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EMPIRICAL MODEL OF A BANK LIFE CYCLE

*The article presents the model of the bank life cycle, composed of the following stages: creation, extensive growth, intensive growth, maturity, decline and liquidation. The methodical approach to the identification of a bank life cycle stage according to its specific features as a financial institution is developed. It consists in the substantiation of indicators for identifying life cycle stages (the growth rate of market share, the income growth rate, the growth rate of personnel expenses). Ukrainian banks are divided into groups by life cycle stages according to the determined indicators using the cluster analysis method. This approach provides the construction of classification functions that allows defining the life cycle stage. This creates the basis for bank's strategic directions development and for the selection of appropriate financial management technologies.*

*Keywords:* bank; life cycle; life cycle stage.

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ЕМПІРИЧНА МОДЕЛЬ ЖИТТЄВОГО ЦИКЛУ БАНКУ

*У статті запропоновано модель життєвого циклу банку, яка складається зі стадій створення, екстенсивного зростання, інтенсивного зростання, зрілості, спаду та ліквідації. Розроблено методичний підхід до визначення стадії життєвого циклу банку з урахуванням специфіки його діяльності як фінансової установи, який полягає в обґрунтуванні показників для ідентифікації стадій (темп зростання ринкової частки, темп зростання доходу, темп зростання витрат на персонал). Розподіл банків України на групи здійснено відповідно до стадій життєвого циклу за означеними показниками з використанням методу кластерного аналізу, побудовано класифікаційні функції, які уможливають визначення стадії життєвого циклу. Це створює підґрунтя для формування стратегічних напрямів розвитку банку, відповідно до яких обираються технології фінансового менеджменту.*

*Ключові слова:* банк; життєвий цикл; стадія життєвого циклу; моделі життєвого циклу.

*Рис. 1. Табл. 2. Літ. 25.*

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ЭМПИРИЧЕСКАЯ МОДЕЛЬ ЖИЗНЕННОГО ЦИКЛА БАНКА

*В статье предложена модель жизненного цикла банка, которая состоит из стадий создания, экстенсивного роста, интенсивного роста, зрелости, спада и ликвидации. Разработан методический подход к определению стадии жизненного цикла банка с учетом специфики его деятельности как финансового учреждения, который заключается в обосновании показателей для идентификации стадий (темп роста рыночной доли, темп роста доходов, темп роста расходов на персонал). Банки Украины распределены по стадиям жизненного цикла в соответствии с перечисленными показателями с использованием метода кластерного анализа, а также построены классификационные функции, позволяющие определить стадию жизненного цикла. Это создаст основу для формирования стратегических направлений развития банка, в соответствии с которыми выбираются технологии финансового менеджмента.*

*Ключевые слова:* банк; жизненный цикл; стадия жизненного цикла; модели жизненного цикла.

**Problem statement.** The life cycle theory has become quite popular nowadays and is widely used in various economic fields, which is mostly triggered by the desire

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to be able to manage changes inevitable for any type of organization. Life cycle model helps revealing risks and opportunities, and also deviations from standard parameters of the internal organizational environment, and thus, it helps determining whether the current activities and the managerial methods applied correspond to the current life cycle stage. All of the above promotes sustainability in its broadest sense and performance stability, and this also helps forecasting further development of an organization and choosing the most efficient development strategy according to the actual development stage. Despite many differences in life cycle models, all of them emphasize the variability of the parameters and goals of organization at various stages of their development, and this, accordingly, requires the variability in methods and technologies of management. All of the above can be fully attributed to banks since they, as any other system, are developing and changing, passing certain stages or elements of a cycle. However, while determining a life cycle stage for a bank, one would need to take into account a specific set of parameters, which display the specific nature of bank's activities as a financial institution.

**Recent research and publications analysis.** Quite a wide range of studies has already covered the description of organizational life cycle stages and their specific features. Studies on this issue date back to the mid of the previous century, in particular, to the works of G. Lippitt and W. Schmidt (1967), L. Greiner (1972), J. Kimberly (1979), N. Churchill and W. Lewis (1983), R. Quinn and K. Cameron (1983), D. Miller and P. Friezen (1984), K. Smith, T. Mitchell, C. Summer (1985), E.G. Flamholtz (1986), B. Scott and Z. Bruce (1987), I. Adizes (1988), J. Anthony and K. Ramesh (1992). These and other works created grounds for further development of the issue, in the current century already, by such researchers as: D.L. Lester, J. Parnell, A. Carraher (2003); J. Aharony, H. Falk, N. Yehuda (2006); G. Shirokova, I. Merkurieva, O. Serova (2006); I. Ivashkovskaya and D. Yangel (2007); V. Dickinson (2008); J. Gao and R. Alas (2010); R. Lipi (2013); L. Gorshkova, Y. Trifonova, V. Poplavskaya (2014); S. Nazarenko (2014).

Among domestic contributions one can note, in particular, the following works: S. Koryagina (2004); I. Sokyrynska (2011), O. Milinchuk (2012); O. Matyushenko (2013).

A number of research papers on the issue have been concerned with theoretical grounding of the quantity of stages in a life cycle and their features in relation to organization. In banking, in particular, the issue of stages determination within a life cycle is comparatively new and thus require further studies.

**Unresolved issues.** Despite the popularity of the life cycle concept in general and its active use in economics for quite a long time already, there is a range of problems in its relation as applied to banking: 1) there are no empirical models of a life cycle in banking; 2) criteria and objective parameters by means of which a certain stage in a bank's life cycle is determined are not properly grounded; 3) specific features of banking as activity is not taken into consideration while determining the stage of a bank's life cycle.

Therefore, **the aim of this research** is to present the empirical model of a bank's life cycle. Within this aim the tasks set for this research are: systematization of the existing models of life cycle; generalizing the approaches to stage determination within the life cycle; grounding the parameters which describe a bank at each stage;

development of a methodological approach to stage determination in a bank's life cycle; overview of the current stage in the life cycles of Ukrainian banks.

**Key research findings.** Analysis of the existing models of organizations life cycles has demonstrated that a number of stages may vary from 3 to 10, besides, researchers tend to emphasize at this on completely different parameters at each stage.

It is worth noting here that some of these models of life cycle do not have the stage of liquidation which can be explained by the widely spread statement that any organization can be revived back and thus, liquidation can be prevented, provided a proper strategy is chosen along with proper management technologies. However, if we consider the banking sector, the stage of liquidation definitely exists, and this is confirmed by the fact that as of 08.04.2015 38 Ukrainian banks were in the process of liquidation ([www.bank.gov.ua](http://www.bank.gov.ua)). Therefore, this stage needs to be included into the model of a bank's life cycle. It is also expedient to distinguish the stages of extensive and intensive growth, since both these stages, aside of the general trend of growth, have their specific features by means of which this growth is actually happening: by means of growing incomes & expenditures and/or by means of widening the market share.

Therefore, the suggested model of bank's life cycle consists of the following stages: creation, extensive growth, intensive growth, maturity, decline and liquidation.

In order to construct the empirical model of bank's life cycle it is necessary to explain the indicators for each stage, and for this matter we perform their grouping in Table 1.

**Table 1. Quantitative and qualitative indicators for determination of a stage in a life cycle**

Author	Indicators to describe the stage in a life cycle
G. Lippit, W. Schmidt (1967)	<i>Quantitative:</i> age. <i>Qualitative:</i> emphasis on management; priorities for various groups of stakeholders; presence of crises and/or conflicts; formalization of managerial procedures; organizational structure
L. Greiner (1972)	<i>Quantitative:</i> age, size, dynamics of sector's growth <i>Qualitative:</i> emphasis on management; type of organizational structure; style of management; control system; incentive system of managers
J. Kimberly (1979)	<i>Quantitative:</i> quantity of personnel; budget volume. <i>Qualitative:</i> role of an entrepreneur; internal social control; relationship management and communication; organization of structures and processes
N. Churchill, V. Lewis (1983)	<i>Quantitative:</i> age, size. <i>Qualitative:</i> style of management; organizational structure; degree of formalization; key strategic goals; owners engagement in actual business management
R. Quinn, K. Cameron (1983)	<i>Quantitative:</i> age, size, efficiency. <i>Qualitative:</i> structure; formalization; centralization; leadership; culture.
D. Miller, P. Friezen (1984)	<i>Quantitative:</i> age, growth rates, volumes of sales. <i>Qualitative:</i> strategy, structure, organizational environment, style of decision-making.
K. Smith, T. Mitchell, C. Summer (1985)	<i>Quantitative:</i> age, sales volume, quantity of personnel, business growth rates. <i>Qualitative:</i> top-management priorities, organizational structure, motivation system, interaction of top managers
E. Flamholtz (1986)	<i>Quantitative:</i> age, size, business growth rates. <i>Qualitative:</i> key targets of development, organizational structure, formalization of planning, control, budgeting, system of management and operations, leadership, decision-making.

Continuation of Table 1

Author	Indicators to describe the stage in a life cycle
B. Scott, R. Bruce (1987)	<i>Qualitative</i> : stages of sector's development; key problems; role of top management; organizational structure; marketing research and commodity policy; system of control; key source of financing; money flow generation; directions of investment; commodity market.
I. Adizes (1988)	<i>Quantitative</i> : age, size, business growth rates. <i>Qualitative</i> : key problems; organizational structure; formalization of policies and procedures; quality of a leader; complexity and variety of operations.
J. Anthony, K. Ramesh (1992)	<i>Quantitative</i> : age; growth of sales volume; ratio of investments in fixed capital to the market value of stocks and the size of long-term debt; annual level of payments on dividends
D. Lester, J. Parnell, F. Carraher (2003)	<i>Quantitative</i> : age, size. <i>Qualitative</i> : power, organizational structure, information processes.
S. Koryagina (2004)	<i>Quantitative</i> : profitability; business activity; liquidity; financial solvency.
J. Aharoni, H. Falk, N. Yehuda (2006)	<i>Qualitative</i> : age; annual rates of sales volume growth; ratio of investments in fixed capital and spending on R&D to total assets; ration of annual flow of net capital to total assets
G. Shirokova, I. Merkurieva, O. Serova (2006)	<i>Qualitative</i> : age of company, quantity of personnel. <i>Qualitative</i> : degree of management formalization.
I. Ivashkovska, D. Yangel (2007)	<i>Quantitative</i> : aggregated indicator of growth, which includes the market share, sales volume, free money flow, economic profit, net profit, dividends paid, investment ratio
V. Dickinson (2008)	<i>Quantitative</i> : money flows from operational, financial and investment activities
J. Gao, R. Alas (2010)	<i>Quantitative</i> : age, size, turnover, business growth rate. <i>Qualitative</i> : field of activity; structure of management.
I. Sokyrynska (2011)	<i>Quantitative</i> : sources of financing; contents and structure of assets; business activity; capital structure; profitability; financial solvency; margin; liquidity; expenditures and paying capacity.
O. Milinchuk (2012)	<i>Quantitative</i> : labour productivity; ratio of full expenditures on labour; net profitability from sales; paying capacity; assets efficiency; indicator of financial autonomy; ratio of the own capital flexibility; ratio of own circulating assets provision; own capital profitability; ratio of absolute liquidity; ratio of instant liquidity.
R. Lipi (2013)	<i>Quantitative</i> : age, size, indicators of growth. <i>Qualitative</i> : indicators of organizational development; sources of financing.
O. Matyushenko (2013)	<i>Quantitative</i> : financial, production-technical, social and marketing systems at an enterprise. <i>Qualitative</i> : administrative-managerial systems of an enterprise.
L. Gorshkova, Y. Tryfonov, V. Poplavska (2014)	<i>Quantitative</i> : market share; dynamics of sales. <i>Qualitative</i> : object of control; conditions of external environment (neutral, favourable, unfavourable), strategy, structure, organizational culture, personnel management.
S. Nazarenko (2014)	<i>Quantitative</i> : rates of sales volumes growth; assets profitability; investment turnover; rate of the added value growth; rate of operating profit growth; free cash flow.

As a result of the carried out analysis, we come to the conclusion that there is no unanimity of viewpoints on the indicators of life cycle stages. The most widely used are the age of organization and its size. We agree with (Miller and Friesen, 1984) that age as a criterion can be applied only at the stage of creation, because the length of stage within a life cycle can be different for organizations from different sectors and fields of activity and within various business conditions and environment. Besides, any organization can set back to the zero level when changing its objectives and development strategies.

As to the criteria of organization's size (which in most approaches means the total quantity of personnel), it should be always considered in dynamics. For example, an organization may have not numerous personnel, but at the same time it has growing volumes of operations, quite efficient management and rather high labour productivity – and this means that it is actually at the stage of growth, despite the number of staff involved.

Other popular parameters are organizational structure, style of management, control system and the degrees of formalization and centralization of management. However, all of them are more like consequences, attributed to the transition from one stage in the life cycle to a next one. And they describe the model of management development, rather than organization itself.

Other studies sometimes mention the parameter "strategy choice", however, in our view, it is not expedient to use it, because the current strategy is often not very well grounded and therefore, it not always depict the actual, current state of organization.

Concerning the criteria related to financial solvency we need to note that despite their importance, they still do not fully describe the development of an organization in time. Besides, crises, as state by I. Adizes (1988) and also L. Greiner (1972), can happen at any stage of the life cycle.

Besides that, despite the fact that Table 1 presents quite a variety of parameters of organization's activity, most of them do not take into account changes in time, while these changes are basically the key indicator of any organization evolution and movement along the life cycle curve.

The authors' systematization of domestic and foreign views lead us to the conclusion about the expediency of using mostly quantitative indicators while determining the life cycle stage, because they demonstrate the development dynamics of the following parameters: scale of activities; market standing; HR policy; profitability.

In determination of a bank's life cycle stage we choose the parameters which fulfill the following criteria: 1) taking into account the specificity of bank's leading activity, i.e. financial one; 2) dynamic description of bank's development which shows the growth rate because only economic changes in time can truly show the actual stage of development; 3) avoiding subjective judgements adherent to many quantitative indicators; 4) information availability, meaning the possibility to obtain the necessary data for calculating the needed indicators using the information from open (public) sources (in our case – banks' reports).

From all of the stated above, as the parameters for determination of a bank's life cycle stage, considering the specific features of its activity as a credit and financial intermediary, we suggest: the annual growth rate of the market share (share of bank's assets in the total banking sector assets); the annual growth rate of incomes; the annu-

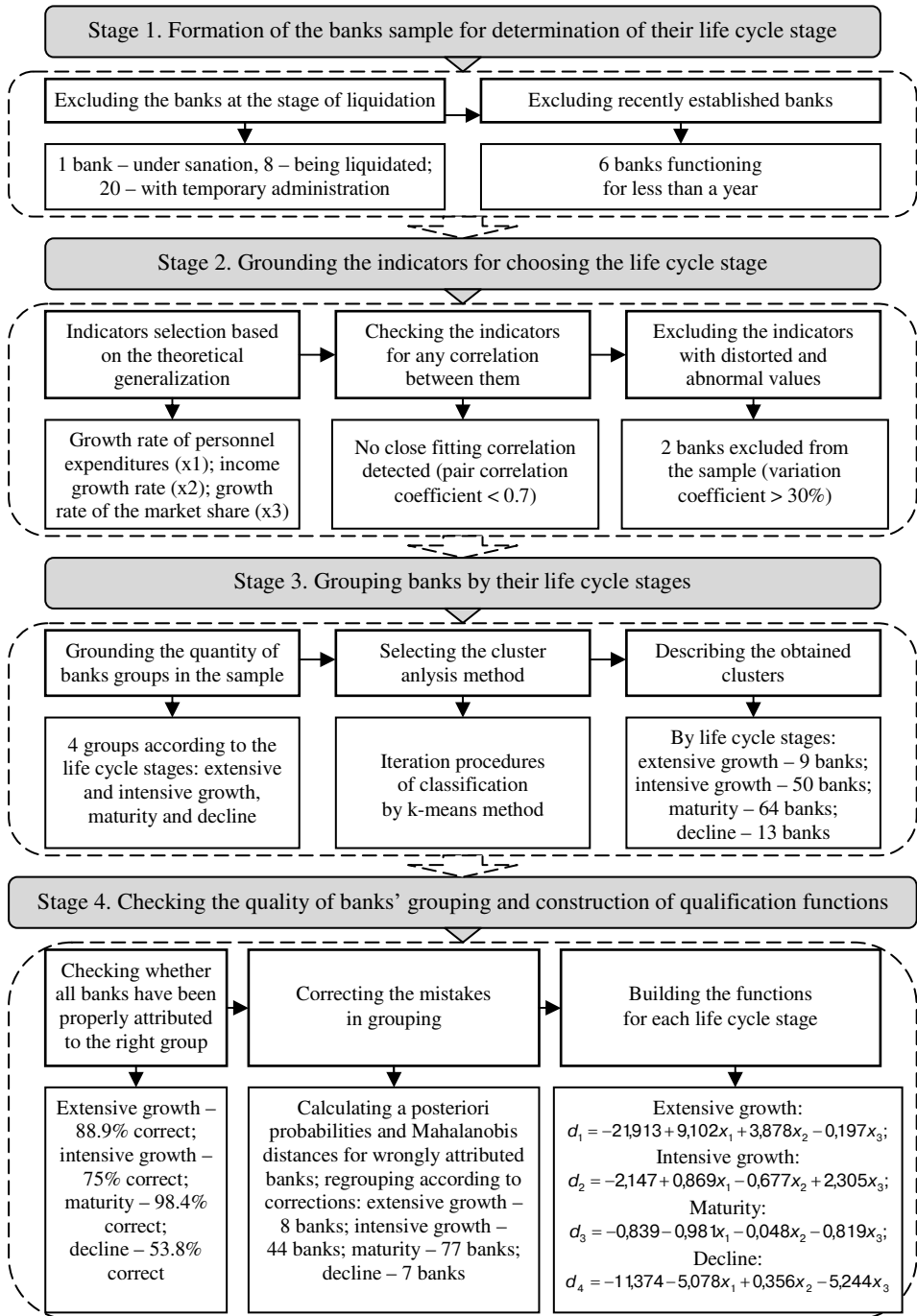


Figure 1. Methodological approach to bank's life cycle stage determination, authors' elaboration

al growth rate of spending on personnel. And using these parameters, we have performed the grouping of Ukrainian banks by the stages of extensive growth, intensive growth, maturity and decline. For this matter we have been using the methodology described in Figure 1.

Economic interpretation of clusters division by the growth rate of market shares, expenditures on personnel and incomes enable us to determine that the first cluster has been formed by the banks being at the stages of intensive growth, the second cluster represents the banks at the maturity stage, the third cluster is formed by the banks at the extensive stage of growth, and finally, the fourth cluster of banks belongs to the stage of decline. To check for the appropriate division into clusters we have applied the discriminant analysis which has demonstrated the existence of some deviations in the cluster analysis results. Then we have calculated the Mahalanobis distances and the posteriori probabilities to correct these deviations and thus, to finalize the procedure of classification.

The groups of banks are presented in Table 2, which was built using the official data of the National Bank of Ukraine, as of 01.07.2014. Please, note that the table also includes the banks at the stage of creation (functioning for less than a year) and also the banks at the liquidation stage.

As we can see from Table 2, 6 Ukrainian banks (3.49%) as of 01.07.2014 were at the stage of creation and/or have been functioning for less than a year. For 10 banks the stage of extensive growth has been determined, since their rates of income growth and personnel expenditures were 309.4% and 298.32% respectively. 44 banks have demonstrated they are at the stage of intensive growth with significant growth of average market share (128.16%), incomes (155.96%) and expenditures on personnel (128.5%). Stabilization of all key indicators development and therefore, the stage of maturity have been determined for 77 banks, or 44.77% of their total quantity. 7 banks are explicitly at the stage of decline, and 28 domestic banks are currently at the stage of liquidation, as according to the official data by the National Bank of Ukraine.

It is worth noting here that each stage of the life cycle potentially can turn into the stage of liquidation, in case there is significant influence of crisis factors, faults in management and/or the strategy has been chosen not properly. In particular, as of 01.02.2014 5 banks were at the stage of intensive growth (Delta, Standart, Nadra, Ukoopspilka and Profin Bank), 4 banks were at the maturity stage (Kyiv, Zlatobank, Energobank, Imexbank), and 2 more banks were at the decline stage (Creditprombank, Omega) – and in March 2015 all of them were at the stage of liquidation already (bank.gov.ua).

**Conclusions.** Analysis of literature on the life cycle theory has enabled us develop and ground the model of bank's life cycle which consists of the stages of creation, extensive growth, intensive growth, maturity, decline and liquidation.

The carried out empirical research on the life cycle models on the example of Ukrainian banks has given us a chance to check the very concept of life cycle and the model applied for validity. And we can state that any bank in its development is going through several stages which differ by the values of the following parameters: the annual rate of market share growth, the annual rate of incomes growth, the annual rate of expenditures growth. These parameters, first of all, take into account the specificity of bank's activity as a financial institution; and secondly, reflect the key

trends in bank's development; thirdly, help avoiding subjective judgements; fourthly, information for these calculations is always available.

*Table 2. Grouping banks in Ukraine by the stage of their life cycles, authors' construction*

Stage	Banks being at this stage of development	# of banks in the group	Share of the bank group in the country's banking system, %
Creation	Bank Clearing Center, Bank Avangard, Investment & Trust Bank, Vektor Bank, Portal Bank, Gefest Bank	6	3.49
Extensive growth	Fidobank, Citybank, Bank 3/4, Union Standard Bank, Unison Bank, Financial Partner Artem-Bank, Alpari Bank, Mykhailivskiy Bank, Alliance Bank	10	5.81
Intensive growth	Delta Bank, Prominvest Bank, Ukrsotsbank, Nadra, Financial Initiative, Credi Agricole Bank, Kyivska Rus Bank, Platinum Bank, Credobank, Diamantbank, Natioonal Investments Bank, FinBank, Fortuna-Bank, Bank Vostok, BM Bank, Procredit Bank, Bank of Investments & Savings, National Credit Bank, Arkada, Credit Europe Bank, International Investment Bank, Bank Renesans Capital, Unikombank, Kominvestbank, Grant Bank, SEB Corporate Bank, Kontrakt Bank, Standard Bank, Trust Bank, Sberbank Russia, Investbank, Bank Sich, Profin Bank, Ucoopspilka, Creditinvest Bank, Oksi Bank, Radabank, Motor-Bank, Ukrbudinvestbanks, Land Capital Bank, Finance Bank, Konkord, Center Bank, Radikal Bank	44	25.58
Maturity	Privatbank, Oshchadbank, Raifassen Bank Aval, First Ukrainian International Bank, VTB Bank, Ukrsibbank, Alfa-bank, Finance and Credit, OTP Bank, Pivdennyi Bank, Zlatobank, Imeksbank, ING Bank Ukraine, Kreshchatyk, Bank Kredit Dnipro, Ukrinbank, Universal Bank, Megabank, Praveks Bank, Divi Bank, Clearing House, Ukrainian Professional Bank, Soyuz, Bank Russian Standard, Avant-Bank, Taskombank, Pireus Bank, MKB, Bank of Cyprus, Idea Bank, VS Bank, Bank Kyiv, Express Bank, Energobank, Aksent-Bank, Misto Bank, Unex Bank, Eurobank, Capital Bank, TK Credit, Poltava Bank, Ukrgazprombank, First Investment Bank, Lviv, Integral Bank, Bank Petrokommerz-Ukraine, Apeks-Bank, Metabank, New Bank, Agrokombank, Ukrainian Capital Bank, Akordbank, Polikombank, Vernum Bank, Stolichnyi, Bank Boguslav, Asvio Bank, Trust-Capital, Region-Bank, KSG Bank, Kredit Optima Bank, People's Capital Bank, Industrial-Financial Bank, Finexbank, Family Bank, Veles Bank, Eastern Industrial Commercial Bank, Ukrainian Bank of Reconstruction and Development, Industrial Bank, Marfin Bank, Ukrkomunbank, Market Technologies Bank, Commercial Industrial Bank, Globus Bank, Europrombank, Bank Sofiyskyi	77	44.77
Decline	BTA Bank, Creditprombank, Premium Bank, Omega Bank, Classicbank, Deutsche Bank – DBU, Astra Bank	7	4.07
Liqui-dation	Old Kyiv Bank, Eurogazbank, Zakhidinkombank, Pivdenkom-bank, Finrostbank, Avtokrazbank, Interbank, Derzhzembank, Cambio Bank, AllUkrainian Bank of Development, First Bank, Legbank, VAB Bank, City Commerce Bank, Melior Bank, Intercreditbank, Aksioma Bank, Prime Bank, Porto-Franco Bank, Demark, Expobank, Green Bank, Aktabank, Aktiv-Bank, Golden Gates Bank, Promeconombank, Ukrbiznesbank	28	16.28



At the stage of creation the values of these parameters can hardly be measured, since "young" banks are functioning for less than a year, therefore, for them only the criteria of age is applicable. On the opposite side, the stage of liquidation is always defined by the official data of the National Bank of Ukraine.

Stages of extensive growth, intensive growth, maturity and decline are determined by the developed methodological approach, testing of which here enables us stating that at the stage of extensive growth the leading place belongs to the growth of incomes along with the growth of spending on personnel, while the stage of intensive growth is characterized mostly by the growth of market share. At the stage of maturity the market share tends to stabilize its growth, while the growth of incomes and personnel spending continue. At the stage of decline the market share tends to reduce, the same applies to incomes and spendings.

**Prospects for further research.** Trends and regularities adherent to particular stages in bank's life cycles require further research, in particular, in the following directions: first, it would be important to study types of corporate and financial strategies chosen by banks at different stages of their life cycle; and secondly, interesting might be the issue of determining the conformity of bank's financial condition parameters to a particular stage in its life cycle.

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