

Iryna D'yakonova (Ukraine)

## Methodological foundations for the modernization of banking supervision in Ukraine on the basis of leading indicators

### Abstract

The article develops the conception for the assessment of imbalances in the banking system by banking supervisory authorities. A special attention is paid to the necessity to consider the peculiarities of banking systems and determine the leading indicators of possible imbalances in the banking system development. It also offers methodical foundations for the development and use of the banking system's quality evaluation.

**Key words:** banking system, banking supervision, monitoring, leading indicators.

**JEL Classification:** G21.

### Introduction

Banking supervision has existed for more than 100 years in countries with the market economy. In the course of its evolution its institutional structure and supervision components were significantly improved. Unchanged, however, remain the main tasks of supervisory authorities of banking systems in different countries of the world.

The Law of Ukraine on the National Bank of Ukraine defines banking supervision as a system of control and active actions of the National Bank of Ukraine aimed at ensuring the observance of banking regulations by banks, stability of the banking system and protection of depositors' and creditors' interests.

The National Bank of Ukraine carries out the supervision over how banks, their branches, divisions and subsidiaries as well as other banking institutions on the territory of Ukraine observe the banking legislation, normative and legal acts of the National Bank of Ukraine. The National Bank supervises the entire banking sector of Ukraine.

The vision of the banking system of Ukraine as comprised of the National Bank of Ukraine and commercial banks is reflected in the Article 4 of the Law of Ukraine "On banks and banking activity": "The banking system of Ukraine consists of the National Bank of Ukraine, other domestic banks and subsidiaries of foreign banks operating in Ukraine in accordance with the provisions of this Law".

We think it is important to study the banking system in more detail in order to define its specific features.

### 1. The detailed elaboration of the study object of supervisory authorities

The banking system enjoys a strategic position in the economy, which is explained by its major functions such as:

- ◆ securing the stability of the national currency;
- ◆ accumulation and redistribution of financial resources of the general population and companies into credits and investments;
- ◆ regulation of supply and demand of money in the economy;
- ◆ organization and harmonization of payments in the economy.

In the authors opinion, the banking system of Ukraine is a constantly developing dynamic, which is closely interacting with its environment. It belongs to the category of active and managed systems inclined to fluctuations. This approach will help us determine the conditions and factors of the banking system stability in the market economy.

Banking system has its specific features because of the peculiarities of the banking business and its impact on the economic environment. This makes it necessary to carry out its separate research.

Below the list of the banking system specific features is offered (Table 1).

Table 1. Description of the banking system specific features

Specific features	Description
Component aspect	Peculiarities of system elements and relations between them and other systems
Systematic and structural aspect	Organizational structure of the system, which is characterized by peculiarities of relationships between its elements, and which determines the subordination of the relationships
Managerial aspect	Self-regulation in conjunction with the management of the system, which ensure the system's development
Functional aspect	A way of expressing the activity and vitality of components and the preservation of their integrity

The description of the banking system as self-regulating means its ability to independently maintain a sound regime of functioning and adequately react to external influences which might disrupt its activity. Self-regulation is assured on the basis of a feedback from other systems, in particular, the economic one.

The description of the banking system as a managed one is determined by the system's tasks and objectives, which, undoubtedly, should coincide with the goals of the society. As the banking system of Ukraine is a two-level one, the banking law and regulations define the tasks for each level: for commercial banks – making profits; for the National Bank of Ukraine – ensuring the stability of the national currency; development and strengthening of the banking system; ensuring the effective and uninterrupted functioning of payment transactions.

Such approach helps researchers choose the appropriate tools for the systematic macro- and microanalyses.

So, the system of banking supervision in Ukraine must be modernized proceeding from the understanding of the banking system as a whole complex of interconnected elements, which develop as a consequence of internal and external factors.

## **2. Modern approaches to the methodology of banking supervision**

The process of banking supervision is carried out both in the distance mode and in the mode of direct inspection.

The obtained estimates are preliminary if there is a possibility to prove them during the direct bank inspection. The results of distant analysis and inspection analysis are used for making decisions in the area of regulation of financial institutions activities, their risks, fiscal policy and economic planning.

Distant supervision, in comparison with inspection, has a number of advantages, which makes it a dominant form of supervision for banking sector analysis. First of all, it provides a bigger coverage with the use of information and analytical systems in the activity of banking supervision, which makes it possible to obtain the analysis results for all financial organizations of the banking sector. Secondly, distant analysis requires less time-spending and efforts in order to perform supervisory functions. Thirdly, distant supervision can provide a picture of the banking sector state for any particular date.

Besides, distant analysis of some credit institutions is often used by customers of credit institutions and other credit organizations for the evaluation of their financial state. A vivid example of this is the rating

agencies, which, by using the information about the activities of credit institutions, draw conclusions regarding their profitability, soundness and prospects.

The main goal of the distant analysis of the banking system is to determine the risks in the banking sector on the basis of quantitative information obtained from bank reporting.

Quantitative information explains the state of some indicators of the banking system in certain time periods.

One of the methods of the banking supervision distant analysis is a system of early warning.

The goal of the early warning is a timely exposure of financially unsound banks, which enables banking supervisory authorities to apply tools for banks' recovery. To achieve this goal, the systems of early warning have been designed to discover unreliable banks.

Normally, an early warning system is a set of indicators, which characterize different sorts of risks, and includes both the methods of their early discovery and automated systems that process the results.

So far there is no concrete conception of such approach: banking supervisory authorities in different countries use different early warning indicators. For example, the Growth Monitoring System (GMS) in the United States traces banks that grow too quickly. The Central Bank of Hungary assesses to what degree banks working on the real estate market are susceptible to risks. The use of regressive models in the USA has become a de facto standard.

In the international practice of banking supervision quite common are the so called "supervisory systems of banking monitoring" – analytical systems that include the assessment of risks and early warning systems.

Such systems are often used in the international supervision practices. The Basel Committee provides their classification.

*Systems of coefficient analysis and analysis of homogeneous groups.* The coefficient analysis is a major instrument of financial state assessment. It is based on a system of indicators – various aspects that characterize the activity of credit institutions. The analysis of homogeneous groups is a logical extension of the coefficient analysis. It studies a bank's position in the group of related credit institutions and makes conclusions about the relative financial stability of the analyzed bank.

*Supervisory rating systems* assess the financial state of credit institutions in accordance with one or several ratings. Rating is an assessment system,

which ranges banks according to certain indicators and employs complex comparative estimates. Ratings are calculated on the basis of reporting data and other information available to supervisory authorities. Supervisory process of the National Bank of Ukraine is also based on the assessment of banks with the rating system CAMELS, which uses the methods of risk assessment and determines common criteria covering the banks' performance in all areas. Recently, one witnesses a tendency towards the reduction of distant ratings' use – banking supervisory authorities in the USA and Holland have stopped applying them.

*Systems of complex analysis of bank risks* allow to assess the profiles of a credit institution's risks by analyzing all of its divisions according to the criteria of efficiency and quality of management. The results are aggregated to obtain the generalized estimates for all types of bank risks.

*Statistical models* employ regressive methods for the evaluation of a forecast value of one or several key indicators based on retrospective information. These models make it possible to detect banks with a high risk of bankruptcy in the future.

Value-at-Risk methods are practically not used in international supervisory practices. According to the recommendations of the Basel Committee they are offered to credit institutions for building their own models of risk assessment. The supervisory authority in this case controls the compliance of internal models of risk assessment with the Basel Committee requirements.

*Stress-testing approaches* are extensively studied in the working publications of central banks in many countries. For example, supervisory authorities in Hong Kong have developed instructions pertaining to stress-testing within the existing standards of bank supervision. For a long time the Bank of Finland has carried out a distant analysis of financial stability of the banking system, in which stress-testing is used for scenario analysis of the future state of the banking sector. In particular, the system of bank analysis (SAABA) of the French bank commission consists of three diagnostic modules. The first is the module of quantitative analysis on the basis of bank reporting and other records, which studies banks' credit portfolio and calculates the probabilities of credit non-payment. It helps assess losses, which are expected for the next three years. The bank is considered reliable if with such losses the norms of capital sufficiency are kept within allowed boundaries. The second module studies the quality of owners of bank's shares (including the ability of these legal and physical persons to support a credit institution). The third module is

based on ratings' data, research results and market records. It diagnoses the quality of bank management, internal control and liquidity. By using the information received from all three modules the system provides a synthetic analysis of a bank, including its reliability.

The Bank of England carries out stress-testing on the basis of the imitation model (Medium Term macroeconomic model), which makes it possible to draw conclusions about the future state of macroeconomy. In many countries the analysis of systemic risks is also used for assessment of probabilities of financial crises. For example, the autoregressive model has helped the Ministry of Finance of the Netherlands avoid major crises. Bank of England and German Central Bank assess the of risks of the interbank crediting market in case of defaults of one or several banks operating on the market.

It should be noted though that the existing rating systems have the following drawbacks:

- ◆ they do not take into consideration qualitative factors that characterize the performance of credit institutions;
- ◆ aggregate function and assessment scales are often not adequate to ratings' goals and do not properly reflect the real state of affairs (for example, CAMEL methods);
- ◆ incorrect choice of scales for assessment of indicators;
- ◆ correlation between indicators, which characterize credit institutions.

Today there are possibilities of implementing such quality indicators of economic systems' development trends as the so called "leading indicators". The contemporary literature describes leading indicators as statistical ones with the capacity to change their growth trends earlier than other indicators.

The systems of leading indicators used for prevention of bank crises can be divided into the following two groups:

- ◆ the first group investigates the modules, which examine the theory of bank crises and use microeconomic data of bank institutions;
- ◆ the second group lays emphasis on macroeconomic indicators.

The research of the evolution of bank crises econometric models (Table 2) confirms the fact that risks in the banking system should be studied in the context of macroeconomic trends.

Table 2. Key indicators in the research of bank imbalances

	Indicators	Hardy and Pazarbaşıoğlu (1998) [19]	Demirgüç-Kunt and Detragiache (1998) [20]	Demirgüç-Kunt and Detragiache (1999) [22]	Hutchinson and McDill (1999) [24]	Eichengreen and Arleta (2000) [23]	Hutchinson (2002) [24]	Demirgüç-Kunt and Detragiache, 2005 [24]	Barth, Caprio, and Levine (2004) [24]	European Central Bank (2005) [24]
Macro variables	GDP growth	*	*	*	*		*	*		
	Real interest rates	*	*	*			*		*	
	Inflation	*	*	*			*		*	
	Changes in terms of trade		*							
	M2/reserves		*	*		*				
	Credit growth		*	*	*	*	*	*		
	Domestic credit to the private sector/GDP	*	*							*
	Real exchange rate	*								
	Import growth	*								
	Interest rates					*				
	Output growth					*				
	Budget surplus					*				
	GDP per capita		*					*		
	Deposits at banks/GDP	*								
	Gross foreign liabilities/GDP		*							
	Banking sector return on equity									*
	Banking sector loans to nonbank deposits									*
	Growth in GDP per capita									*
	Residential property prices									*
	Stock price index					*				
	Region, country, or OECD dummy	*				*				
	Industry concentration							*		
Institutional variables	Deposit insurance dummy		*		*					
	Central bank independence				*					
	Liberalization				*	*	*			
	Moral hazard index						*	*		
	Diversification index							*		
	Government						*			
	Contract enforcement						*			
	Accounting disclosure						*			
	Capital regulations								*	
	Bank entry and activity restrictions						*	*	*	
	Ownership							*	*	
	Economic freedom							*		
	Banking freedom							*		
	Institutional environment							*		

Table 2 proves the fact that the analysis of the banking system development can not be conducted without the research of macroeconomic trends. Moreover, in the recent years the preference is given to the research of microeconomic variables and institutional basis of the banking system development.

As we maintain that the banking system is integrated into the national economic system and the functioning of these systems has clear signs of coherence, it would be expedient to combine the two approaches in the research of the banking system: microlevel approach – banking system and

its functioning as a closed system, and macrolevel – macroeconomic indicators.

This approach can also be used for the construction of a system of leading indicators, which characterize the development of Ukrainian banking system.

However, in the authors view, it is important that banks themselves have an opportunity to assess the above mentioned indicators.

The new system of banking system development indicators assessment can be based on the methods of surveys for the evaluation of companies' business expectations recently introduced by the National Bank of Ukraine.

Such surveys are conducted by central banks in Canada, Germany, Japan, Ireland, France, Great Britain, Austria, Poland, Russia and Byelorussia. These methods are characterized by the quality assessment of indicators, determination of development trends of separate indicators or a group of indicators.

The goal of the quarterly surveys of companies' business expectations is to provide high-quality analytical and forecast data about the economic conditions for enterprises and financial development of regions.

The results of these surveys are taken into consideration by the National Bank of Ukraine for the formation of the monetary policy. They are the source of information about the current microeconomic processes and the principal factors of influence on companies, helping create new instruments for the economic growth analysis.

### 3. Methodical foundations for assessment of leading indicators of Ukrainian banking system development

We propose the use of new methods for the organization of surveys of Ukrainian banking system in order to analyze the main trends on the market of banking services. This system should be based on the methods of research of indicators for credit resources' supply and demand. The assessment of quality indicators would help explain quality data for different time periods. For the monitoring of such indicators the feedback from companies is an important source of information for the comprehensive assessment of:

- ◆ factors, which determine supply and demand of credit resources;
- ◆ risks, which are considered by banks in examining credit applications;
- ◆ expectations of credit market developments;

- ◆ pricing policy and indicators considered in the granting of credits (mortgage, maximum amount of credit line, terms, etc.);
- ◆ risk management policy;
- ◆ dividend policy of commercial banks;
- ◆ competitive environment;
- ◆ banking system potential.

Surveys would provide the necessary information for the analysis of the market quantitative parameters, factors, which determine financial stability and which are considered during decision-making in the monetary policy and forecasting.

The goal of surveys is the assessment of changes in demand and supply of credit resources, risk management systems, and realization of banking supervision principles. The surveys should provide the necessary data for the analysis of relationships in the banking system, for stress-testing and evaluation of financial stability indicators.

The target group of respondents, frequency of surveys and the structure of questionnaires can be changed depending on the current tasks and trends in the banking system.

Organization of a feedback is an important instrument ensuring the functioning of this system.

### 4. Assessment of results

1. Research results will be assessed through calculation of a net interest margin.

$$2. S = \frac{\sum_{p=1}^n A_p}{\sum_{p=1}^n A_p + \sum_{g=1}^n A_g} \cdot 100\% - \frac{\sum_{g=1}^n A_g}{\sum_{p=1}^n A_p + \sum_{g=1}^n A_g} \cdot 100\%, \quad (1)$$

where S is a net interest margin, per cent;  $A_p$  – the number of respondents, who noted the parameter's increase ("softening");  $A_g$  – the number of respondents, who noted the parameter's decrease ("hardening").

Of 100 banks that took part in the survey 40 banks emphasized the general trend towards an increase in credit demand, while 60 banks noted the decrease in credit demand. Accordingly, the net interest margin will be ( -20 per cent ), which will correspond to the expected trends towards insignificant reduction of banks' credit activity.

3. The mean values of every factor are calculated according to demand and supply factors.

4. The results will also be assessed with the help of "diffusion index", which is an aggregated indicator, which reflects the respondents' views. The scale of

the index values has a range from -100 per cent to 100 per cent. Index value equating zero indicates that the respondents' view about the current situation has not changed in comparison with the past surveys. When the respondents' view changes in the positive or negative direction this has an influence on the final results: correspondingly towards increase/decrease, softening/hardening. Index data are calculated with the following formula:

$$Id = (Pk + Pn * 0.5) - (Zk + Zn * 0.5), \quad (2)$$

where  $Ld$  is diffusion index;  $Pk$  – percentage of respondents, who noted a “significant increase”;  $Pn$  – percentage of respondents, who noted a “slight increase”;  $Zk$  – percentage of respondents, who noted a “significant decrease”;  $Zn$  – percentage of respondents, who noted a “slight decrease”.

Generalized information about the results of Ukrainian banks' surveys should be disseminated among all banks, which participated in these surveys. This would help assess the general prospects in the development of the banking sector in the context of macroeconomic trends.

For banking supervisory authorities of the National Bank of Ukraine such information should serve as leading indicators of the banking system development.

### Conclusions

1. Under modern conditions banking supervision should be based on the understanding of the banking

system as a system integrated into the national economic system. Therefore, it should be studied on the basis of research of both micro- and macroeconomic trends.

2. The system of leading indicators of imbalances in Ukrainian banking system should be built on the basis of qualitative assessment of performance parameters of banking institutions and the banking system in general. The structure of banks surveys by bank supervisory authorities should be constructed in such a way as to obtain the leading indicators for imbalances in the banking system.

3. The results of bank surveys can be used for the monitoring of banks on three levels:

- ◆ process analysis on microlevel;
- ◆ process analysis on regional level;
- ◆ analysis and forecasting of the banking system in general (Fig .2).

4. The results of such surveys can provide useful information both for the National Bank of Ukraine and banks of the second level of Ukrainian banking system.

5. The comparison of separate indicators or a group of indicators would provide an opportunity to assess the existence of asymmetric information in the national economic system and to establish relations between the system's separate elements in such a way that the impulses will be absolutely correctly interpreted by respondents.

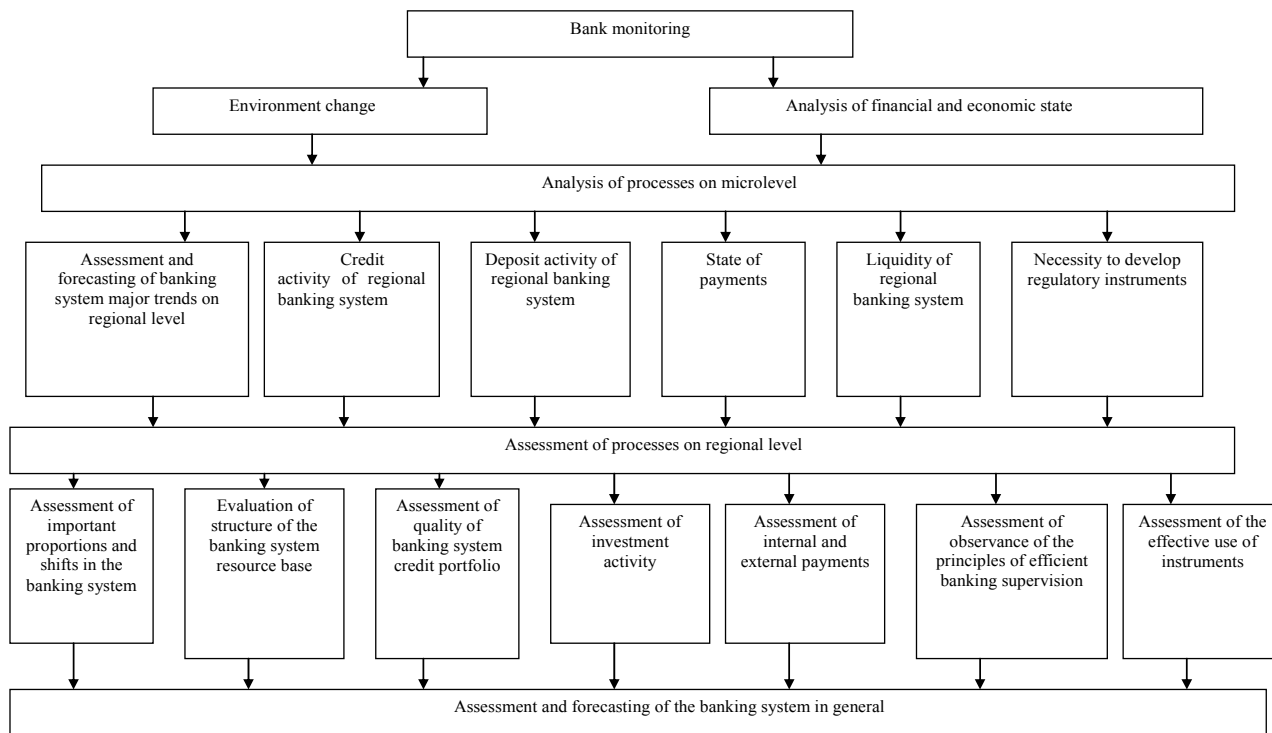


Fig. 1. Monitoring of Ukrainian banking system

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