

# “Assessment of financial monitoring efficiency in the banking system of Ukraine”

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## ARTICLE INFO

Alina Bukhtiarova, Andrii Semenog, Mila Razinkova, Nataliia Nebaba and Józef Antoni Haber (2020). Assessment of financial monitoring efficiency in the banking system of Ukraine. *Banks and Bank Systems*, 15(1), 98-106. doi:10.21511/bbs.15(1).2020.10

**DOI** [http://dx.doi.org/10.21511/bbs.15\(1\).2020.10](http://dx.doi.org/10.21511/bbs.15(1).2020.10)

**RELEASED ON** Friday, 20 March 2020

**RECEIVED ON** Thursday, 09 January 2020

**ACCEPTED ON** Thursday, 12 March 2020

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## 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

**36**



NUMBER OF FIGURES

**1**



NUMBER OF TABLES

**5**

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## BUSINESS PERSPECTIVES



LLC "CPC "Business Perspectives"  
Hryhorii Skovoroda lane, 10,  
Sumy, 40022, Ukraine  
[www.businessperspectives.org](http://www.businessperspectives.org)

**Received on:** 9<sup>th</sup> of January, 2020  
**Accepted on:** 12<sup>th</sup> of March, 2020  
**Published on:** 20<sup>th</sup> of March, 2020

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

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# ASSESSMENT OF FINANCIAL MONITORING EFFICIENCY IN THE BANKING SYSTEM OF UKRAINE

## Abstract

The transformation processes taking place in the global economy and the expansion of global business ties increase the overall vulnerability of the international banking system. One of the problems related to money laundering is the process of evaluating the efficiency of financial monitoring measures. The article discusses the issues of assessing the effectiveness of financial monitoring in the banking system of the country. For Ukraine, this problem is especially relevant, because there is a bank-centric model of the financial market (about 90% of assets go through the banking system) in the country. According to official data, 50% of economic activity in Ukraine ends with money laundering. The article presents the improved method that quantifies the level of financial monitoring system effectiveness at commercial banks of Ukraine based on calculations of the integral index. The index indicates the dynamics of the financial system protection degree from the money laundering threat based on the expediency and efficiency of financial monitoring in the banking system. As a result, more comprehensive conclusions about the level of financial security of the country are made. According to assessments, in 2017–2018 the efficiency of financial monitoring of the banking system of Ukraine was at the middle level (about 64%). The proposed method can be applied to evaluate the effectiveness of the financial monitoring system in any country and become the basis for improving the anti-money laundering system through the banking system.

**Keywords** monitoring, banks, effectiveness, bank supervision,  
Ukraine

**JEL Classification** G20, G21, G28

## INTRODUCTION

In the process of dynamic development of the banking system and the use of the latest financial technologies, the overall level of vulnerability of the international financial system increases and, as a result, threatens the national security of each country. The ongoing processes of the world economy globalization lead to many problems, in particular, those related to counteracting the legalization of proceeds of crime, terrorism financing and a number of predictable crimes. The search for and the elimination of money laundering schemes should be the basis for a joint and focused activity of the authorities.

Ukraine is on its way to socio-economic transformation aimed at the maximum coordination of financial and credit relations of the world's leading economies. The problem of combating money laundering is extremely important for Ukraine, since most of the national capital is located abroad. Subsequently, this capital will return to Ukraine in the form of foreign investment with appropriate "preferential" conditions. The problem of creating an integrated system of financial monitoring is important and vital today; its solution can contribute to the socio-economic development of the country, reforming the budget and social security system of the population, efficient use of state property and ensuring an adequate level of national security.

It should be noted that in Ukraine there is a system of banking supervision of the National Bank of Ukraine to ensure the stability of the banking sector and protect the interests of depositors. In general, the supervisory authorities of the National Bank of Ukraine have developed a system for monitoring the functioning of the banking sector and identifying risks associated with the activities of banking institutions (CAMELS ratings, early response indicators, etc.). At the same time, there is an urgent need to increase the transparency of banking institutions (in terms of financial condition, results of operations, ownership structure) and openness of the decision-making process in the financial sector.

Besides, banking supervision should be able to identify the internal problems of the bank. These may be fraudulent acts, violations of laws and regulations, etc. In general, solvency and liquidity should be given particular consideration when assessing one's financial position. In the event of problems in the activities of banks, the banking supervisory authorities may decide on several radical measures to interfere with the activities of troubled banks.

The most dangerous is the merger of shadow capital with the state apparatus. The influence of shadow capital on various fields of political life, in particular, on the activities of parties, people's deputies, regional authorities, local governments and the media, is increasing. All this undermines the credibility of systemic changes, the international image of the state, and threatens national security. A specific feature of financial monitoring is its implementation at two interrelated levels: at the first level, information on financial transactions is collected, processed, analyzed and verified, as well as provided by financial monitoring bodies and other organizations (state financial monitoring); at the second level, measures are being taken to identify financial transactions that may involve money laundering risks (initial financial monitoring, including mandatory and internal financial monitoring).

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## 1. LITERATURE REVIEW

In Ukraine, the financial monitoring system was established relatively recently, therefore, insufficient attention has been paid to its study.

Increased attention to the issue of increasing the effectiveness of financial monitoring among scientists and practitioners is largely due to its importance for ensuring the economic security of the state. Today, although the Ukrainian banking system has somewhat stabilized, its changes are continuing. Corruption is the most dangerous manifestation of counteraction to monetary reform. Commercial bribery allows criminal groups to use the work of banks to launder criminal proceeds. To determine the effectiveness of risk factors for the bank, the weighted sum method is used.

Thus, Kolodiziev, Chmutova, and Lesik (2018) propose to use the analysis of causal links to identify the causes of the crisis trends spreading and the rationale for the most effective levers of regulatory influence on the banking system parameters by the central bank according to the stages of the banking system stability monitoring. Their research is based

on the use of the canonical correlation method to structure causal links between the indicators for assessing the banking system stability, which are grouped into four sub-indices. The causes of detected deviations are determined to take into account the results of applying the canonical correlations method. Regression models have been constructed to confirm the dependence of the banking system stability index on the changes in parameters that characterize banking regulation instruments and to determine the most effective of them. Practical testing of the submitted proposals is carried out based on the indicators of the Ukrainian banking system for 2007–2016.

Kozmenko and Belova (2015) investigated the peculiarities of identifying systemically important banks and assessing their impact on the occurrence of economic crisis. Based on the building of a binary logit model they found out a correlation between the activity of systemically important banks and the onset of economic crisis in Ukraine in 2008, 2009 and 2013. Authors paid attention to the problem that is gradually solved by creating a special Committee on Banking Supervision regarding the definition of systemically important banks.

Meanwhile, Besanko and Kanatas (2015) characterized a credit market equilibrium in which banks coexist with capital markets, and firms obtain funding from both sources. They acknowledge that there is a problem of incentives between insiders and third-party capital providers. Banks can provide not only credit, but also monitoring services. The authors show that when banks cannot pre-commit to a particular level of monitoring, there is a unique balance in the credit market, when firms are financed by bank credit and external capital. In this equilibrium, the marginal substitution of bank credit for capital market financing would raise the company's stock price.

For example, Demirgüç-Kunt and Detragiache (2000) use a weighted banking system fragility index (BSF index) to measure changes in bank vulnerability to crisis. Using monthly sectoral data for selected 22 countries, it is argued that this type of a fragility index seems to be very useful for measuring and monitoring changes in the banking system fragility. That is, it can significantly contribute to the policymakers' efforts towards early detection of approaching banking system difficulties. The authors proposed to use the banking-system-fragility index to monitor and identify the banking system difficulties by using monthly data. Since the BSF index reflects changes in the sectoral climate more precisely and timely, it significantly reduces the possibility that the crisis or high fragility episodes are misidentified, contrary to the case of event-based identification strategies. According to the article, the BSF index makes it possible to work with more frequent data on banking crises.

Krishnan, Ritchken, and Thomson (2005) examined whether mandating banks to issue subordinated debt would improve market monitoring and risk control. To assess whether subordinated debt enhances risk monitoring, they extract a credit-spread curve for each banking firm in the sample and examine to see if changes in credit spreads reflect changes in bank risk variables after controlling for changes in market and liquidity variables. The authors do not find convincing and consistent evidence that they do. To evaluate whether subordinated debt controls risk-taking, they examine whether the first issue of subordinated debt changes the risk-taking behavior of a bank and find that it does not.

Tobias, Covitz, and Liang (2015) presented a forward-looking monitoring program to identify and track the sources of systemic risk over time and to facilitate the development of preemptive policies to promote financial stability. They offer a framework that distinguishes between shocks, which are difficult to prevent, and vulnerabilities, which amplify shocks. Based on substantial research, they focus on leverage, maturity transformation, interconnectedness, complexity, and the pricing of risk as to the primary vulnerabilities in the financial system. The monitoring program tracks these vulnerabilities in four areas: the banking system, shadow banking, asset markets, and the nonfinancial system. The framework also highlights the policy trade-off between reducing systemic risk and raising the cost of financial intermediation by taking preventive measures to reduce vulnerabilities.

Beck, Demirgüç-Kunt, and Levine (2006) begin their research with the question: "Which commercial bank supervisory policies ease – or intensify – the degree to which bank corruption is an obstacle to firms raising external finance?" Based on new data from more than 2500 firms across 37 countries, this paper provides the first empirical assessment of the impact of different bank supervisory policies on firms' financing obstacles. The authors believe that the traditional approach to banking supervision, which provides for empowering official supervisory agencies to monitor, discipline, and influence banks directly, does not improve the integrity of bank lending. Rather, they find that a supervisory strategy aimed at empowering private monitoring of banks by forcing them to disclose accurate information to the private sector tends to lower the degree to which corruption of bank officials is an obstacle to firms raising external finance. In extensions, they find that regulations that empower private monitoring have a particularly beneficial effect on the integrity of bank lending in countries with sound legal institutions.

## 2. AIMS

The purpose of the article is to develop a scientific and methodological approach to assessing the level of efficiency of financial monitoring system of commercial banks based on calculating the integral indicator and improving the system of combating money laundering through the banking system.

### 3. METHODS

The study of the effectiveness of the financial monitoring system is necessary to ensure the financial security, namely the security of the state's banking system and its separate components.

The effectiveness of the financial monitoring of banking activities can be assessed using the integrated performance indicator. Therefore, it is recommended to build a linear mathematical model (Halitsyn, 2001).

$$z_i = \sum_{i=1}^n a_i z_i, \sum a_i = 1, 0 \leq a_i, z_i \leq 1, \quad (1)$$

where  $z_i$  – normalized financial monitoring performance indicators,  $a_i$  – weighting factors that determine the degree of the  $i$ -th indicator's contribution.

Thus, the calculation of the integrated financial monitoring performance indicator includes the following steps:

- to generate a set of indicators according to the relevant criteria (aggregated indicators);
- to standardize indicators;
- to determine the weighting coefficients of indicators in each aggregate indicator;
- to calculate the aggregate indicators by the weighted sum method;
- to determine the weight coefficients of the aggregate indicators;
- to calculate the integral performance index.

Once the benchmarking system has been established, the next step in evaluating the effectiveness is the development of indicators to draw conclusions about the effectiveness of financial monitoring according to the appropriate characteristics.

The next step in studying the effectiveness of financial monitoring is indicator standardization. When forming a set of indicators, it is important to ensure their information unidirectionality. For this purpose, the indicators are divided into in-

centives (stimulants) and disincentives. The correlation between the integral index and the stimulus index is straightforward, but with the stimulus index, it is inverse. It is also important that expediency and cost indicators are shown as incentives and performance indicators as disincentives.

Standardization of indicators should be carried out with maximum values for stimulants and minimum values for disincentives for some indicators. It will allow maintaining standardized values of indicators within the set limits [0; 1].

$$z_i = \begin{cases} x_i / x_{max} \\ x_{min} / x_i \end{cases}, \quad (2)$$

where  $z_i$  – normalized financial monitoring performance indicators;  $x_i$  – the actual value of the  $i$  indicator;  $x_{max}$  – the maximum value of the  $i$  indicator within the dynamic range;  $x_{min}$  – the minimum value of the  $i$  indicator within the dynamic range.

Next, weights of standardized indicators within the individual aggregate indicators are determined, and then the aggregated indicators within the integrated index. To do this, the Fishburn rule is used, which will allow determining the level of indicator significance according to their graduation. If the system of indicators is ordered by the degree of decreasing significance, then the significance of the  $I$  indicator should be determined as follows (D'yakonova & Shyyan, 2013).

$$r_i = \frac{2 \cdot (N - i + 1)}{(N + 1) \cdot N}, \quad (3)$$

where  $r_i$  – the weight factor of the  $i$  indicator;  $N$  – the number of indicators;  $i$  – ordinal number (rank) of the  $i$  indicator.

Based on the values of standardized primary indicators and the corresponding weights, the aggregate indicators and the integrated performance index are calculated.

Financial monitoring covers a wide range of organizational, methodological and management activities. Creating an integrated financial monitoring system will give a positive impetus to the development and stability of a bank and the banking system as a whole. As a result, the National



Bank of Ukraine pays particular attention to ensuring that banks understand the nature of transactions and receive sufficient information to identify money-laundering risks. Banks' efforts should be aimed directly at combating money laundering, not at low-risk customers.

Since performance is determined by many characteristics, when assembling elements of a series, it is necessary to combine all the characteristics as a whole. In this case, it is recommended to perform aggregation following the applicable principles, so the weighted sum method will be used. In the first stage, the aggregate indicators are calculated, and in the second, weighting coefficients are considered and an integral index is defined.

## 4. RESULTS

The dynamics of performance indicators are given in Table 1.

Table 2 shows the calculation of the normalized indicators of the financial monitoring effectiveness of Ukrainian banks for 2014–2018.

The next step in the analysis is to calculate the weighting coefficients of the standardized indicators. The results of the calculations of the aggregated performance indicators are presented in Table 3.

The results of the weight calculations to determine the overall integral indicator of the effectiveness

**Table 1.** Performance indicators of financial monitoring of the Ukrainian banking system in 2014–2018, %

Indicator	Symbol	Year				
		2014	2015	2016	2017	2018
The share of possible legalization (money laundering) (% of GDP)	$x_1$	17.06	3.42	15.44	10.22	6.35
The shadow economy level by monetary method (% of GDP)	$x_2$	31	33	27	24	23
The share of messages by banks (% of total)	$x_3$	97.16	98.2	99.07	99.20	98.66
The share of messages selected for further active work (% of total)	$x_4$	15.48	6.39	4.52	4.97	5.26
The proportion of criminal proceedings (%)	$x_5$	75.45	52.19	28.79	21.57	32.09
The proportion of criminal cases sentenced (%)	$x_6$	28.89	19.66	18.29	37.58	5.61
The share of the value of distrained and seized property (% of total laundering)	$x_7$	1.15	8.13	5.87	5.63	6.22
The share of appropriations for the maintenance of the authorized body (% of the budget expenditures)	$x_8$	0.006	0.005	0.004	0.017	0.007

**Table 2.** Normalized indicators of financial monitoring effectiveness of Ukrainian banks in 2014–2018

Indicator	Symbol	Year				
		2014	2015	2016	2017	2018
The amount of possible legalization (money laundering)	$z_1$	0.20	1.00	0.22	0.33	0.54
The shadow economy level by monetary method	$z_2$	0.74	0.70	0.85	0.96	1.00
The share of bank messages	$z_3$	0.98	0.99	1.00	1.00	0.99
The share of messages selected for active work	$z_4$	1.00	0.41	0.29	0.32	0.34
The proportion of criminal proceedings	$z_5$	1.00	0.69	0.38	0.29	0.43
The proportion of criminal cases sentenced	$z_6$	0.77	0.52	0.49	1.00	0.15
The share of the value of distrained and seized property	$z_7$	0.14	1.00	0.72	0.69	0.76
The share of appropriations for the maintenance of the authorized body	$z_8$	0.67	0.80	1.00	0.24	0.59

**Table 3.** Weighting coefficients for the aggregate financial monitoring performance of the Ukrainian banking system

Indicator	Rank	Weighting factor ( $a_i$ )	Confidence indicator	Rank	Weighting factor ( $a_i$ )
The amount of possible legalization (money laundering)	1	0.667	Expediency	1	0.500
The shadow economy level by monetary method	2	0.333			
The share of bank messages	1	0.333	Effectiveness	2	0.333
The share of messages selected for active work	2	0.267			
The proportion of criminal proceedings	3	0.200			
The proportion of criminal cases sentenced	4	0.133			
The share of the value of distrained and seized property	5	0.067	Economy	3	0.167
The share of appropriations for the maintenance of the authorized body	1	1.000			

**Table 4.** Ranks and weights for determining the integral indicator of the effectiveness of the banking system financial monitoring

Indicator	Rank	Weighting factor ( $a_i$ )
The amount of possible legalization (money laundering)	1	0.222
The level of the shadow economy by monetary method	2	0.194
The share of bank messages	3	0.167
The share of messages selected for active work	4	0.139
The proportion of criminal proceedings	5	0.111
The proportion of criminal cases sentenced	6	0.083
The share of the value of distrained and seized property	7	0.056
The share of appropriations for the authorized body maintenance	8	0.028

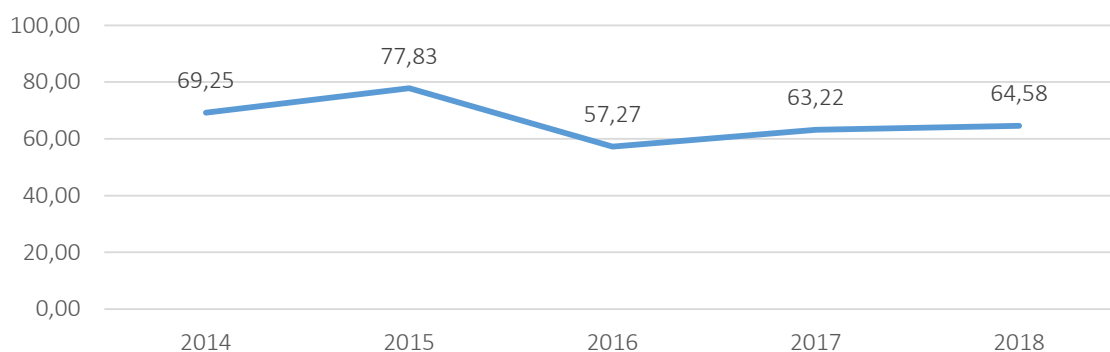
of the banking system monitoring are presented in Table 4.

The research results are presented by constructing a graph of the effectiveness of the banking system financial monitoring (Figure 1).

To interpret the results obtained, the scale of distribution of values based on the Harrington desirability function is used (see Table 5).

Based on the calculations, one can observe an ambiguous trend in the effectiveness of financial monitoring in Ukraine. The situation in

2015 compared to the previous year improved to 77.83%, which was the highest indicator for the period under review. First of all, this can be explained by the creation of the central executive body, the State Financial Monitoring Service of Ukraine. During 2016, the efficiency level was low and did not exceed 57.27%. However, the 2017–2018 indicators increased and showed the effectiveness of financial monitoring of the banking system in Ukraine at 63.22% and 64.58%, respectively. This trend may be related to a decrease in the amount of possible legalization and an increase in criminal proceedings over the past two years.

**Figure 1.** Dynamics of the integrated performance indicator of the financial monitoring of the Ukrainian banking system, %

**Table 5.** The value of Harrington desirability function

Desirability	Desirability scales
Very good	0,80-1,00
Good	0,63-0,80
Satisfactory	0,37-0,63
Bad	0,20-0,37
Very bad	0,00-0,20

## 5. DISCUSSION

Evaluation of the financial monitoring system through the example of Ukraine indicates a gradual increase in its efficiency. At the same time, an analysis of the current state of the banking system has revealed some problems in its functioning. First, the massive closure of banking institutions in Ukraine. This problem can be solved by moving to a policy of mergers and acquisitions of banks. The following is a crisis of customer distrust in banks, which now plays a key role in ensuring the smooth functioning of the banking sector. Therefore, in the short term, solving this problem is a priority for both the National Bank of Ukraine and the management of each bank. Second, the issue of the presence of a significant portion of problem assets of banks remains open; this requires systemic measures on the part of the National Bank of Ukraine. Further research may be related

to the development of a set of measures to improve the functioning of the Ukrainian banking system at the present stage. The anti-money laundering system in the banking system should be developed using international experience based on current legislation in accordance with international standards. However, it is not enough to monitor the progress of countries and gain positive experience in the field of financial monitoring. The world needs cooperation in developing institutional infrastructure to prevent the economy criminalization by legalizing the proceeds of crime, establishing the essence of these mechanisms, their components and organizing the process of their interaction. The question of allocating the political component of the protection of high officials who have been exposed to the involvement of illegal money laundering schemes and determining the proportionality of damages to the financial system remains debatable.

## CONCLUSION

Based on the calculation of integrated indicator of financial monitoring of the Ukrainian banking system effectiveness, the following conclusions can be drawn. Analysis of changes in the level of shadowing of the economy makes it possible to determine not only its general state during the corresponding period, but also divide it into stages, using other indicators, which are important for improving financial monitoring. Every year, the number of messages sent increases, which helps to improve the effectiveness of financial monitoring. The reduction in the number of messages selected for active work in 2014–2015 may depend on the following factors: the number of messages sent; errors in the messages; there are good reasons to continue processing some messages. The situation in 2015 compared to the previous year improved to 77.83%, which was the highest indicator for the period under review. In particular, this is explained by the creation of a central executive authority, namely, the State Financial Monitoring Service of Ukraine. In 2016, the efficiency level was low and did not exceed 57.27%. But 2017–2018 indicators have grown and shown the effectiveness of financial monitoring of the banking system of Ukraine at the level of 63.22% and 64.58%, respectively. This trend may be related to a decrease in the amount of possible legalization and an increase in criminal proceedings over the last two years. The ratio of the share of seized and distrained property to the total amount of money laundering and legalization of criminal proceeds also increases, which indicates an increase in the efficiency of the courts and preparatory bodies.



## ACKNOWLEDGMENT

The study was conducted as part of state budget research of Sumy State University – Formation of a Public Finance Transparency System as a Prerequisite for Combating Corruption in Ukraine (0118U003585) (in the context of evaluating the effectiveness of financial monitoring of the Ukrainian banking system) and Formation of Tools for the Ukrainian Economy Unshadowing Based on Causal Modeling of Interaction Trajectories of Financial Intermediaries (0120U100473) (in the context of substantiating the need and directions for improving the financial monitoring system in Ukrainian banks).

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