“Identifying the volatility of compliance risks for the pension custodian banks”

AUTHORS	Svitlana Achkasova Olena Bezrodna Yevheniia Ohorodnia

ARTICLE INFO	Svitlana Achkasova, Olena Bezrodna and Yevheniia Ohorodnia (2021). Identifying the volatility of compliance risks for the pension custodian banks. *Banks and Bank Systems*, *16*(3), 113-129. doi:10.21511/bbs.16(3).2021.11
DOI	http://dx.doi.org/10.21511/bbs.16(3).2021.11
RELEASED ON	Wednesday, 22 September 2021
RECEIVED ON	Monday, 05 July 2021
ACCEPTED ON	Thursday, 05 August 2021

JOURNAL	"Banks and Bank Systems"
ISSN PRINT	1816-7403
ISSN ONLINE	1991-7074
PUBLISHER	LLC “Consulting Publishing Company “Business Perspectives”
FOUNDER	LLC “Consulting Publishing Company “Business Perspectives”

NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
63	4	3

BUSINESS PERSPECTIVES

LLC "CPC "Business Perspectives"
Hryhorii Skovoroda lane, 10,
Sumy, 40022, Ukraine

www.businessperspectives.org

Svitlana Achkasova (Ukraine), **Olena Bezrodna** (Ukraine),
Yevheniia Ohorodnia (Ukraine)

IDENTIFYING THE VOLATILITY OF COMPLIANCE RISKS FOR THE PENSION CUSTODIAN BANKS

Abstract

The high probability of risk transfer from banks to their counterparties in the field of non-state pension provision (pension account owners, non-state pension funds, insurance companies, asset management companies, etc.) determines the relevance of this study. The paper aims to develop a toolkit for identifying the compliance risk volatility for pension custodian banks based on causal modeling.

This toolkit contributes to: 1) tentative cognitive mapping of the causal relationship between the compliance risks of pension custodian banks in the field of financial monitoring and financial and reputational risks to assess their acceptability by stakeholders in non-state pension programs, and 2) impulse modeling.

The created toolkit is based on the performance data provided by Ukrainian banks, as well as on the reports of the National Bank of Ukraine. Apparently, an increase in penalty rates by 0.1% would reduce the compliance risks for banks by 0.03%, and the number of violations in financial monitoring (specifically the improper assessment/reassessment of customer risks) by 0.01%. In turn, the compliance risk volatility inherent in custodian banks affects the variability of their reputational and financial risks. Thus, reducing the compliance risks by 0.1% would improve the reputation of banks and increase their regulatory capital by 0.01%.

The study findings substantiate the use of the created toolkit to supplement the risk profile components for pension custodian banks, thereby demonstrating the potential volatility of their compliance risks and their consequences for banks and individual groups of their stakeholders.

Keywords compliance risks, custodian banks, pension assets, financial monitoring, financial and reputational risks

JEL Classification C15, G21, G23

Received on: 5th of July, 2021
Accepted on: 5th of August, 2021
Published on: 22nd of September, 2021

Svitlana Achkasova, Ph.D. in Economics, Associate Professor of the Department of Banking and Financial Services, Simon Kuznets Kharkiv National University of Economics, Ukraine.

Olena Bezrodna, Ph.D. in Economics, Associate Professor of the Department of Banking and Financial Services, Simon Kuznets Kharkiv National University of Economics, Ukraine. (Corresponding author)

Yevheniia Ohorodnia, Ph.D. in Economics, Simon Kuznets Kharkiv National University of Economics, Ukraine.

Conflict of interest statement:
Author(s) reported no conflict of interest

INTRODUCTION

In addition to the key functions inherent in the specifics of banking business, integration into non-state pension programs increases the functional load on banks with respect to pension assets (directly in cooperation with the owners of pension accounts; through "chain transactions" with non-state pension funds, insurance companies, asset management companies), as well as the complex integration of the functions performed by the founder, asset administrator, and asset manager when creating corporate pension funds. Accordingly, when the role of banks increases, financial and social effects are synthesized, ultimately enhancing the importance of banks in ensuring the stability of the national financial system and implementing the strategically vital tasks to promote socio-economic development in a country.

The defined contribution pension system in Ukraine is still in its infancy. In 2018–2020, the total asset value of non-state pension funds grew by almost 32% (from UAH 2,651,000,000 to UAH 3,488,600,000),

while the profit from the asset investment increased by 57% (from UAH 1,355,300,000 to UAH 2,119,700,000). Meanwhile, bank deposits and public securities as fixed income instruments (despite the existing restrictions on the assets investment by non-state pension funds in the amount of 50% for each specific investment area) account for more than 80% of invested pension assets.

Banks are naturally interested in raising additional funds, but other entities involved in pension asset depositing and safekeeping programs ("chain transactions") are exposed to certain threats, taking into account the sufficiently risky activities conducted by the banks. Therefore, to protect the property rights and lawful interests of the participants of non-state pension funds, it is necessary to (1) intensively supervise and monitor banks that are engaged in the pension assets safekeeping (the National Securities and Stock Market Commission licenses the Ukrainian banks to perform the depositary functions in accordance with its own procedures); and (2) form and implement the prudent approach to the policy relevant issues by the counterparties of pension custodians concerning the establishment and development of mutual relationship, i.e. the reasonable approach to the custodian bank selection, as well as its performance monitoring in order to secure them against any potential transference of the bank's financial risks. As it happens, pension assets kept in the Ukrainian banks are poorly secured so far. Once these banks are qualified as insolvent, the return of the pension assets is under certain threats. On the one hand, this is because non-state pension funds' assets (with the exception of deposits) are not included in the liquidation estate of such banks; on the other hand, this is caused by the return of deposits, for which the insolvent banks retain liabilities before the non-state pension funds at the cost of the liquidation estate sale only on a seventh-priority basis.

In addition to financial risks that can directly affect the financial position of pension custodian banks and define their stability, the need to minimize banks' exposure to compliance risks is of paramount importance for other participants of non-state pension programs interacting with these banks. Otherwise, financial and reputational damage resulting from the compliance risk actualization will affect their financial standing, destabilize and pose a threat to pension assets.

Directive (EU) 2016/2341 of the European Parliament and of the Council dated December 14, 2016 on the activities and supervision of institutions for occupational retirement provision (IORPs) is particularly emphatic about the importance of sufficient potential for the implementation of risk management and compliance functions (EU, 2016).

Therefore, given the importance of the issues pertaining to compliance control and compliance risk assessment, not only for pension custodian banks and supervisory agencies, but also for their counterparties in the field of non-state pension programs, it is necessary to develop a theoretical basis and tools to assess the potential increase and materialization of the compliance risks.

1. THEORETICAL BASIS

1.1. Banks' compliance with regulatory requirements

The regulations applicable to implementing the compliance functions and the key principles of the institutional compliance management in banks were developed by the Basel Committee on Banking Supervision and presented as consultation documents (BCBS, 2003–2005). In turn, scholars address the following aspects in the study reports: implementing the compliance functions in banks (Singh, 2003; Edwards & Wolfe, 2004; Haynes, 2005; Misha, 2016); functional duties and roles of bank compliance officers (Fox, 1999; Meissner, 2018); assessing the compliance risks and their consequences, and compliance risk management (Haddad, 2016; Safari et al., 2016; Limentani & Tresoldi, 2012; Misha, 2016; Nicolas & May, 2017; Birindelli & Feretti, 2008; Ludwick, 2006; Losiewicz-Dniestrzanska, 2015; Asenov, 2015; L. Prorokowski & H. Prorokowski, 2014; Kaminski & Robu, 2016; Root, 2019).

http://dx.doi.org/10.21511/bbs.16(3).2021.11

According to analytical studies (Birindelli & Feretti, 2008) on the identification of compliance regularities and, specifically, the comparison of compliance systems used by Italian banks and structural subdivisions of foreign banking groups, the latter seem to pay more attention to compliance issues. Gabbi et al. (2011) also factored in the criterion of international activity while cross-checking various groups of financial institutions (banks, insurance and investment companies) and pointed out that financial go-betweens with foreign capital appeared to be more experienced in terms of their ability to assess compliance risks and recognize their danger. In addition, Gabbi et al. (2011) identified the relationship between the scope (size) of the financial institution's business and the effective compliance risk management therein. According to Arasa and Ottichilo (2015), smaller institutions have limited income and cannot maintain the expenses on the compliance with KYC (Know Your Customer) requirements. Dahl et al. (2016) address the matter of assessing the compliance costs while comparing the same for the smaller and the bigger banks, and conclude that smaller banks incur bigger expenditures. In their empirical studies, which involved officers of the Latvian banks, Lagzdins and Sloka (2012) reviewed assessing compliance systems and implementing compliance programs. Following the study, the authors concluded that banks had no program concept defining the need for organizational improvements, especially for small- and medium-sized banking institutions.

In its report, the international consulting company Ernst & Young (E&Y, 2021) notes that COVID-19 truly catalyzed the changes in leading banks and predicated the need for the expedited transformation of the compliance function. One of the latest studies conducted by Ernst & Young covered 21 European banks, most of which today implement compliance functions by using traditional compliance risk monitoring models. However, there seem to be a great interest and outlines of prospective ways of adopting a more technologically advanced model (by integrating it into the compliance function to promote compliance with regulatory requirements).

Considering the need to achieve the synergy between the objectives of compliance functions and risk management in banks (Fox, 1999), Edwards and Wolfe (2007) and Mikes (2008) studied certain aspects concerning the significance of compliance with regulatory requirements and the improvement of compliance functions and risk management not only for financial institutions, but also for their stakeholders. Edwards and Wolfe (2007) point out that an important aspect of day-to-day life of any corporate business, especially financial institutions of the United Kingdom, implies the ability to demonstrate the compliance with and competence in regulatory requirements to regulators and other third parties. Mikes (2008) also emphatically indicates that the interaction with a large number of stakeholders would require that risk managers form a clearly defined position regarding risk functions in the organizational management process and clarify the involved parties' expectations with respect to risk management.

As for the intersection of the banking sector and non-state pension provision, relevant issues appear to be more related to defining the specific features of the activities conducted by custodian banks and the problems inherent in the custodian business (Lugho, 2007; Chan et al., 2007; Scrimgeour, 2011; Kyalo, 2014; Mrsik & Trpkov, 2015; Coste et al., 2021, and others). To this end, Kyalo (2014) addressed the problems faced by banks that provide custodian services in the context of pension assets. The author also found out that Kenyan banks engaged in the depositary services provision are most frequently exposed to the regulatory non-compliance, credit, strategic, and reputational risks. That is why custodian banks are also subject to high compliance costs (Coste et al., 2021) and get involved in the efforts to curtail money laundering (Chan et al., 2007).

1.2. Compliance risks of banks: assessment and management issues

The compliance risk is most frequently construed as the likelihood of legal sanctions, claims of supervisory authorities, considerable financial or reputational damage that an organization may face resulting from its failure to comply with the applicable laws, bylaws, industrial standards, best practices, and ethical standards. Given the substantive characteristics of the compliance risk, its conse-

quences for banks can be disastrous. According to Safari et al. (2016), the institutions are exposed to the compliance risk due to their relationship with numerous interested parties. As it follows from to the paper (PricewaterhouseCoopers LLP, 2003), one of the reasons why financial institutions are unable to comply with the regulatory requirements is the gap between the historical approach to compliance and what is really needed for assessing and reducing the totality of the existing risks. Due to the negative perception by regulators, customers, and other stakeholders concerned, these organizations are threatened with losing their reputation. On the other hand, the actualization of compliance risks may affect stakeholders.

Compliance risk assessment is carried out in several ways: in terms of the probability of events occurring and their consequences, if they do occur (Ludwick, 2006; Birindelli & Feretti, 2008), taking into account the impact factors (Haynes, 2005) or the risk probability and rating of the risk factors (Losiewicz-Dniestrzanska, 2015). When reviewing the compliance risks identification and assessment for banks, Asenov (2015) suggests applying the following indicators: the number of customer complaints, the amount of cash payments, the number and frequency of the detected violations for the banks' failure to comply with the applicable laws, etc. In the context of compliance risk assessment, Nicolas and May (2017) deem it necessary to take into account the findings of the supervisory control, the data obtained from the internal compliance tests and the external audit results, external inspections and calculations, customer data, business data, etc.

According to Ernst & Young (E&Y, 2021), the main areas covered by the banks' compliance function are as follows: compliance with the requirements of the applicable laws, financial crimes enforcement, data confidentiality, cybersecurity, operational activities, and interaction with the third parties (counterparties). Some areas are characterized by the related risks, one of which is the compliance risk associated with the prevention of money laundering, terrorist financing and proliferation of weapons of mass destruction.

The AML (Anti-Money Laundering) compliance and risk management in this field was addressed by Singh (2003), Apreda (2006), Lagzdins and Sloka (2012), Viritha et al. (2015), Arasa and Ottichilo (2015), Naheem (2015), Yeoh (2019), Raghavan (2006), Davilas (2014), Maximillian and Teichmann (2017), Bello and Harvey (2017), Kolodiziev et al. (2020), as well as in the Guidance for a Risk-based Approach in the Banking Sector (FATF, 2014), and outlined in the Guidelines to Sound Management of Risks Related to Money Laundering and Financing of Terrorism (BCBS, 2014).

Singh (2003) and Apreda (2006), Lagzdins and Sloka (2012) emphatically point out that the AML compliance represents a powerful tool for the improvement of corporate governance in the banks. According to Singh (2003), the enhanced interest to promotion of the efficient corporate governance is further boosted by the concerns of the international financial community about the use of the banking system as a channel for criminal money laundering and terrorism financing. However, as it follows from Yeoh (2019), the efficient compliance with regulatory requirements by banks for the purpose of money laundering/terrorism financing (ML/TF) prevention is still hindered by the competitive pressure, shareholder income imperatives, incentives for the aggressive profitability growth and the growing prices on the shares.

To identify the bottlenecks in the compliance function implementation for the purpose of supporting the anti-money laundering program, Viritha et al. (2015) interviewed bank employees in India. The questions offered to the respondents covered the following areas: the employee's and the bank's profiles; countermeasures (anti-money laundering policy; customer identification procedures, risk assessment, and management; bank transfer management; transaction monitoring; reporting; updating of the KYC mechanisms); problems related to the anti-money laundering policy implementation (deficient resources, lack of customer support, and other restrictions to promote the anti-money laundering policy). Following the study, the authors rated the adaptability of the ML/TF policies established by Indian banks as unsatisfactory. Arasa and Ottichilo (2015) studied factors influencing the compliance with the KYC requirements by Kenyan banks. Out of the factors with the statistical importance confirmed by the existing regressive model, the authors singled out: cus-

http://dx.doi.org/10.21511/bbs.16(3).2021.11

tomer properties, bank size, staff competence, and the infrastructure of data communication technologies. The authors emphasized that the first two factors had the biggest impact on the compliance with the KYC requirements. Root (2019) emphasizes the necessity to identify root causes of the compliance violations taking into account the provisions of cognitive psychology, behavioral economics, and behavioral ethics. The author also refers to the multi-faceted nature of the cause of such discrepancies, such as the flawed implementation of the compliance function, difficulties associated with supervising the compliance programs, and the lack of the integrated compliance culture throughout the corporate structure.

According to the Guidelines to Sound Management of Risks Related to Money Laundering and Financing of Terrorism (BCBS, 2014), inadequate or improper ML/TF risk management (due to insufficiently operated risk management and control policies and procedures) provokes grave consequences for the banks. These consequences include, among others, the enforcement actions taken by regulators and damages incurred directly or indirectly by banks. All this requires a risk-oriented approach that serves to promote the development of the prevention and mitigation measures that are proportionate to the identified ML/TF risks, and the accessibility of all pertinent information about banks and compliance risks (FATF, 2014).

To achieve the effective compliance risk management of banks in the field of financial monitoring, researchers pointed out the need to promote the consistency between the compliance with anti-money laundering requirements, general customer relations, and the structure of internal control over business areas (Raghavan, 2006); integrate the process of compliance with anti-money laundering rules into the corporate social responsibility (Naheem, 2015); introduce the uncertainty-based approach as an alternative to the risk-based approach (Bello & Harvey, 2017); integrate the internal control systems, risk management, personnel management, and computerization of systems and processes related to compliance (Haddad, 2016); develop a compliance risk assessment program while considering potential financial losses, regulatory impact and negative impact on reputation (Nicolas & May, 2017); automate the collation of data for generation of compliance risks reporting (Ludwick, 2006); and combine the automated machine learning and big data analysis algorithms to detect fraudulent schemes (Kolodiziev et al., 2020).

According to Kaminski and Robu (2016), when implementing the compliance function, it is necessary to identify the prospects for the applicability of laws, rules, and regulations in business and processes; create risk description standards; develop the procedures for risk identification and assessment (methodology and tools for the risk measurement); develop and apply the standards to the analysis of the causes and risk tracking; analyze customers, transactions and products while taking into account risk criteria; assess the status of the general compliance program on a regular basis; understand the bank's risk culture and its strengths, as well as potential shortcomings. Asenov (2015) states that in the compliance risk management process, it is necessary to determine the risk profile, develop a system of decision-making powers in a bank, implement monitoring of operational risk indicators, and improve information and management systems.

Therefore, based on the analysis of the academic literature, it can be concluded that modern researchers mostly focus on general recommendations regarding the implementation of the efficient compliance functions by bank, particularly, the AML compliance. In addition, considering the regulatory compliance and improvement of risk management in the field of pension programs is well-timed and important (Musalem & Palacios, 2003; Stewart, 2010; IOPS, 2008; OECD, 2009; IOPS, 2012).

It is important to understand that AML threats identification, the objective assessment thereof, and forecasting of potential consequences are fundamental for the development of the operational algorithm applicable to: taking measures to promote the prevention and to counter further violations of regulatory requirements in financial monitoring; the elimination of these consequences and support of enhanced and efficient functioning of the risk management system in custodian banks; and preventing the involvement of pension assets in criminal money laundering schemes.

This sets the focus on the search for tools in the field of identification, measurement, and modeling of banks' compliance risks in financial monitoring, as well as represents an extremely important aspect for banks (pension custodians), their regulators, and other interested parties to the non-state pension system where it applies to establishing the feasibility vector while identifying the relations and threats to their development.

This aim of this paper is to form a toolkit for identifying volatility of compliance risks faced by banks (pension custodians) in the field of financial monitoring, based on causal modeling (cognitive map).

2. RESULTS

This study considers three key criteria defining the acceptance of pension custodian banks (meaning their reliability as counterparties), namely, compliance risks (Sheedy et al., 2019), taking into account the consequences of their actualization, financial risks and reputational risks (Osakwe et al., 2020; Barakat et al., 2019). The paper discusses the possibility of changing these criteria as a result of probable violations in the field of financial monitoring and measures taken to mitigate their impact, as well as measures taken by supervisory agencies, internal banking policies introduced by institutions in the field of AML compliance, and factoring in the likelihood of customers involving their bank in the network schemes.

To assess the compliance and variability of the acceptance criteria applicable to pension custodian banks affected by violations in financial monitoring and the enforcement measures, the supervision of the bank's activities, and the likelihood of the network schemes by customers, the causal approach and cognitive modeling method were applied. The choice of the cognitive modeling method was dictated by the need to:

- formalize and define the structural interaction of banking compliance criteria, actions taken by a regulator, likelihood of network schemes by market participants, and the quality of the intrabank compliance policy, as presented by the cognitive map concepts; and
- generate the potential scenarios for the modification of key compliance criteria used by pension custodian banks due to changes in the perspective involvement of banking institutions in the network schemes, the need to enhance the intrabank compliance, changes in the Central Banks' policies and the banking institutions' performance.

The cognitive modeling method is based on the construction of a fuzzy cognitive map. The cognitive map is a mathematical model of an indicative graph with peaks represented by multiple concepts. The directed arcs of the graph represent causal (cause-and-effect) links between the concepts (Kyzym & Uzunov, 2007; Gorelova et al., 2019).

It is suggested to use the following fuzzy cognitive maps presented in Silov (1995) in order to build a cognitive map of the acceptance criterion variability applied to pension custodian banks affected by violations and measures taken in financial monitoring, their performance supervision and the likelihood of network schemes by customers:

$$FCM = \langle C, F, W \rangle, \quad (1)$$

where C = $\{C_i\}$ – multitude (of concepts); $F = \{F_i\}$ – multitude of links between the concepts; $W = \{W_{ij}\}$ – multitude of arc weights (links).

To achieve the objectives, a set of 32 indicators was generated to characterize the banking institutions' compliance criteria, their variability, and the resulting volatility, which would serve as an analytical basis for the conduct of cognitive modeling and, consequently, development of the toolkit (Table 1).

To determine the compliance criteria variability for pension custodians, taking into account the impact of violations and influence in financial monitoring, and to promote the supervision of banks' performance through the enforcement of mandatory prudential ratios, and the likelihood of network schemes by customers, it is required to calculate key system indicators of a cognitive map, namely, consonance (Outdegree), dissonance (Indegree), and the impact of concepts on the system (Centrality). These indicators are determined when comparing the contours on the concept

http://dx.doi.org/10.21511/bbs.16(3).2021.11

Table 1. Analytical background for modeling banks' compliance risks (pension custodians) in the field of financial monitoring and their consequences

Parameter groups	Components
Parameters of banks' conformity (as pension custodians) to the interested parties' expectations in the field of non-state pension provision	Integrated index of the compliance risk assessment of bank financial monitoring (O1)
	Reputational risks (O2)
	Bank financial risks (O3)
Parameters characterizing factors that influence the key criteria of the banks' conformity to the interested parties' expectations in non-state pension provision and determine their variability	
Parameters for assessing the likelihood of the network schemes by bank customers	Country of incorporation (M1)
	Country of operation (M2)
	Accounting transactions potentially related to financial monitoring (M3)
	Channels of fund acquisition (M4)
	Falsification of documents (M5)
	Straw persons (M6)
	Legal entities (M7)
Parameters of violations in the field of financial monitoring	Violations related to the PEP service (C1)
	Failure to identify financial transactions subject to the mandatory financial monitoring (C2)
	Requirements for the identification, verification, and study of the bank's customers violated by the bank (C3)
	Improper customer risk assessment/reassessment (C4)
	Implementation of risky activities in financial monitoring (C6)
	Late information provision at the NBU's request and failure to provide the NBU with complete and reliable information in relevant reports (C9)
	Bank's failure to refuse to serve customers in cases provided by the legislation on financial monitoring (C12)
Parameters of the enforcement measures for violations in financial monitoring	Total penalty (Y1)
	Written warning (Y2)
	Penalty (Y3)
Banks' performance supervision parameters based on the enforcement of mandatory prudential ratios	Amount of regulatory capital (K1)
	Regulatory capital adequacy ratio (K2)
	Capital adequacy ratio (K3)
	Liquidity ratio (K4)
	Ratio of the maximum amount of credit risk per counterparty (K5)
	Ratio of large credit risks (K6)
	Ratio of the maximum amount of credit risk for transactions with persons related to a bank (K7)
	Ratio of investing in securities separately for each institution (K8)
	Total investment ratio (K9)
	Limits on the long open foreign exchange position (K10)
	Limits on the short open foreign exchange position (K11)
	Liquidity Coverage Ratio (K12)

Note: Violations committed by banks in financial monitoring that proved to be of little importance in the course of the study include failure to apply the proper procedure of data submission to the competent agency (C5); failure to apply financial transaction suspension procedures (C7); improperly performed obligation to develop, enforce, and update the bank's bylaws pertaining to financial monitoring on a regular basis in accordance with the applicable laws (C8); operating software that does not automatically detect and suspend financial transactions before it has been completed in cases envisaged by the applicable laws (C10); failure to apply the proper procedure to record financial transactions (C11).

maps in accordance with the compliance criterion, balance, and the extent of impact (Silov, 1995).

A consonance is the function that takes into account positive and negative impact and links between all research process components. The higher the value, the higher the validity of the impact indicator. A dissonance reflects the extent of distrust in the impact results.

In turn, the impact on the system exerted by the concepts reflects the maximum positive or ne-

gative impact of violations and the appropriate measures in the field of financial monitoring, the Central Bank's regulations, the level of the internal compliance established by a banking institution and the likelihood of network schemes on the criteria of banks' conformity to the interested parties' expectations in the context of implementing the non-state pension system.

Based on the calculated values of the relevant system indicators and the matrix of mutual influence between the concepts of a non-linear cognitive map, one would proceed with impulse modeling (using the Mental Modeler software) and implement variability scenarios for the compliance criteria applicable to banks that act as pension custodians, factoring in the interested parties' expectations that result from the changes in the measures of financial monitoring, compliance, banking regulation, and supervision.

The cognitive modeling was based on the statistical reporting of the National Bank of Ukraine (NBU) and performance indicators of ten systemically important banks of Ukraine, to which influence measures were applied for identified violations in the financial monitoring sphere during 2018–2020 (NBU, 2018–2020).

The resulting fuzzy cognitive map (see Appendix A) represents a mutual relationship between the variability of compliance criteria applicable to banks acting as pension custodians (levels of compliance risks in the financial monitoring sphere, financial and reputational risks) impacted by financial monitoring, supervised by the National Bank of Ukraine and facing the likelihood of the network schemes by bank customers.

The parameters that are construed to be the key concept of the cognitive model were calculated as follows:

1) the compliance risk assessment is based on applying the methodology to build an integrated indicator presented in Chmutova et al. (2020);

2) the reputational risk assessment relies on the average values of three ratings (mentioned below) that form the reputation of banking institutions. Based on the criteria of publicity, accessibility, awareness, objectivity, and locality, the following factors have been chosen to assess the banks' reliability:

- the bank soundness rating of the Ministry of Finance of Ukraine (where the key components include stress resistance, loyalty of depositors, expert opinion of the analysts, ranking by retail deposits);
- the financial health rating developed and introduced by the International Center for Policy Studies supported by the Independent Association of the Banks of Ukraine (based on the reliability sub-index, containing the criteria that characterize the degree of the bank's compliance with the key prudential ratios; sub-index of efficiency, namely, the criteria reflecting the bank's ability to generate profit and the efficient use of its assets);
- the bank viability rating by the business portal of Ukraine (based on the values of instant liquidity, size of net assets, and the amount of impaired loans);

3) the assessment of the financial risk by building an integrated indicator containing the values for capital adequacy, overall liquidity, and liquidity coverage for all currencies, as well as credit risk ratios, investment ratios, and the net foreign exchange position limit.

According to Appendix A, the fuzzy cognitive map of the acceptance criterion variability applied to the banks acting as pension custodians, taking into account the impact factors, combines 32 components, including: 10 driver concepts characterizing the impact on other concepts but giving no evidence of being affected by any of these concepts; 22 ordinary concepts that are regular concepts influencing and being influenced by the system components. The first category includes all the indicators characterizing the potential threats of the bank's involvement in network schemes (Country of incorporation, M1; Country of operation, M2; Transactions, M3; Channels of fund acquisition, M4; Falsification of documents, M5; Straw persons, M6; Legal entities, M7) and actions of the financial monitoring regulator (Total penalty, Y1; Written warning, Y2), liquidity requirements (K4).

http://dx.doi.org/10.21511/bbs.16(3).2021.11

To formalize the dependence of the acceptance criteria applied to the banks acting as pension custodians, as well as violations and influence measures in financial monitoring, the probable existence of the network schemes and prudential ratios implemented by the National Bank of Ukraine, the influence strength is determined taking into account the correlation analysis (Appendix B).

The linguistic-numerical scale (Saliieva & Yaremchuk, 2019) helps identify the relationship between the key impact measures in financial monitoring and key criteria of banking institutions ranging from medium (0.35 – 0.6] to strong (0.6 – 0.85]. Based on the correlation analysis (see Appendix B) and the linguistic construction, the key relationships were formalized and identified (weak, moderate, and strong).

The following analyses were conducted using the matrix of concepts that comprises a non-linear cognitive map of the transitively looped cognitive matrix. These include:

1) the structural analysis of the cognitive map showing the acceptance criterion variability applicable to pension custodians, taking into account the impact exerted by financial monitoring measures and regulations of the National Bank of Ukraine in non-state pension provision and the likelihood of network scheming by the bank's customers;

Table 2. Formalization of compliance criteria for banks acting as pension custodians, financial monitoring measures, the extent of banks' internal compliance and NBU regulations

Component	Indegree	Outdegree	Centrality	Type
Compliance risk assessment of bank financial monitoring (O1)	7.55	2.87	10.42	Ordinary
Reputational risks (O2)	2.58	0.36	2.94	Ordinary
Bank financial condition (O3)	3.03	0.34	3.37	Ordinary
Country of incorporation (M1)	0	1.5	1.5	Driver
Country of operation (M2)	0	1.5	1.5	Driver
Transactions (M3)	0	1.5	1.5	Driver
Channels of fund acquisition (M4)	0	1.5	1.5	Driver
Falsification of documents (M5)	0	1.5	1.5	Driver
Straw persons (M6)	0	1.5	1.5	Driver
Legal entities (M7)	0	1.5	1.5	Driver
Requirements for the identification, verification, and study of the bank's customers violated by the bank (C3)	5.56	1.37	6.93	Ordinary
Bank's failure to refuse to serve customers (C12)	6.99	0.42	7.41	Ordinary
Violations related to the PEP service (C1)	4.78	0.71	5.49	Ordinary
Implementation of risky activities in the field of financial monitoring (C6)	3.6	1.43	5.03	Ordinary
Failure to identify financial transactions (C2)	2.47	1.2	3.67	Ordinary
Total penalty (Y1)	0	4.12	4.12	Driver
Written warning (Y2)	0	2.31	2.31	Driver
Penalty (Y3)	1.24	4.3	5.54	Ordinary
Large credit risks (K6)	0.43	3.52	3.95	Ordinary
Regulatory capital (K1)	0.62	2.83	3.45	Ordinary
Late information provision at the NBU's request (C9)	1.35	1.4	2.75	Ordinary
Improper customer risk assessment/ reassessment (C4)	0.34	1.54	1.88	Ordinary
Regulatory capital adequacy (K2)	0.49	3.08	3.57	Ordinary
Total investment (K9)	0.47	1.02	1.49	Ordinary
Capital adequacy (K3)	0.31	3.51	3.82	Ordinary
LCR (K12)	3.1	0.69	3.79	Ordinary
Long open foreign exchange position (K10)	0.53	0.1	0.63	Ordinary
Maximum amount of credit risk per one counterpart (K5)	1.6	1.1	2.7	Ordinary
Maximum amount of credit risk for the transactions with persons related to the bank (K7)	1.64	0.49	2.13	Ordinary
Investing in securities separately for each institution (K8)	1.22	0.42	1.64	Ordinary
Liquidity (K4)	0	0.85	0.85	Driver
Short open foreign exchange position (K11)	0.94	0.36	1.3	Ordinary

2) the analysis of the structural importance of the cognitive map elements. The analysis yielded functional indices (Table 2), such as consonance (Outdegree), dissonance (Indegree), and impact of one factor on another (Centrality).

According to Table 2, the compliance risks in financial monitoring and the impact factors such as penalties charged resulting from the NBU's enforcement measures and warning letters represent a key compliance indicator of the bank. The components used to assess banks' financial risks that simultaneously belong to the compliance criteria applicable to banking institutions (mandatory prudential ratios) comprise a separate group of important impact factors, such as: the size, adequacy of regulatory and fixed capital, and exposure of banks to considerable credit risks. Improper assessment/revaluation of customer-related risks appear to be the most significant violation to the model.

Having considered the importance of the integrated system indicators (Table 2), the analysis of the variability of compliance indicators (compliance risks in financial monitoring, reputational and financial risks of banks) proceeded with the impulse approach to three scenarios (see Figures 1, 2 and 3).

Scenario 1 implies the increase of penalties by 0.1%; Scenario 2 – the reduction of compliance risk by 0.1%; Scenario 3 – the increase in the capitalization of a banking institution (i.e. the increasing regulatory capital) by 0.1%.

The study mathematically proves that (1) the bank's compliance risk in terms of financial monitoring is a key acceptability criterion applicable to pension custodians; and (2) changes in this indicator determine the variability of the bank's reputational risk and its financial parameters.

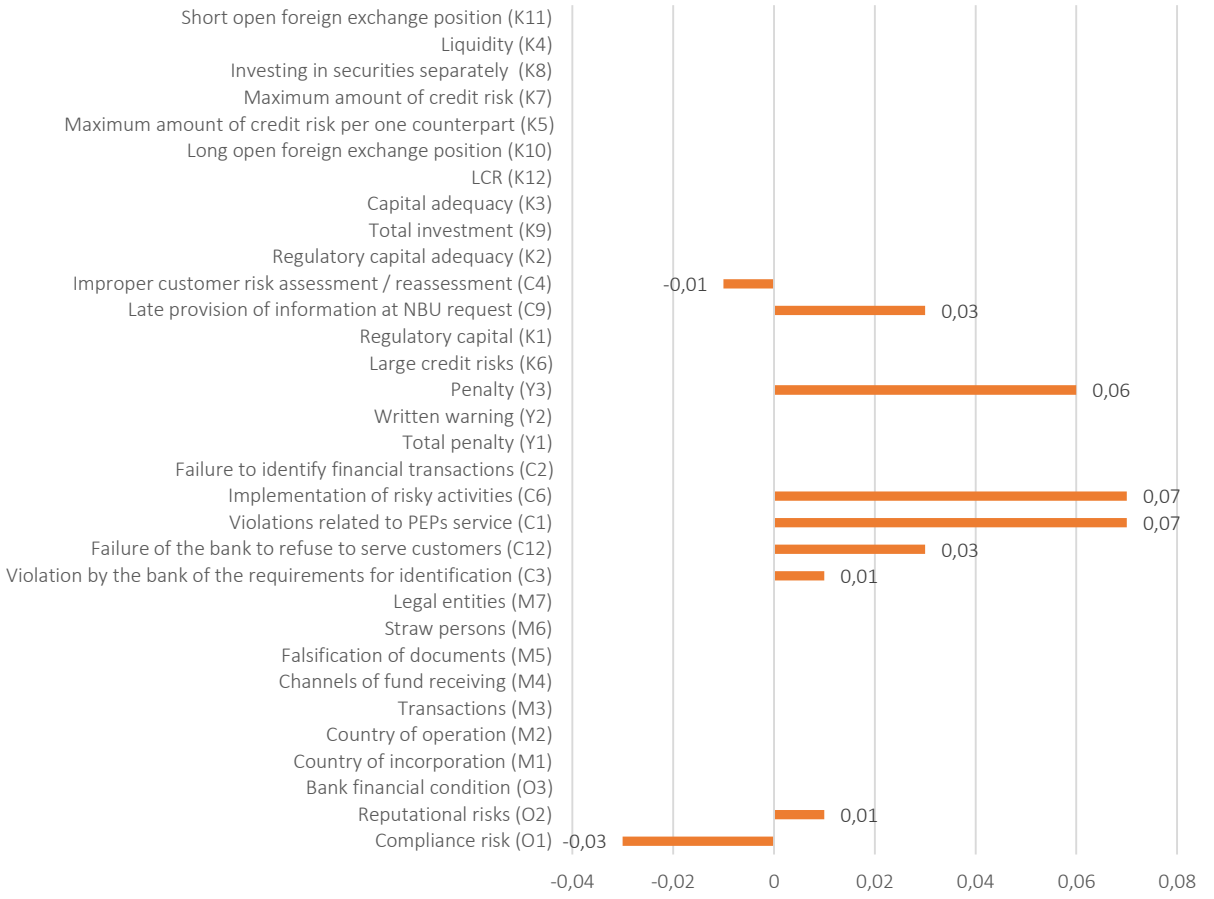

Figure 1. Forecasted variability of compliance indicators and expectations of the bank's counterparties in the field of non-state pension in response to the change in the amount of penalties

http://dx.doi.org/10.21511/bbs.16(3).2021.11

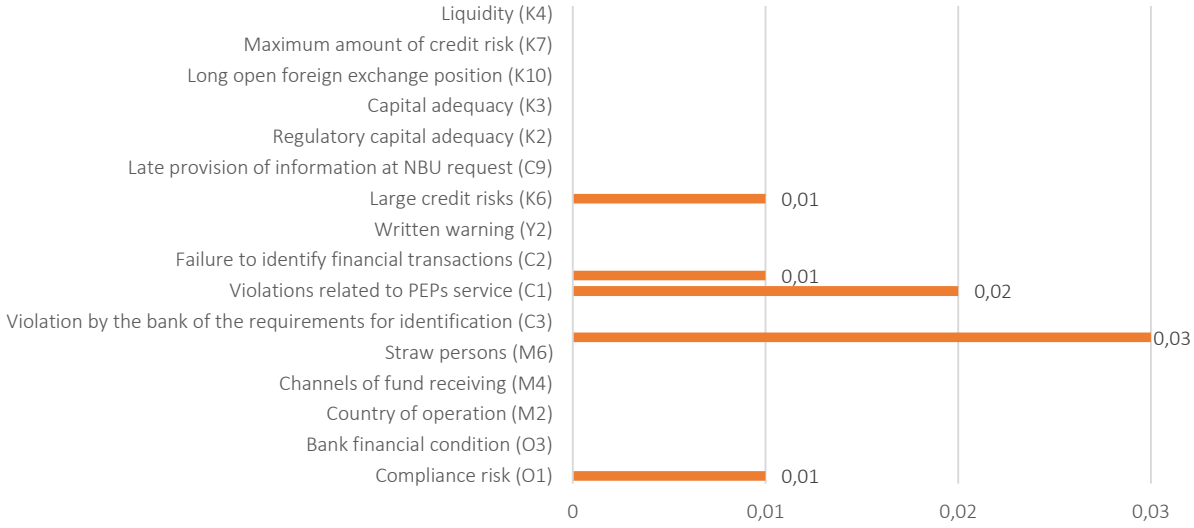

Figure 2. Forecasted variability of compliance indicators and expectations of bank's counterparties in the non-state pension sphere affected by changes in the intrabank compliance system

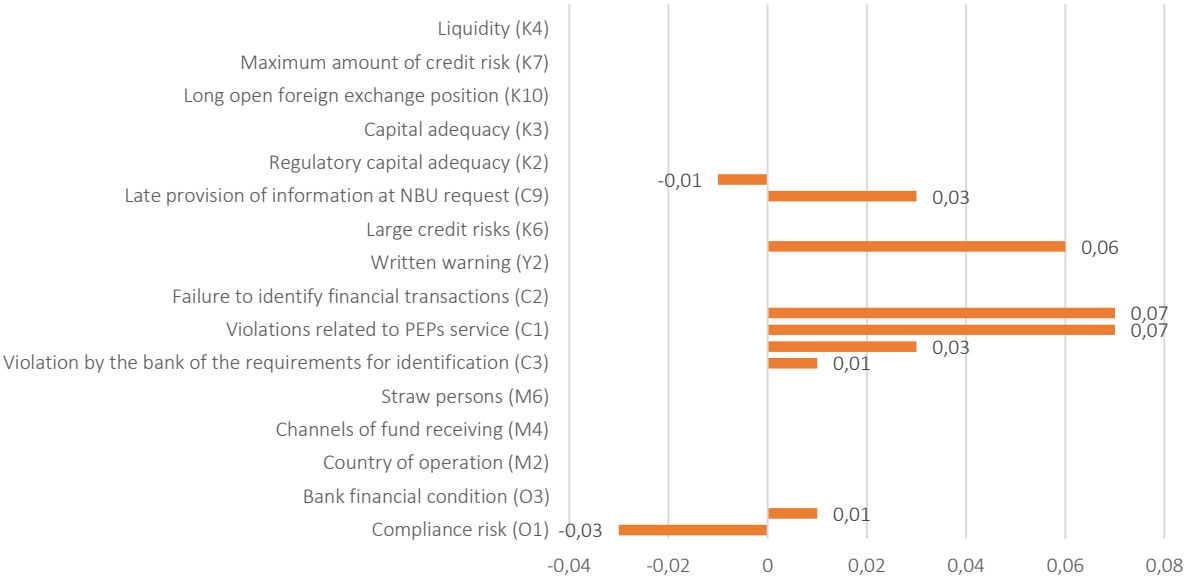

Figure 3. Forecasted variability of compliance indicators and the bank's counterparties' expectations in the non-state pension sphere affected by the changes in capitalization

3. DISCUSSION

The study findings lead to the following conclusion. According to Scenario 1 of impulse modeling (Figure 1), an increase in the size of penalties would bring down the compliance risk by 0.03% and reduce the reputational risk, which, in turn, would reduce the number of violations in financial monitoring, specifically reducing the likelihood of improper assessment/revaluation of customer-related risks (C4) by 0.01%. Given that the amount of penalties is the resulting factor of the influence, there will be a simultaneous growth in the number of penalties (Y3) for the following violations of the applicable laws by banks acting as pension custodians in financial monitoring: violations related to PEPs (C1); failure to detect financial transactions that are subject to mandatory financial monitoring (C2); failure to comply with the requirements regarding the identification, verification, and study of the bank's customers (C3); conduct of risky activities in financial monitoring (C6); delayed provision of information requested by the NBU and failure to provide complete and accurate informa-

tion in the relevant reports to the NBU (C9); and the bank's failure to discontinue customer service in cases envisaged by the applicable laws regulating the financial monitoring matters (C12).

According to Scenario 2 (see Figure 2), the reduction in the compliance risk indicators for banks acting as pension custodians in the context of financial monitoring will promote the improvement of their reputation in the non-state pension system and the need to increase the bank's regulatory capital by 0.01%, as the number of violations related to servicing PEPs (C1) will grow by 0.03%; failure to detect financial transactions that are subject to mandatory financial monitoring (C2) – by 0.01%; and risky activities in financial monitoring (C6) – by 0.02%. Increases in the authorized capital to comply with the Central Bank's regulatory requirements often acquire a manner other than cash investments made by stakeholders. The increase in capital occurs due to the debt conversion to the parent structure, which may catalyze violations in the field of financial monitoring.

An increase in the authorized capital by 0.1% (Scenario 3, Figure 3) will boost the reputation of pension custodians by 0.01% and reduce their compliance risk by 0.03%. Changes in the field of potential violations follow the same tendencies as variation in the amount of penalties.

This study offers a completed cognitive model, and the results of impulse modeling should be integrated in the risk profile of banks acting as subjects of primary financial monitoring, which would promote further informing of their counterparties on the matters of non-state pension provision in the context of the probable involvement of pension assets in criminal schemes and potential threats to further interaction with custodian banks.

Therefore, in contrast to the existing recommendations to banks regarding their risk profiles (National Bank of Ukraine, 2019), i.e. in addition to factoring in the data on their business risks, structural risks, organization, and efficiency of the intrabank system, other business parameters that can serve as markers of potential threats to the interested parties, specifically on the matters of non-state pension provision, should also be integrated into the risk profile. This will help formulate recommendations regarding the procedure of risk profile building for the bank (pension custodians), taking into account the need to expand its components, which is implemented through:

- analyzing and assessing the business risk pertinent to a bank on an overall basis. This block covers the parameters of the bank's business model: the nature of the bank's products and services, sales channels, customer portfolio, availability of PEPs, geographical location and the "geography" of transactions;
- analyzing and assessing the structural risk pertinent to the bank on an overall basis. This block covers the aspects of the ownership/capital structure, asset size, and corporate governance mechanism;
- analyzing and assessing the organization and efficiency of the intrabank control system on an overall basis. This block covers the aspects of the quality risk management and functioning of the internal control system;
- analyzing the probability of changes (volatility) in the compliance risk in financial monitoring and consequences of its actualization. This block covers the aspects of implementing the financial monitoring, supervision of the bank's performance and the likelihood of network schemes by customers; it further defines the ability to forecast not only compliance risks but also financial and reputational risks, which are the main criteria for the acceptability of banking institutions by their counterparties in the field of non-state pension, subject to the influence of the analyzed factors.

CONCLUSION

This study outlines a toolkit to help identify the volatility of compliance risks faced by banks acting as pension custodians through causal modeling.

http://dx.doi.org/10.21511/bbs.16(3).2021.11

Within the framework of the developed toolkit, the compliance risks pertinent to banks (pension custodians) in the field of financial monitoring, along with reputational and financial risks, were considered as the criteria for the conformity of banks to the counterparties' expectations in the context of non-state pension provision. The method of cognitive modeling (that implies structuring of the cause-and-effect relationship) allowed building a fuzzy cognitive model of the relationship between the relevant impact factors and implement three predictive scenarios.

According to Scenario 1 test results (increasing the amount of penalties against the banks for the violations of applicable laws in the field of financial monitoring by 0.1%), the increased amount of penalties will: reduce the compliance and reputational risks of pension custodians by 0.03%; reduce the number of their violations in financial monitoring while specifically reducing the likelihood of improper assessment/revaluation of the customer risks by 0.01%.

According to Scenario 2, compliance risks of banks acting as pension custodians reduced by 0.1% will minimize reputational risks and increase the banks' regulatory capital by 0.01%, along with the increase in the number of violations (by 0.03%, 0.01% and 0.02% respectively) in connection with: 1) servicing of PEPs; 2) failure to identify financial transactions that are subject to mandatory financial monitoring; and 3) risky activities carried out in the financial monitoring sphere.

According to Scenario 3 (increased capitalization of a banking institution through the increase in regulatory capital by 0.1%), banks acting as pension custodians will strengthen their reputation by 0.01% and reduce their compliance risks by 0.03%. The trends in the field of potential violations are similar to those in the first scenario tested.

Therefore, according to the results of applying the toolkit developed to identify the volatility of compliance risks pertinent to banks acting as pension custodians, (1) compliance risks in financial monitoring are indeed the key criterion for determining the acceptability of banks in the non-state pension sphere, and the volatility of compliance risks causes variability in reputational risks pertinent to banking institutions and their financial parameters. To this effect, reduced compliance risks of custodian banks will contribute to strengthening their reputation and boost their regulatory capital, while simultaneously increasing the likelihood of individual violations in the field of financial monitoring. And, secondly, compared to the specific features inherent in the supervision of banks acting as pension custodians, the likelihood of network schemes by their customers, increased enforcement measures in financial monitoring would further increase the volatility of compliance risks for the banks.

The results of this study, obtained using the developed tools, are proposed for integration into the risk profiles of banks acting as pension custodians. In general, they provide an important basis for further empirical research in the understudied context of anti-money laundering compliance risk management, expanding and improving the design of banks' compliance systems using the obtained cognitive model (forecasting the probability of a risk event and reputational and financial damage).

AUTHOR CONTRIBUTIONS

Conceptualization: Svitlana Achkasova, Olena Bezrodna, Yevheniia Ohorodnia.
Data curation: Olena Bezrodna, Yevheniia Ohorodnia.
Formal analysis: Olena Bezrodna, Yevheniia Ohorodnia.
Investigation: Svitlana Achkasova, Olena Bezrodna.
Methodology: Svitlana Achkasova, Olena Bezrodna, Yevheniia Ohorodnia.
Project administration: Olena Bezrodna, Yevheniia Ohorodnia.
Software: Yevheniia Ohorodnia.
Supervision: Svitlana Achkasova.

Validation: Svitlana Achkasova, Olena Bezrodna.
Visualization: Svitlana Achkasova, Yevheniia Ohorodnia.
Writing – original draft: Svitlana Achkasova, Yevheniia Ohorodnia.
Writing – review & editing: Svitlana Achkasova, Olena Bezrodna, Yevheniia Ohorodnia.

ACKNOWLEDGMENT

The work is prepared and financed within the framework of the state budget research work No. 45/20202021 "Formation of a risk-oriented system of accumulative pension provision" (DR No. 0120U101508).

REFERENCES

1. Apreda, R. (2006). *Tailoring Compliance Risk and the Compliance Function for Non-Financial Organizations (a Step Further and Beyond the Basel's Proposal for Banks)* (Documento de Trabajo 325). Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=997123
2. Arasa, R., & Ottichilo, L. (2015). Determinants of Know Your Customer (KYC) Compliance among Commercial Banks in Kenya. *Journal of Economics and Behavioral Studies, 7*(2), 162-175. https://doi.org/10.22610/jebs.v7i2(J).574
3. Asenov, E. (2015). Characteristics of Compliance Risk in Banking. *Economic Alternatives, 4,* 20-28. Retrieved from https://www.unwe.bg/uploads/Alternatives/2-Asenov.pdf
4. Barakat, A., Ashby, S., Fenn, P., & Bryce, C. (2019). Operational risk and reputation in financial institutions: Does media tone make a difference? *Journal of Banking & Finance, 98,* 1-24. https://doi.org/10.1016/j.jbankfin.2018.10.007
5. Basel Committee on Banking Supervision (BCBS). (2003). *The compliance function in banks* (Consultative Document). Retrieved from https://www.bis.org/publ/bcbs103.pdf
6. Basel Committee on Banking Supervision (BCBS). (2005). *Compliance and the compliance function in banks.* BIS. Retrieved from https://www.bis.org/publ/bcbs113.pdf
7. Basel Committee on Banking Supervision (BCBS). (2014). *Sound management of risks related to money laundering and financing of terrorism.* Guidelines. Retrieved from https://www.bis.org/bcbs/publ/d505.pdf
8. Bello, A.U., & Harvey, J. (2017). From a risk-based to an uncertainty-based approach to anti-money laundering compliance. *Security Journal, 30,* 24-38. https://doi.org/10.1057/s41284-016-0002-0
9. Birindelli, G., & Feretti, P. (2008). Compliance risk in Italian banks: the results of a survey. *Journal of Financial Regulation and Compliance, 16*(4), 335-351. https://doi.org/10.1108/13581980810918404
10. Chan, D., Fontan, F., Rosati, S., & Russo, D. (2007). *The Securities Custody Industry* (ECB Occasional Paper No. 68). European Central Bank (ECB). Retrieved from https://www.econstor.eu/bitstream/10419/154521/1/ecbop068.pdf
11. Chmutova, I. M., Bezrodna, O. S., & Nechyporenko, D. I. (2020). The Methodological Instrumentarium for Assessing Compliance Risks of Financial Monitoring of Banks. *Business Inform, 11,* 296-309. (In Ukrainian). https://doi.org/10.32983/2222-4459-2020-11-296-309
12. Coste, Ch. E., Tcheng, C., & Vansieleghem, I. (2021). *One size fits some: analysing profitability, capital and liquidity constraints of custodian banks through the lens of the SREP methodology* (Occasional Paper No. 256). Retrieved from https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op256~3e9f3e8b43.en.pdf
13. Dahl, D., Meyer, A., & Neely, M. (2016). Scale Matters: Community Banks and Compliance Costs. *The Regional Economist,* 1-3. Retrieved from https://www.stlouisfed.org/~/media/Publications/Regional-Economist/2016/July/scale_matters.pdf
14. Davilas, N. C. (2014). AML compliance for foreign correspondent accounts: a primer on beneficial ownership requirements and other challenges. *Journal of Investment Compliance, 15*(1), 4-16. https://doi.org/10.1108/JOIC-01-2014-0003
15. Edwards, J., & Wolfe, S. (2004). The compliance function in banks. *Journal of Financial Regulation and Compliance, 12(3),* 216-224. https://doi.org/10.1108/13581980410810795
16. Edwards, J., & Wolfe, S. (2007). Ethical and Compliance-Competence Evaluation: a key element of sound corporate governance. *Corporate Governance: An International Review, 15*(2), 359-369. Retrieved from https://core.ac.uk/download/pdf/76923.pdf
17. Ernst & Young (E&Y). (2021). *Compliance transformation: how banks can leverage opportunities now*. Ernst & Young. Retrieved from https://www.ey.com/en_gl/banking-capital-markets-risk-regulatory-transformation/compliance-transformation-how-banks-can-leverage-opportunities-now
18. EU. (2016). Directive (EU) 2016/2341 of the European Parliament and of the Council of 14 December 2016 on the activities and supervision of institutions for

http://dx.doi.org/10.21511/bbs.16(3).2021.11

occupational retirement provision (IORPs). *Official Journal of the European Union, L 354/37*. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32016L2341

19. FATF. (2014). *Guidance for a risk-based approach the banking sector.* Retrieved from http://www.fatf-gafi.org/media/fatf/documents/reports/risk-based-approach-banking-sector.pdf
20. Fox, J. (1999). Risk management from a banking compliance officer's viewpoint. *Journal of Financial Regulation and Compliance, 7*(1), 27-30. https://doi.org/10.1108/eb024994
21. Gabbi, G., Tanzi, P. M., & Nadotti, L. (2011). Firm size and compliance costs asymmetries in the investment services. *Journal of Financial Regulation and Compliance, 19*(1), 58-74. https://doi.org/10.1108/13581981111106176
22. Gorelova, G., Pankratova, N., & Borisova, D. (2019). Problems of interregional integration, cognitive modeling. *IFAC-Papers On-Line, 52*(25), 168-173. https://doi.org/10.1016/j.ifacol.2019.12.467
23. Haddad, H. (2016). Internal Controls in Jordanian Banks and Compliance Risk. *Research Journal of Finance and Accounting, 7*(24), 17-31. Retrieved from https://core.ac.uk/download/pdf/234631892.pdf
24. Haynes, A. (2005). The effective articulation of risk-based compliance in banks. *Journal of Banking Regulation*, *6,* 146-162. https://doi.org/10.1057/palgrave.jbr.2340188
25. International Finance Corporation (IFC). (2019). *Anti-Money-Laundering (AML) & Countering Financing of Terrorism (CFT) Risk Management in Emerging Market Banks* (Good Practice Note). Retrieved from https://www.ifc.org/wps/wcm/connect/e7e10e94-3cd8-4f4c-b6f8-1e14ea9eff80/45464_IFC_AML_Report.pdf?MOD=AJPERES&CVID=mKKNshy
26. IOPS. (2008). *Guidelines for the Supervisory Assessment of Pension Funds*. Retrieved from http://www.iopsweb.org/principlesandguidelines/Guidelines%20for%20the%20Supervisory%20Assessment%20of%20Pension%20Funds%20final%20new%20cover-page.pdf
27. IOPS. (2012). *IOPS Toolkit for Risk-Based Pensions Supervision*. Retrieved from http://www.iopsweb.org/rbstoolkit/Module3identifyingrisks.pdf
28. Kaminski, P., & Robu, K. (2016). *A best-practice model for bank compliance*. Retrieved from https://www.mckinsey.de/~/media/McKinsey/Business%20Functions/Risk/Our%20Insights/A%20best%20practice%20model%20for%20bank%20compliance/A_best_practice_model_for_bank_compliance_2.pdf
29. Kolodiziev, O., Mints, A., Sidelov, P., Pleskun, I., & Lozynska, O. (2020). Automatic machine learning algorithms for fraud detection in digital payment system. *Eastern-European Journal of Enterprise Technologies, 5*(9), 14-26. https://doi.org/10.15587/1729-4061.2020.212830
30. Kyalo, G. M. (2014). *The Role of Custodial Services Offered by Banks in the Settlements and Management of Pension Funds*. Retrieved from http://erepo.usiu.ac.ke/bitstream/handle/11732/2664/Georgina.pdf
31. Kyzym, M., & Uzunov, V. V. (2007). *Programmno-tselevoy podkhod k gosudarstvennomu upravleniyu sotsialnoy napriazhennostyu v regionakh strany [Target-oriented approach to the governance of social tension in a country]*. Kharkiv: INZhEK. (In Russian).
32. Lagzdins, A., & Sloka, B. (2012). Compliance program in Latvias' banking sector: the results of a survey. *European Integration Studies, 6,* 225-232. Retrieved from https://pdfs.semanticscholar.org/e555/caa0702cb9375b35939cfc5a05995b3f3e95.pdf
33. Limentani, R. N., & Tresoldi, N. (2012). Compliance Function in banks and Reputational risk. *BANCARIA, 10,* 88-93. Retrieved from https://bancaria.it/en/livello-2/archive-2/last-summary/october-2012/compliance-function-in-banks-and-reputational-risk/
34. Losiewicz-Dniestrzanska, E. (2015). Monitoring of Compliance Risk in the Bank. *Procedia Economics and Finance, 26,* 800-805. https://doi.org/10.1016/S2212-5671(15)00846-1
35. Ludwick, K. (2006). Tackling risk-based compliance. *Journal of Investment Compliance, 7*(4), 61-64. https://doi.org/10.1108/15285810610719961
36. Lugho, A. J. (2007). *Responses of banks offering custodian banking services to environmental changes affecting the banking industry in Kenya.* Retrieved from http://erepository.uonbi.ac.ke/bitstream/handle/11295/7429/full%20text%20.pdf?sequence=4
37. Maximillian, F., & Teichmann, J. (2017). Twelve methods of money laundering. *Journal of Money Laundering Control, 20*(2), 130-137. https://doi.org/10.1108/JMLC-05-2016-0018
38. Meissner, M. H. (2018). Accountability of senior compliance management for compliance failures in a credit institution. *Journal of Financial Crime, 25*(1), 131-139. https://doi.org/10.1108/JFC-11-2016-0074
39. Mikes, A. (2008). *Risk Management at Crunch Time: Are Chief Risk Officers Compliance Champions or Business Partners?* SSRN. http://dx.doi.org/10.2139/ssrn.1138615
40. Misha, Av. E. (2016). The Compliance Function in Banks and the Need for Increasing and Strengthening its Role – Lessons Learned from Practice. *European Journal of Sustainable Development, 5*(2), 171-180. https://doi.org/10.14207/ejsd.2016.v5n2p171
41. Mrsik, J., & Trpkov, D. V. (2015). Custodian banks and the evolution of the emerging capital markets: the case of Macedonia. *Economic Development, 17*(3), 319-332.
42. Musalem, A. R., & Palacios, R. J. (2003). Public Pension Fund Management. Governance, Accountability, and Investment Policies. *Proceedings of the Second Public Pension Fund Manage-*

ment Conference. Retrieved from https://openknowledge.worldbank.org/bitstream/handle/10986/14880/302250PAPER0public0pension.pdf?sequence=1&isAllowed=y

43. Naheem, M. A. (2015). AML compliance – A banking nightmare? The HSBC case study. *International Journal of Disclosure and Governance, 12*(4), 300-310. Retrieved from https://link.springer.com/article/10.1057/jdg.2015.4

44. Naheem, M. A. (2015). HSBC Swiss bank accounts-AML compliance and money laundering implications. *Journal of Financial Regulation and Compliance, 23*(3), 285-297. https://doi.org/10.1108/JFRC-03-2015-0016

45. National Bank of Ukraine (NBU). (2018–2020). *Supervision*. Retrieved from https://bank.gov.ua/en/supervision

46. NFP. (2020). *Pidsumky rozvytku systemy nederzhavnoho pensiinoho zabezpechennia stanom na 31.03.2020 [Results of development of the non-state pension system as of March 31, 2020]*. (In Ukrainian). Retrieved from https://www.nfp.gov.ua/files/OgliadRinkiv/NPF/NPF_I_kv%202020.pdf

47. Nicolas, S., & May, P. V. (2017). Building an effective compliance risk assessment programme for a financial institution. *Journal of Securities Operations & Custody, 9*(3), 215-224. Retrieved from https://www.henrystewartpublications.com/sites/default/files/Nicolas%2C%20Stephanie%20%26%20May%2C%20Paul%20JSOC%209-3.pdf

48. OECD. (2009). *OECD Guidelines for Pension Fund Governance.* Retrieved from https://www.oecd.org/pensions/private-pensions/34799965.pdf

49. Osakwe, Ch. N., Ruiz, B., Amegbe, H., Chinje, N. B., Cheah J.-H., & Ramayah, T. (2020). A multi-country study of bank reputation among customers in Africa: Key antecedents and consequences. *Journal of Retailing and Consumer Services, 56,* 102182. https://doi.org/10.1016/j.jretconser.2020.102182

50. PricewaterhouseCoopers LLP. (2003). The compliance gap. *Journal of Investment Compliance, 4*(2), 31-38. https://doi.org/10.1108/15285810310813040

51. Prorokowski, L., & Prorokowski, H. (2014). Organisation of compliance across financial institutions. *Journal of Investment Compliance, 15*(1), 65-76. https://doi.org/10.1108/JOIC-12-2013-0041

52. Raghavan, K. R. (2006). Integrating anti-money laundering into the compliance structure: how the requirements for compliance with BSA/AML are changing the emphasis of corporate governance and finance functions. *Bank Accounting & Finance, 19*(6), 29.

53. Root, V. (2019). The compliance process. *Indiana Law Journal, 94*(1), 203-251. Retrieved from https://core.ac.uk/download/pdf/232680189.pdf

54. Safari, R., Shateri, M., Baghiabadi, H. S., & Hozhabrnejad, N. (2016). The significance of risk management for banks and other financial institutions. *International Journal of Research – GRANTHAALAYAH, 4*(4), 74-81. https://doi.org/10.29121/granthaalayah.v4.i4.2016.2757

55. Saliieva, O. V., & Yaremchuk, Yu. E. (2019). Rozrobka kohnityvnoi modeli dlia analizu vplyvu zahroz na riven zakhyshchenosti kompiuternoi merezhi [Development of a cognitive model to analyze the impact of threats on the level of security of a computer network]. *Reiestratsiia, zberihannia i obrobka danykh – Registration, storage and data processing, 21*(4), 28-39. (In Ukrainian). https://doi.org/10.35681/1560-9189.2019.21.4.199268

56. Scrimgeour, B. (2011). Assets or liabilities? Custodian risk in the new paradigm. *Journal of Securities Operations & Custody, 4*(2), 112-121. Retrieved from https://hstalks.com/article/1275/assets-or-liabilities-custodian-risk-in-the-new-pa/?business&noaccess=1

57. Sheedy, E., Zhang, L., & Ho Tam, K. Ch. (2019). Incentives and culture in risk compliance. *Journal of Banking & Finance, 107,* 105611. https://doi.org/10.1016/j.jbankfin.2019.105611

58. Silov, V. B. (1995). *Priniatiye strategicheskikh resheniy v nechetkoy obstanovke [Making strategic decisions in a fuzzy environment]* (228 p.). Moscow: INPRO-RES. (In Russian). Retrieved from http://elkniga.info/book_69.html

59. Singh, D. (2003). Basel Committee on Banking Supervision: Compliance and the compliance function in banks. *Journal of International Banking Regulation, 5*(2), 110-112. Retrieved from https://link.springer.com/content/pdf/10.1057/palgrave.jbr.2340160.pdf

60. Stewart, F. (2010). *Pension Funds' Risk-Management Framework: Regulation and Supervisory Oversight* (OECD Working Papers on Insurance and Private Pensions No. 40). OECD publishing. Retrieved from https://www.oecd.org/finance/private-pensions/44633539.pdf

61. Verhage, A. (2009). Compliance and AML in Belgium: a booming sector with growing pains. *Journal of Money Laundering Control, 12*(2), 113-133. https://doi.org/10.1108/13685200910951893

62. Viritha, B., Mariappan, V., & Venkatachalapathy, V. (2015). Combating money laundering by the banks in India: compliance and challenges. *Journal of Investment Compliance, 16*(4), 78-95. https://doi.org/10.1108/JOIC-07-2015-0044

63. Yeoh, P. (2019). Banks' vulnerabilities to money laundering activities. *Journal of Money Laundering Control, 23*(1), 122-135. https://doi.org/10.1108/JMLC-05-2019-0040

http://dx.doi.org/10.21511/bbs.16(3).2021.11

APPENDIX A. COGNITIVE MAP

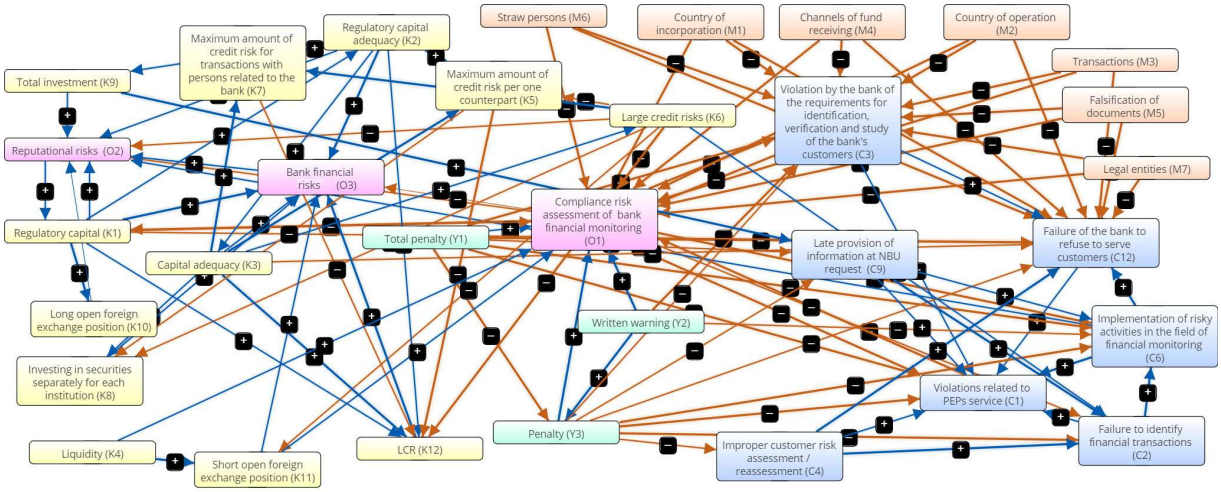

Figure A1. Cognitive map of acceptance criterion variability applicable to banks acting as pension custodians in light of the counterparties' expectations for non-state pension provision, taking into account the impact factors (violations and measures of financial monitoring, regulations of the National Bank of Ukraine and the likelihood of the network schemes by bank customers)

APPENDIX B. CORRELATION ANALYSIS RESULTS

Table B1. Matrix of mutual impact on the acceptance criteria applied to banks acting as pension custodians due to the NBU's measures and violations committed by banks in the field of financial monitoring, as well as potential actualization of network schemes (fragmentary presentation)

	O1	O2	O3	K1	K2	K3	K10	K11	K12	Y1	Y2	Y3	C1	C2	C9	C12	M1	M7
O1	1	−0.190	−0.132	−0.229	0	0	0	−0.183	0	0.435	0.647	0.797	0.707	0.367	0.238	0.258	−0.5	−0.5
O2	−0.190	1	0.340	0.392	0.420	−0.264	0.102	0	0.120	0	0	−0.109	0.134	0	0.168	−0.238	0	0
O3	−0.132	0.340	1	0.556	0.683	−0.372	0	−0.134	0.694	0	0	−0.138	0	−0.121	0	0	0	0
K1	−0.229	0.392	0.556	1	0.487	−0.207	0.528	0.272	0.316	−0.271	0	−0.222	−0.208	0	0	−0.311	0	0
K2	0	0.420	0.683	0.487	1	−0.307	0	−0.112	0.344	0	0.124	0	0	0	0.291	0	0	0
K3	0	−0.264	−0.372	−0.207	−0.307	1	−0.252	0.256	−0.610	0	−0.129	0	−0.177	−0.186	0	0.363	0	0
K10	0	0.102	0	0.528	0	−0.252	1	−0.106	0.270	−0.124	0	0	−0.166	0.232	0	0	0	0
K11	−0.183	0	−0.134	0.272	−0.112	0.256	−0.106	1	−0.270	0	−0.116	−0.145	−0.115	0	0	0	0	0
K12	0	0.120	0.694	0.316	0.344	−0.610	0.270	−0.270	1	0	0	0	0	0	0	0	0	0
Y1	0.435	0	0	−0.271	0	0	−0.124	0	0	1	0	0.621	0.580	0.167	0.378	0.820	0	0
Y2	0.647	−0.219	0	0	0.124	−0.129	0	−0.116	0	0	1	0.156	0.260	−0.155	0	−0.129	0	0
Y3	0.797	−0.109	−0.138	−0.222	0	0	0	−0.145	0	0.621	0.156	1	0.811	0.604	0.337	0.482	0	0
C1	0.707	0.134	0	−0.208	0	−0.177	−0.166	−0.115	0	0.580	0.260	0.811	1	0.447	0.415	0.236	0	0
C2	0.367	0	0	0	0	−0.186	0.232	0	0	0.167	−0.155	0.604	0.447	1	0.557	0	0	0
C9	0.238	0.168	0	0	0.291	0	0	0	0	0.378	0	0.337	0.415	0.557	1	0	0	0
C12	0.258	−0.238	0	−0.311	0	0.363	0	0	0	0.820	−0.129	0.482	0.236	0	0	1	−0.5	−0.5
M1	−0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	−0.5	1	0
M7	−0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	−0.5	0	1