

Linking Institutional Factors with the Financial Soundness of Banks. Evidence from the CEE Region

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Abstract

Sustainable financial sector needs the sound banking system. The soundness of the banking system is the subject for effects from institutional factors representing the areas of economy, society, public sector, legislation, technologies, and climate change. Although, studies rarely pay attention to the complex approach, where all areas are analysed simultaneously within the study. Design of the present study aims to analyse institutional factors of interdisciplinary nature, which demonstrate potential significance for the sound banking system. The authors focus on the cases that differ by the level of the soundness of banks. The approach provides the novelty of research. Method. During the research, the authors identify and characterise linkages between the factors of institutional environment and the soundness of banks. For the aim, monographic method and correlation analysis are applied. Analysis. The analysis is organised by using two cases that differ by the level of the soundness of banks – the region of Central and Eastern Europe and ten countries with the highest level of the soundness of banks in the world according to the data on Global Competitiveness Report. Results. For the cases that differ by the level of the soundness of banks, the research results demonstrate similarity by the linkages with indicators representing depth of financial system and corporate governance. Differences between the cases appear by the linkages with indicators representing public sector performance and stability of financial system. Conclusions. For the case with lower level of the soundness of banks, overall trends that are necessary for functioning of the sound banking system are observed. Although, several indicators that by their sense are significant for the sound banking system demonstrate negative direction or weak relationship with the soundness of banks what has to be improved in the future and appear as a result of the peculiarities of the banking sector in the region.

Keywords: banks, financial soundness, institutions, factors, correlation.

1. Introduction

The article is devoted to the institutional factors significant for the soundness of banks. The article aims to detect linkages between institutional factors and the soundness of banks for the region of Central and Eastern Europe (the CEE region) comparing results with ten countries that demonstrate the highest level of the soundness of banks in the world according to the data of Global Competitiveness Report (“top 10”). Given a sense of indicators under research, the comparison of the cases will allow for understanding of encouraging and hindering factors in relation to the sound banking system.

Within the research, the authors identify and characterise the linkages between institutional factors and the soundness of banks. Indicators considered within the article represent comprehensive interdisciplinary understanding of institutional factors, which affect the banks and relate to the areas of economy, society, public sector, legislation, climate change,

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and technologies. The research provides novel contributions in the terms of the simultaneous analysis of interdisciplinary institutional factors for the cases with different level of the soundness of banks.

During the analysis, the authors solve two research problems, which appear from interdisciplinary nature of the complex of institutional factors – understanding a set of indicators for the analysis and availability of comparable data.

Interest to the research question is grounded on scientific debates devoted to the factors that are significant for the soundness of banks. The reason to characterise linkages between institutional factors and the soundness of banks lies in both previous research results and analysis of statistical data. Variety of factors are at the scientific focus. For example, economic freedom, political stability, entrepreneurial environment and culture, societal well-being, technological expansion, supervisory regulation, institutional reforms, corporate governance, and even climate change (e.g., Chan et al., 2015; Berglund & Makinen, 2019; Jin et al., 2017; Fang et al., 2014; Lamperti et al., 2021). Scientists also indicate that quality of institutions is significant for the sound financial sector and banks (Hou & Wang, 2016; Bermpei et al., 2018; Ahmed et al., 2021; Shabir et al. 2023).

In addition to the results of the previous studies, the authors see the reason for the research question in empirical fact that relationship between quality of institutions and overall stability of the financial system exists and that it is stronger for the case with higher level of the soundness of banks (see Figure 1).

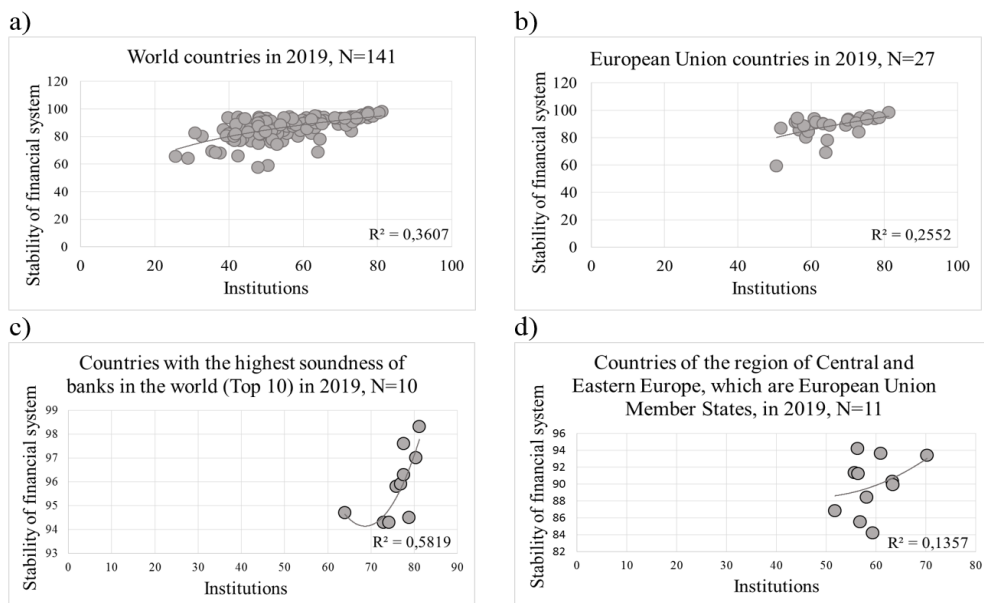


Figure 1 – Relationship between institutional quality and stability of financial system in 2019

Note: “Top 10” countries and countries of the Central and Eastern Europe are indicated in the section Method.

Source: elaborated by the authors using data of The Global Competitiveness Report 2019 (Schwab, 2019).

The data presented on Figure 1 demonstrate relationship between quality of institutions and stability of the financial system. The data analysed indicate that relationship exists and

that it is stronger for the countries, which are ranked from the first to the tenth place in the world according to the data on the soundness of banks (“top 10”) (see Figure 1c). The results ground understanding that higher quality of institutions is prerequisite for more stable financial system and, particularly, for the soundness of banks. The cases with less pronounced relationship (see Figure 1 a, b, d) confirm intention to search reasons for the level of soundness of banks within institutional factors, because the mentioned cases include countries with differentiated not similar (as at Figure 1c) soundness of banks.

This is result from variety of factors directly and indirectly affecting the soundness of banks in every case depending on characteristics of institutional quality. For example, scientists take into account institutional quality and reforms (e.g., Fang et al., 2014; Méréő & Piroška, 2016; Bermpei et al., 2018; Mikheeva & Juuse 2021; Shabir et al. 2023), as well as institutional framework (e.g., Chan et al., 2015), when studying the soundness of banks. Special attention in scientific studies is devoted to transition countries (e.g., Setiawan et al. 2021; Fang et al., 2014) as, for example, the CEE region is.

Thus, if obvious differences in relationship between institutional quality and the stability of the financial system exists (see Figure 1 c, d), within the study, the authors focus on linkages between institutional factors and the soundness of banks for the cases of the CEE region and the “top 10” countries. In the context of the countries with less developed financial markets, scientists indicate on possibilities to take advice from the experience of the developed economies (e.g., Setiawan et al. 2021). Thus, comparison of the two cases with different level of the soundness of banks will provide both scientific and practical implications for policy and managerial needs.

For the analysis, attention is devoted to the institutional factors representing economy, society, public sector, legislation, climate change, and technologies. The authors apply correlation analysis to the appropriate data obtained from the “The Global Competitiveness Report 2019” (Schwab, 2019).

The analysis is organized in the next five sections. The section Literature offers scientific experience by explaining institutional factors, which are at the centre of studies devoted to the soundness of banks. The section Method explains the logic of research as well as method applied and data used. The section Results presents calculation results organized for the analysis. The section Discussion provides the consideration of calculation results in context of the peculiarities of the banking sector in the CEE region. The section Conclusion concludes the article by highlighting the findings and their contribution to the knowledge gap in the theme.

2. Literature

The banking system is very complex phenomenon, which relates to economy, society, public sector, legislation, technologies, and more recently to climate change. All the mentioned areas disclose interdisciplinary nature of the institutes, which ensure functionality of the banking system. In terms of the institutional quality, the banking system is a subject for effects from variety of factors representing the mentioned areas of economic and societal lives. Given a variability of institutions, the banking system may experience differentiated cycles of development and differentiated level of the soundness. The level of the soundness is qualitative condition of the banking system as whole and of

the concrete banks. Characteristics of this condition appear from interconnectedness of the banking system with all development processes. Theoretically, institutional factors, which affect the soundness of banks, may be understood depending on sense of relationships between banks and representatives of economic, societal, public, legislative, technological, and climatic areas. Given the sense of relationships between banks and the mentioned areas, scientists link the soundness of banks with institutional factors. Although, studies mostly focus on concrete or several factors and rarely pay attention on the complex approach, where every areas are included and compared simultaneously.

Overall, scientists conclude that quality of institutions is significant for the sound banking system (e.g., Hou & Wang, 2016; Bermpei, 2018; Menshikov et al., 2019; Ahmed et al., 2021; Shabir et al. 2023). However, scientists continue to evaluate, which institutional factors are more relevant for the soundness of banks. Literature analysis allows concluding that the level of the soundness of banks is affected by, for example, economic freedom, political stability, entrepreneurial environment and culture, development of financial market, societal well-being, technological expansion, supervisory regulation, institutional reforms, corporate governance, and even climate change (e.g., Chan et al., 2015; Berglund & Makinen, 2019; Jin et al., 2017; Bergantino & Capozza, 2018; Fang et al., 2014; Kočenda & Iwasaki, 2020; Lamperti et al., 2021; Agoraki & Kouretas, 2021).

Although, discussions on significance of institutional factors still are ongoing and even differentiate depending on the cases under research. Scientists focus on both external and internal institutional factors. For example, Agoraki and Kouretas (2021) highlight the role of regulatory and supervision measures for banks' core activities, i.e. loans. In the context of the supervision, Chan et al. (2015) pay attention to institutional framework, economic freedom, and political stability. Chan et al. (2015) indicate that a strength of supervisory activities has to be balanced with market peculiarities for avoiding increase of transactional costs and for improving effectiveness of monitoring. In this regard, Abreu et al. (2019) stress that weak regulations and weak shareholders and creditors rights negatively affect the soundness of banks. Yin (2019) finds out that institutional framework and regulatory measures are significant for mitigating globalization effects on overall financial stability. For example, Perić et al. (2018) mention about possible transfer of financial risks from parent bank countries. Ashraf (2017) in the study focus on political institutions and their quality. Ashraf (2017) indicates that the sound political institutions are encouraging for higher risk-taking behaviour of banks. Fang et al. (2014) write that reforms of legal institutions are favourable for the soundness of banks.

Berglund and Makinen (2019) focus on the previous experience and conclude that for the higher soundness in the future banks need to learn from the past financial crises. Additionally, scientists pay attention on the crisis of non-financial nature, i.e., covid-19 pandemic. In this context, Shabir et al. (2023) conclude that institutional quality and financial development are crucial for the soundness of the banking sector. In other studies, scientists focus on financial technologies and mostly find positive effects on the banking sector, for example, in activities devoted to risk control and reduction of costs (e.g., Wang et al., 2021). In studies, scientists also pay attention to social capital and conclude that high social capital ensures higher soundness of banks during crisis (e.g., Jin et al., 2017).

Given that the climate change negatively affects soundness of the banking sector (e.g., Battiston et al., 2021), the newest direction for the regulatory framework in the financial

sector relates to the climate issues, which affect banking sector (Baer et al., 2021). However, activities for mitigating effects of climate change also may provide risks for the soundness of financial system (e.g., Diluiso et al., 2021).

Scientific experience is wide and studies include peculiarities of the banking sector and/or region for presenting the case studies for better understanding of more relevant institutional factors for the soundness of banks. For example, peculiarities that distinguish research results may relate to the reforms made in the banking sector, bank size, institutional characteristics, abilities to adopt the newest technologies, the level of the soundness of banks, macroeconomic environment, and geographical characteristics (e.g., Cheng & Qu, 2020; Fang et al., 2014; Huang, Chiang, & Tsai, 2015; Menshikov et al., 2019; Yin, 2019; Kenjegaliev & Simper, 2011; Jiang & Wu, 2023).

Design of the present study aims to demonstrate interdisciplinary nature of the factors, which form institutional environment and are significant for the soundness of banks. The attention is paid to the cases that differ by the level of the soundness of banks.

3. Method and Data

Within the research, the authors analyse and characterise the linkages between the factors of institutional environment and the soundness of banks by using two cases that differ by the level of the soundness of banks. The authors focus on the set of the factors representing economy, society, public sector, legislation, technologies, and climate, thus providing the complex approach to the analysis. Answering the question provides knowledge on common and distinctive factors in case of different level of the soundness of banks what is of interest for maintaining and increasing the level of the soundness of banks in the future.

The cases under research include the countries, which demonstrate the highest soundness of banks among 141 countries (“top 10”) and the region of Central and Eastern Europe (CEE region).

From the “The Global Competitiveness Report 2019” (Schwab, 2019), the authors select ten countries (from 141 included in the report) with the highest soundness of banks – countries, which are ranked from the first until tenth place in the world). The “top 10” countries according to the data of Global Competitiveness Report (Schwab, 2019) are differentiated by both geographical and financial characteristics (Australia, Canada, Chile, Finland, Luxembourg, Norway, Switzerland, New Zealand, Singapore, Hong Kong SAR) what allow to suppose that linkages detected for the case “top 10” provide knowledge on institutional factors that would be more relevant for the soundness of banks.

The CEE region includes countries as indicated in the Glossary of Statistical Terms of OECD (OECD, 2001). The authors analyse those countries of the region, which are the Member States of the European Union (Bulgaria, Czech Republic, Croatia, Hungary, Estonia, Latvia, Lithuania, Poland, Romania, Slovak Republic, and Slovenia).

For the aim, the authors calculate Pearson correlation coefficients. Within the calculations, the indicator soundness of banks presents dependent variable, in turn, the set of institutional factors presents independent variables. It is noteworthy that explanation of correlation coefficients has to be based on understanding of both numerical values and logical interconnectedness of variables analysed.

For the analysis, the authors use indicator “Soundness of banks” from “The Global Competitiveness Report 2019”. This indicator presents the response to the survey question – In your country, how do you assess the soundness of banks? (Schwab, 2019, p. 622).

Institutional factors that would affect soundness of banks are of interdisciplinary nature and relate to economy, legislation, technologies, climate, society, and public sector. Given that interdisciplinary data analysed have to be comparable and prepared within the single methodology the authors solve the issue by using the data from the “The Global Competitiveness Report 2019” (Schwab, 2019). Selection of the indicators is grounded on the results of scientific studies (see section Literature) and are limited with availability of indicators within the “The Global Competitiveness Report 2019”.

For presenting economy, the authors choose such indicators as ‘Financing of SME’, ‘Venture capital availability’, ‘Growth of innovative companies’, ‘Companies embracing disruptive ideas’ from the “The Global Competitiveness Report 2019” (Schwab, 2019). These indicators represent core activities of the banking sector, their contribution to economic growth as well as innovativeness of the economy.

For presenting public sector, the authors choose such indicators as ‘Government ensuring policy stability’, ‘Government long-term vision’, ‘Government’s responsiveness to change’, ‘Burden of government regulation’ from the “The Global Competitiveness Report 2019” (Schwab, 2019). These indicators indicate on ability of public sector to contribute to long term perspectives for all subsystems of economy and society.

For presenting technologies, the authors choose such indicators as ‘Digital skills among active population’, ‘Legal framework’s adaptability to digital business models’ from the “The Global Competitiveness Report 2019” (Schwab, 2019). These indicators demonstrate digital literacy level of society (i.e., clients of the banking sector) and responsiveness of legal framework to technological changes in business environment.

For presenting society, the authors choose such indicators as ‘Attitudes towards entrepreneurial risk’, ‘Healthy life expectancy’ from the “The Global Competitiveness Report 2019” (Schwab, 2019). These indicators discover interest of society to become entrepreneur and overall well-being.

For presenting shareholders, creditors and debtors of banks, the authors choose such indicators as ‘Property rights’, ‘Intellectual property protection’, ‘Efficiency of legal framework in challenging regulations’, ‘Efficiency of legal framework in settling disputes’, ‘Reliance on professional management’, ‘Willingness to delegate authority’, ‘Non-performing loans % of gross total loans’ from the “The Global Competitiveness Report 2019” (Schwab, 2019). These indicators represent rights of shareholders, creditors and debtors of banks as well as professionalism level of corporate governance and financial performance of core activities of the banking sector.

For presenting banks’ monitoring and reporting, the authors choose such indicator as ‘Strength of auditing and accounting standards’ from the “The Global Competitiveness Report 2019” (Schwab, 2019). This indicator presents how strong, easy and economic activity encouraging are requirements of supervisory institutions.

For presenting climate change, the authors choose such indicators as ‘Energy efficiency regulation’, ‘Renewable energy regulation’, ‘Environment-related treaties in forcecount (out of 29)’ from the “The Global Competitiveness Report 2019” (Schwab, 2019). These indicators demonstrate commitment to sustainability goals.

Separate indicators for the legislation are not presented, but they appear in the above-mentioned indicators selected for other institutional factors, e.g., climate change, monitoring and reporting, technologies.

Overall, the selected indicators for the analysis represent economic freedom, financial stability and depth, political stability, supervisory processes, corporate governance, entrepreneurial culture, well-being level, adoption of information and communication technologies, and climate change. The factors, which are significant for the analysis in the studies devoted to the institutional factors and the banking sector.

The novelty of this study appears in the analysis of the complex of the factors, which represent all the mentioned areas – economy, society, public sector, legislation, technologies, and climate change.

For calculations of correlation coefficients, the authors use scores of the above-mentioned indicators from the “The Global Competitiveness Report 2019” (Schwab, 2019).

The analysis pays attention to the strength and direction of the correlation coefficients. The next step in the analysis is devoted to the focus on the CEE region, which needs improvements of the level of soundness of banks comparing with the “top 10” countries. The authors consider peculiarities of the banking sector of the CEE region in the context of the calculations made within the study.

4. Research Results

For the aim of the article, the authors calculate Pearson correlation coefficients for detecting linkages for the soundness of banks and set of indicators appropriate for characteristics of institutional factors in economic, technological, climatic, societal, legislative and public areas in the banking sector. The results of correlation analysis are presented in Figure 2 for two cases under research.

The linkage between the soundness of banks and institutional factors has to appear because of logical supposition that well designed, smartly governed and highly interested institutions that represent wide range of areas of public, entrepreneurial, and societal life are prerequisite for the stable and active financial sector. However, contribution of institutional factors differs depending on the cases.

According to the calculations, the soundness of banks is linked with institutional factors for the both cases under research. Although, the detected linkages differ for the considered indicators. It is noteworthy to indicate that correlation coefficients discover moderate, low and very low relationship between the soundness of banks and the considered indicators.

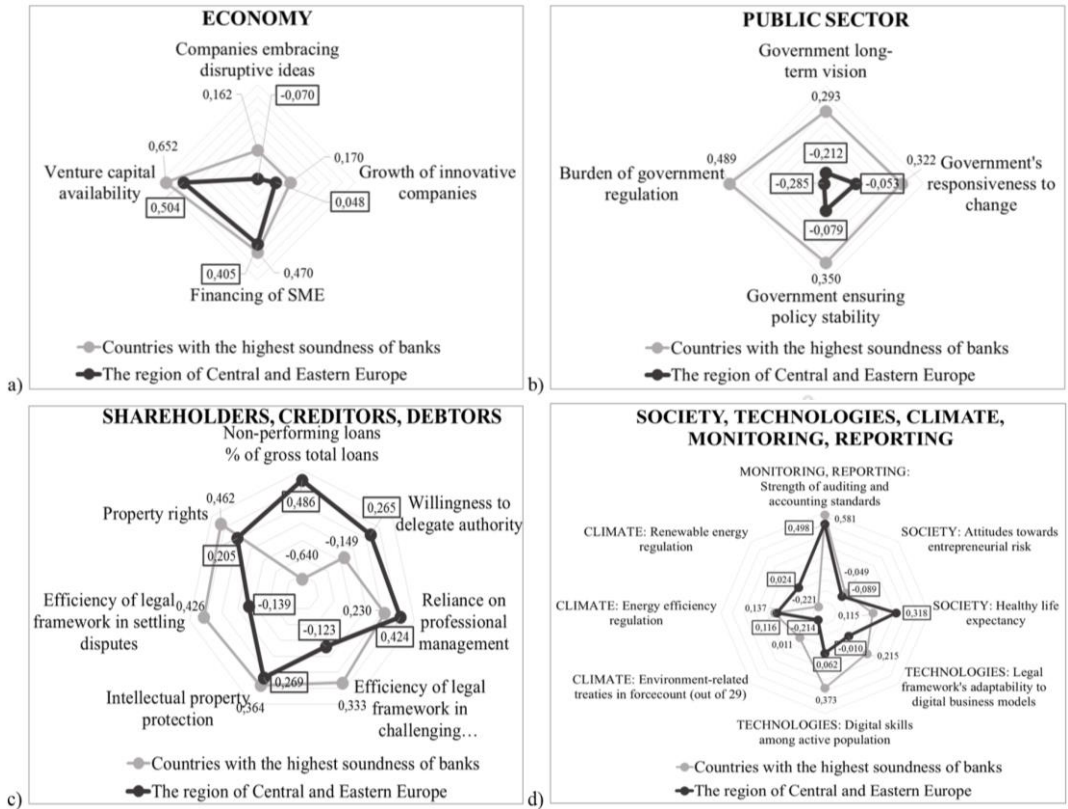


Figure 2 – Linkages between indicators representing institutional factors and the soundness of banks in the “top 10” countries and in the CEE region, in 2019, Pearson correlation coefficients
 Note: “top 10” countries and countries of the Central and Eastern Europe are indicated in section Method.
 Source: elaborated by the authors using data of The Global Competitiveness Report 2019 (Schwab, 2019).

Moderate linkages appear between the soundness of banks and indicators representing economy, banks’ monitoring and reporting, and for indicators representing shareholders, creditors and debtors for the countries with the highest soundness of banks and for the CEE region. Particularly, $r=0.652$ for the “top 10” countries and $r=0.504$ for the CEE region by the indicator ‘Venture capital availability’ (representing economy). For the indicator ‘Strength of auditing and accounting standards’, $r=0.581$ for the “top 10” countries and $r=0.498$ for the CEE region. For the indicator ‘Non-performing loans % of gross total loans’ $r= -0.640$ for the “top 10” countries and $r=0.486$ for the CEE region. Given a sense of the above-mentioned indicators, calculation results are expectable. Venture capital aims to encourage further development of risky entrepreneurial ideas what may affect the soundness of banks in both directions, i.e., positively in case of success and negatively in case of failure. Auditing and accounting activities are mandatory for the banking sector and thus linkage has to appear brightly. Non-performing loans depending on their characteristics may worsen financial conditions of banks and affect overall stability of the financial system.

Correlation coefficients' values for other indicators disclose low or very low linkages with the soundness of banks. Although, coefficients brightly vary for several indicators.

The more pronounced difference between the cases under research appears for such institutional factor as public sector, where direction of relationship is opposite for all considered indicators for the countries with the "top 10" and the CEE region. Particularly, indicators 'Government long-term vision', 'Government's responsiveness to change', 'Government ensuring policy stability', 'Burden of government regulation' demonstrate weak and even very weak (for the CEE region) relationship with the soundness of banks. The direction of correlation coefficients indicates that relationship between the soundness of banks and indicators representing public sector is positive for the "top 10" countries and negative for the CEE region.

Opposite direction of correlation coefficients for the cases under research appears also for such indicators as 'Companies embracing disruptive ideas', 'Legal framework's adaptability to digital business models', 'Non-performing loans % of gross total loans', 'Willingness to delegate authority', 'Efficiency of legal framework in challenging regulations', 'Efficiency of legal framework in settling disputes', 'Burden of government regulation', 'Environment-related treaties in forcecount (out of 29)', and 'Renewable energy regulation'.

Negative correlation coefficients indicate that increase of independent variable (indicators presented at Figure 2) decreases values of dependent variable (soundness of banks). Thus, despite low and very low correlation coefficients for several considered indicators and the soundness of banks, it is possible to detect the quality of relationship and possible areas for improvements.

The more pronounced similarity between the cases under research is observed for indicators 'Financing of SME', 'Venture capital availability', 'Strength of auditing and accounting standards', and 'Energy efficiency regulation'. Thus, the "top 10" countries and the CEE region demonstrate similar development for indicators representing economy and banks' monitoring and reporting.

In conclusion, it is noteworthy to indicate that indicators, which are more closely linked with the soundness of banks and the relationship is positive, are similar between the "top 10" countries and the CEE region (see Figure 2). Given a sense of the indicators analysed, it is possible to highlight that indicators representing depth of financial system and corporate governance are significant regardless of the level of the soundness of banks. Differences between two cases under research appears for the negative relationship for indicators representing public sector and stability of financial sector.

5. Discussion

In the context of the soundness of banks, Shabir, Jiang and Işık (2023) conclude that quality of regulatory and institutional environment is significant, especially, during the crisis time. In the context of the institutional quality, Ahmed et al. (2021) indicate on the effects for the long run economic growth. The effects that appear from the institutional environment may be understood through evaluation of certain factors.

In the scientific studies, transition countries gain special attention in the context of the peculiarities of financial system. The CEE region includes countries that went through restructuring of the banking system at the end of the XX century. Depth and stability of

financial system, structure of financial investments, technical efficiency of the banking sector, regulatory measures, loan growth, internationalization of the banking sector, ability of banks to overcome crises, and soundness of banks are at the core of studies (e.g., European Investment Bank, 2020; Kočenda & Iwasaki, 2020; Vunjak et al., 2020; Horvatova, 2018; Gallizo et al., 2017; Lapteacru, 2017; Iwanicz-Drozdowska & Witkowski, 2016; Jočiene, 2015; Nitoi & Spulbar, 2015; Li & Ferreira, 2011; ECFIN Economic Brief, 2010; EC Directorate-General for Economic and Financial Affairs, 2010; Brada et al., 2021; Agoraki & Kouretas, 2021).

The characteristics of the banking sector in the CEE region are useful for understanding research results. Table 1 presents general characteristics.

Table 1 – General characteristics of the banking sector in the CEE region

Positive characteristics	Negative characteristics
Completed process of restructuring and reforming of the banking sector during the transition to market economy;	Foreign investments in banking sector are not diversified sufficiently;
Introduction of European Union's standards;	Dependence of banks in domestic market on decisions made in parent banks;
Increased competitiveness of the banking sector due to reforms made;	Foreign banks may encourage financial vulnerability of the banking sector in host country;
Increased competition between participants of financial market;	Efficiency of banks is not stable in the region and varies depending on country and time;
Entrance of foreign investments;	Due to differences in institutional environment, cost efficiency in the region is lower comparing with more advanced economies in Europe;
Cross-border cooperation between financial institutions using as a basis cultural and languages as well as geographical neighbouring;	Insufficient regulation and risk management in banking sector;
Ability to absorb and to overcome financial crisis relatively stable and fast, although, at NUTS3 regional level regions differ in their performance.	Insufficient investments in "green" and "digital" areas of development.

Source: compiled by the authors using European Investment Bank, 2020; Kočenda & Iwasaki, 2020; Vunjak et al., 2020; Horvatova, 2018; Gallizo et al., 2017; Lapteacru, 2017; Iwanicz-Drozdowska & Witkowski, 2016; Jočiene, 2015; Nitoi & Spulbar, 2015; Li & Ferreira, 2011; Deroose et al., 2010; European Commission. Directorate-General for Economic and Financial Affairs, 2010; Brada et al., 2021.

Understanding of the mentioned general characteristics in the context of institutional factors considered within the article, it is noteworthy to indicate that the CEE region demonstrates linkages, which result from the previous and ongoing developments and provide effects on the level of the soundness of banks.

In conclusion, it is possible to compare institutional peculiarities between two cases under research according to the data of correlation coefficients. For solving the issue on data comparability for the indicators of interdisciplinary nature, the authors used data from the "The Global Competitiveness Report 2019" (Schwab, 2019). Within the mentioned report (Schwab, 2019) each indicator relates to the certain pillar and its components. The next table (see Table 2) highlights pillars and its components (from the Global Competitiveness Report 2019), which are represented by the indicators analysed previously. The Table 2

demonstrates similarities and differences for the cases under research in terms of the essence of the institutional factors. The knowledge presented may be useful for the further analysis.

Table 2 – Summary of more pronounced similarities and differences for the cases under research in terms of the nature of institutional factors

Areas linked with the functioning of the banking system	Indicator analysed	Pillar or its component according to the Global Competitiveness Report
Similarities for the cases under research		
Economy	'Venture capital availability'	Depth of financial system
	'Financing of SME'	
Banks' monitoring and reporting	'Strength of auditing and accounting standards'	Corporate governance
Differences for the cases under research		
Shareholders, creditors, debtors	'Non-performing loans % of gross total loans'	Stability of financial system
Public sector	'Government long-term vision'	Public sector performance
	'Government's responsiveness to change'	
	'Government ensuring policy stability'	
	'Burden of government regulation'	

Note: Similarities and differences by strength and/or direction of relationship according to correlation coefficients.

Source: compiled by the authors using calculation results and sense of indicators from Schwab (2019).

In the conclusion of the data analysis, it is noteworthy to present similarities and differences that appear between the two cases under research. Given the initial framework of the data analysed (see Schwab, 2019) it is possible to indicate similarity between the CEE region and the "top 10" countries by the 'Depth of financial system' and the 'Corporate governance' and difference by the 'Stability of financial system' and the 'Public sector performance'.

For the CEE region, scientists characterise structural reforms that create competitive labour and business markets (Psillaki & Mamatzakis, 2017). Additional positive effects on the banking sector appear from credit regulations according to the research of Psillaki and Mamatzakis (2017). Delis (2010) writes about substantial effects from macroeconomic conditions on the banking sector. In the context of the CEE region, Setiawan et al. (2021) conclude that development of financial market sector and macroeconomic stability will foster economic growth. Scientists indicate that the CEE region has highly concentrated banking market and less-developed financial market (Bergantino & Capozza, 2018) with low convergence level (Nițoi & Pochea, 2016).

Overall, regulatory and supervision measures (for example, capital requirements, official supervision, market discipline) significantly affect performance of the banking sector according to the research of Agoraki and Kouretas (2021). In the context of the CEE region, scientists devote attention to the ownership structure by indicating effects on

lending offer (Agoraki and Kouretas 2021) and determining effects depending on type of crises (Allen et al., 2017). Corporate governance is recognized as crucial for the soundness of banks among other factors (e.g., Kočenda & Iwasaki, 2020).

In the CEE region, high expansion of credit activities stimulated overheating of economies and increasing of non-performing loans (Festić et al., 2011). Studying the effects on the banking sector, scientists analyse ownership (e.g., Efthyvoulou & Yildirim, 2014), technology gap (Huang, Chiang, & Tsai, 2015), and credit risks (e.g., Škrabić Perić, Rimac Smiljanić, & Aljinović, 2018).

Scientists link indicators that represent public sector performance with success and stability of the banking system. For example, using covid-19 pandemic time as case study Shabir, Jiang, & Işık, (2023) indicate on significance of regulatory environment and institutional quality for the soundness of banks. Měřo and Piroška (2016) write that the role of state is significant in maintaining stable banking sector in the countries of the CEE region. Additionally, Agoraki and Kouretas (2021) show the role of regulatory measures and supervision activities for the development of loan activities. Mikheeva and Juuse (2021) argue that bureaucratic approach to financing-related decisions may hinder development of strategic vision to economic policies.

In conclusion, it is noteworthy to indicate that the CEE region follows overall trends that are necessary for functioning of the sound banking system (see Figure 2, Table 2). The strongest positive relationship appears for the indicators representing the 'Depth of financial system' and the 'Corporate governance' (see Figure 2). Given results for the "top 10" countries, the CEE region needs to pay more attention to the quality of indicators related to the 'Public sector performance' and the 'Stability of financial system'.

The detailed look at the initial data for the analysis at country-level within the groups under research demonstrates that mostly the countries are homogenous within the group and heterogeneous between the groups by indicators. Figure 3 presents indicators, which according to the analysis provide similarities and differences between the cases (see Figure 3 and Table 2).

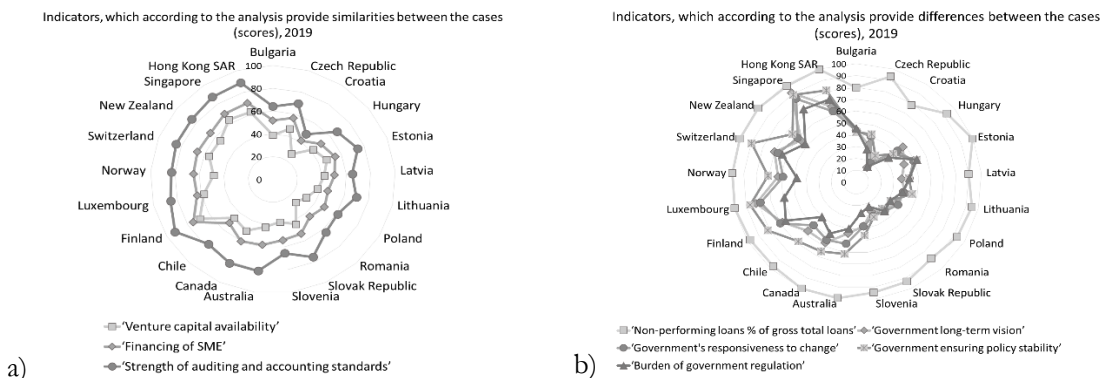


Figure 3 – Indicators which according to the analysis provide similarities and differences between the cases, 2019, scores

Note: "top 10" countries and countries of the Central and Eastern Europe are indicated in section Method.

Source: elaborated by the authors using data of The Global Competitiveness Report 2019 (Schwab, 2019).

Analysis of the scores at countries' level (see Figure 3), allows for understanding peculiarities of institutional environment for the cases under research. Average scores for indicators that ensure similarities between the cases under research (see Table 2) indicate on lower level of the 'Depth of financial system' and the 'Corporate governance' in the CEE region. Although, the CEE region lags behind the "top 10" countries no more than by 20 score points for the indicators of 'Venture capital availability' (average scores for the CEE region is 38.4, for the "top 10" 55), 'Financing of SME' (average scores for the CEE region is 50, for the "top 10" 64.5), 'Strength of auditing and accounting standards' (average scores for the CEE region is 65.8, for the "top 10" 84.7).

Maximal scores for the indicators demonstrate that Estonia (for 'Venture capital availability'), Czech Republic (for 'Financing of SME'), and Slovak Republic (for 'Strength of auditing and accounting standards') reach the results that are the highest within the CEE region but are close to only the minimal scores within the "top 10" countries. Thus, combining the results from the correlation analysis (see Figure 2, Table 2) with the results from the indicators' analysis (see Figure 3) allows concluding that development direction of the institutional environment of banks in the CEE region is correct but quality level insufficient at the moment what results in lower level of the soundness of banks than in the "top 10".

Minimal scores for indicators that ensure similarities between the cases under research demonstrate lower results in the CEE region than in the "top 10" for the 'Venture capital availability' and 'Strength of auditing and accounting standards'.

Differences between the countries within the CEE region are not pronounced very brightly, although exist (see Figure 3a). Overall, the CEE region needs to boost development of the 'Depth of financial system' and the 'Corporate governance', especially in the countries with the lower results (see Figure 3a).

In terms of the differences between the CEE region and the "top 10" (see Table 2), average scores indicate on significantly lower results in the CEE region in terms of the 'Stability of financial system' and the 'Public sector performance'. The countries of the CEE region, which demonstrate better results for the public sector performance, significantly lag behind the "top 10" (e.g., the 'Government long-term vision' – maximal score 47.6 in Hungary, and 81.9 in Luxembourg, minimal score 15.1 in Croatia, and 43.9 in Australia). Similarly, bright differences between the CEE region and "top 10" are observed for the indicators 'Government's responsiveness to change', 'Government ensuring policy stability', and 'Burden of government regulation' (see Figure 3 a, b). Differences for the indicator 'Non-performing loans % of gross total loans' are less pronounced (average scores for the CEE region is 90.7, for the "top 10" 99). Additionally, the maximal scores 99.6 in Estonia is very close to the maximal scores in Canada 100 (see Figure 3). Although, minimal values differ brighter, i.e., 78.4 in Croatia and 97.1 in Chile.

In conclusion, it is noteworthy to indicate that in the terms of the indicators analysed, countries mostly are homogenous (see Table 2, Figure 3) within the cases under research except some outlying results (see Figure 3). Differences between maximal and minimal scores comparing the cases under research confirm that the CEE region needs improvements in the quality of institutional environment and the according indicators.

Although, the research has limitations in terms of geography of the cases under research and data applied for the analysis, the research results may be useful for better understanding of the peculiarities of institutional factors encouraging the soundness of banks.

6. Conclusions

At this stage of the research, it is noteworthy to indicate that relationship between quality of institutions and overall stability of the financial system exists. The article is devoted to the institutional factors significant for the soundness of banks. The article aims to detect linkages between institutional factors and the soundness of banks for the CEE region and to compare results with the “top 10” countries according to the data of Global Competitiveness Report.

Banking sector is the subject for the effects from institutions representing economy, society, public sector, legislation, climate change, and technologies. The analysis of scientific literature allows for supposing that understanding of institutional factors, which are of greater significance for the soundness of banks, still is insufficient. This article contributes to the knowledge gap by including in the analysis the institutional factors of interdisciplinary nature and comparing the cases that differ by the level of the soundness of banks. The novel contributions of the research relate to the complex approach and the analysis of interdisciplinary institutional factors simultaneously what is rarely presented in studies.

Authors' calculations allow concluding that regardless of the level of the soundness of banks, similar strength and direction of linkages between the soundness of banks and indicators ‘Venture capital availability’, ‘Financing of SME’, and ‘Strength of auditing and accounting standards’ are observed. Given the sense of the indicators analysed, the results indicate that the ‘Depth of financial system’ and the ‘Corporate governance’ are important for the soundness of banks according to the cases the “top 10” and the CEE region. The previous research findings highlight significance of the mentioned institutional factors for the soundness of the banking system (e.g., Kočenda & Iwasaki, 2020; Shabir, Jiang, & Işık, 2023; Bergantino & Capozza, 2018; Psillaki & Mamatzakis, 2017). The present research adds knowledge as a result of comparison of the cases with different level of the soundness of banks. Additionally and in contradiction to the criticism presented within the studies on the CEE region's banking system, the present study demonstrates also positive tendency on similarity between the region and the “top 10” in terms of the linkages between the institutional factors and the soundness of banks.

For the cases under research, the more pronounced difference appears by opposite direction of relationship for indicators representing public sector, i.e., ‘Government long-term vision’, ‘Government's responsiveness to change’, ‘Government ensuring policy stability’, ‘Burden of government regulation’ and for indicator ‘Non-performing loans % of gross total loans’. Thus, the sense of the indicators analysed indicates that difference between the cases appears by the linkages with indicators representing the ‘Public sector performance’ and the ‘Stability of financial system’. These results correspond with the previous research experience, where researchers highlight the role of state for ensuring stability and development of the banking sector and indicate on necessity to improve

public sector performance in the CEE region (e.g., Mérő & Piroska, 2016; Agoraki & Kouretas, 2021; Mikheeva & Juuse, 2021). The present study demonstrates that the CEE region lags behind the “top 10” countries in terms of linkages between the public sector performance and the soundness of banks.

Overall, characteristics of the banking sector in the CEE region confirm conclusions that appear from the calculations results. The region has successfully implemented reforms of the banking sector and has introduced European Union’s standards. As a result, one may indicate that the CEE region has similar strength and direction of linkages for the soundness of banks with indicators, which represent the ‘Corporate governance’ as well as the ‘Depth of financial system’ as in the countries with the highest soundness of banks.

Dependence of the banks in the region from the decisions in parent banks in other countries and insufficient diversification of foreign investments increase vulnerability of financial system. As a result, one may indicate that the CEE region has different direction of linkage for the soundness of banks with indicator representing stability of financial system as in the “top 10” countries. Insufficient regulation and risk management caused moderate performance in public sector.

In conclusion, for the case with lower level of the soundness of banks, research results indicate that overall trends that are necessary for functioning of the sound banking system are observed. Although, several indicators significant for the sound banking system demonstrate weak and/or negative direction of relationship with the soundness of banks what has to be improved in the future.

Thus, the results of the correlation analysis and indicators’ analysis allow indicating that development direction of the institutional environment of banks in the CEE region is correct but the quality level is insufficient at the moment what results in the lower level of the soundness of banks than in the “top 10”. The research findings may provide knowledge for development of institutional environment of banks.

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