CHAPTER «ECONOMIC SCIENCES»

PLANNING AND FORECASTING OF FINANCIAL ACTIVITIES IN OSCHADBANK

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Abstract. *The purpose* is to scientifically substantiate theoretical and methodological provisions on planning and forecasting the financial results of the bank, objectifying the practical application of the concept of strategic plan development, justification of the effectiveness of the implemented method of machine learning in planning and forecasting. The financial and economic crises of recent years have been the result of serious shortcomings in the system, structure and functioning of most credit institutions. In the process of creating and operating a new credit system and intensifying interbank competition, banks will face acute problems such as choosing the strategic direction of the bank's development, planning and development, as well as identifying specific measures to study and develop the banking market. *Methodology*. The paper also uses such general scientific research methods as analysis and synthesis, deduction and induction, methods of prognostic, logical-analytical modeling, mathematical statistics. This paper uses the results of research and practical activities of the author, data on social and economic development of Ukraine, commercial banks, the main theoretical principles and conclusions of modern economics, as well as official materials of statistical bodies. *Results*. In order to improve the quality

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of the financial planning and forecasting system, the use of machine learning in the process of planning and forecasting the bank's financial results and expanding the range of macroeconomic indicators was proposed. Also, some provisions and conclusions of the study are practically implemented in the activities of Oschadbank in developing a system of planning and forecasting financial results. *Value*/*originality*. The scientific novelty of the work is that the proposed methodological and theoretical developments in the formation of planning and forecasting system brought to the stage that allows them to be used in the preparation of planning and calculation justification of efficiency and development of commercial banks of various profiles.The obtained scientific results are also of practical importance, characterizing the economic, financial, social efficiency and effectiveness of the system of planning and forecasting of the strategy of activity and development of the bank formed in the work.

1. Introduction

Formation and development of a market economy directly depends not only on the formation and effective functioning of the financial market, but also on the need to ensure the organization and regularity of current functioning and long-term, strategic development of one of the main links banking system -credit organizations. In this case, the effective functioning of the credit institution can be ensured by a system of planning and forecasting indicators of its activities and development. Part of such a system is not only current, medium and long-term plans of the bank, but also strategic planning, development of strategic direction of the bank, which is directly related to the planning of banking marketing.

The financial and economic crises of recent years have been the result of serious shortcomings in the system, structure and functioning of most credit institutions. In the process of creating and operating a new credit system and intensifying interbank competition, banks will face acute problems such as choosing the strategic direction of the bank's development, planning and development, as well as identifying specific measures to study and develop the banking market. This is due to the fact that the main reason for the most common gaps in the activities of banks is the low quality of strategic management, as well as the lack of an effective planning system as a basic management function.

The urgency of solving these problems and problems is especially growing in economic crises, as the presence of effectively functioning commercial banks – one of the conditions for successful development of the financial market. In turn, the effective functioning of commercial banks as participants in the financial market, its dominant sectors – money market, securities market, loan capital market, directly depends on the rationale for current, long-term medium – and long-term planning and development strategy. Expanding the range of banking operations, blurring the line between traditional banking and quasi-banking operations, completing the extensive development of the banking system and competition for cheap resources leads to the need to plan and regulate relations related to the formation and use of monetary resources. Therefore, the formation of theoretical, conceptual and methodological provisions of the mechanism for planning and forecasting the activities of a commercial bank, the development of its development strategy is becoming increasingly important. Currently, the theoretical and methodological foundations of systematic planning and forecasting of activities and development of a commercial bank, including strategic planning, development of long-term, medium-term and current plans and marketing planning to achieve strategic goals in agreeing on resources, intermediate stages and ultimate goals are clearly insufficiently developed. There is a need to form such methodological, methodological and practical provisions of system planning and forecasting of socio-economic development of a commercial bank, which could form the basis of this system.

Objectification and substantiation of the importance of system analysis and methodological decisions for the long-term development of the banking services market in the presence of such areas as planning product and pricing strategies, planning delivery systems and incentives are also waiting for a solution.

The urgency of the topic lies in the need to solve such important economic and social problems as the creation of a scientifically sound system of planning and forecasting the effectiveness of a commercial bank as a full participant in the financial market.

The main purpose is to scientifically substantiate theoretical and methodological provisions on planning and forecasting the financial results of the bank, objectifying the practical application of the concept of strategic

plan development, justification of the effectiveness of the implemented method of machine learning in planning and forecasting.

Theoretical and methodological basis of the work were educational works in the field of management, regulation, planning and forecasting of socio-economic systems of commercial organizations, banking management, machine learning, analytical reviews of banking portals, statistics. In the course of the research the legislative and normative acts of Ukraine, NBU resolutions, Presidential Decrees were studied.

The paper also uses such general scientific research methods as analysis and synthesis, deduction and induction, methods of prognostic, logical-analytical modeling, mathematical statistics. This paper uses the results of research and practical activities of the authors, data on social and economic development of Ukraine, commercial banks, the main theoretical principles and conclusions of modern economics, as well as official materials of statistical bodies.

The scientific novelty of the work is that its proposed methodological and theoretical developments in the formation of planning and forecasting system brought to the stage that allows them to be used in the preparation of planning and calculation justification of efficiency and development of commercial banks of various profiles.

2. Economic crisis effects on consumer behavior

In a constantly changing financial market environment, the most responsible part of banking management is planning, in the process of which banking policy is developed, from the emergence of the basic idea and its implementation in the plans of specific measures and quantitative (digital) indicators.

Planning of the bank is a management process associated with the study of financial and economic results of its operation, identifying factors, trends and proportions of economic processes, sound areas of development of the bank.

However, the plan cannot be firm. This is due to the fact that the external among banks is dynamic, flexible, as it develops according to market laws.

The results of the activity cannot be successful if the bank strictly adheres only to the implementation of the plan without taking into account the requirements of the external environment (needs and demands of customers, actions of competitors, various public organizations, press behavior, etc.).

The plan cannot be given exceptional importance. It should be promptly changed in accordance with the situation in the financial market. In the process of carrying out planned tasks, it may change depending on the market situation.

Planning allows to determine the prospects of the bank's development, ie to predict its future, use all resources more rationally, avoid possible risks as a result of active and passive operations, timely introduce new services, improve the quality of services according to market conditions, ensure profitability and consistent capital growth.

Planning should apply to all objects of management, areas of activity of the credit institution and the ongoing processes or existing relationships. At the same time, the bank's management constantly has to solve a number of complex tasks, including: prioritization and selection of financial market sectors that allow the bank to make optimal use of its human and customer potential, as well as a portfolio of banking products; setting interest rates that provide a sufficient margin; allocation of free resources taking into account the specifics of liabilities, their value, urgency, which would allow to comply with certain liquidity requirements, risk limits; determining tactics of behavior in the markets, the use of free resources for transactions with securities, currency values; risk management, hedging; personnel and branch management, setting limits on their operations.

The practice of development and decision-making in each credit institution has its own characteristics, which are determined by the nature and specifics of its activities, organizational structure, the current system of communications. However, there are common features of the activity planning process. These are the only principles that shape the technology of developing and adopting a plan used by any commercial bank.

1. Formation of strategic thinking in senior managers, ensuring that each leader understands the need to implement planning.

2. Creating optimal conditions and evaluation system for the implementation of strategic goals and objectives. Such conditions include the introduction of management of individual units as independent business / units whose activities are regulated and evaluated on market principles; introduction of financial management, which allows to adequately calculate the potential profitability and evaluate various aspects of their activities. At this stage, it is important to implement a system of

evaluation of the bank's performance in terms of compliance with external and internal objectives as part of financial and management accounting, which will be the basis for monitoring the progress and evaluation of planning results.

3. Creating a strategic planning infrastructure, which means ensuring control and evaluation of planning results by senior management; creating a system of responsibility of employees and managers of various departments, stimulating the achievement of goals; allocation of a special unit, provides strategic planning.

4. Formation of a detailed strategic plan based on the assessment of the possible impact of the external environment, as well as on the assessment of the strengths and weaknesses of the bank, its capabilities and risks.

5. Implementation of the system mutually support the goals of the bank, departments and the employee. Personal goals of employees, being realized, should lead to achievement of the purposes of division, set of the reached purposes should provide performance of the corresponding strategic purpose of bank and strategy as a whole. One of the most common approaches to implementing this principle is the implementation and maintenance of a corporate culture.

6. Implementation of a system for monitoring and forecasting the behavior of the external environment and adjusting strategies. At this stage, it is necessary to create conditions under which not only the relevant unit, but also the organization as a whole would be involved in monitoring the environment.

Strategic plans should be adjusted accordingly based on the information received.

7. Development of strategy and tactics of behavior in the current environment. The implementation of the described principles allows the credit institution to create an effectively functioning planning system. Its most significant characteristics are:

a) flexibility and indicativeness, ie the ability to quickly adjust the plan in the event of unexpected changes in the market situation;

b) a carefully thought-out and organized process of monitoring the implementation of targets, which aims not only to register the actual deviation from the plan, but also to determine the real reasons for non-compliance and untapped potential;

c) alternative planning – drawing up a multivariate plan for rapid response to changing market conditions;

d) integration of the planning system into the organizational structure of the bank, which involves participation in the preparation of the plan and control of its implementation by managers of all levels of government;

e) orientation of development strategy and individual plans to maximize financial results,

The bank should create a single information base for situational analysis conducted during strategic planning, business / planning, current planning and planning of bank operations.

It is created and implemented in the practice of the bank due to a certain management technology that provides the creation of a data warehouse (DATA WARE NOUSING). In a mode close to real time, it receives information about the bank's operations and external characteristics of financial markets, and the formats of descriptions of operations and market indicators should be unified. This will create standard procedures for their processing and obtain comparable reports on the dynamics of external and internal processes and indicators used for situational analysis in resource planning and current management.

The effectiveness of the planning function in a commercial bank is determined primarily by the regularity and level of organization of this process. The need for continuity and consistency of principles and methods of preliminary analysis, planning and control leads to a high degree of formalization of this procedure, which is expressed in the minimum requirements for technology to determine future indicators and information used, which include the following.

1. The bank must have a special unit, based on strategic analysis, prepares draft documents that reflect the concept, goals and plans for the development of the bank, and keeping them up to date (adequate to changing conditions). Such a unit must act in accordance with the provisions of a special package of internal regulations, the core of which are the methods used by the information support service to collect, process, analyze and submit information. It should be borne in mind that the problem of quickly obtaining reliable and high-quality management information can be solved only comprehensively. This requires, on the one hand, to have the appropriate methodological support, clear to every head of the bank, on the other – to optimize the structure of the bank and its document flow.

2. A developed system of internal banking planning should ensure the development and approval (documentation) of:

a) the concept (mission) of the bank, designed for the period, realistically predictable;

b) systems of qualitative and most important quantitative goals of the bank's activities or intentions ("goal tree" of the bank) for a specific planning period;

c) the system of policy directions of the bank in relation to all significant objects of banking management, ie the system of objectives of the bank, received a refined qualitative and quantitative expression (for the same or less period);

d) lists of practical measures (organizational, legal, analytical, financial / economic, technical and technological, personnel) indicating the specific deadlines, volumes, performers to be taken to implement each of the approved policies of the bank and the bank budget.

We should keep in mind the most common mistakes in the interpretation of banking planning: limiting planning tasks only to making plans or identifying ways to achieve the intended goals (ie excluding tasks related to the formulation of concepts, priorities, goals and policies). bank); restricting the planning of the bank's activities only by planning its finances; full or partial focus of planning results exclusively on senior management.

The result of the development of a system of policy directions of the bank and practical measures for their implementation are financially sound plans for the development of the bank, which should: be a coherent, consistent set of plans, characterized by different planning periods, different levels of detail of work that apply to the development of the bank as a whole and (or) its individual units, the implementation of individual decisions; be in a state of constant development (regularly reviewed and, if necessary, updated according to fixed rules).

3. The bank must have at its disposal a special service and integrated information support technology (justification) of all management decisions made in it, for which this service must: to promote the strategic analysis carried out by a special planning unit; timely (in a mode close to the real time mode) to provide processed in a certain way current information and data on the results of its operational analysis, the process of making management of the bank and its departments of management decisions

of an operational nature. Such information and the conclusions made on its basis should characterize, first of all, the current state of all assets and liabilities of the bank, their consistency, urgency, associated risks.

4. In the process of planning and operational management, the heads of the bank and its main divisions must have at their disposal documented and regularly updated according to certain rules substantiated information: about the characteristics of the bank itself, including a description of its weaknesses and strengths, a list of external opportunities that can provide the bank with comparative advantages, a list of obstacles to the bank's activities; determining its specialization for the current and future periods; description of the qualities that distinguish the bank from competitors, as well as key corporate values recognized by all employees of the bank; determination of the principles and limits of the bank's flexible response to certain possible changes in the conditions of its activities; comparison of actual results with planned ones; on the markets and industries covered by the bank's interests; about the clientele (as detailed information as possible).

This means that in fact planning should be based not on analysis in general, but on strategic analysis (analysis of deep factors), while regulation (operational management) should be based on the requirements of approved plans (programs) of bank development, but taking into account operational results current, daily) analysis.

The planning process includes the preparation of long-term forecast plans. The purpose of these documents is to provide the bank's staff with an understanding of the general objectives, strategies and tactics of their implementation, as well as what resources the bank has at its disposal.

In other words, planning provides an understanding of the goal, the invariance of ways to achieve it depending on certain parameters that determine the external environment. planning allows you to interconnect all aspects of the bank's activities with the help of consolidated indicators, to link the results with the interests of the team through a system of material and other incentives. Each credit organization's practice of development and decision-making has its own characteristics, determined by the nature and specifics of its activities, organizational structure, the existing communication system. However, as already mentioned, there are common features for the planning process, wherever it takes place. This is the only

core on which the technology of development and adoption of the plan, which is used by any credit institution.

Currently, several strategies are known that allow not only to exist but also to develop even in times of crisis.

The first is to find, identify and target small growing market segments within the stagnant sector.

The most difficult thing in this approach is to correctly identify and predict their development.

Another approach is to diversify through continuous work to improve the quality of existing and introduce new banking information technologies. This approach is promising because successful innovation or significantly higher quality can contribute to the growth of the customer base, as well as the benefits of this kind allow you to win in non-price competition and earn high profitability of new services.

The third approach is to focus on a sharp reduction in costs in order to achieve higher profitability at competitive prices for services. First of all, it is the rejection of unprofitable business units and structural units, reducing operating and operating costs by optimizing internal technological processes. Naturally, there are many strategies of the bank, but these approaches can be used in different modifications depending on the state of the environment and the availability of resources for their implementation.

Planning the activities of credit institutions requires consideration of specific conditions associated with their place in the system of market relations.

First, the movement of financial capital prevails in the process of providing banking services. Accordingly, special attention is paid to the planning of financial indicators and characteristics of cash flows. Based on the specifics of the banking institution, the main emphasis should be on planning own funds, operations to raise and place funds. Planning of fixed assets, the cost of inventories is relatively less important.

Second, regulating the activities of credit institutions by establishing mandatory economic standards makes it necessary to plan these standards, which allows you to decide whether or not to carry out operations and helps to avoid violating the limits of standards. planning the timing of banking operations allows them to be completed before the reporting date.

Third, the bank is a settlement center and an intermediary in the financial operations of other economic agents. This leads to his active participation in many other organizations of various industries and forms of ownership. Thus, the dependence of banks on the customer base is very high, so it is important to plan and forecast the activities of counterparties and customers of the bank in the part that is directly related to it: lending, raising funds, etc.

Extreme instability of the external environment should also be taken into account. Theoretically, we can identify four blocks of change that can affect the credit institution: political, economic, technological, social.

Recently, the rate of change in the external environment has increased significantly, which has increased risk and uncertainty. To overcome the risk, a flexible planning structure is needed, based on various proposals related to the development of environmental conditions.

Now the concept of strategic planning of banking is of undoubted interest, as this form of planning is effective with a high level of instability, which is determined in terms of three characteristics: the degree of familiarity of events, the pace of change and predictability of the future. Factors influencing the value of these characteristics are quite diverse, which gives hope for positive results of strategic planning in modern conditions.

As a rule, the bank's strategic plan reflects: 1) the initial conditions and assessment of the environment in which the bank should operate; 2) market priorities, depending on which the distribution of funds; 3) assessment of the strengths and weaknesses of the bank, opportunities and dangers; 4) adjustments to the strategy in order to realize market opportunities; 5) the choice of time for strategic action; 6) expected results.

Starting with setting long-term goals and determining investment priorities, the bank develops an action strategy, in the inseparable unity of which is the amount of funds needed for its implementation. In the development of the strategy are formed current plans aimed at making strategic changes, the need for which is dictated by constant changes in market conditions. The implementation of these changes determines the range of tasks of managers. this is the fundamental difference between the dogmatically accepted planning of our country and the strategic planning practiced in many Western banks.

It is thanks to the current situation that you can adjust the chosen strategy, which is an integral condition for achieving the desired strategic goals in any type of banking.

In addition to strategic planning, the theory of banking management mentions other, diverse types of planning: marketing, current, tactical, operational, financial, personnel planning, etc. The following types of planning can be distinguished according to the scope and level of detail of the defined tasks and targets: planning of the bank's strategy, which involves determining the bank's mission, its goals and objectives, priorities for future development; marketing planning aimed at developing banking products that are in demand in the market; business planning, designed to identify specific ways to address strategic objectives and the implementation of promising banking services and structural constraints on the bank's operations, which will allow it to achieve optimal financial results while limiting the overall level of risk of the bank; operational planning, which determines the list and timing of specific projects that ensure the implementation of the business plan, as well as the amount and structure of resources required for this and the payback period; financial planning, the purpose of which is to assess the financial results expected in the implementation of a particular version of the business plan or current plan, and the construction of the bank's forecast balance sheet; drawing up cost estimates and using the bank's profits, touches on the issue of determining the amount of overhead costs of the bank and the necessary capital costs for new programs or projects; budget planning, which determines the main directions and planned financial performance of individual structural units of the bank (so-called business units); current activity planning, the task of which is to prepare and coordinate current decisions on specific operations of the bank in order to maintain its current liquidity and solvency and ensure compliance with the bank's limits; structuring the organization and planning of personnel, which are designed to determine the system of powers and responsibilities for the implementation of targets, to ensure operational interaction of the bank in the implementation of the plan and select staff with the necessary qualifications to solve long-term and current problems.

All types of planning are closely interconnected, most of them are both separate stages of the process of developing the bank's strategy, and elements of the current management of the credit institution. To avoid contradictions that arise in management decisions due to the inconsistency of individual planning and analytical procedures, it is necessary to develop a technology of current, long-term and strategic planning, which would determine the

general standards of these processes. The solution of this problem involves the creation of: a single information repository of the bank, containing all external and internal information necessary for planning and management decisions, a single methodology for analysis and planning of the bank, ensuring comparability of all planning and analytical indicators used in credit management; unified regulations for planning the activities of the credit institution, which defines the responsibilities of management and structural units of the bank at different stages of the planning process, deadlines, regularity and responsibility for the implementation of planning procedures.

In turn, forecasting is one of the main components of the management process. Without forecasting, without an idea of the expected course of events, it is impossible to make an effective management decision. Anticipation of possible consequences when making any decision is a necessary condition for an effective management system. Management theorist and practitioner Henri Fayol defined the term "Management" as follows: "To manage – means to anticipate, organize, dispose of, coordinate and control; anticipate – take into account the future and develop a program of action.

The generalized concept of "prediction" combines many different ways to obtain information about the future. predictions in the most general form can be divided into scientific and non-scientific. Scientific prediction is based on knowledge of the laws of nature and society. Unscientific prediction – on the foreboding, human intuition.

The basis of such foresight may be life experience or belief in supernatural forces that determine the future.

The study of the concept of "prediction" allows you to specify its content more fully. In the scientific literature you can find various forms of concretization of this concept. The generalization of these studies, which have not lost their relevance today, is the concept of the famous scientist, sociologist IV Bestuzheva-Lada, who identifies the following sets of forms of concretization of prediction: predictive (belongs to the category of "prediction"); attributive.

Foresight in this context implies a description of possible or desired prospects, states, solutions to problems of the future and includes such specific forms as premonitions, predictions and predictions.

In turn, the prescription is related to solving problems, choosing from a variety of alternatives, using information about the future for purposeful activities, including the construction of the future. The prescription, in contrast to the prediction, in some way affects the future. Here we can identify the following specific forms: planning, goal setting, programming, design. Due to the fact that at the moment nothing is known for sure about the future, all forms of prediction have features of uncertainty. Moreover, its various forms are characterized by varying degrees of uncertainty. As the procedure for predicting the future becomes more complicated and the associated level of validity of these developments increases, the degree of uncertainty of judgments about the future inherent in each of the forms of prediction gradually decreases.

Indeed, if foreboding is a simple form of prediction inherent in any living organism, and contains information about the future at the level of intuition, and prediction is defined as a type of intellectual activity based on personal experience, then goal setting is associated with conscious human activity. as a way of integrating its actions into a system and characterizes the prediction in thinking of the result of activities, and design – is a set of measures that involves the implementation of a set of actions that ensure the achievement of certain goals. Unlike specific forms of anticipation that may exist on their own, goal-setting, planning, programming, and design are interrelated characteristics of the decision-making process on which any management system is based.

Attempts to predict the future can not ignore the constant changes in the world, nature and society, including projected objects and conditions of their existence. But it is impossible to predict everything. However, the forecast, as well as knowledge, can be constantly changing and thus be quite accurate. In scientific research, foresight is so important that it is no exaggeration to say that science is first and foremost a scientific foresight. The largest of them have always been a kind of turning point in cognition, indicating the direction of movement.

Planning the bank's activities – a complex analytical process, requires extensive experience and knowledge from the economist to take into account all possible factors affecting the activities of this credit institution.

The need to accurately determine the future socio-economic and demographic situation in the region, as well as the dynamics of the bank's

performance determines the widespread use of different methods of planning and forecasting depending on the economic nature of the object of study. The main difference between the forecast and the plan is that the indicators are projected, which the bank can not fully manage: the amount of customer funds, risks and actions of competitors; what is completely in the sphere of influence, such as costs, can be planned.

However, the specifics of banking is such that not only external but also many internal factors of credit institution development do not depend on it: the monetary policy of the central bank, its performance of supervisory functions, public confidence in the banking system, currency regulation and other factors that lead to the widespread use of forecasting methods.

There is no universal method of forecasting due to the variety of simulated situations; economists use more than 100 forecasting methods. One of their options for classification, based on inductive and deductive approaches, assumes that the whole set of forecasting methods is represented by two groups depending on the degree of their homogeneity: simple and complex. A group of simple methods combines homogeneous in content and tools forecasting methods. Complex methods – a set of methods implemented by special prognostic systems.

In addition, all forecasting methods are divided into three classes: factual, expert (intuitive) and combined. Their selection is based on the nature of the information on the basis of which the forecast is made:

1) factual methods are based on factual information material about the past and present of the development of the forecasting object. They are most often used in search forecasting for evolutionary processes;

2) expert (intuitive) methods based on the use of knowledge of specialists / experts about the object of forecasting and generalization of their views on the development of the object. These methods are more in line with the normative forecasting of abrupt processes, but due to the low accuracy of such forecasts and their high dependence on the experience of a particular employee or group of employees, they are not widely used in banking. They are mostly used either in small credit institutions or during the current planning of secondary indicators;

3) combined methods include methods with a mixed information basis, in which as primary information along with expert and factual is used.

The most common in banking are the following forecasting methods.

I. Statistical methods

1. Extrapolation on the moving average. Used for short-term forecasting purposes (up to one year). The need for this method arises when the available data of the time series do not allow to detect any trend (trend) of a process due to random and periodic fluctuations of the original data.

This method is to replace the actual levels of the time series with calculated ones, which have much smaller fluctuations than the original data. The average is calculated for data groups for a certain time interval, and each subsequent group is formed with a shift of one period.

The moving average method assumes that when calculating the average seems to slip from one period to another; with each new step the average is updated due to new information about the actual process.

Thus, the forecast is based on the assumption that the next time in its size will be equal to the average calculated for the last time interval.

The advantage of this method is the ease of use, the disadvantage is the low probability of realization of the planned indicator (and for economic processes, this probability should be equal to 95%).

2. Exponential average. When calculating the forecast using the moving average, the earlier the observation time, the less it affects the value of the moving average, ie the effect of past values should fade as you move away from the moment for which the average is determined. One of the methods of smoothing the time series with regard to "aging" is the calculation of exponential averages, which are widely used in short-term forecasting and are based on the use as a forecast of a linear combination of past and current observations.

This method has the advantages of the moving average method and allows to achieve greater accuracy of the forecast through the use of a correction factor, but the linearity of the exponential mean function allows it to be applied to phenomena for which functional dependence is expressed by a more complex model.

3. Autoregressive dependence. This method is based on the premise that economic processes have certain specifics: they are interdependent and inertial. The latter means that the value of almost any economic indicator at time t depends in some way on the state of this indicator in previous periods: the value of the projected indicator in previous periods should be considered as a factor.

4. Multifactor regression analysis. This method is used to build a forecast of any indicator, taking into account the existing relationships between it and other indicators. First, as a result of qualitative analysis, k factors (X1, X2, ..., Xk) are identified, which, according to the analyst, affect the change in the predicted Y, and build a regression dependence of any type: linear, parabolic, hyperbolic, exponential, logarithmic, power, and others.

The use of this method gives good results with a high degree of accuracy, but there are difficulties in selecting the most significant factors influencing the modeled process: in addition to close connection with the resultant factor, they should not be multicolleniary . In addition, the problem is the choice of dependence, because in banking, linear relationships are rare, which complicates the process of selecting the regression equation.

II. Mathematical method of forecasting. It is necessary in order to formalize (ie write in terms of a mathematical model) the task of optimal management and forecasting. With high accuracy of the planned indicators, this method is not common due to the complexity of the selection of indicators for the vectors of the resulting, status and controlled variables, environmental characteristics so that they are interrelated and comparable. In addition, not all banking processes can be described by mathematical formulas, and at certain periods of time or at certain values of variables do not lose the economic meaning of the phenomenon.

III. Plan-forecast based on the model of economic dynamics of the bank. The model is based on the theory and methods of automatic regulation and takes into account the impact of the main aggregate economic indicators of the bank, as well as tax payments and depreciation of fixed assets on the growth trajectory of the bank's capital. In modeling, a basic assumption is made about the continuity of financial flows of revenues and payments, which is justified in the case of choosing a fairly long period of averaging, for example, a month.

The dynamic model is used for forecast and planned calculations of aggregate performance indicators of the credit institution. Based on it, spreadsheets are developed, "matrix plans" for calculating monthly indicators for the medium-term planning period – from three to 12 months. The calculation method is built as follows: part of the indicators is set as the initial parameters of the model, and the other part of the indicators is calculated using the equations of the model.

For example, you can thus predict the monthly capitalized income and the amount of equity, using as a source of borrowed resources, set on the basis of the method of extrapolation or other methods. This set of initial and calculated indicators will answer the question of what will happen to capital in this dynamics of resources involved.

If, on the contrary, initially set the amount of capitalization of profits, and the estimated value of the amount of resources involved, the planning model will answer the question of what resources must be owned to ensure the desired capital growth in the planning period. This opposition of calculation models is conditional, as it is advisable to use a larger set of initial parameters when planning and forecasting to increase the accuracy of forecasting and planning in accordance with the bank's strategy.

Developed electronic "plan-matrices" allow you to quickly lose different situations of the future. They can serve as a working tool for both analysts and managers at any level.

Technological forecasting is divided into research and regulatory. The basis of exploratory forecasting is the focus on the opportunities presented, the establishment of trends in situations on the basis of information available in the development of the forecast.

Exploratory forecasting corresponds to the movement in the space of technology from lower-level technology to higher-level technology. In other words, from means and opportunities to needs and goals.

The basis of regulatory forecasting is the focus on the mission of the credit institution, the needs and goals to which it seeks to achieve. Normative forecasting corresponds to the movement in the space of technologies from higher-level technologies to lower-level technologies.

Within the framework of technological forecasting, such tasks as the development of forecasts in the field of economic and commercial activity, social and political activities are solved. One of the central problems in forecasting is an effective combination of survey and normative forecasting methods.

Exploratory forecasting is characterized by the use of such methods as extrapolation, modeling, the method of historical analogy, scriptwriting, etc., which are based on the analysis of accurate empirical data.

When using exploratory forecasting methods, quantitative information is preferred, although the use of non-quantitative information in exploratory forecasting is also possible.

An example of this is the use of intuitive methods, the method of scenarios or the method of expert curves, which allow to identify emerging trends, based not only on empirical data, but also on the experience of highly qualified experts.

Among the main methods used in normative forecasting are the methods of Patern, Delphi, forecast graph Glushkov, Pospelov, etc.

Among other types of forecasting are sometimes predictions using feedback, intuitive methods, "workarounds", etc. but the main ideas used in the development of forecasts are quite fully represented in the survey and regulatory forecasting.

In the conditions of general globalization, informatization and constantly changing economic stop in the country the main task of the management becomes forecasting of future indicators, optimization and increase of efficiency of activity. Most of the processes that take place in business are in continuous interdependence. analysis of these relationships helps to reveal the essence of the processes and try to predict future phenomena and indicators. forecasting is necessary in all areas of management and at all levels of activity.

Recent advances in both analytical and computational methods have greatly simplified empirical studies of nonlinear models and led to the emergence of numerous analytical approaches in this area, significantly increasing the number of forecasting methods. Artificial intelligence technologies are completely new in this field. Artificial intelligence (AI) is a branch of computer science that studies the possibility of providing intelligent reasoning and action with the help of computer systems and other artificial devices. In most cases, the algorithm for solving the problem is unknown in advance.

The idea of creating an artificial human resemblance to solve complex problems and model the human mind has existed since ancient times. However, the ancestor of artificial intelligence (II) is the medieval Spanish philosopher, mathematician and poet Raymond Raymond, who in the XIII century. tried to create a mechanical machine for solving various problems on the basis of the general classification of concepts developed by him. However, only invented by Charles Babbage in 1833, a mechanical calculator can be considered the direct ancestor of the intelligent computer.

The final birth of artificial intelligence as a scientific field occurred only after the creation of computers in the 40's of XX century. At the same time, Norbert Wiener created his main works on a new science – cybernetics .

The term "artificial intelligence – II" was proposed in 1956 as part of an annual project of the same name at Dartsmouth College (USA). After the recognition of artificial intelligence as a separate branch of science, it was divided into two areas: neurocybernetics and cybernetics of the "black box". these parts. The basic idea of neurocybernetics is that the only object capable of thinking is the human brain, so any "Thinking" device must somehow reproduce the structure. Thus, neurocybernetics focuses on software and hardware modeling of structures similar to the structure of the brain. The efforts of neurocybernetics have focused on creating elements similar to neurons and combining them into functioning systems. these systems are called neural networks, or neural networks. Actively developing field of artificial intelligence – machine learning (Machine Learning) – includes models, methods and algorithms focused on automatic accumulation and formation of knowledge based on data analysis and generalization. Machine Learning is the systematic learning of algorithms and systems, as a result of which their knowledge or quality of work increases as experience is gained.

To build such algorithms and systems used mathematical statistics, numerical methods, optimization methods, probability theory, graph theory, various techniques for working with data in digital form.

In recent years, this area is closely related to the rapidly evolving systems of data mining – data analysis and knowledge discovery – the search for patterns.

There are two types of learning: inductive learning, or learning by precedent, based on the identification of empirical patterns in the data; deductive learning involves the formalization of knowledge of experts and their transfer to the computer in the form of a knowledge base.

Deductive learning belongs to the field of computer systems that can partially replace a specialist in solving a problem situation. Therefore, the terms machine learning and inductive learning can be considered synonymous. Most precedent teaching methods have been developed as an alternative to classical statistical approaches.

There are many objects (situations) and many possible answers (reviews, reactions). There is some relationship between answers and

objects, but it is unknown. We know only the final set of precedents-pairs "object, answer", called the training sample. On the basis of these data it is necessary to restore the implicit dependence, ie to build an algorithm capable of issuing a fairly accurate classifying answer for any possible input object. This dependence is not necessarily expressed analytically, and here neural networks implement the principle of empirically formed solution. An important feature is the ability of the trained system to generalize, ie to adequately respond to data beyond the existing training sample. To measure the accuracy of the answers, an evaluative quality functional is introduced.

This formulation is a generalization of the classical problems of approximation of functions. In classical approximation problems, objects are real numbers or vectors. In real applied problems, the input data on objects can be incomplete, inaccurate, non-numerical, heterogeneous. These features lead to a great variety of machine learning methods.

3. Differences in consumer spending behaviour among age groups

Oschadbank is a universal bank serving the retail sector, SMEs and corporate clients in all market segments. It is state-owned. As of January 1, 2020, the bank's assets amounted to UAH 233 billion. Oschadbank's national banking network includes about 2,200 branches, almost 3,000 ATMs and 2,800 payment terminals. More than 35,000 commercial POS-terminals are connected to the bank's processing. Sberbank issued more than 10 million payment cards. The bank owns Internet banking and the Oschad 24/7 payment system.

In 2015–2016, Oschadbank rebranded and changed its financial strategy. According to the Report on financial results in 2020, the bank received a profit of 2776371 thousand UAH, which is 2615165 thousand UAH. above the level of 2018. This indicates the effectiveness not only of rebranding and marketing strategy, but also the management of financial results in the financial management of the bank.

The main purpose of managing the financial results of PJSC "Oschadbank" is to maximize net profit as the main source of growth of the bank's value and well-being of all participants in market, corporate, commercial and social relations.

In February 2018, the Government of Ukraine approved the Principles of Strategic Reform of the State Banking Sector of Ukraine. According

to these principles, the main goal of the reform of public sector banks (PrivatBank, Oschadbank, Ukreximbank and Ukrgasbank) was to create and maintain a reliable and competitive banking system, much of which was to become private. medium-term horizon.

The state remains committed to building a reliable and competitive banking system, which in the medium term is largely focused on private property, and the main priorities identified in the strategic principles of 2018, namely:

1. Implementation of strategies for individual banks, in order to ensure their functioning as stable, profitable institutions operating on a commercial basis.

2. Sustainable model of leadership and management of public sector banks: protection and support of corporate governance reform together with supervisory boards with a majority of independent members, accountability and strategy implementation, while avoiding political interference in the management and operations of banks.

3. Decrease in the share of non-performing assets in the balance sheets of public sector banks.

4. Reduction of exposure of the state and state enterprises in public sector banks.

During the revision of the Principles in 2018, the position of the leading universal bank of Ukraine was chosen as a key area for Oschadbank. Sberbank's strategy focused on several key components: remaining a leading player in corporate banking, increasing its presence in the micro, small and medium business segment, strengthening its position in retail lending and commission products, optimizing its branch network, and ensuring IT development in terms of digital. distribution and security of the system, optimize the operating model and improve the risk management system and non-performing loans.

In general, the financial results of Sberbank during 2018–2020 were within the approved strategy, which provided for a non-market ROE for this period. The bank reached a profit of 2.7 billion UAH. in 2020. The bank's ROE was below 2% in 2018–2020.

In addition to the general financial indicators, the review of the key components of the bank's strategy shows that the bank has made achievements in achieving some of the goals set by the strategy. The position

in retail lending and commission products showed a moderate strengthening by increasing the share of the retail lending market by 1.1 percentage points. and commission income growth of 56%.

Maintaining a leading position in the segment of corporate business and SMEs: achievements have been insignificant. In general, the market share of corporate clients and SMEs decreased by 1.4 percentage points. in 2019 compared to 2017. Optimization of the branch network: the bank is implementing the initiative at a sufficient level, reducing the number of branches by 27% to ~ 2400 branches in 2019. The Bank plans to continue this trend and reach the target size of its branch network in 1800-2000 branches in 2020.

The operating model has undergone major changes as the bank has centralized its back office and IT functions. Such centralization is also necessary for other divisions of the bank. At the same time, the bank's cost-effectiveness ratio (CIR) ranged from 78% in 2017, rising to 147% in 2018 and recovering to 98% in 2019. Improving the IT system: some progress has been made, in particular the bank has introduced a single IT platform in all regions, which allows you to consolidate customer data into one centralized system, and introduced new systems to protect against cyber fraud. Risk and non-performing assets management has been strengthened. The Bank reduced the share of non-performing assets by 6 percentage points. from 2017 to 2019 and reduced the cost of risk (CoR) for the entire loan and investment portfolio to almost 0%. The state expects Oschadbank to become a full member of the Individual Deposit Guarantee Fund in 2020.

Based on the previously chosen direction and strengths of the bank, as well as key assumptions about the business model of the bank and the macroeconomic situation, Oschadbank should review its strategy for further development.

Table 1

Expected performance indicators in 2024

	Oschadbank	Privatbank	Ukrgasbank	Ukreximbank	Total
Net profit, UAH billion	3-3,7	15,8-19,3	1,6-2,0	1,8-2,2	22,2-27,2
ROE, %	14-18	31-37	16-19	13-16	22-28

In 2018, Oschadbank adopted the principles of development of the banking sector until 2024. Sberbank considers further improvement of customer experience and technological leadership to be its strategic priorities. According to the report, Oschadbank JSC increased the share of lending to individuals and legal entities in 2020 compared to 2018, the annual increase was 0.4%.

One of the important components of assessing the bank's performance is to assess the growth rate of key indicators, which is carried out in order to determine in which direction the bank is developing – decline or growth, to identify the level of banking development in the future.

Table 2

Growth rates of key indicators of Oschadbank

Name of article	2018	2019	2020	Absolute deviation of 2018 from 2020, +; -
Annual growth rates of assets, %	34,05	13,85	-6,6	-40,65
Annual growth rates of liabilities, %	4,01	12,00	-8,47	-12,48
Annual growth rates of equity, %	22,08	5,1	10,8	-11,28

The share of Oschadbank in the Ukrainian banking market in terms of assets increased from UAH 2,146,353,373 thousand. up to 233599897 thousand UAH or 8%. This figure decreased by 6% compared to 2019. According to the results of 2020, the growth rates of liabilities decreased by 12.48% and equity by 11.28% compared to 2018.

Table 3

Financial results of Oschadbank

Indexes	2018	2019	2020	Absolute deviation of 2018 from 2020, thousand UAH
Interest income	19351416	15442611	15099630	-4251786
Interest expenses	(13896078)	(13576217)	(10476135)	-3419943
Net interest income	5455338	5498549	7990807	+2535469
Commission income	5236356	6438707	8043794	+2807438
Commission expenses	1771336	2235702	3080856	+1309520
Net profit (loss)	161206	255074	2776371	+2615165
CIR, %	98	97	80	-18

From the analysis we see that Oschadbank in 2020 increased interest income by 4251786 thousand UAH, while reducing interest expenses by 3419943 thousand UAH. this provided an opportunity to increase the bank's net profit by 2615165 thousand UAH. The stable dynamics of growth of Sberbank's commission income, namely an increase of 1.5 times compared to 2018, ensured that Sberbank maintained its leading position in the market on this indicator. Oschadbank increased the amount of net profit by UAH 2,615,165 thousand. in 2020 compared to 2018 The positive dynamics of the growth rate of net profit is explained by the increase in the dynamics of net interest income by 2635469 thousand UAH. for the study period. Interest expenses in 2020 decreased by 3419943 thousand UAH and amounted to 10476135 thousand UAH. Commission expenses tended to increase by 42% during the study period. Following the results of 2020 there is a decrease in such an indicator as CIR. CIR – Cost Income Ratio – is the ratio of operating expenses to operating income. CIR is actively used around the world to assess the effectiveness of the bank by investors, shareholders, rating agencies, etc . Calculation of Cost / Income means the presence in the numerator of operating costs, which traditionally include labor costs, administrative costs, depreciation. The denominator contains the bank's net operating income: income in the form of interest and commissions on banking operations, income from securities transactions and other income. Thus, the CIR determines how many hryvnias must be spent to generate one hryvnia of income. The negative dynamics of this indicator in recent years indicates that the bank needs to spend less money every year to receive one hryvnia income. Over the last year, the cost of such costs has decreased by 17%.

Understand the causes and factors of changes in the main financial results of the bank need a more detailed analysis of balance sheet indicators, income and expenses in terms of components, macroeconomic trends.

According to the figure, it is obvious that the reason for the increase in interest income was an increase in the share of interest on investments. This type of income increased by UAH 2,500,635 thousand, the share of which increased from 10% to 22%. At the same time, it should be noted that the share of interest on loans to customers is gradually decreasing. Thus, the amount of interest received on loans amounted to 9625781 thousand UAH in 2018 and gradually decreased to 8704190 thousand UAH in 2020. In 2020. almost no interest was received on funds in banks, other

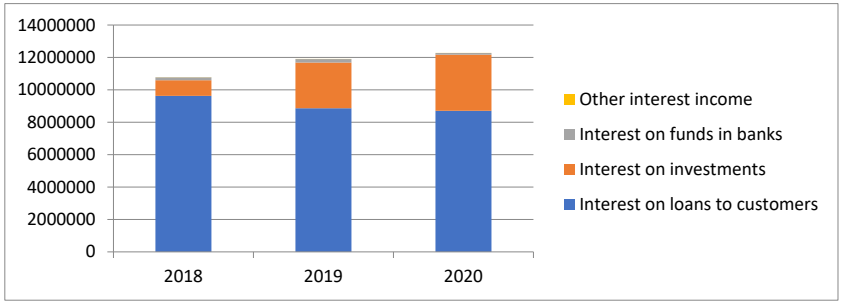

Figure 1. Interest income on financial assets measured at amortized cost of Oschadbank

interest income. When planning interest income, banks expertly determine the indicators for achieving the target level of interest income. Some indicators are planned based on the dynamics of previous years. The main macroeconomic indicators and trends of their development (household income, inflation, industrial production index, GDP, etc.) are also taken into account. Thus, the planning of bank interest income is a complex process that affects many factors, including those that go beyond the activities of the bank itself. Interest expenses are planned in similar ways. In particular, to forecast the interest costs of attracting customer funds, the main drivers are: the amount of borrowed funds in terms of private and corporate customers, current accounts, banking products, currency; interest rates, etc. Among the macroeconomic indicators in the calculation of planned interest costs are the following indicators: household income, average interest rates of commercial banks, retail trade, etc.

Interest expenses of Oschadbank during 2018–2020 decreased due to a decrease in the amount of interest on customer accounts and interest on issued Eurobonds. Interest expenses on customer accounts for this period decreased by 1477380 thousand UAH and in 2020 amounted to 8840648 thousand UAH this type of expense has the largest share among other types of interest expenses. Interest on issued Eurobonds, the share of which decreases annually, also has a large impact on the amount of interest expenses. Thus, the amount of interest on Eurobonds issued decreased from UAH 2,879,165 thousand to UAH 1,210,767 thousand, or 2.3 times. The sum of other interest expenses has insignificant shares.

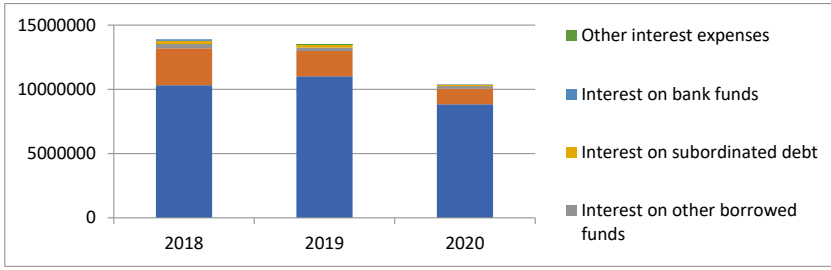

Figure 2. Interest expenses on financial liabilities valued at amortized cost of Oschadbank

In 2018–2020 the amount of interest income decreased by 884474 thousand UAH, and the amount of interest expenses by 3419943 thousand UAH. This provided an opportunity to receive in 2020 net interest income in the amount of UAH 7,990,807 thousand.

Figure 4 presents some of the main indicators of Oschadbank's activity for 2018–2020, including the bank's assets and loans to customers.

The figure shows that throughout the analyzed period, the bank's assets show an uneven increase in the total amount. Thus, compared to 2018, assets in 2019 increased by 14%, compared to 2019 by 7% in 2020. There is also a decrease in the bank's loan portfolio. In 2020, compared to 2018, there is a decrease in the amount of "Loans to customers" by 4317099 thousand UAH or 6.4%. Among the reasons for the decrease in assets should be noted: fluctuations in the national currency, a decrease in corporate loans and the revaluation of government securities in accordance with international financial reporting standards (Ruda, 2021).

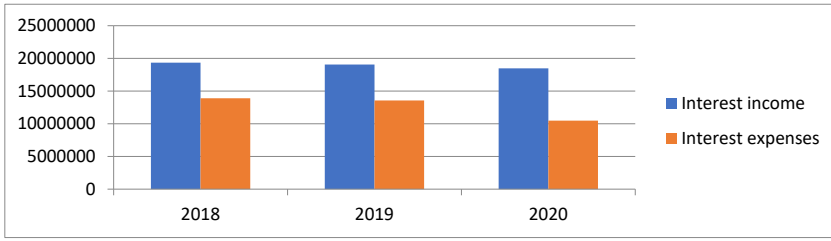

Figure 3. Dynamics of the ratio of income and expenses of net interest income of Oschadbank

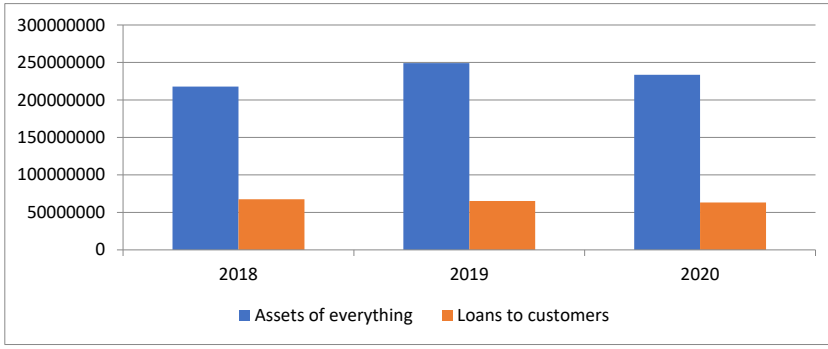

Figure 4. Dynamics of assets and loan portfolio of Oschadbank for 2018–2020

Thus, Oschadbank JSC is one of the largest state-owned banks in Ukraine, which demonstrates the positive dynamics of capital growth. In order to effectively manage the bank, find ways to minimize costs and maximize profits, it is necessary to explore the methods of planning and forecasting that the bank uses in its activities.

The bank's equity is the most important indicator that can be considered separately from others; allows you to see the reliability of the bank, efficiency and prospects. Share capital is the main component of equity, its share of less than 100% demonstrates the efficiency of the bank, because the components of equity are also reserve and other funds, retained earnings.

The bank's equity is the main means of ensuring the stable operation of the bank and the implementation of financial planning. Consider the dynamics of the bank's equity. The equity of Oschadbank JSC increased by 18% during the study period.

In the structure of equity, the largest share during the analyzed period is occupied by share capital, the amount of which is constant. Retained earnings, which have fallen by 8.7% in recent years, also account for a significant negative share. The equity of the studied bank in 2020 increased by 18.27% compared to 2018.

Retained earnings are an extremely important source of equity formation and indicate the bank's own development potential. Analyzing retained earnings as a source of equity, it should be noted that JSC "Oschadbank" has

Table 4

Dynamics of equity of Oschadbank for 2018–2020, thousand UAH

Liabilities articles	2018	2019	2020	Growth rate (decline) 2018 from 2020,%
Equity	49724980	49724980	49724980	-
Reserve for overvalued buildings	1821887	1817194	1572968	86,3
Reserve for revalued investments	215554	1018205	976060	at 4,5 times
Cumulative amount of exchange differences	1513	1061	1583	-
Uncovered damage	(33215794)	(33004661)	(30334988)	91,3
Uncontrolled share of participation	13529	13493	13524	-
Total equity	18561669	19570272	21954127	118,27

an uncovered loss on 01.01.2020 – 30334988 thousand UAH, the amount of which has decreased in recent years. But in general, the amount of the bank's equity is positive, which indicates the required level of efficiency and quality management of the bank.

The Bank performs capital management in order to ensure the continuation of the bank's activities, maximizing shareholder profits by optimizing the ratio of borrowed funds and equity. The Management Board of Oschadbank systematically reviews the capital structure. The course

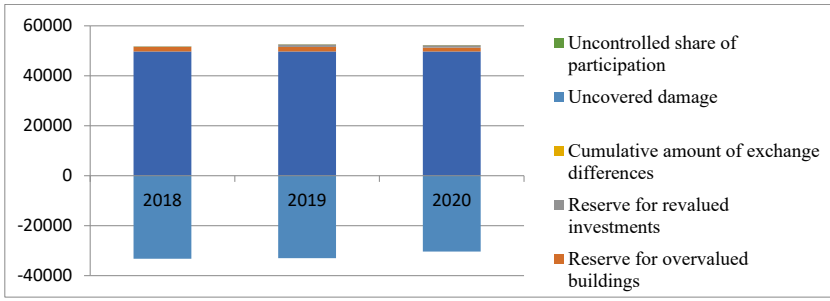

Figure 5. Dynamics and structure of Oschadbank's own capital, UAH mln

examines the cost of capital and the risks associated with each class of capital. Based on the recommendations of the bank's board, it introduces adjustments to the capital structure by issuing additional shares, attracting additional credit funds or repaying existing loans. Thus, equity acts as self-insurance, providing a buffer against insolvency, and if it is positive, it reduces the degree of risk of the activity, which allows for effective planning of future activities.

Let's define the absolute autonomy of Oschadbank, which is determined by the ratio of equity (net assets) to the total value of assets, which is characterized as part of the property formed at the expense of equity.

Table 5

Dynamics of assets and equity of Oschadbank

Name of article	2018	2019	2020	Absolute deviation of 2018 from 2020, +; -
Assets, thousand UAH	217786209	249144745	233599897	+15813688
Equity, thousand UAH	18561669	19570272	21954127	+3392458
Ratio between equity and assets, %	8,5	7,6	9,3	+0,8

Oschadbank's asset fund, formed at the expense of equity, is growing annually, and in general has increased by 0.8% during this period.

The dynamics of net profit of Oschadbank JSC shown on the chart showed that in 2020 the profit amounted to 2776371 thousand UAH. As you can see from the chart, there is a rapid increase in net income. Compared to the two previous analyzed years, we can see a significant improvement in the financial situation, because in 2018–2019. the bank received small amounts of net profit. The income received by the bank in 2020 was due to the following components: net interest income and commission income, as well as a significant reduction in the cost of deductions to the provision for impairment of loans and advances in other banks.

The most commonly used method of analyzing the efficiency of the bank is the DuPont model. This method examines the relationship between profitability and risk of the bank and reveals the impact of individual factors on the results of its activities. The calculation of indicators is carried out according to the financial statements.

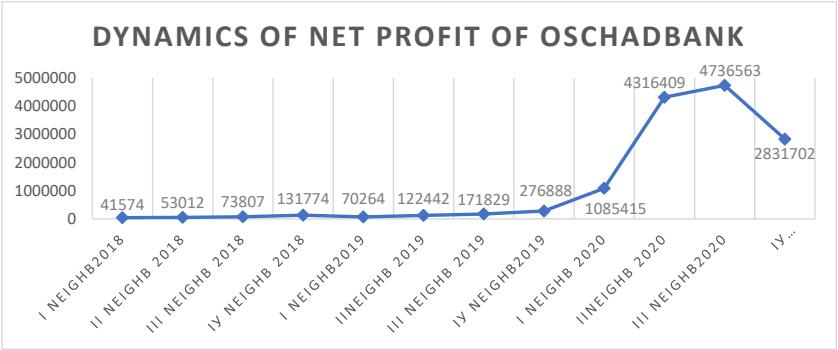

Figure 6. Dynamics of net profit

In Dupont's model, the bank's risk indicator is the capital multiplier (MC) – the ratio of average assets to the bank's equity. The greater the expression of the capital multiplier, the greater the risk. Or the higher the profit, the riskier the structure of the bank balance sheet will be, other things being equal.

$$ROE = ROA*МК,$$

$$ROE = ЧП/А *А/К$$

The ROE indicator is the ratio of the bank's net profit to the average amount of the bank's equity over the period and characterizes the efficiency of own funds (generated by share and additional capital, as well as reserve fund and retained earnings) invested in the bank's business. The value of the ROE indicator is to determine the level of return (in the form of net profit) from the shareholders' funds invested in the bank, as well as retained earnings directed by the bank to business development.

ROA is the ratio of net income to the average for the period of the bank's assets and allows assess the effectiveness of active operations of the bank: how many hryvnias of net profit the bank earns for each hryvnia invested in its assets as financial (loans to individuals and legal entities, interbank loans, securities) and non-financial (fixed assets and intangible assets). Its use makes it possible to assess the effectiveness of the bank's investments in the base for the formation of profits of its assets. Both of the above indicators are related to the consideration of the bank as a whole as a business entity. This approach is manifested both in the calculation of the numerator of

indicators (net profit – the final financial result of the bank after accounting for interest and non-interest expenses, write-offs and revaluation of assets and tax payments) and in the calculation of the denominator (bank assets – its investment in various financial market instruments, as well as fixed assets and intangible assets).

Table 6

Decomposition analysis of equity of Oschadbank

Name of article	2018	2019	2020	Relative deviation of 2018 from 2020,%
Net profit, thousand UAH	161206	255074	2776371	1722,25
Assets, thousand UAH	217786209	249144745	233599897	107,26
Equity, thousand UAH	18561669	19570272	21954127	118,27
ROE	0,86	1,30	12,64	1469,76
ROA	0,07	0,10	1,18	1685,71
MK	11,73	12,73	10,6	90,36

Indicators of the efficiency of the use of financial resources during 2018–2020 were positive, which is explained by the profitability of Oschadbank for this period. The change in ROE and ROA in 2020 was due to changes in net income – by UAH 2,615,165 thousand, which led to significant increases in these indicators. At the same time, the capital multiplier decreased by 10%.

ROE is an indicator of stability. The analysis of this indicator makes it possible to predict how stable the bank's profitability level is. Analyzing this indicator, it is necessary to compare the growth rate of net profit and equity. This indicator characterizes the bank's ability to manage all its funds. The optimal value of this indicator is at least 15%. Oschadbank demonstrates a steady increase in this indicator during the study period, which is close to the recommended one.

ROA characterizes the return on assets. In practice, it is considered that if the level of return on assets exceeds 1%, the bank operates profitably. Although Oschadbank JSC received a net profit during 2018–2020, the recommended value of the indicator the bank received only in 2020, which amounted to 1.18%.

The equity multiplier shows how many hryvnias of assets each hryvnia of equity should provide and, accordingly, what share of bank resources can be formed in the form of debt obligations. The MC (capital multiplier) ratio of Oschadbank JSC decreased from 11.73 in 2018 to 10.6 in 2020, which indicates a decrease in the degree of risk of the banking institution.

In general, the DuPont model provides an assessment of the state of the bank in the market, the formation of financial benchmarks in the planning and forecasting of bank finances.

Summing up the analysis of all the above indicators, the financial condition of Oschadbank can be described as quite stable, despite the uncertainty and instability of the financial market and the pandemic of coronavirus infection, which has a negative impact on economic activity. In the reporting period, the bank continued to serve primarily the population, which provided it with a leading position in the retail banking market. During this period, new economically sound approaches in tariff policy were developed to maintain the leading positions in servicing settlement and cash operations of corporate clients, which allowed to increase the mobility of price management for products and services of corporate business.

To improve the performance of Oschadbank, it is necessary to develop a policy on the formation, distribution, use of its financial results for various banking operations, various activities, etc. It is also necessary to develop and implement measures and justification of management decisions to maximize profits. In accordance with the developed measures to make current and operational plans of income and expenses, with the main attention to plans for the formation of interest income.

Having analyzed the financial indicators of the Bank, we can characterize the financial condition of Oschadbank as good, as evidenced by the gradual increase in indicators such as bank capital, increase in loan portfolio.

Thus, the main direction in the bank's management system is financial management, which involves planning, regulating and controlling the bank's operations and their income and expenses, ensuring the stability of financial results and improving the economic efficiency of the bank.

Thus, planning is an integral function of bank management, carries out the formation of a comprehensive financial and economic policy of the bank, which allows you to maximize the bank's share in the market, gain leadership and is a multifaceted, multifaceted management process.

4. Findings

Based on the above disadvantages of the system of financial planning and forecasting, it is proposed to consider the introduction of such technological innovations as machine learning and artificial intelligence.

Let's start by studying aspects of these technologies. At present, machine learning and artificial intelligence are some of the most advanced modern technologies. Machine Learning is a unit of artificial intelligence that uses algorithms that can learn on their own, ie they do not need to be specially programmed for a specific task. The technology is used for face recognition, music, machine translation, medical diagnostics, fraud detection, prediction of stock price dynamics and so on.

Currently, bank vaults are literally inflated by a huge amount of customer data (questionnaires, transaction and communication histories) and inside information – in general, from all the data that arise as a result of all the activities of the bank. Artificial intelligence in conjunction with Machine Learning makes it possible to study the behavior and needs of customers, and based on them to make decisions autonomously, which would take an ordinary person more than one hour, and maybe a day. For example, JPMorgan Chase has developed a Machine Learning algorithm called Contract Intelligence (COiN), which is used to analyze documents and aggregate important data from them.

This tool allowed the bank to process 12,000 loan agreements in a few seconds, which usually took 360,000 man-hours. Artificial Intelligence and Machine Learning have been used for many years, but it is Big Data that allows them to reach their peak – it is a set of approaches, tools and methods of processing structured and unstructured data of huge volumes so that a person can their further effective application. accordingly, the greater the amount of information received, the more and more accurate the result can be obtained, for example, about the needs and behavior of customers. In this regard, it is critical for the banking industry to rely on and collect a large amount of information about each customer. An example of the collection of such information can be ATM transactions, mobile banking, which the client performs on a daily basis. In this case, the bank's goal will be to achieve a quick normal transaction for the client with one button, without unnecessary search and input of information based on information about all transactions performed by the client.

The main areas of banking where machine learning methods are currently actively used are: search, segmentation and customer retention; scoring and underwriting; fight against fraud; search and retention of employees; investment management; collection management; collection activities; customer support.

Some examples of cases of application of machine learning methods in Ukrainian banks: the work of Ukrsibbank contact center operators has been accelerated twice; 24% more efficient than live operators was the robot collector in PJSC Oschadbank; the maximum time required to make a decision on a loan in Alfabank Bank has been reduced by 3 times; the index of detection of suspicious transactions in VTB Bank was increased to 95%; 1.5 times reduced collection costs in Ukrgasbank.

Ukreximbank actively uses machine learning to increase sales.

Models of propensity to consume product help Bank to divide customers into groups in terms of probable response to the product offer, the method of classification – to divide customers into certain classes. In addition, the bank monitors the customer's transaction activity. For example, when you reduce the number of purchases on debit or credit cards, the customer falls into a class with a high probability of outflow. For initially undefined classes, the clustering method allows you to divide objects into clusters. It consists in allocating client segments with a unique combination of characteristics on a set of product parameters.

To improve the quality of models, Ukeximbank uses several methods of machine learning – neural networks, random forest, gradient boosting. These methods have already improved the propensity to purchase consumer credit and credit cards by 10 to 12% compared to the classical logistic regression.

In Ukrsibank, the decision to implement models based on machine learning methods was made in February 2018. Already the first results of the pilot project showed a significant increase in the quality of models compared to traditionally used in practice models based on logistic regression. Ukrsibbank actively uses machine learning in collection activities.

The best results are shown by Ukrsibbank – ensembles from the models constructed by a method of gradient boosting with optimization of hyperparameters. The constructed models show good quality and stability, and the organization of ensembles allows to create combinations

of noncorrelated predictors, for example, points from various vendors. In addition, the use of Machine Learning methods allows you to most effectively use the data of the bank and to refuse sampling. An important advantage is the self-learning models, ie the ability to rebuild with new data.

Scoring system has become very widespread on the basis of machine learning technology – not only the system, but also the method of credit risk assessment, as well as risk management based on the forecast of the probability of default by a particular borrower on the loan. In this case, machine learning has automated the process of issuing loans, which now also takes little time to process loan applications, both for individuals and legal entities. Previously, the last time of consideration could take more than a week, which slowed down the activities of companies applying for this service. Currently, the scoring model is used by Oschadbank, Bank Kyiv, and VTB Bank.

But not only in Ukraine there is success in the use of participatory methods, but also abroad. For example, back in February 2017, Wells Fargo invested in the creation of a chat bot with Artificial Intelligence for the company's Facebook messenger. this virtual assistant is used to reset the password and provide account information without having to fill out multiple pages of forms. Now this is a simple dialogue that can take a few minutes.

Citibank, for example, has invested in FeedzAI, a company that focuses on using data science to detect and stop fraudulent transactions in a variety of financial activities, including online banking and mobile banking. FeedzAI uses machine learning algorithms to analyze huge amounts of Big Data data in real time and immediately notifies financial institutions of suspected fraud.

The symbiosis of "big data" and machine learning offers a fundamentally new approach to the problems of customer segmentation, lending and forecasting, as well as solving a wide range of analytical problems.

Thus, current experience in the use of machine learning methods shows positive results of the bank, in particular, improving processes, saving resources and increasing the efficiency of the bank. However, it is necessary to compare modern machine learning methods in planning and forecasting .

5. Conclusions

The main results of the work are: acquaintance of the authors with modern scientific literature on planning and forecasting in banking institutions; research of modern and advanced methods of machine learning, directions and spheres of their use in credit organizations; basic methods of planning and forecasting, stages of business planning, analysis of key performance indicators, development strategies, values, core values and goals of Oschadbank; study of methods of planning and forecasting of financial results used in Oschadbank; analysis and evaluation of planning and forecasting methods used in the bank; identification of the main shortcomings of the existing planning and forecasting system; comparison of applied forecasting methods in Oschadbank and modern forecasting methods using machine learning; identifying ways to improve the shortcomings found in the planning and forecasting system of Oschadbank.

The goal set by the authors, which is to develop and scientifically substantiate theoretical and methodological provisions on planning and forecasting the financial results of the bank, objectifying their practical application of the concept of strategic plan development, substantiation of the effectiveness of the implemented planning and forecasting system, was achieved. The authors proposed a specific model for forecasting commission income from the trading acquiring market using modern Machine Learning methods. The effectiveness of the implemented forecasting system has been proven: the model has higher forecasting accuracy, requires less human and time resources. In turn, the high accuracy of the forecast of the bank's operating indicators allows: to see the future picture of developments until the end of the year; to carry out competent coordination of the organization of employees; to adjust the planned values, which are set before the beginning of the year, when critical data is detected; improve or change the strategy for achieving the targets of each territorial bank; assess the future profitability of the bank; evaluate the work done and reward the bank's employees.

The set tasks were achieved in the work. Theoretical and methodological provisions of the features characterizing the directions of planning and forecasting of financial results of activity of commercial banks in the market of banking services are formulated. The main functions of planning and forecasting, their importance in the management of a commercial bank

are revealed in the work. The author has developed a rational system of planning and forecasting the activities and development of a commercial bank and methodologically based on the example of Oschadbank. In addition, the paper analyzes, compares and evaluates the planning and forecasting system operating in the bank, and modern, promising methods of forecasting planning.

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