We are pleased to present to readers the work that is a result of co-operation between the Bronislaw Markiewicz State Higher School of Technology and Economics in Jaroslaw (Poland) and Simon Kuznets Kharkiv National University of Economics (Ukraine).

The monograph is dedicated to the 90th anniversary of the Simon Kuznets Kharkiv National University of Economics.

The findings provided herein address the development aspects of the risk-based approach to combating money laundering. The analysis includes international standards applied to regulate and develop the risk-oriented financial monitoring system; financial intermediaries' functioning peculiarities under the economy digitalization conditions and the peculiarities of primary financial monitoring conducted in the insurance industry and by banks; theoretical and methodological provisions for assessment and banks' risk management from the standpoint of the factors influencing the money laundering processes.

The monograph is intended for lecturers, scientists, students of economic universities, specialists of public authorities, financial institutions and businesses.

KhNUE Simon Kuznets

pwste PAŃSTWOWA WYŻSZA SZKOŁA TECHNICZNO EKONOMICZNA

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The Bronislaw Markiewicz State Higher School of Technology and Economics in Jaroslaw

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Edited by Ryszard Pukala & Iryna Chmutova

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MONOGRAPH

Editors:

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2020

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The international project was implemented in accordance with the Cooperation Agreement between the Bronislaw Markiewicz State Higher School of Technology and Economics (Jaroslaw city, Poland) and the Simon Kuznets Kharkiv National University of Economics (Ukraine) dated November 24, 2014

International Project Head

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PREFACE

The “Risk-Based Approach to Combating Money Laundering” monography is based on the results of studies conducted within the framework of an international project titled “Best international Practices for Implementing a Risk-based Approach to Combating Money Laundering”, executed as part of the agreement between the Bronislaw Markiewicz State Higher School of Technology and Economics in Jarosław and the Simon Kuznets Kharkiv National University of Economics – which celebrates its 90th anniversary this year.

The monograph comprises four sections exhibiting a consistent structure, corresponding to the subject matter of the study. It presents the main provisions of the FATF International Standards. The first one deals with the introduction of a risk-oriented approach. The authors presented a concept of a risk-oriented solution within the system designed to countering money laundering and financing of terrorism in Ukraine, developed in line with international recommendations and capable of being used by various countries as an example of innovative solution within the discussed scope.

Moreover, the monograph reflects changes taking place in the financial services market, including its digitalisation, that call for creating conditions that ensure stability of processes in the scope of developing financial monitoring. A separate part of the study is devoted to the processes of countering money laundering in the field of insurance. Two sections are dedicated to introducing a risk-based approach to financial monitoring in the banking system, since it is the banks that have the highest degree of risk control as part of basic financial monitoring. Practical aspects of analysing borrowers’ creditworthiness for the purpose of minimising credit risk of the banks have also been presented.

A characteristic feature of the monograph is broad international literature, which is a subject of interest not only among specialists in the field of finance, but also among information processing professionals.

The execution of the international project has been successful. The project has contributed to forming a team of scientists from Poland and Ukraine and creates conditions for solving new international problems not only in the scope of financial monitoring, but also as regards the development of the financial services market as well as digitalisation of the economy and finance.

Head of the international project
Ryszard Pukala

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INTRODUCTION

The growth of economic risks aggravates the need to create an effective risk-oriented system that can prevent the legalization of money received by illegal means (money laundering), terrorist financing, and proliferation of mass destruction weapons. This purpose invokes the creation of respective international organizations that apply appropriate sanctions to those countries that commit violations in the financial monitoring sphere, and specially authorized domestic bodies for financial monitoring whose activities aim to prevent money laundering, terrorist financing, and proliferation of mass destruction weapons. Therefore, at present, implementing the international standards established by the Financial Action Task Force on Money Laundering (FATF), the norms stipulated in the EU Directives (including Directive 2015/849 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing), and introducing a risk-oriented approach in the field of preventing and combating money laundering is a modern trend aimed to build the national financial monitoring system; it is in the focus of many scientists not only in the European community, but throughout the world.

Specially authorized bodies and other entities exercising regulation and supervision in the field of financial monitoring are unable to function without cooperation with the primary links of the financial monitoring system, namely the primary financial monitoring subjects. In turn, the establishing and use of risk-oriented criteria to determine their risks of being involved in money laundering schemes provide means for systematizing, generalizing these criteria, and creating a theoretical basis for increasing the efficiency of the state financial monitoring.

Today, Ukraine, like most of the developed countries of the world, is pursuing an active policy to implement international standards for combating corruption and crime in the financial sector, as defined in the FATF Recommendations. In particular, on April 28, 2020, the new Law of Ukraine “On preventing and countering the legalization of money received by illegal means (money laundering), terrorist financing, and proliferation of mass destruction weapons” came into force, which defined a transparent instrument of prosecution for money laundering and unfair withdrawal of accumulated funds, as well as introducing a risk-oriented approach by the primary financial monitoring subjects when verifying their clients. The risk-oriented approach eliminates total control over financial transactions, which helps to reduce bureaucratic procedures for client identification and verification. However, in order to duly protect the rights and legitimate interests of citizens, society, and the state, and to ensure national security, it is necessary to determine the main provisions for the formation of a risk-oriented system for combating money laundering, terrorist financing and proliferation of mass destruction weapons. This will improve the process of detecting, verifying and investigating crimes related to money laundering and other illegal financial transactions.

Banks and other financial intermediaries hold a specific place in the financial monitoring system. The economy digitalization being one of the drivers for the developing financial relations, the expanding types and channels of the provision of their services, is marked by an increase in the risks associated both with the specifics of their activities and other risks threatening the entire financial system. In particular, the volume and complexity of financial crime have increased dramatically in the context of the economy digitalization. Money launderers use different types of services, as well as various combinations of businesses, to clean up dirty money. As a result, the regulatory requirements to prevent and combat money laundering are becoming more stringent. The evolution of the regulatory landscape, the business environment for financial intermediaries, digital and anti-money laundering technologies explains the need for research into the digital development of anti-money laundering in the financial sector.

Taking into account the peculiarities of banks' activities and their functions, the banking sector represents a financial system component with the highest vulnerability to money laundering risks. The risk of using banking institutions for money laundering is in one way or another associated with their other risks (operational risk, credit risk, strategic risk, market risk, liquidity risk, reputational risk, compliance risks, etc.). Its occurrence may result from one risk transforming into another one, or vice versa, entail additional consequences. Therefore, the comprehensive risk-oriented approach offers the foundation for identifying AML threats and developing an operational algorithm for tracking them. As part of its implementation, it is critical to consider the connection between the risks to be involved in money laundering schemes faced by financial institutions with primary and secondary factors-causes of occurrence and their consequences that may have a recurring nature. In this respect, ensuring an increase in the efficiency of the functioning and/or adequacy of the risk management system using tools for identifying threats, assessing, controlling, monitoring and minimizing money laundering risks is a platform for eliminating and/or preventing them in further activities performed by the primary financial monitoring subjects, preventing the involvement in the money legalization processes by taking appropriate measures and preventing the facts of violating legal requirements in the relevant area.

The monograph intends to develop theoretical and methodological provisions and recommendations for the application of the risk-oriented approach to counter money laundering.

The specified goal stipulates the following tasks:

- developing the main provisions of the concept for forming a risk-oriented system applied to combat money laundering and terrorist financing based on international experience;
- systematizing the provisions for the legal regulation of the implemented risk-oriented approach in the field of combating money laundering and terrorist financing at the state level to determine risk-oriented signs indicating the possible involvement of a primary financial monitoring subject in money laundering schemes;
- exploring the specifics of defining and structuring the financial service market in the economy digitalization environment and analyzing the digital development of countering money laundering in the insurance sector;
- developing theoretical and methodological foundations and preparing recommendations for the practical implementation of the risk-oriented approach by Ukrainian banks as a crucial element of the primary financial monitoring of banks;
- determining the fundamental nature and characteristics of the banking system risks, in particular, those associated with the money legalization, and preparing recommendations for leveling these types of risks using monitoring tools;
- providing recommendations on analyzing the borrowers' creditworthiness to minimize credit risks faced by banks;
- investigating the fundamental nature of the banks' strategic risk, developing recommendations for its assessment, and analyzing the relationship

between failures in the banking strategy implementation and the compliance risk in the field of financial monitoring.

The monograph consists of three sections, which address the following problems: international standards applied to regulate and develop a risk-oriented financial monitoring system; changes in the financial monitoring in the context of the digitalized financial relations; the peculiarities of using the risk-oriented approach during the primary financial monitoring implemented by banks; and individual risks met by banks in the system of factors influencing the money laundering processes.

The monograph includes the results obtained during the fundamental research work "Risk-oriented approach to combating money laundering, terrorist financing and proliferation of mass destruction weapons" (No. 0118U000058) performed by the Simon Kuznets Kharkiv National University of Economics. The theoretical provisions and practical developments presented in the monograph constitute a part of scientific publications submitted by its authors and conceptually synthesize conclusions on the development and implementation of the risk-based approach to combating money laundering.

2.1. Features of defining and structuring the financial service market in the economy digitalization environment

The economy digitalization processes have significantly influenced all aspects of the financial service market functioning; its objects and entities, as well as its structure and essential characteristics, have undergone changes. The introduction and development of FinTech innovations notably transformed the financial service parameters, which in turn resulted in qualitatively new forms of interaction between owners and users of financial services, as well as financial intermediaries. Digital technologies have in a certain way influenced the change in the state's role in the financial service market, the approaches and tools in the work performed by financial institutions, the customers' expectations and habits, and conditioned the developing financial service democratization and growing financial inclusion. All this actualizes the need to clarify the concept content and determine the structure of the financial service market in the economy digitalization settings.

The essence and structure of the financial service market was studied by N. M. Vnukova, D. I. Dema, I. V. Abramova, I. A. Shubenko, I. V. Nedilska, V. M. Trokoz, Yu. M. Kovalenko, O. R. Shevchuk, L. M. Horbach, O. B. Kaun, I. O. Shkolnyk, Ye. P. Bondarenko, V. P. Khodakivska, B. M. Vyshyvana, I. V. Soloshkina, V. V. Zymovets, O. A. Osadcha, R. Y. Bacho, M. S. Rakhman, V. V. Shevtsova and others. The relationship between the components of the financial service market and the financial market was investigated by M. V. Dubyna, Yu. M. Kovalenko, R. Y. Bacho and I. I. Blahun. Among the scientist who dedicated their works to studying the impact exerted on the financial service market by economy digitalization there were H. V. Belinska, M. I. Dyba, L. V. Zherdetska, V. V. Kovalenko, A. A. Mazaraki, V. I. Mishchenko, H. M. Pochenchuk, A. Yu. Semenoh, M. V. Tarasyuk, A. Ya. Kuznyetsova, H. H. Chmeruk, P. M. Rubanov, N. M. Pantyelyeyeva, L. O. Haryaha and others. But the systemic impact of the economy digitalization on the financial service market remains not fully explored both in theoretical and methodological aspects.

Various aspects are considered by the authors while peering into the essence of the financial service market concept, in particular, it is described through the prism of correlation with the financial market, through the legal aspects of relations among financial service market participants, as economic relations of the benefit exchange, as a sphere of the financial service market participants' activity (table 2.1).

Table 2.1. Generalization of approaches aimed to define the financial service market concept

No.	Concept definition by scientists	Author, source	Key definition aspect
1	2	3	4
1	Financial service markets represent **a sphere of activity conducted by financial service market participants** with a view to providing and consuming certain financial services. Financial service markets include professional services in the markets of banking services, insurance services, investment services, securities trading and other market types that ensure **the financial asset turnover**	The Law of Ukraine "On Financial Services and State Regulation of Financial Service Markets" [214]	The participants' activity sphere, a mechanism for financial resource allocation
2	By its economic nature, the financial service market is **the economic relations that arise between financial intermediaries and other economic agents** regarding **the financial resource allocation**, sale and purchase of temporarily available funds and securities	D. I. Dema, I. V. Abramova, I. A. Shubenko, I. V. Nedilska, V. M. Trokoz [59]	Economic relations, a mechanism for financial resource allocation
3	**An aggregate wide range of relations to meet the existing need for various financial services** (insurance, banking, investment, etc.) **and to form a prospective one in order** to generate income for institutional units representing the financial economy sector, to meet consumer demand, where the subject of sale and purchase is a specific product, namely a financial service. If such a service is understood as a benefit, then the financial service market is meant to be **a system of regular, mainly monetary, mutually beneficial, voluntary and competitive benefit exchange**	Yu. M. Kovalenko [95]	A system of regular benefit exchange, a part of the financial system

1	2	3	4
4	**Aggregate mandatory legal relations with respect to regulation and supervision over the activities of financial institutions** by public authorities and local governments, in order to ensure appropriate conditions for implementing financial transactions, making a profit, protecting the depositors' property interests and creating a favorable investment climate	O. R. Shevchuk [173]	Aggregate legal relations
5	**Economic relations** arising between financial intermediaries and other economic agents regarding **the financial resource allocation, sale and purchase of temporarily available monetary funds and securities**	L. M. Horbach, O. B. Kaun [82]	Economic relations, a mechanism for financial resource allocation
6	**The financial market includes the money market, the credit resource market, the securities market and the financial service market**	I. O. Shkolnyk [174]	A financial market segment
7	**Financial service markets cover legal relationships established among financial service market participants,** with the formation, development and termination of such relationships determined directly by the financial service	I. V. Soloshkina [175]	Legal relations among financial service market participants

Source: compiled by the author

In order to more deeply analyze the financial service market concept, it is advisable to consider it in conjunction with the financial market concept. In their works [48; 64; 174], scientists distinguish the following correlations between these concepts:

- they are completely identical;
- they are completely independent and not identical;
- the financial market concept is broader than the financial service market concept; it includes the latter as a component (segment);
- the financial service market concept is broader and includes the financial market concept.

We believe that all these statements are quite correct, depending on which theoretical aspect is considered as the main one while defining the concepts in question.

2.1. Features of defining and structuring the financial service market in the economy digitalization environment

According to the main theoretical aspects of the "financial service market" concept, it is advisable to highlight the following (see table 2.2):

- the institutional aspect – financial service markets are a sphere of activity conducted by financial service market participants [214];
- the economic aspect – the financial service market is the economic relations that arise between financial intermediaries and other economic agents [82];
- the financial aspect (1) with the financial service market seen as a part of the financial system that is an aggregate wide range of relations formed in order to generate income for institutional units representing the financial economy sector, to meet consumer demand, where the subject of sale and purchase is a specific product, namely a financial service [95];
- the financial aspect (2) with the financial service market seen as a mechanism for financial resource allocation [214; 59; 82].

Table 2.2. Theoretical approaches to defining the essence and correlation of the "financial market" and "financial service market" concepts (compiled by the authors in reliance upon generalization)

Correlation between the concepts / Theoretical aspects of the concepts	The financial service market and the financial market are identical concepts	The financial service market and the financial market differ from each other and are equivalent markets within the financial system of the state	The financial market contains the financial service market in its structure	The financial service market is a more meaningful concept by its nature and includes the financial market in its structure
Aggregate markets and institutions	+	+	+	+
A system of economic relations	+	+	+	+
A mechanism for financial resource allocation	+	+	+	–
A part of the financial system	+	+	–	–

Source: developed by the author based on [42; 43; 48; 82; 64; 214; 95; 129; 156; 59; 161; 175; 90; 173; 174])

It should be noted that the specified theoretical aspects of the "financial service market" concept coincide with the key approaches to defining the "financial market" concept selected by I. I. Blahun [42]:

- the financial market as a mechanism for financial resource allocation;
- as a system of economic relations;
- as a system of institutions and markets.

Let us consider the results obtained during a comparative analysis referring to the correlation between the concepts of "financial service market" and "financial market" with reference to the key theoretical aspects/approaches (see table 2.2):

- these concepts are identical. For instance, V. P. Khodakivska [90] regards these two concepts as identical in the institutional context, since they communicate the general name for those markets which are distinguished by the existing supply and demand for various financial assets. M. V. Dubyna [64] also shares this view and emphasizes the complexly structured institutional nature of both markets. M. V. Dubyna [64], B. M. Vyshyvana [208] and V. V. Zymovets [217] describe these two markets as mechanisms that ensure the interaction with financial assets, as well as the formation of supply and demand for financial resources. M. V. Dubyna also believes that both markets represent aggregate economic relations in the economic area and belong to the financial system designed to serve the real economy sector;
- the concept is completely independent and not identical. In Ye. P. Bondarenko's [48] understanding the institutions of the financial market and the financial service market perform different functions and take on different roles; the markets are independent and exist independently of each other. When it comes to defining the financial market and the financial service market considering the mechanism for financial resource allocation, Ye. P. Bondarenko [48] emphasizes the presence of various objects: if the object of financial relations in the financial market is financial assets, then in the financial service market the same applies to financial services. N. S. Ryazanova [161] points out the simultaneous existence of both markets – the financial market and the financial service market – and lays stress on the fact that they are yet different; the author remarks that both markets represent a system of economic relations, but technically, the trade articles are different, they may refer to some financial service, or money capital. I. V. Soloshkina [175] draws attention to the self-reliance and independence of both markets as the financial system components, arguing that the financial service markets, like the financial market, form a separate segment of the financial system.

2.1. Features of defining and structuring the financial service market in the economy digitalization environment

According to Ye. P. Bondarenko [48], the financial service market and the financial market are equivalent with relation to a part of the financial system; this is due to the fact that the availability of financial services is attributable to the financial resources circulating while the economic system is functioning; they efficiently complement the mobilization and use of financial resources in other subsystems constituting a part of the financial system in force within the state;

- the financial market concept is broader than the financial service market concept; it includes the latter as a component (segment); When it comes down to analyzing the financial market, I. O. Blank [43] states that its sale and purchase object involves various financial instruments and financial services, which means the inclusion of the financial service market into the financial market as its component. In the terms of defining markets as mechanisms for financial resource allocation, Ye. P. Bondarenko [48] also recognizes the subordination of the financial service market to the financial market and indicates that, although financial services are very different in their structure, they all share the features of creating and using financial resource funds aimed at performing economic activities. Notably, while defining markets as a system of economic relations, Ye. P. Bondarenko [48] also considers the "financial market" concept broader than the "financial service market" concept, as it covers not only financial relations (the inclusion of the financial service market as a component is emphasized), but also various forms of ownership relations and reallocation (transformation);
- the financial service market concept is broader and includes the financial market concept. For instance, taking into consideration the institutional aspect, O. A. Osadcha [129] declares the financial service market more generalized due to the fact that a large part of the financial market belongs to it. In keeping with the approach to defining markets as a system of economic relations, M. V. Dubyna [64] draws attention to the financial service market as a broader concept than the financial market, since the provision of financial services among individual entities, in particular, ensures the financial resource movement and satisfying the needs of both parties: the need for monetary funds and the desire to derive additional income from their allocation, that is, the financial market functions as part of the financial service market.

Proceeding from generalizing the theoretical approaches to defining the essence and correlation of the "financial market" and "financial service market" concepts, it is necessary to recognize their close interaction, variety of aspects and ambiguity of their interpretation by most scientists. At the same time, it should be noted that the equivalence of the financial market and the financial service market as the financial system components, and the priority role of the financial market as a mechanism for financial resource allocation form the prevailing point of view. Taking into account the peculiarities attributable to functioning of the studied markets under the economy digitalization conditions, the authors bring a focus on the need to reflect the changes that are manifested in the use of the appropriate infrastructure and innovative financial technologies [42].

From this perspective, the generalized interpretations of the financial service market afford grounds for the following definition: **the financial service market** is a component of the financial system, which involves the use of appropriate infrastructure and innovative financial technologies and is designed to serve the real economy sector, represents a system of markets, institutions and economic relations among individual entities that are intended for the purchase and sale of financial services; this results in the financial resource movement and satisfying the participants' needs for the necessary monetary funds and deriving additional income from their allocation.

The priority of this wording lies in considering all four theoretical aspects applied to define the "financial service market" concept, as well as focusing on the specifics of the financial service market functioning under the economy digitalization conditions.

The economy digitalization significantly affects all aspects of the financial service market functioning, changes its institutional structure, financial technologies and instruments, influences the specifics of relationships among market entities and puts forward new tasks to be solved as part of the country's financial system. In the current digitalization of the financial economy, the greatest importance is attached to FinTech innovations, which, while competing with traditional financial services, provide customers with a prospect to obtain high quality at the best price, ensure a high level of motivation and financial inclusion. The FinTech innovations have a particularly massive impact on the overall structure of the financial service market. This is considered as a reason to recognize the expediency of singling out the specific FinTech innovative structure, along with the market and institutional structure of the market.

The market structure with regard to the FinTech innovations can be determined by studying their directions [94; 134], subsystem components [105; 113], categories [70], types [198; 169; 171], and classification [34; 188; 164] (table 2.3).

Table 2.3. Market structure and FinTech innovation ranking*

The types of FinTech innovations	**Authors**													**Number of mentions**	**Rank**
	V. V. Kovalenko	**A. A. Mazaraki, S. V. Volosovych**	**L. O. Haryaha**	**Strategy of Ukrainian financial sector development until 2025**	**H. M. Pochenchuk**	**A. Ya. Kuznyetsova, H. H. Chmeruk**	**A. Yu. Semenoh, S. V. Tsyrulyk**	**D. W. Arner**	**Financial Stability Board**	**PwC**	**World Economic Forum**	**C. Tsai, K.-J. Peng**	**UK Fintech Focus Report**		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Financial management: - personal finance (Personal Finance, Wealth Tech, Deposits & Lending); - institutional finance - alternative financing and crediting (Crowdfunding, P2P, P2B, Robots-Consultants) -crediting without intermediaries - G2G, B2B crediting.	+	+	+	+	+	+	+	+	+	+	+	+	+	13	1
Payments, money transfers, clearing, settlements	+		+	+	+	+	+	+	+	+	+	+	+	12	2
Inshurtech	+	+	+	+	+	+	+		+	+	+		+	11	3
Digital and neobanks, digital banks (Internet Banking, Mobile Banking, Mobile	+		+	+		+		+				+	+	7	4

Wallets, Contactless Payment)															
Investment activity of banks and capital markets (Investment Banking/Capital +Market, Investment Management, Capital Raising)		+				+	+		+	+	+			6	5
Marketplaces, market support (Market Provisioning, Internet Marketing, Smart Contracts, E-Commerce, Interaction “Business Entity-State (BE2S)”, Interaction “Business Entity-Business (BE2B)”, Interaction “Business Entity Financial Institutions (BE2FI)”, Interaction “Business Entity-Individuals (BE2I)”	+			+		+			+	+	+			6	5
Technologies and infrastructure (NFC Technologies, Internet Trading, Internet Brokerage, “Cloud” Technologies, Paperless Technologies, Machine Learning, Artificial Intelligence, E-Governance)	+		+	+	+	+		+						6	5
Regulatory technologies (RegTech, SupTech)		+		+	+			+						5	6
Analytics and data security (BigData, Analytics, Security, Smart Identification, Personal Financial Assistants, NBU’s BankID)				+	+	+		+				+		5	6
Cybercurrency, cryptocurrency (Blockchain and Bitcoin), digital currency market,	+	+	+	+										4	7

currency exchange platforms, e-hryvnia (CBDC – Central Bank Digital Currency)															
Operation and risk management (Human Resource Management (HRM), Business Intelligence (BI), Enterprise Content Management (ECM))					+	+		+						3	8
Consumer interface					+	+		+						3	8
Gamification (games and quests for customers)						+								1	9

*__Note__: the ranking is consistent with the frequency of mention in literary sources
Source: developed by the author based on [34; 78; 94; 105; 113; 134; 164; 169; 171; 179; 188; 198]

As can be seen from the above, in most cases the authors identify the FinTech innovations as those involving innovations in managing personal and corporate finances, which include alternative finance; payments, money transfers, settlements and clearing; as well as inshurtech.

The existing large number of FinTech innovations suggests the need to classify them. In our opinion, P. M. Rubanov [164] presented a classification of FinTech innovations, which becomes viable in this aspect; the author proposes to highlight their following classification features:

- the institutional feature;
- the financial service type;
- the innovative technology type;
- the fintech service user.

If seen from **the marketing approach** to determining the structure of the FinTech innovation market, the most perspective is the classification feature “the fintech service user” according to which services are allocated specifically for [164]:

- individuals (households);

- small and medium business;
- big business;
- financial institutions;
- regulators, audit companies;
- technology companies.

Taking all the foregoing into account, it may be concluded that considering the financial service market concept made it possible to reveal the complexity and variety of aspects found in this concept, its dialectical connection with the financial market concept. The results obtained during the in-depth analysis of the interaction between these concepts provided means for defining the financial service market concept following on from the peculiarities of its functioning under the economy digitalization conditions and considering it as part of the financial system in effect within the state, as aggregate economic relations, as aggregate markets and institutions, and as a mechanism for financial resource allocation. The significant impact of economy digitalization on the financial service market made it necessary to observe its structural changes caused by the introduction and dynamic development of FinTech innovations.

CONCLUSIONS

The economy development and the success of implementing the integration vector are largely determined by the effectiveness of the state financial monitoring system, which is primarily oriented at counteracting such a social phenomenon as the legalization of money received by illegal means and terrorist financing.

The monograph elaborates the main provisions for building a risk-oriented system aimed to combat money laundering, terrorist financing, and proliferation of mass destruction weapons; their application will contribute to implementing the state policy in the fight against these negative phenomena. It has been established that four out of six regulators in the Ukrainian financial service market (namely, the National Securities and Stock Market Commission, the Ministry of Finance, the Ministry of Justice, and a specially authorized body) still use outdated, formal, and ineffective criteria for assessing the risks to be involved in the money legalization faced by primary financial monitoring subjects. The Ministry of Digital Transformation, as a newly created regulator, has not yet developed such criteria. And only the National Bank of Ukraine has already considered the requirements of FATF, AMLD4, and the new Law on Financial Monitoring in its criteria. The National Securities and Stock Market Commission received a proposition to unify risk-oriented signs identifying the possible involvement of a primary financial monitoring subject in money laundering schemes, and to introduce its own procedures, which will be identical to the mechanisms implemented by the National Bank of Ukraine, aimed at the state financial monitoring for professional participants in stock markets, taking into account the specifics of their activities.

The research also addressed the features of the financial service market functioning in the digitalized economy environment. It was determined that traditional insurers are ill-prepared for digital activities in the digital markets of the future and, accordingly, for combating money laundering and terrorist financing in the digital economy. However, online market conditions force insurance companies to implement digital technologies in this area, in particular, digital identification of policyholders. As it was identified while analyzing the digital development of anti-money laundering in insurance, the digitalization process comprises three directions: InsurTech, RegTech, and SupTech. Insurance companies are implementing digital client identification procedures for online sales and claim settlement, as well as analyzing clients' digital experiences. Automation is seen in the processes related to insurers' compliance with anti-money laundering regulations, including the submission of reports to financial monitoring bodies. Supervisors digitize and improve control and analysis of anti-money laundering operations. The integrated application of digital technologies will provide means for improving the insurers' ability to duly verify clients, identify, and monitor suspicious transactions through joint efforts.

Acting as intermediaries between the owners of temporarily free funds and those who need them, banks quite often underestimate the risks of being attracted to money laundering and terrorist financing schemes. The research determined that the crucial element that provides banks, as primary financial monitoring subjects, with the ability to counter money laundering, is a risk-oriented approach. The risk-oriented approach provides for the formation of money laundering risk management system and the adoption of appropriate measures in a manner and volume that ensure the effective minimization of these risks.

The researchers investigated the legal regulation of the financial monitoring system in European countries and Ukraine, considered the main risks associated with the legalization of money received by illegal means (money laundering), terrorist financing, and/or proliferation of mass destruction weapons, their types, and evaluation criteria, which allowed determining the specifics of the risk-oriented approach in the banking sector for Ukraine and developing recommendations aimed to improve the procedure for financial monitoring based on the implementation of the positive experience acquired by European countries. It was proposed to identify threats subject to the type and jurisdiction of clients, as well as the financial transaction types and channels for their implementation, which intends to effectively manage the ML/TF risks with a focus on minimizing and/or avoiding them.

Proceeding from the relation between the risks of being involved in money laundering processes faced by banks and other banking risks, the researchers suggest recommendations concerning the following: improving the efficiency of credit risk and strategic risk management; application of monitoring tools to identify potential threats in the banks' activities.

Taking into account the lack of recommendations for solving the problem of the significance and normative values of individual indicators when assessing the bank borrowers' (individuals') creditworthiness, the work presents a toolkit to solve this problem. The module for assessing the individual borrowers' creditworthiness, developed using fuzzy logic, addresses such parameters as the borrower's financial stability, social stability, sources and servicing of the borrower's debt, and credit conditions. The input and output parameters are investigated as a set of linguistic terms with a linear (triangular and trapezoidal) membership function. The use of the proposed tools will ensure the quality of banking institutions' work with regard to preventing the growth of distressed assets and minimizing credit risks.

To assess the bank's strategic risk, it is proposed to consider the ratio of the actual and planned values of the parameters for measuring the degree of achieving the financial and non-financial strategic goals set by the bank and the development level identified for the system of organizational and economic support for the bank's strategic management. The synthesis of results in certain assessment areas characterizing the primary and secondary strategic risk, respectively, provides means for determining its generalizing level (high, medium, or low) and foreseeing the emergence of other risks associated with it, including the money laundering risk and compliance risk. It is concluded that the overestimation of the planned values calculated based on the indicators for measuring strategic goals, in particular, the bank's performance parameters, increases the possible realization of the strategic risk and may induce banks to fail to comply with the legislation requirements in the field of financial monitoring in order to obtain financial benefits.

In general, the conclusions and proposals presented in this monograph aim to develop theoretical and methodological tools and practical recommendations for the implementation of the risk-oriented approach to combating money laundering.

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APPENDIX

Annex 1

Indicators (characteristics of membership functions) for assessing of the borrower financial stability (A).

Symbol	Name	Symbol	Linguistic assessment	Triangular and trapezoidal numbers for the value of linguistic variable				Interval
a1	The current ability to pay (CAP)	a11	low	1	1,25			1< CAP <1,25
		a12	middle	1,20	1,3	1,40	1,5	1,25< CAP <1,5
		a13	high	1,45	2			CAP >1,5
a2	Funds on accounts in banks	a21	absent	0	1			No funds on accounts in banks (1 point)
		a22	insufficient	0,75	1,5	2		Funds on accounts in the amount less than the loan amount (2 points)
		a23	sufficient	1,7	3	4		Funds on accounts that exceed the amount of the loan (4 points)
a3	Ensuring the credit (EC)	a31	sufficient	100	110	125		The collateral value of the property less than 25% higher than the amount of credit debt 100%< EC <125%
		a32	middle	120	130	140	150	The collateral value of the property at least 25% higher than the amount of credit debt 125%< EC <150%
		a33	high	145	200	250		The collateral value of the property at least 50% higher than the amount of credit debt EC >150%

Appendix

Annex 2

Indicators (characteristics of membership functions) for assessing of the borrower social stability (B).

Symbol	Name	Symbol	Linguistic assessment	Triangular and trapezoidal numbers for the value of linguistic variable				Interval
b1	Work experience	b11	low	0	1	3		To 3 years;
		b12	middle	2,5	3,5	7	10	From 3 to 10 years;
		b13	high	8,5	15			More than 10 years
b2	Age borrower	b21	young	20	25	35		20-35 years;
		b22	adult	30	35	45	55	35-55 years
		b23	old	50	65	70		55-70 years ;
b3	Place of work (position)	b31	low	0,5	1			The worker or employee (0.5 or 1 point)
		b32	middle	0,75	1,5	2		Specialist, top manager of the company (2 points)
		b33	high	1,75	2,5	3		Own businessor the head (3 points)

Appendix

Annex 3

Indicators (characteristics of membership functions) for assessing of the borrower social stability (C).

<table>
<tr><th>Symbol</th><th>Name</th><th>Symbol</th><th>Linguistic assessment</th><th colspan="4">Triangular and trapezoidal numbers for the value of linguistic variable</th><th>Interval</th></tr>
<tr><td rowspan="3">c1</td><td rowspan="3">Sources of debt repayment</td><td>c11</td><td>unstable</td><td>0</td><td>0,1</td><td>0,2</td><td></td><td>Unstable additional income (0.2 points)</td></tr>
<tr><td>c12</td><td>stable</td><td>0,15</td><td>0,4</td><td>0,6</td><td></td><td>Stable additional income (0.6 points)</td></tr>
<tr><td>c13</td><td>stable and reliable</td><td>0,50</td><td>0,7</td><td>0,8</td><td>1</td><td>The official salary and other confirmed income (1 point)</td></tr>
<tr><td rowspan="3">c2</td><td rowspan="3">Credit history</td><td>c21</td><td>sufficient</td><td>0</td><td>5</td><td></td><td></td><td>There is a breach of contract (0 points) Not used (5 points);</td></tr>
<tr><td>c22</td><td>good</td><td>4</td><td>6</td><td>8</td><td></td><td>Systematic delay payments over 7 days (4 points) Systematic delay payments to 7 days (6 points) Delay payments not systematically to 7 days (8 points)</td></tr>
<tr><td>c23</td><td>excellent</td><td>7</td><td>10</td><td></td><td></td><td>Individual cases of overdue payments (7.5 points) Debt service is good without violations (9 points)</td></tr>
<tr><td rowspan="4">c3</td><td rowspan="4">Auto-mobile ownership</td><td>c31</td><td>cheap</td><td>300</td><td>1000</td><td>2000</td><td>3000</td><td>Cost up to USD 3,000</td></tr>
<tr><td>c32</td><td>budget</td><td>2500</td><td>5000</td><td>7000</td><td>1000 0</td><td>Cost from 3 000 to 10 000 USD.</td></tr>
<tr><td>c33</td><td>medium</td><td>9000</td><td>15000</td><td>25000</td><td>30000</td><td>Cost from 10 000 to 30 000 USD</td></tr>
<tr><td>c34</td><td>expensive</td><td>2700 0</td><td>5000 0</td><td>7500 0</td><td>10000 0</td><td>Cost from 30 000 USD.</td></tr>
</table>

Appendix

Annex 4

Indicators (characteristics of membership functions) for credit conditions (D).

Symbol	Name	Symbol	Linguistic assessment	Triangular and trapezoidal numbers for the value of linguistic variable				Interval
d1	The purpose of lending	d11	Consumer lending	0	0,5			Purchases of consumer goods (0.5 points)
		d12	Auto Loans	0,4	1	1,5	2	Purchase of cars (1 point-domestic, 2 points-import)
		d13	Mortgage Lending	1,75	2	2,5		Purchase of house (2 points - secondary market, construction - 2.5 points)
d2	Loan term	d21	Short	0,1	1			To 1 year
		d22	Medium	0,75	2	3	5	From 1 to 5
		d23	Long	4	10	15		From 5 to 15
d3	Lending amount	d31	Small	1000	5000	10000	20000	To 20 000 UAH
		d32	Medium	18000	25000	35000	50000	From 20 000 to 50 000 UAH
		d33	Big	48000	70000	100000		Over 50 000 UAH

Annex 5

The rules for forming assess of the financial stability of the borrower (A) (A1 weak; A2 sufficient; A3 strong).

The combination of components			Financial stability A
a11	a21	a31	A1
a11	a22	a31	A1
a11	a23	a31	A2
a11	a22	a32	A1
a11	a21	a32	A1
a11	a23	a33	A2
a11	a22	a33	A1
a11	a21	a33	A1
a11	a23	a32	A2
a12	a21	a31	A2
a12	a22	a31	A2
a12	a23	a31	A3
a12	a22	a32	A2
a12	a21	a32	A2

The combination of components			Financial stability A
a12	a23	a33	A3
a12	a22	a33	A3
a12	a21	a33	A2
a12	a23	a32	A3
a13	a21	a31	A2
a13	a22	a31	A2
a13	a23	a31	A3
a13	a22	a32	A2
a13	a21	a32	A2
a13	a23	a33	A3
a13	a22	a33	A3
a13	a21	a33	A2
a13	a23	a32	A3

Appendix

Annex 6

The rules for forming assess of the social stability of the borrower (B) (B1 weak; B2 sufficient; B3 strong).

The combination of components			Social stability B
b11	b21	b31	B1
b11	b22	b31	B1
b11	b23	b31	B1
b11	b22	b32	B2
b11	b21	b32	B1
b11	b23	b33	B2
b11	b22	b33	B2
b11	b21	b33	B1
b11	b23	b32	B1
b12	b21	b31	B1
b12	b22	b31	B2
b12	b23	b31	B1
b12	b22	b32	B2
b12	b21	b32	B2

The combination of components			Social stability B
b12	b23	b33	B2
b12	b22	b33	B3
b12	b21	b33	B3
b12	b23	b32	B2
b13	b21	b31	B2
b13	b22	b31	B2
b13	b23	b31	B1
b13	b22	b32	B2
b13	b21	b32	B2
b13	b23	b33	B3
b13	b22	b33	B3
b13	b21	b33	B3
b13	b23	b32	B2

Appendix

Annex 7

The rules for forming assess of the debt service of the borrower (C) (C1 satisfactory; C2 good; C3 excellent).

The combination of components			Debt service C
c11	c21	c31	C1
c11	c22	c31	C1
c11	c23	c31	C1
c11	c22	c32	C1
c11	c21	c32	C1
c11	c23	c33	C1
c11	c22	c33	C1
c11	c21	c33	C1
c11	c23	c32	C1
c12	c21	c31	C1
c12	c22	c31	C1
c12	c23	c31	C1
c12	c22	c32	C1
c12	c21	c32	C1
c12	c23	c33	C2
c12	c22	c33	C2
c12	c21	c33	C2
c12	c23	c32	C2

The combination of components			Debt service C
c13	c21	c31	C1
c13	c22	c31	C2
c13	c23	c31	C2
c13	c22	c32	C2
c13	c21	c32	C2
c13	c23	c33	C3
c13	c22	c33	C3
c13	c21	c33	C2
c13	c23	c32	C3
c11	c21	c34	C2
c11	c22	c34	C2
c11	c23	c34	C2
c12	c21	c34	C2
c12	c22	c34	C2
c12	c23	c34	C3
c13	c21	c34	C2
c13	c22	c34	C3
c13	c23	c34	C3

Appendix

Annex 8

The rules for forming assess the credit conditions (D) (D1 low risky; D2 risky; D3 very risky).

The combination of components			Credit conditions D
d11	d21	d31	D1
d11	d22	d31	D1
d11	d23	d31	D1
d11	d22	d32	D2
d11	d21	d32	D1
d11	d23	d33	D3
d11	d22	d33	D3
d11	d21	d33	D2
d11	d23	d32	D2
d12	d21	d31	D1
d12	d22	d31	D2
d12	d23	d31	D2
d12	d22	d32	D2
d12	d21	d32	D2

The combination of components			Credit conditions D
d12	d23	d33	D3
d12	d22	d33	D3
d12	d21	d33	D2
d12	d23	d32	D2
d13	d21	d31	D2
d13	d22	d31	D2
d13	d23	d31	D3
d13	d22	d32	D2
d13	d21	d32	D3
d13	d23	d33	D3
d13	d22	d33	D3
d13	d21	d33	D3
d13	d23	d32	D3

Appendix

Annex 9

The rules for forming assess of the creditworthiness of borrowers (R) (R1 low; R2 satisfactory; R3 good; R4 very good).

The combination of components				Creditworthiness of borrowers
A1	B1	C1	D1	R1
A1	B1	C1	D2	R1
A1	B2	C1	D2	R1
A1	B2	C1	D3	R1
A2	B2	C1	D2	R2
A2	B1	C1	D2	R1
A2	B2	C1	D3	R2
A3	B1	C1	D1	R2
A1	B2	C1	D1	R1
A1	B3	C1	D1	R2
A1	B1	C1	D3	R1
A1	B3	C1	D3	R1
A2	B1	C1	D1	R2
A2	B2	C1	D1	R3
A2	B3	C1	D1	R3
A2	B1	C1	D3	R2
A2	B3	C1	D3	R2
A2	B3	C1	D2	R2
A3	B3	C1	D3	R3
A3	B1	C1	D3	R2
A3	B2	C1	D1	R3
A3	B2	C1	D3	R3
A3	B3	C1	D2	R3
A1	B2	C2	D2	R2
A1	B1	C2	D1	R1
A1	B1	C2	D3	R1
A1	B2	C2	D3	R2
A1	B3	C3	D1	R2
A1	B2	C3	D1	R2
A2	B3	C3	D1	R4
A1	B3	C1	D2	R2
A3	B3	C1	D1	R3
A3	B1	C1	D2	R2
A3	B2	C1	D2	R3
A1	B2	C2	D1	R2
A1	B1	C2	D2	R1
A1	B3	C2	D1	R2
A1	B3	C2	D2	R2
A1	B3	C2	D3	R2
A2	B2	C2	D2	R3
A2	B1	C2	D2	R3

The combination of components				Creditworthiness of borrowers
A2	B2	C2	D1	R3
A2	B3	C2	D2	R3
A2	B2	C2	D3	R3
A2	B1	C2	D1	R3
A2	B3	C2	D3	R3
A2	B3	C2	D1	R3
A2	B1	C2	D3	R2
A3	B3	C2	D3	R3
A3	B2	C2	D2	R3
A3	B3	C2	D2	R3
A3	B1	C2	D1	R3
A3	B3	C2	D1	R4
A3	B1	C2	D3	R3
A3	B1	C2	D2	R2
A3	B2	C2	D1	R3
A1	B3	C3	D3	R2
A1	B1	C3	D1	R2
A1	B1	C3	D3	R1
A1	B1	C3	D2	R1
A1	B2	C3	D2	R2
A1	B3	C3	D2	R2
A2	B3	C3	D3	R3
A2	B2	C3	D2	R3
A2	B3	C3	D2	R3
A2	B1	C3	D1	R3
A2	B1	C3	D2	R2
A2	B2	C3	D1	R4
A2	B1	C3	D3	R2
A3	B3	C3	D3	R4
A3	B3	C3	D1	R4
A3	B3	C3	D2	R4
A3	B1	C3	D1	R3
A3	B1	C3	D2	R3
A3	B2	C2	D3	R3
A1	B2	C3	D3	R2
A2	B2	C3	D3	R3
A3	B1	C3	D3	R3
A3	B2	C3	D3	R3
A3	B2	C3	D2	R3
A3	B2	C3	D1	R4

Annex 10

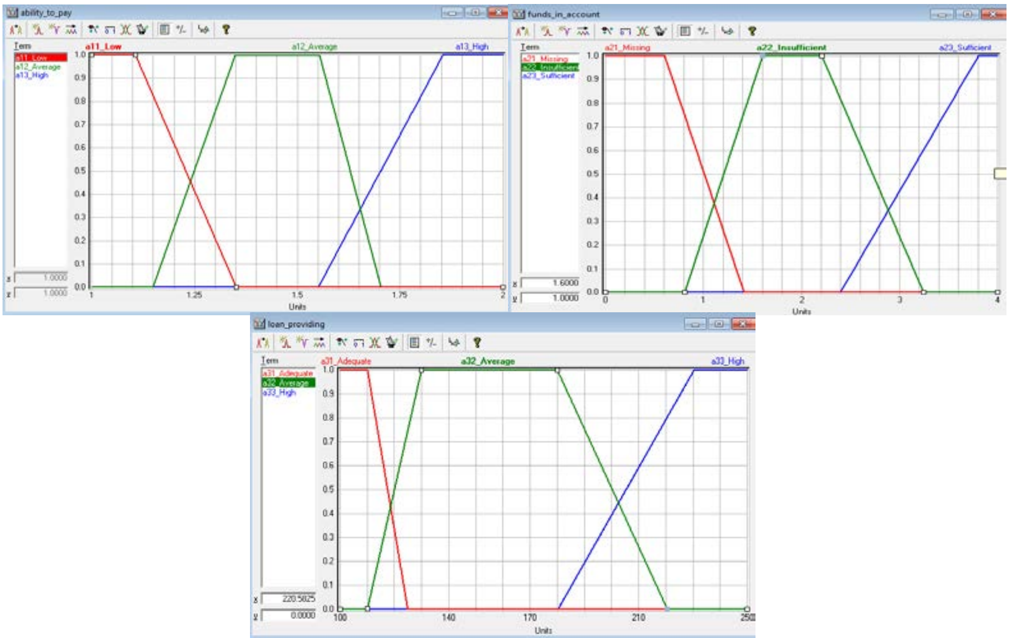

Figure 1. Computer representation of membership functions for input variables (a1, a2, a3) of the component "financial stability of the borrower" (A)

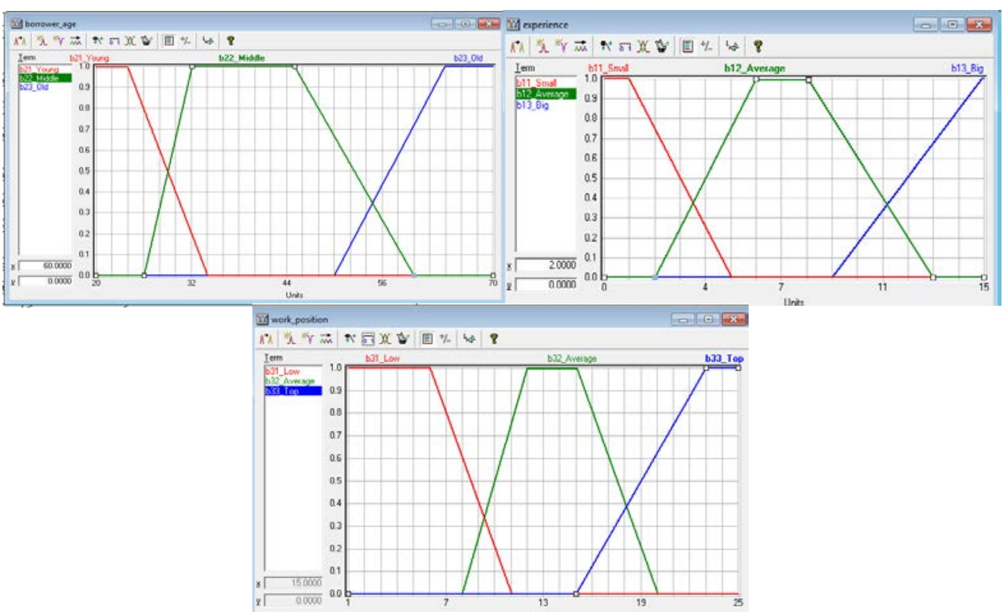

Figure 2. Computer representation of membership functions for input variables (b1, b2, b3) of the component "social stability of the borrower" (B)

End of annex 10

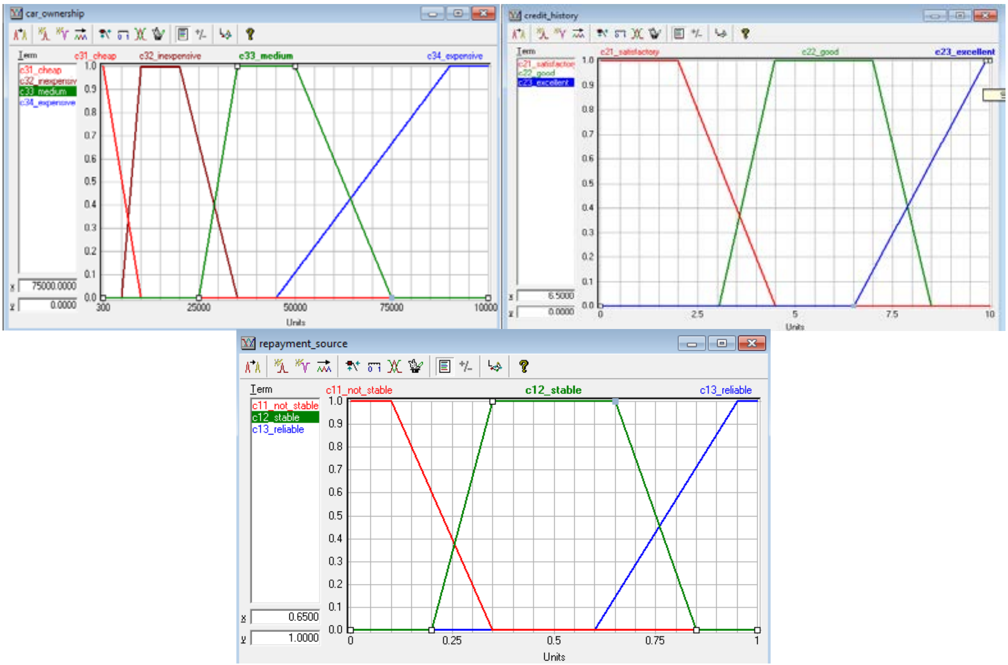

Figure 3. Computer representation of membership functions for input variables (c1, c2, c3) of the component "debt service" (C)

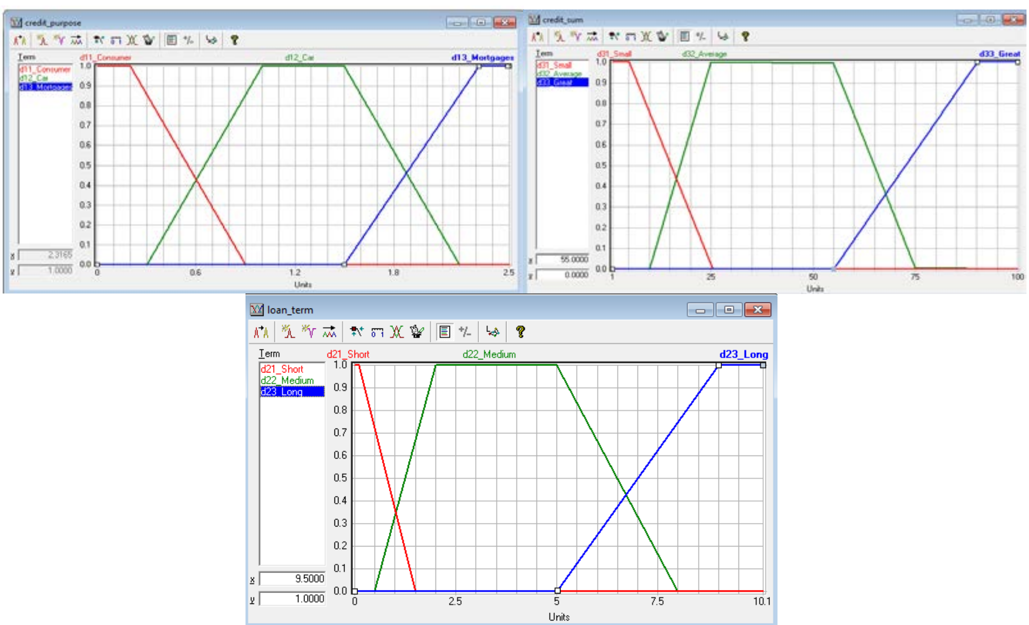

Figure 4. Computer representation of membership functions for input variables d1, d2, d3) of the component "credit condition" (D)

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We are pleased to present to readers the work that is a result of cooperation between the Bronislaw Markiewicz State Higher School of Technology and Economics in Jaroslaw (Poland) and Simon Kuznets Kharkiv National University of Economics (Ukraine).

The monograph is dedicated to the 90th anniversary of the Simon Kuznets Kharkiv National University of Economics.

The findings provided herein address the development aspects of the risk-based approach to combating money laundering. The analysis includes international standards applied to regulate and develop the risk-oriented financial monitoring system; financial intermediaries´ functioning peculiarities under the economy digitalization conditions and the peculiarities of primary financial monitoring conducted in the insurance industry and by banks; theoretical and methodological provisions for assessment and banks´ risk management from the standpoint of the factors influencing the money laundering processes.

The monograph is intended for lecturers, scientists, students of economic universities, specialists of public authorities, financial institutions and businesses.

KhNUE Simon Kuznets

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