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Bank's financial management technologies forming at strategic and operational levels

Abstract. *The purpose* of the paper is to improve the process of formation of bank financial management technologies at the strategic and operational levels considering the maturity of its financial management system and the efficiency of production processes. The following *methods* are applied in the study: the correlation and multivariate factor analyses to form a system of indicators for the evaluation of the bank's production processes; taxonomy to obtain a complex estimate of the bank's production processes; scaling (using the three-sigma rule) to differentiate the levels of integral quantitative indicators; fuzzy logic to distinguish between the levels of integral qualitative indicators. *Results.* The paper suggests that operational level technologies of bank financial management should be formed according to the efficiency of the bank's production processes defined by integrated indicators of the basic banking operations ensuring the flow of financial resources: credit operations, borrowing operations, currency operations, securities operations, payment and cash services. Strategic level technologies, such as the Balanced Scorecard, financial controlling, budgeting and benchmarking, are selected according to the evaluation of the bank's financial management maturity, which incorporates the efficiency of its production processes, the readiness of the bank's financial managers to use integrated technologies, the degree of formalization and information support of financial management. *Conclusions.* All of the above will make it possible to choose and apply the appropriate technologies that will most effectively ensure the flow of financial resources and achievement of the planned financial results due to their consistency with the current level of development of the bank and maturity of its financial management system.
Keywords: Bank; Financial Management Technology; Financial Management System Maturity; Bank's Production Processes; Banking Transactions
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Формування технологій фінансового менеджменту банку на стратегічному й операційному рівнях
Анотація. У статті запропоновано теоретичне й методичне забезпечення формування технологій фінансового менеджменту банку, яке передбачає визначення стратегічно спрямованих технологій на основі оцінювання рівня зрілості системи фінансового менеджменту банку, та операційно-спрямованих технологій на основі оцінювання стану його відтворювальних процесів за інтегральними показниками банківських операцій: кредитних, із залучення коштів, валютних, з цінними паперами, з розрахунково-касового обслуговування та обґрунтування інтервалів їхніх значень. Це дозволить обирати та використовувати саме ті технології, які найбільш ефективно забезпечуватимуть рух фінансових ресурсів і отримання запланованого фінансового результату завдяки їхній відповідності поточному рівню розвитку банку.
Ключові слова: банк; технології фінансового менеджменту; зрілість системи фінансового менеджменту; відтворювальні процеси банку; банківські операції.

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Формирование технологий финансового менеджмента банка на стратегическом и операционном уровнях
Аннотация. В статье предложено теоретическое и методическое обеспечение формирования технологий финансового менеджмента банка, которое предусматривает определение стратегически ориентированных технологий на основе оценивания уровня зрелости системы финансового менеджмента банка, и операционно-ориентированных технологий на основе оценивания состояния его воспроизводственных процессов по интегральным показателям банковских операций: кредитных, по привлечению средств, валютных, с ценными бумагами, по расчетно-кассовому обслуживанию и обоснование интервалов их значений. Это позволит выбирать и использовать такие технологии, которые будут наиболее эффективно обеспечивать движение финансовых ресурсов и получение запланированного финансового результата благодаря их соответствию текущему уровню развития банка.
Ключевые слова: банк; технологии финансового менеджмента; зрелость системы финансового менеджмента; воспроизводственные процессы банка; банковские операции.

1. Introduction

Modern banking is getting more sophisticated due to the growth in the number of transactions, services and their diversity as well as due to managerial influences produced by the system of financial management, its tools growing more comprehensive. The high level of complexity of the bank's external and internal environment shapes the need to divide its financial management process into managerial procedures implemented through the choice of appropriate tools and methods, which in their entirety constitute the essence of financial management technologies. A number of modern integrated technologies such as the Balanced Scorecard, financial controlling, budgeting and benchmarking should be viewed today as effective strategic tools that allow the bank to focus its activities on achieving its goals and contribute to the efficiency of its operation.

The world practice has already developed a proven record in application of these technologies, which fact was

supported by the results of the survey made by Bain & Company, a consulting firm, in 2013. According to this survey, benchmarking and the Balanced Scorecard are among top 10, and budgeting is among top 25 most common management tools [1].

However, the application of the technologies in question is limited in most of the domestic banks and facing certain challenges in the process of their formation In particular, this applies to the lack of consideration given to practicability and feasibility of their implementation, the available technologies of financial management being unfocused on the financial needs of the specific stage of the bank's development; financial management technologies on the strategic and operational levels being not fully compatible; managerial procedures that comprise financial management technologies being not properly harmonized and regulated.

2. Brief Literature Review

Although the results of applied scientific research of the use of integrated technologies for organization management are available stated in the works done by R. Kaplan and D. Norton (Kaplan & Norton, 1996) [2], P. Niven (Niven, 2006) [3], A. Neely, C. Adams and M. Kennerley (Neely, Adams & Kennerley, 2002) [4] dedicated to application and implementation of a balanced scorecard; A. Deyhle (Deyhle, 1986) [5], R. Mann and E. Mayer (Mann & Mayer, 2004) [6], H. Folmut (Folmut, 2003) [7], D. Han (Han, 2005) [8] on formation of the system of controlling; R. Camp [9] (Camp, 1989), J. Harrington (Harrington, 1995) [10] on benchmarking problems; J. Brimson, J. Antos and S. Player (Brimson, Antos & Player, 1998) [11], D. Han (Han, 2005) [8], J. Shim and J. Siegel (Shim & Siegel, 2008) [12] regarding financial management based on budgeting, the technological paradigm of the bank financial management is yet to receive a proper development. Furthermore, practically no attention has been given to the issues of feasibility analysis of introduction of management technologies with regard to the current state of the organization and its management system. In this respect, it is worth to mention the work [13], which offers to assess feasibility of introduction of the controlling technology based on the matrix formed by the level of development of the controlling complex and the company's performance level. While evaluating a large number of components of the management system among which there are functional charts and processes, stages, organizational and methodological support, this approach disregards staff competencies needed to perform the controlling functions and the degree of formalization of managerial processes, which are important characteristics of maturity of the management system, into which the relevant technology is to be integrated.

The problems of development and application of integrated technologies for bank financial management were highlighted by the following authors: N. Shulga [14] and I. Parasii-Verhunenko [15; 16] on banking controlling and balanced scorecard, O. O. Vasiurenko [17], O. Volkova [18] on the use of the budgeting technology. However, the mechanism for selecting a financial management technology, which would be relevant to the available options and feasibility of introduction of a specific technology at a certain stage of development of the bank financial management system, calls for further development. This is important since the system might not have the characteristics required for application of integrated technologies. In addition, little attention has been given to compatibility of financial management technologies at the strategic and operational levels, which can be achieved through formation of consistent technologies.

3. The purpose of this paper is to improve the process of formation of bank financial management technologies at the strategic and operational levels according to the maturity of its financial management system and efficiency of reproduction processes. The stated objective calls for the need to handle the following tasks: 1) to develop a set of indicators for evaluation of the bank's reproductive processes and assessing their efficiency based on the integrated index; 2) to identify the characteristics of maturity of the bank's financial management system and determine its level; 3) to offer such types of financial management technologies that will be suitable for use by domestic banks at the operational and strategic levels.

4. Results

The study suggests that at the operational level financial management technologies should be selected according to the evaluation of the efficiency of the bank's production processes by integral indices of the basic banking operations that provide the flow of financial resources: credit operations (I1), borrowing operations (I2), currency operations (I3), securities operations (I4), payment and cash services (I5) graded as low, average and high, whereas at the strategic level, it should be done according to the bank's financial management maturity which incorporates the efficiency of its production processes, the readiness of the bank's financial managers to use integrated technologies, such as the Balanced Scorecard, financial controlling, budgeting and benchmarking, as well as the degree of formalization and information support of financial management (Figure).

The above parameters were formed based on the method of organization maturity evaluation [19] in terms of: human resources, information, systems adapted to the specifics of the bank's operations and its financial management system since it is this system that embodies integrated technologies. Accordingly, the «information» and «systems» elements, which contain indices very similar in scope, were combined into the «Degree of formalization and information support of financial management» parameter. Given that the essence of the banking business is to convert financial flows, i.e. to turn the flow of borrowed resources into the active operations flow, the method was extended to incorporate production processes.

The system of indicators was created in order to evaluate the efficiency of the bank's production processes in terms of the five banking operations mentioned above, the number of indicators upon theoretical generalization of scientific sources being 52. The indicators calculated according to the data related to 133 banks registered in Ukraine as of 1 July 2014 (banks in liquidation and banks placed under receivership were not included) were tested for the absence of close linear relationship. Then those with a paired correlation coefficient over 0.7 for each banking operation were excluded, followed by multivariate analysis performed to select the most significant indicators and identification of those with a factor weight greater than 0.7.

This resulted in the following set of indicators: for credit operations – the credit activity coefficient, the loan coverage ratio, the loan to capital ratio, the share of corporate loans, the non-standard debt share of loan portfolio, the share of income from loans in total income, the income from loans to interest expenses; for borrowing operations – the time deposit sourcing activity ratio, the activity ratio of using liabilities in the loan portfolio, activity ratio of using time deposits in the loan portfolio, the net capital to individuals time deposit, the interbank market dependency ratio, the share of interbank loans in bank liabilities; for operations with currency – the share of currency credits in the total volume of currency operations, the share of currency liabilities in total liabilities, the effectiveness of use of borrowed currency resources by the bank, return on currency assets, the share of profits from currency operations in total profit, currency transactions income to average total assets; for securities operations – the share of security portfolio for sale in total assets, the share of trading security portfolio in total assets, the yield on security portfolio for sale, the share of income from sale of securities in portfolio for sale, share of income from sale of securities in trading portfolio, share of income from sale of securities before redemption in total revenues; for payment and cash services (PCS) – the share of commission income on PCS in total commission income, the share of commission expenses on PCS in total commission expenses, the non-interest margin on PCS.

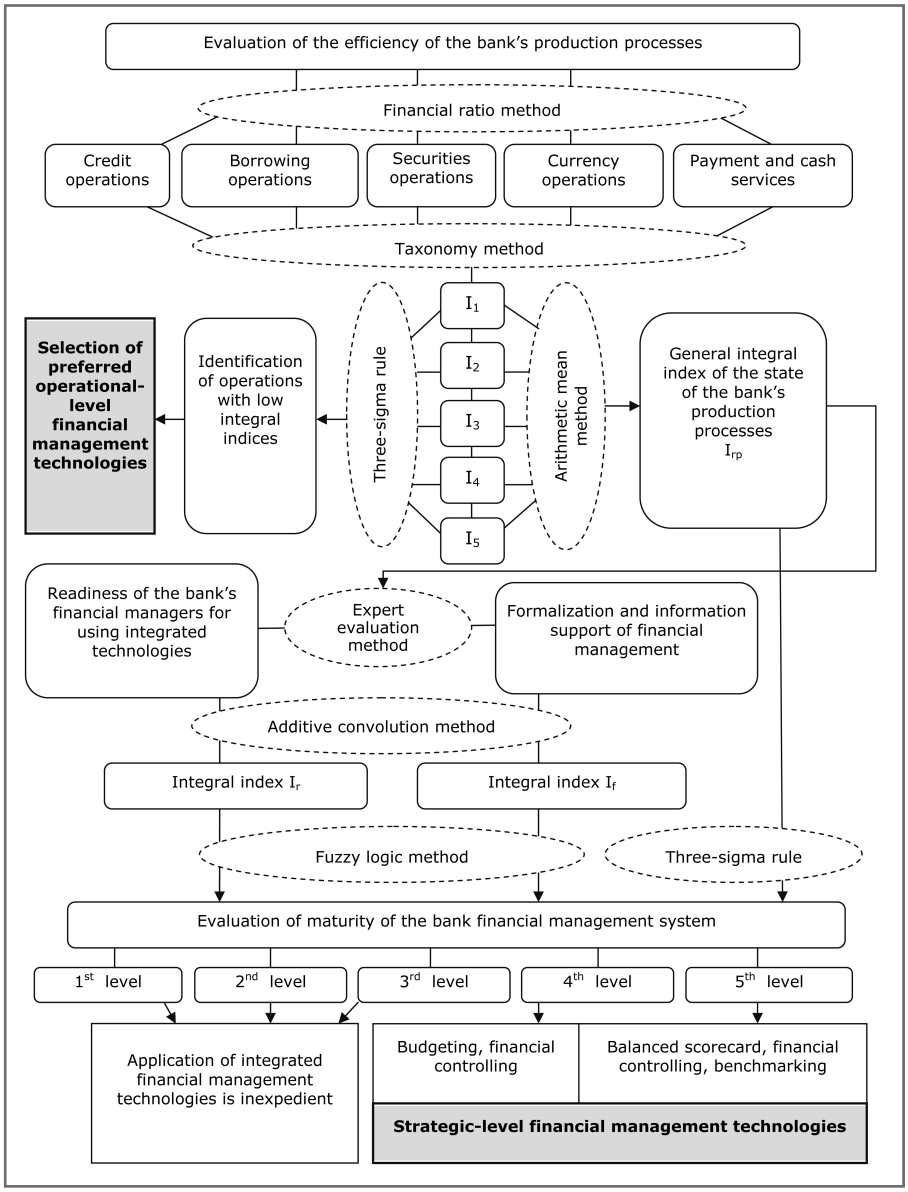

Fig.: **Methodological support of the choice of bank financial management technology**
Source: Compiled by the author

These indicators were joined to form the integral indices for each type of banking operations using the taxonomy method and to find the level of their values (high, average, low) by scaling with the use of the three-sigma rule.

The proposed methodical solutions were tested in Ukrainian banks with regard to the stages of their development since the system of financial management is subject to changes at each stage.

The stages of development of the banks as of 1 July 2014 were established by identification of their life-cycle phases, such as establishment, extensive growth, intensive growth, maturity, decline and liquidation.

The establishment phase was defined as the one with less than one year of operation; the liquidation phase was determined from the official data of the National Bank of Ukraine.

The extensive and intensive growth phases were established according to the market share, income and personnel expenses and annual growth rates.

Recommendations regarding the choice of preferred financial management technologies on the operational level are demonstrated using the example of banks which on 1 July 2014 were at the extensive growth phase (Table 1).

When choosing financial management technologies at the operational level, priority is given to the type of banking operations with a low value of the integral index, which signals a need for improvement of their performance.

Tab. 1: **Preferred operational-level technologies of bank financial management**

Bank	I_1		I_2		I_3		I_4		I_5		Preferred technology
	V	Lvl	V	Lvl	V	Lvl	V	Lvl	V	Lvl	
Fidobank	0.201	**L**	0.399	A	0.301	A	0.085	A	0.393	A	credit portfolio management
Citibank	0.313	A	0.197	**L**	0.396	H	0.279	H	0.378	A	deposit portfolio management
Bank 3/4	0.171	**L**	0.284	**L**	0.271	A	0.059	A	0.251	A	credit and deposit portfolio management
Union Standard Bank	0.361	A	0.378	A	0.221	A	0.052	A	0.166	**L**	payment and cash services management
Unison Bank	0.229	A	0.321	**L**	0.377	H	0.075	A	0.178	**L**	deposit, payment and cash services management
Finansovyi Partner	0.146	**L**	0.146	**L**	0.144	**L**	0.169	H	0.311	A	credit and deposit portfolio, currency transactions management
Artem-Bank	0.296	A	0.407	A	0.278	A	0.044	**L**	0.273	A	security portfolio management
Alpari Bank	0.187	**L**	0.496	H	0.161	**L**	0.098	A	0.288	A	credit portfolio and currency transactions management
Mykhailivskyi Bank	0.305	A	0.435	A	0.255	A	0.045	**L**	0.365	A	security portfolio management
Alliance Bank	0.322	A	0.428	A	0.236	A	0.056	A	0.089	**L**	payment and cash services management

Source: Compiled by the author
Note: V - value; Lvl - level; L - low level; A - average level; H - high level; I1 - integral credit operations index; I2 - integral borrowing operations index; I3 - integral currency operations index; I4 - integral securities transactions index; I5 - integral payment and cash services index

The following sequence has been suggested for the selection of strategic level financial management technologies:

1. Evaluation of the bank's production processes by overall criteria defined as the arithmetic mean of integrated taxonomic indicators of banking operations and differentiation of its values into five levels according to the organizational maturity models [20]. Under this model, at the first level of maturity there are no specific technologies available; the second level is characterized by the use of basic management technologies that allow for performance of key management functions of planning, accounting and control; the third level involves the use of electronic document management technologies, building of databases; the fourth level features such technologies as budgeting, electronic banking, financial controlling; at the fifth level of maturity all management technologies are integrated to form a single system subject to continuous improvement.

2. Evaluation of the readiness of the bank's financial managers to use integrated technologies based on partial indicators obtained by the expert method followed by their combination into an integrated index using the additive convolution method. It is proposed that the readiness of the bank's financial managers be determined by evaluation of three groups of their competencies [21]:

- personal skills (procreativity, communication, creativity, dedication, responsibility);
- general management skills and abilities (teamwork, leadership, conflict management, strategic thinking, delegation and control);
- special management skills (reasoning and decision-making under conditions of uncertainty and volatility, analytical skills, abilities to adopt new lines and practices of business and to use them, skills and abilities to generate reasonable recommendations, knowledge of theoretical background, recommendations offered by modern national and world science regarding the use financial management technologies).

3. Evaluation of the degree of formalization and information support of financial management of the bank using the expert method by surveying senior- and mid-level managers and building of the integrated index. The bank's financial management formalization degree was assessed in terms of the content, structure, interrelation, participants, documents, results of management procedures carried out within the financial management system. Information support of the bank's financial management was analyzed in the following terms offered in [22]: awareness and use of information about external environment; quality of information support of internal processes; personal attributes of information support; information resources technology platform.

4. Validation of consistency of the values of the integrated indices of readiness of financial managers to use integrated technologies and the degree of formalization and information support of financial management with a specific maturity level using fuzzy logic tools.

5. Evaluation of the general level of maturity of financial management as an arithmetic mean of maturity levels by its components.

A practical application of the above approach is presented by the example of banks which were at the extensive growth phase on 1 July 2014 (Table 2).

Since the banks at the fourth and the fifth level of maturity are mature enough to apply of integrated technologies of financial management, all banks experiencing extensive growth are in position to introduce them. Thus, it will be most feasible for PJSC «Fidobank» and PJSC «Citibank» (Ukraine), which have the highest level of maturity of the financial management system to use the Balanced Scorecard, financial controlling, benchmarking technologies, whereas the banks with the forth level of maturity may be recommended to apply the technologies of budgeting and financial controlling.

Tab. 2: **Results of evaluation of maturity of the financial management system of the banks**

Bank	Integrated index of the efficiency of the bank's reproduction processes		Integrated index of readiness of the bank's financial managers for use of integrated technologies		Integrated index of the degree of formalization and information support of financial management		General maturity level
	value	level	value	level	value	level	
Fidobank	0.285	5	0.850	5	0.800	4	5
Citibank	0.313	5	0.750	4	0.910	5	5
Bank 3/4	0.207	4	0.800	4	0.750	4	4
Union Standard Bank	0.235	4	0.570	3	0.780	4	4
Unison Bank	0.236	4	0.640	4	0.560	3	4
Finansovyi Partner	0.183	3	0.710	4	0.750	4	4
Artem-Bank	0.260	5	0.650	4	0.580	3	4
Alpari Bank	0.246	4	0.640	4	0.560	3	4
Mykhailivskyi Bank	0.281	5	0.680	4	0.570	3	4
Alliance Bank	0.226	4	0.580	3	0.750	4	4

Source: Compiled by the author

5. Conclusions

The main conclusions of this research effort are as follows:

1. Operational level technologies of bank financial management are those used to manage the basic banking operations that ensure the flow of financial resources, i.e. credit operations, borrowing operations, currency operations, securities operations, payment and cash services. Strategic level technologies are integrated technologies of financial management such as the Balanced Scorecard, financial controlling, budgeting and benchmarking.

2. At the operational level, it would be reasonable to form financial management technologies of a bank depending on the efficiency of its production processes that reflect conversion of the flow of borrowed funds into the flow of active operations and are characterized by the integral taxonomic index of banking operations. Here, the preferred financial management technology is selected for banking operations that require efficiency improvement within the set ranges of integral indices (high, average, low).

3. At the strategic level, it is proposed that the bank's financial management technologies should be chosen according to the level of maturity of its financial management system, which reflects available opportunities for introduction and application of such technologies. Maturity of the bank's financial management system is defined by five levels, with each level corresponding to certain technologies and with the use of integrated technologies being feasible at the highest (fourth and fifth) maturity levels. The bank financial management system maturity level is established by differentiation of the integrated indices of the efficiency of the bank's production processes, the readiness of the financial managers to use integrated technologies, the degree of formalization and information support of financial management.

Further research may investigate the synthesis of a consistent bank financial management technology as a set of interrelated and complementary strategic and operational level technologies, with their content being subject to modification depending on the bank's life-cycle phase.

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