studies, as well as public non-financial companies and public financial institutions, which are controlled by government institutions. One necessary, but inadequate, condition for including a public body outside the government institutions sector is a sufficient level of decision-making autonomy that would allow us to consider it an independent institutional unit⁵. For completeness, it

³ For a definition of the sector, see ESA2010 par. 20.05-20.07. The public institutions sector is furthermore divided into the subsector of central public institutions, local public institutions and social security funds, see par. 2.111-2.117 ESA2010.

⁴ SNA2008, par. 22.6 states that "it is hence useful to create a sector consisting of all units in the public institutions sector and all public corporations in order to analyse the total impact of the government on the economy."

⁵ See par. 2.12 ESA2010.

needs to be added that by definition the public sector does not include non-profit institutions serving households⁶, households, and, based on convention, also does not include non-residential entities owned by residential public entities⁷.

As it has been made clear, the public sector is divided between two basic parts, the government sector, including non-market public units, and the rest of the public sector, including public units whose behaviour is akin to private market producers. As a result, a public institution operating on a market-oriented basis, as it is treated in the methodology, adds to the “size of government” only in terms of its transactions with government institutions, or through its assets and liabilities where a government institution is a counterparty.

With this, we are approaching one of the methodological sources for the underestimation of the size of government in statistics, which is the treatment of market behaviour in the statistical methodology. Evidently, the way the methodology assesses market behaviour is of key importance, which is briefly discussed further on. At this point however, it is important to keep in mind that the size of the economic sphere governed by political forces might be presented on several levels of aggregation. This can be illustrated by the differences between all the concepts in terms of the number of institutions.

Table 1: State, government institutions, public sector, Czech Republic, 2017

	Number of institutions
Organisational units of the State	278
Government institutions (government sector)	18,094
Public sector	19,269

Source: Business register

It is worth adding that although the number of organisational units of the State is comparatively low (278), they manage most of the revenues and expenditures of the public sector.

Discussion of the boundaries of macroeconomic entities

As mentioned in the previous section, the scope of the government institutions sector is fundamentally influenced by the methodical description of market behaviour in the SNA2008 and ESA2010 national accounting manuals (including the follow-up manual specifically covering government deficit and debt). The method used to delineate the non-

⁶ In case of public control of a non-profit institution for households, this is a public non-market producer which must, by definition, be included in the sector of public institutions.

⁷ A statistical image of the public sector as a whole is furthermore influenced by objective limits during the creation of macroeconomic statistics. These include first and foremost the convention of including an economic unit in only a single institutional sector, whereas the decision on which sector it is included in is predominantly based on majority ownership. As a result, this leads to the over- or undervaluation of the size of the public sector, the scope of which is de-facto unquantifiable due to not taking into account the ownership of shares by public institutions.

market sphere has gone through significant changes since the first methodologies for national accounts were released.

At present, the public sector itself is delineated via the application of the concept of control⁸, which generally represents the ability of government institutions to affect or directly determine the policies of the given producer. If the given producer is owned or otherwise significantly influenced by a government institution, for example, via specific regulatory actions, then it is included in the public sector. The next step then assesses the economic behaviour of the given public entity, i.e. whether it is considered a market or non-market public producer. The market or non-market nature of the public entity is assessed using a range of quantitative as well as qualitative criteria⁹.

The first (quantitative) criterion compares revenues with selected costs in order to arrive at the conclusion if prices charged by a producer are economically significant or not¹⁰. This criterion therefore assesses behaviour on the basis of the statistical analysis of prices. A number of objections can be raised against this approach. First, the rule requires at least 50% of production costs to be covered by own revenues, i.e. without any specific financial assistance received from the government. So, if only 51% of total revenues comes from households as customers, which are free to decide whether to buy or not, and the remainder is, for example, covered by the government to avoid losses, it is still sufficient - from the methodological point of view - to consider the given public producer as a market producer. This approach is highly questionable. The provision of subsidies to a public producer provides little market incentive. Furthermore, the existing prices do not reveal whether they are a result of the operation of market forces. Prices as a criterion for the assessment of market behaviour are therefore more misleading than useful.

While in the ESA1995 methodology the quantitative criterion plays a dominant role, the revised ESA2010 standard places more emphasis on qualitative criteria that primarily target the motivational environment surrounding the given producer. Which sector a public producer is placed in therefore depends on the existence of private competitors, free entry into the given branch, the structure of customers in terms of economic sectors or the transfer of risks associated with the performance of the given activity. This second group of criteria requires profound analysis of the institutional environment in which public units operate¹¹. Although this approach is highly relevant, it stands on the application of "soft criteria" which are the subjects of subjective assessments.

Irrespective of the treatment of market behaviour, the question still remains: Is the division of the public sector into a market and non-market part for measuring government

⁸ Par. 20.18 and 20.306 ESA2010

⁹ Par. 3.27-3.41 ESA2010, MGDD section 1.2.4.

¹⁰ The notion of economically significant prices is defined in the par. 20.19 ESA, as "prices which have a substantial influence on the amounts of products producers are willing to supply and on the amounts of products that purchasers wish to acquire."

¹¹ This recent trend has led not only to an expansion of the government sector, but also to instability in the delimitation of sectors and ambiguities in international comparability. Simply put, pushing quantitative criteria to the background created the opportunity for subjective assessments and heterogeneity in the application of the rules.

size economically and analytically justifiable? In par. 22.6 of the SNA, the authors implicitly admit that data for the public sector provide a more complete picture on the influence of the government on the economic system. The separation of public entities based on whether their behaviour follows market principles or not is therefore the subject of ongoing methodological discussions and disputes. Patherine and Blades (1982) emphasise the fact that the subject of the activities of these institutions is not redistribution; their decision-making on production and prices is chiefly guided by the market mechanism rather than controlled by political forces.

On the other hand, some authors view this concept as a weak point of the methodology as well as of macroeconomic aggregates¹². Public institutions always benefit from at least an implicit guarantee from the government. The risk of going bankrupt is therefore mitigated, thereby shaping its decision-making process as well as its innovativeness. Besides, the control from the side of government also allows the government to effectively implement its economic and social policies through the publicly controlled institutions - with examples including public banks, public transport companies and public infrastructure companies.

To divide the public sector between the market and the non-market sphere is therefore highly questionable. International statistical authorities like the International Monetary Fund or Eurostat have recently begun to appreciate the importance of getting the full picture on the public sector. It is with this in mind that they launched a data collection process the aim of which is to collate data on those public institutions, which in the national accounts methodology are left out of the government sector and the size of government.

Quantitative analysis

Different levels of aggregation can naturally provide a significantly different image of economic behaviour or the impact of public entities on the economic system. This is demonstrated here through an examination of the differences in the national accounting data published by the Czech Statistical Office (hereinafter CZSO). Key indicators are compared for the central government institutions subsector, such as the best approximation of a state entity, the government institutions sector and the public sector as a whole, whereby the data are taken from the satellite account published by the CSZO.

In this definition, the public sector also covers public financial institutions and especially the central bank as the implementing body of economic monetary policies. With respect to the need to have data on the impact of fiscal authorities, modified data will also be used for the public sector that does not cover the impacts of monetary policies, represented notably by the central bank¹³. Nevertheless, the analysis will focus first and foremost on

¹² For instance Bajo and Primorac (2015), Stiglitz (1989), Sennholz (1987), DiLorenzo and Bennett (1983).

¹³ Even though the central bank is considered, by the national accounting methodology, a non-market producer and its production is appraised on the basis of its costs (ESA2010, p. 63), by convention it is also the only public non-market producer which is currently left outside the government institutions sector.

the quantitative differences between the government institutions sector and the public sector.

Table 2 presents an overview of the flow parameters representing the given levels of aggregation of government institutions in relation to GDP.

Table 2: Percentage share of GDP per flow and (sub)sector, Czech Republic, 2011-2015¹⁴

Flows	Measurement unit	2011	2012	2013	2014	2015
Value added						
- central government institutions	% GDP	6.8	6.9	7.0	6.9	6.7
- government sector	% GDP	13.7	13.9	14.0	13.6	13.3
- public sector	% GDP	18.4	18.3	18.4	18.3	17.7
- public sector (excl. central bank)	% GDP	18.3	18.3	18.3	18.3	17.6
Total revenues						
- central government institutions	% GDP	28.9	29.1	29.3	28.3	29.1
- government sector	% GDP	40.3	40.5	41.4	40.3	41.1
- public sector	% GDP	51.3	51.4	52.0	50.0	50.1
- public sector (excl. central bank)	% GDP	50.9	51.0	51.5	49.7	49.8
Total expenditures						
- central government institutions	% GDP	31.2	32.8	30.9	30.4	30.3
- government sector	% GDP	43.0	44.5	42.6	42.2	41.7
- public sector	% GDP	53.8	55.0	52.6	51.5	49.8
- public sector (excl. central bank)	% GDP	53.6	54.7	52.4	51.2	49.7
Final (economic) balance						
- central government institutions	% GDP	-2.3	-3.7	-1.6	-2.0	-1.2
- government sector	% GDP	-2.7	-3.9	-1.2	-1.9	-0.6
- public sector	% GDP	-2.5	-3.6	-0.6	-1.5	0.3
- public sector (excl. central bank)	% GDP	-2.6	-3.7	-0.9	-1.5	0.1

Source: CZSO; own calculations

¹⁴ Data on total government revenues and expenditures are presented on a consolidated basis, i.e. the most significant internal flows are excluded to avoid double- or multiple-counting of certain flows due to a fragmented public or government sector.

With respect to production, i.e. based on the percentage share of GDP, available data show less significant differences between the government institutions sector (13.3% in 2015) and the public sector (17.7%). However, more significant differences can be seen in the widely used analytical aggregates of total revenues and expenditures¹⁵. In 2015, total public sector revenues represented 50.1 percentage points (hereinafter p.p.) of GDP, i.e. 10 p.p. more than the total revenues of the government institutions sector. With regards to total expenditures, the public sector represented a share of 49.8 p.p. of GDP, which is 8.1 p.p. more than the government institutions sector.

Over the whole timeline, the share of public sector revenues in GDP was 10.3 p.p. higher than the revenues of the government institutions sector. With respect to total expenditures, the size of the public sector was on average 9.8 p.p. higher than that of the government institutions sector. The concept of the public sector in national accounting therefore identifies the size of the public sector as being an economically larger entity than the government institutions sector, as described by the data used in empirical research.

With respect to economic balance, used for instance to quantify fiscal impulses for the purposes of implementing monetary policies, the data reveal differences both with respect to the overall level and year-on-year changes. In 2015, a year-on-year comparison showed a reduction in the definition of the government institutions sector by 1.3 p.p., and in the case of the public sector, the scope of year-on-year improvement exceeded these values by a further 0.5 p.p.

The change in the economic balance between the specified years also underwent significant changes. While the balance in the government sector was 2.1 p.p. lower in 2015 than in 2011, in the public sector the economic balance underwent a change of +2.8 p.p. Once the impact of the central bank policies is taken into account, this change can be corrected to +2.7 p.p. The scope of the fiscal impulse therefore indicates significant differences between the government institutions sector and the public sector.

Naturally, status parameters are also relevant for analysing the impact of the public sector on the economy. Table 3 presents the percentage share of individual macroeconomic entities in the ownership of assets, liabilities, including debts, and employment in the total economy.

¹⁵ Total revenues and expenditures are quantified as per the definition listed in the ESA2010 manual, par. 20.76 and 20.92.

Table 3: Percentage share of total economy per stock and (sub)sector, Czech Republic, 2011-2015

Stocks	Measurement unit	2011	2012	2013	2014	2015
Total assets						
- central government institutions	% TE ¹⁶	24.2	24.0	22.4	21.7	20.9
- government sector	% TE	32.4	32.1	30.2	29.4	28.6
- public sector	% TE	37.8	37.5	36.5	35.9	35.7
- public sector (excl. central bank)	% TE	35.9	35.5	34.1	33.3	32.6
Total liabilities						
- central government institutions	% TE	10.8	12.1	11.7	11.8	11.0
- government sector	% TE	11.9	13.3	12.8	12.9	11.9
- public sector	% TE	17.7	19.0	19.3	19.3	20.1
- public sector (excl. central bank)	% TE	13.0	14.8	13.9	13.9	13.5
Debt						
- central government institutions	% TE	15.2	16.2	15.1	14.5	14.1
- government sector	% TE	16.2	17.2	16.0	15.4	14.9
- public sector	% TE	27.9	28.6	28.8	29.0	29.8
- public sector (excl. central bank)	% TE	19.5	21.1	19.5	19.6	18.2
Number of employees						
- central government institutions	% TE	8.5	8.4	8.4	8.4	8.4
- government sector	% TE	19.3	19.0	19.1	19.1	19.0
- public sector	% TE	23.4	22.6	22.8	22.9	22.6
- public sector (excl. central bank)	% TE	23.3	22.6	22.8	22.8	22.6

Source: CZSO; own calculations

The differences between individual levels of aggregation are especially notable in the case of liabilities, including debt¹⁷. While the government institutions sector reached a debt share of 14.9% at the end of 2015, for the public sector this stood at 29.8%. A significant growth in this indicator is caused notably by the inclusion of liabilities arising from the implementation of monetary policies. If the impacts of the monetary policies were

¹⁶ TE = total economy.

¹⁷ I.e. liabilities with a fixed maturity period linked to payments of interest or other regular payments.

disregarded, the growth of the debt compared to the government institutions sector would be 3.3 p.p. in the given year. With respect to ownership, the public sector's percentage share of total assets was 35.7% at the end of 2015, i.e. 7.1 p.p. more than the percentage share of the government institutions sector.

As the level of aggregation increases, we see fluctuating increases of 5 to 8 p.p. in the percentage share of total assets and liabilities. On the other hand, the data on percentage shares in relation to total liabilities and debts show that the central government institutions sector has a dominant position within the government institutions sector when it comes to foreign sources of funding. The difference between both units amounts to about 1 p.p. on average. However, the inclusion of public companies leads to a significant increase in the percentage shares of the public sector, especially due to the liabilities arising from the implementation of monetary policies. The data show that at the end of 2015 the public sector's share of the total volume of liabilities was 20.1%, and of the volume of debt 29.8%.

Table 3 also illustrates the percentage shares of individual public sector units in the total number of employees according to the national accounting concept. With respect to the number of employees, differences that are more prominent are especially notable between the central government institutions subsector and the government institutions sector, on average by 10.7 p.p. This is predominantly caused by the fact that a range of key activities undertaken by the government institutions sector, for example, individual consumption services such as transportation, education or medical services, are provided at a local level, which has an impact on the number of employees in local government institutions. Extending the population of entities through the addition of public market producers therefore further increases the percentage share of the public sector, but to a lesser extent than is the case for flow- or state-based financial parameters.

The analysis of the data therefore illustrates significant differences between individual macroeconomic units in terms of the percentage share of overall revenues and expenditures in GDP, whereby the same also applies to total liabilities and debts. The data describing the public sector according to the national accounting concept(s) provide(s) a significantly different image of the scope of the flows passing through the public sector. The same also goes for the financial position of the sector, as measured by the value of its liabilities and debts. On the other hand, less profound differences can be found on the basis of production indicators, indicators measuring the ownership of assets and the number of employees. These show that the growing impact of the public sector need not always be accompanied by an increase in the number of employees in the public sector.

Conclusion

The macroeconomic aggregates of national accounting utilised in empirical research to express government size represent neither the sole nor the broadest means by which to delineate the size of the public sector in an economic system. As shown, national accounting works with several levels of public entity aggregation. The central government

institutions subsector is the narrowest and at the same time closest concept to the entity referred to as the “State”. The wider group of government institutions then represents an important subgroup of the public sector, but not the public sector as a whole, since the methodology further divides the public sector into a market and non-market sphere. As a result, the utilisation of data about the government institutions sector to estimate government size in empirical research leads to an underestimation of the scope of government influence on an economy. At the same time, it was shown that this statistical underestimation is most prominent for the flow indicators of total revenues and expenditures, which are predominantly used in empirical studies to estimate government size.

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