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Анализ стабильности банковского сектора Азербайджана в условиях экономического кризиса на основе эконометрической модели

Данная статья посвящена влиянию ряда макроэкономических показателей на величину резервов на возможные потери в банковском секторе Азербайджана.

Цель исследования. *Цель исследования – проанализировать устойчивость банковского сектора к воздействию макроэкономических потрясений в экономике; изучить, что включает в себя понятие финансовой устойчивости банковского сектора и какие методы используются в процессе ее анализа и оценки, исследовать зависимость ряда переменных, характеризующих состояние банковского сектора, от различных макроэкономических шоков, свойственных экономике; проанализировать, как Центральный банк участвует в регулировании и мониторинге финансовой устойчивости банковского сектора, а также посредством каких мер он поддерживает банки в период кризиса.*

Материалы и методология. *Практический этап работы заключается в создании множественной регрессионной модели, которая выявит степень влияния макроэкономических шоков на положение банковского сектора Азербайджана. Для проведения анализа и построения уравнений регрессии были использованы квартальные данные за период 2012–2023 гг. Информация была взята из ряда источников: 1) Официальный сайт Центрального банка Азербайджана; 2) Официальный сайт Министерства финансов; 3) Официальный сайт Госкомстата Азербайджана; 4) Отчеты о развитии банковского сектора и банковского надзора. Для анализа и оценки значений зависимых переменных резервов на возможные потери и рентабельности активов, значения по банковскому сектору в целом взяты из годовых отчетов о развитии банковского сектора и банковского надзора.*

Поскольку исходные данные в работе квартальные, наша модель будет представлять собой временной ряд, оцененный с помощью обычного метода наименьших квадратов (МНК). Лаговые переменные могут быть включены во временной ряд. Лаги в объясняющих переменных учитывают степень возможного лага, с которым макроэкономические шоки влияют на банки. Иными словами, изменения значений макроэкономических факторов не оказывают немедленного воздействия на положение банков, а проявляются через некоторое время и носят отложенный характер [7]. Такие лаги необходимо выявлять и учитывать для формирования более точной и полной картины влияния макроэкономических колебаний на банковский сектор.

В ходе предварительной диагностики данных было выявлено наличие гетероскедастичности и автокорреляции первого порядка. Для их устранения применяются поправки Ньюи-Уэста, корректирующие вариационно-ковариационную матрицу для получения более последовательных оценок коэффициентов регрессии.

Результаты. *При выборе показателей для изучения степени влияния макроэкономических факторов на устойчивость банковского сектора мы учитывали особенности экономики нашей страны. Дело в том, что Азербайджан является сырьевой страной, экспорт которой почти на 70% состоит из топливно-энергетических товаров [30]. Это означает, что размер экспортных доходов, финансовое положение компаний и стабильность экономики во многом зависят от ценовой конъюнктуры на мировом энергетическом рынке, а именно от цены на нефть.*

Кроме того, Азербайджан относится к числу стран с развивающимся рынком, для которого характерны повышенная неустойчивость (волатильность) валютных курсов и нестабильность финансовых рынков, а также высокие процентные ставки и спреды. Поэтому для нашей страны характерен риск резкого оттока капитала в случае кризиса в мире, поскольку инвесторы стремятся вывести свои средства из стран, наиболее уязвимых к влиянию макроэкономических потрясений.

Динамика ВВП является одним из важных показателей экономической активности государства. Его падение в период кризиса негативно сказывается на различных сферах экономической и социальной жизни [8].

Индекс Бакинской фондовой биржи отражает состояние фондового рынка крупных компаний, которые являются наиболее важными для экономики страны [9]. Обвал индекса означает ухудшение положения компаний, снижение рыночной стоимости их активов и акций, обострение проблем с выплатой внешнего долга и получением новых кредитов для обеспечения функционирования их деятельности. Кроме того, обвал котировок на фондовом рынке приводит к большим потерям в результате их отрицательной переоценки.

Заключение. *При проведении исследования устойчивости банковского сектора Азербайджана на основе эконометрической модели необходимо учитывать определенные ограничения. Во-первых, доступность и достоверность данных - важный аспект, который может повлиять на точность результатов исследования. Во-вторых, для полного понимания изучаемых вопросов необходимо учитывать контекст и специфику банковской системы Азербайджана. Наконец, в данном исследовании не рассматриваются социальные и политические факторы, которые также могут влиять на устойчивость банковской системы. При интерпретации результатов и выработке рекомендаций следует учитывать ограничения исследования.*

Ключевые слова: *макроэкономические показатели, банковский сектор Азербайджана, регрессионная модель, квартальная стабильность, шоки, биржевой индекс, экономический кризис, факторы.*

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Analysis of the Stability of the Banking Sector of Azerbaijan in Conditions of Economic Crisıs Based on the Econometric Model

This article is devoted to the influence of a number of macroeconomic indexes on the amount of reserves for possible losses in the Azerbaijan banking sector.

The purpose of research. *The purpose of the research to analyze the stability of the banking sector to the impact of macroeconomic shocks in the economy, study what the concept of financial stability of the banking sector includes, and what methods are used in the process of its analysis and assessment, investigate the dependence of a number of variables characterizing the state of the banking sector on various macroeconomic shocks inherent in the economy, analyze how the Central Bank is involved in regulating and monitoring the financial stability of the banking sector, as well as through what measures it supports banks in times of crisis.*

Materials and methodology. *The practical stage of the work is to create a multiple regression model that will reveal the degree of impact of macroeconomic shocks on the position of the Azerbaijan banking sector. To carry out the analysis and construct regression equations, quarterly data for the period 2012-2023 were used. Information was taken from a number of sources: 1) Official website of the Central Bank of Azerbaijan; 2) Official website of Ministry of Finance; 3) Official website of Azerbaijan State Statistics Committee; 4) Reports on the development of the banking sector and banking supervision. To analyze and estimating the values of the dependent variables of provisions for possible losses and return on assets, values for the banking sector as a whole are taken from annual reports on the development of the banking sector and banking supervision.*

Since the source data in the work is quarterly, our model will be a time series estimated using the ordinary least squares (OLS) method. Lagged variables may be included in the time series. The lags in the explanatory variables take into account the degree of possible lag with which macroeconomic shocks affect banks. In other words, changes in the values of macroeconomic factors do not have an immediate impact on the position of banks, but appear after some time and are delayed [7]. Such lags need to be identified and taken into account in order to form a more accurate and complete picture of the impact of macroeconomic fluctuations on the banking sector.

During preliminary diagnostics of the data, the presence of heteroscedasticity and first-order autocorrelation was revealed. To eliminate it, Newey-West corrections are applied, adjusting the variation-covariance matrix to obtain more consistent estimates of regression coefficients.

Results. *When selecting indexes to study the degree of impact of macroeconomic factors on the stability of the banking sector, we took into account the peculiarities of the economy of our country. The fact is that Azerbaijan is a raw materials country, the export of which consists of almost 70% of fuel and energy products [30]. This means that the size of export revenues, the financial position of companies and the stability of the economy are highly dependent on the price situation in the global energy market, namely the price of oil.*

In addition, Azerbaijan belongs to a number of countries with an emerging market, which is characterized by increased volatility of exchange rates and instability of financial markets and high interest rates and spreads. Therefore, our country is characterized by the risk of a sharp outflow of capital in the event of a crisis in the world, as investors seek to withdraw their funds from countries that are most vulnerable to the influence of macroeconomic shocks.

GDP dynamics are one of the important indicators of the economic activity of the state. Its fall during the crisis negatively affects various spheres of economic and social life [8].

The Baku stock exchange index reflects the state of the stock market of large companies, which are the most important for the country's economy [9]. The collapse of the index means a deterioration in the position of companies, a decrease in the market value of their assets and shares, and increases problems with paying external debt and obtaining new loans to ensure the functioning of their activities. In addition, the collapse of quotes on the stock market leads to large losses as a result of their negative revaluation.

Conclusion. *When conducting a research of the sustainability of the banking sector in Azerbaijan based on an econometric model, it is necessary to take into account certain limitations. First, the availability and reliability of data is an important aspect that can affect the accuracy of the study results. Secondly, to fully understand the issues under study, it is necessary to take into account the context and specifics of the banking system of Azerbaijan. Finally, this study does not examine social and political factors that may also influence the sustainability of the banking system. Limitations of the study should be considered when interpreting the results and making recommendations.*

Keywords: macroeconomic indexes, Azerbaijan banking sector, regression model, quarterly stability, shocks, stock exchange index, economic crisis, factors.

Introduction and purpose of research. Banks and the banking system are one of the most important economic institutions in any country today. Banks provide quick settlements between economic agents; contribute to the investment of savings of the population and firms and the development of the economy as a whole. The country's economy and banking sector are closely interconnected. On the one hand, the stability of the banking sector plays a key role in ensuring the efficient allocation of financial resources and enhancing economic growth. On the other hand, the macroeconomic environment influences the condition and stability of the banking sector.

In the context of globalization and international integration, the economies of countries are becoming more open, which leads to an increase in their vulnerability to external macroeconomic shocks occurring in the world. This is confirmed by the fact that crises in the world have become more frequent and are taking on increasingly serious proportions and consequences. The effects of the crisis affect various aspects of the economy, including the banking sector, on the stability of which the normal functioning and development of the economy depends.

Therefore, at present, much attention is paid among researchers to studying the impact of macroeconomic shocks on the banking sector. The topic is relevant at the present time, since during a crisis, the condition of banks and their stability largely

determines how quickly and with what losses the country will overcome the impact of macroeconomic shocks. It is the banking sector that, to a greater extent, distributes financial flows and provides liquidity to the real sector of the economy, which experiences a shortage of funds during the crisis. In other words, banks are a kind of circulatory system of the country that needs to be monitored and maintained to function smoothly. If banks are highly vulnerable to macroeconomic shocks and are unable to withstand these shocks, the consequences and development of the crisis for the country will be more serious.

Main goal of research to identify macroeconomic shocks, the dynamics of which significantly affect the state of the banking sector, assess the strength and nature of the impact and propose possible measures to minimize the potential losses that they entail. The main goal of the anti-crisis management system for the financial stability of the banking system is to recognize the scale of influence of crisis factors; determination of ways and methods of anti-crisis management, measures to overcome the future crisis with minimal losses.

In the international space, there are a large number of international, national and regional organizations involved in improving the regulation and supervision of the activities of financial institutions. Ensuring the financial stability of banking systems involves the development and application of anti-crisis regulation tools.

The main goal of implementing anti-crisis measures is to ensure financial stability, stability, and solvency of banking activities. Therefore, public administration and supervision of activities must ensure stability and sustainability. State management of the process of selecting and implementing anti-crisis measures should be coordinated at the mega, macro and micro levels, taking into account the specific features of the functioning of banks, its significance for the state, including the participation of the state in the capital of banking institutions and the economy as a whole.

Recent publications. In publications, the financial stability of the banking sector has also been studied quite little, but recently more and more attention has been paid to this topic in the context of growing risks of crises in the world, the globalization of the economy and the impact of shocks on the banking sector. Despite the fairly active use of the term financial stability, its precise definition is extremely rarely given. Thus, in the work of S.M. Ilyasov, which is devoted to the analysis of the stability of the banking system, a definition is given in terms of stability according to a certain parameter: "an economic system (including banking) functions stably according to a certain parameter if the deviation of this parameter does not exceed an acceptable value, and interference can be compensated within certain limits." In addition, he considers stability as a whole as a set of optimal values of many parameters - a region of stability, the transition from which means the system enters an unstable state [2].

According to Lavrushin, O.I., Fetisov, G.G., "the stability of the banking system is understood as the ability of the latter to carry out, at a level set by society, its inherent functions and role in the economy, regardless of the influence of external and internal forces that impede their implementation" [5].

The stability of the banking system is a property of its development that allows the system to perform its functions and role in the economy regardless of the nature and nature of the disturbing influences of internal and external factors, including on the basis of a qualitative change in its structure.

The banking system is stable if it is in a state of equilibrium and it is very important to achieve this equilibrium. Otherwise, it is problematic to call a system stable if it is not in equilibrium, since this means that exogenous and endogenous external factors were still able to negatively affect the banking system and knocked it out of its usual state.

Mukhtarov Shahriyar, Mammadov Jeyhun and Ahmadov Fariz are analyzed the relationship between inflation ,oil prices and exchange rate in Azerbaijan. Fluctuation of these determinants impact to banking sector of Azerbaijan ranging from 1995 to 2017.Estimation result of VECM model show that the oil prices and exchange rate have positive and significant impact inflation in the long run period[6].

G. Shinasi, who conducted a fairly large amount of research in the study of this area, believed that financial stability takes place subject to the ability of the financial system to simultaneously perform three main functions. "First, the financial system effectively and continuously promotes the intertemporal redistribution of resources in the economy from savers to investors and the distribution of economic resources in general. Secondly, financial risks for the future are identified and assessed with acceptable accuracy, and are also relatively well managed. Third, the financial system is in such a state that it can absorb financial and economic unexpected events and shocks without strain, if not continuously" [1].

In the "Encyclopedic Dictionary" [3] stability is interpreted as the ability of a system to maintain its structure and functional features, sufficient for activity, under various parameters of the external environment, and it is noted that the stability of the entire system depends on its ability to respond to external influences of the environment and the stability of the system itself, determined by its internal factors.

In "Macmillan's Dictionary of Modern Economic Theory" [4] stability is defined as a period, often used in the analysis of the state of partial or general equilibrium of economic systems to indicate the degree of stability of an equilibrium price or group of prices in relation to external influences on the system, which temporarily deviates the price from the equilibrium level.

Main result of research. At the first stage, a model will be built, the purpose of which is to study the influence of a number of macroeconomic indicators on the amount of reserves for possible losses in the Azerbaijani banking sector.

It is worth emphasizing that a decrease in the amount of reserves can be caused not only as a result of an improvement in the borrower's creditworthiness, but also when bad loans are written off. Therefore, in our opinion, in order to obtain more accurate estimates, it is worth using not the absolute value of reserves of the banking sector, but their change over the period per manat of all issued loans, expressed as a percentage. In regression it will be referred to as LLP.

To construct a regression dependence of reserves for possible losses, the following indicators are included (Table 1).

The correlation matrix between the dependent and explanatory variables confirms the signs of the hypothesized relationship (Table 2).

Static model of LLP dependence on macroeconomic variables.

The estimated regression equation has the following form (static model):

$$LLP_t = \beta_0 + \beta_1 * x_{1t} + \beta_2 * x_{2t} + \\ + \beta_3 * x_{3t} + ... + \beta_n * x_{nt} + \varepsilon_t$$

Where β_n is the coefficient in front of the corresponding macroeconomic variable, t – is the quarterly values of the indicators.

During the analysis, the following results were obtained (Table 3).

Таблица 1 (Table 1)

Макроэкономические факторы

Macroeconomic factors

Designation	Variable name	Alleged dependence with LLP
GDPGR	GDP growth rate, %	negative
INW	Inflow(+)/outflow(-) of capital, billion dollars	negative
OP	Oil price, $	negative
DER	Dollar exchange rate, $	Positive/negative
BSEI	Baku stock exchange index, points	negative

Источник: Составлено автором

Source: Compiled by the author

Таблица 2 (Table 2)

Резервы на возможные потери – коэффициенты корреляции

Provisions for possible losses - correlation coefficients

	LLP	OP	DER	GDPGR	INW	BSEI
LLP	1.000000	-0.332309	0.186917	-0.263344	-0.284022	-0.304302
OP	-0.332219	1.000000	-0.354132	0.083111	-0.014876	0.887593
DER	0.186827	-0.354132	1.000000	-0.085418	-0.100980	-0.498243
GDPGR	-0.263344	0.083111	-0.085418	1.000000	0.368538	0.055321
INW	-0.283122	-0.014876	-0.100980	0.369438	1.000000	0.145351
BSEI	-0.303402	0.887593	-0.498243	0.054421	0.145351	1.000000

Источник: Составлено автором

Source: Compiled by the author

Таблица 3 (Table 3)

Модель зависимости резервов на возможные потери от макроэкономических факторов

Model of dependence of reserves for possible losses on macroeconomic factors

Dependent Variable: LLP				
Method: Least Squares				
Date: 08/02/24 Time: 15:09				
Sample (adjusted): 2012Q2 2023Q1				
Included observations: 44 after adjustments				
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.837674	0.867630	3.269926	0.0043
OP	-0.007169	0.002789	-3.392541	0.0027
DER	0.006271	0.026846	-2.436731	0.0298
GDPGR	-0.016927	0.005692	-2.849358	0.0072
L2GDPGR	-0.025245	0.007857	-3.125458	0.0035
L1INW	-0.009333	0.002207	-4.383809	0.0002
R-squared	0.679729	Mean dependent var		0.389141
Adjusted R-squared	0.589408	S.D. dependent var		0.398214
S.E. of regression	0.306976	Akaike info criterion		0.599170
Sum squared resid	3.464996	Schwarz criterion		0.844919
Log likelihood	-6.860748	Hannan-Quinn criter.		0.689794
F-statistic	6.820711	Durbin-Watson stat		1.375157
Prob(F-statistic)	0.001134			

Источник: Составлено автором

Source: Compiled by the author

$$LLP = 2.837 - 0.007 * OP + \\ + 0.006 * DER - \\ - 0.0169 * GDPGR - \\ - 0.035 * L2GDPGR - \\ - 0.009 * L1INW$$

The regression is generally significant at the 1% level because Prob (F-st) = 0.001134 < 0.01. In addition, the value of $R^2_{adj} = 0.67$, which characterizes the quality of the regression fit, is at a fairly good level and within the limits obtained in other works that study the influence of macroeconomic factors on the stability of the banking sector.

During the analysis, it turned out that for this model the Baku stock exchange index was not significant. On the one hand, this can be explained by the presence of multicollinearity between the oil price and the level of the Baku stock exchange index. It includes all major oil and mining companies in the country, therefore, its dynamics depend on market prices for the companies' shares, which in turn are determined by oil prices. Since the oil price is significant for our model, the Baku stock exchange index can be excluded without significant losses. In addition, in my opinion, the dynamics of the Baku Stock Exchange index is unlikely to have a strong impact on the size of reserves for possible losses of banks, since basically these companies have strong support from the state and, if necessary, when credit risk increases, the state will provide them with financial assistance to replenish funds and fulfill loan obligations to banks. It is also worth noting that large companies prefer to take out loans abroad, since interest rates on loans there are much lower than in Azerbaijan. Thus, we can conclude that the fall in the Baku Stock Exchange index does not significantly worsen the bank's position by increasing reserves for possible losses.

The oil price (BRENT) turned out to be significant in the model and has a negative sign. It follows that a macroeconomic shock in the form of a decrease in oil prices leads to banks increasing reserves for possible losses, thereby worsening the financial position of the banking sector. The significance of oil prices confirms the vulnerability of economic sectors, including banks, to fluctuations in the international oil market. In the context of falling oil prices, the volume of revenues from its sales decreases. This negatively affects a large part of the country's economy, not just the energy sector. Budget revenues and expenses are reduced, the solvency of non-financial sector organizations and household incomes are reduced, and inflation is rising. Ultimately, this leads to a decrease in the creditworthiness of borrowers and the value of assets, and as a result, to an increase in credit risk and an increase in reserves for possible losses.

The exchange rate of the dollar against the manat (Dollar) in our model is significant in explaining the impact on the level of reserves for possible losses. At first glance, it is difficult to identify a clear impact of the dynamics of the dollar exchange rate; it all depends on the type of borrowers to whom loans were issued in foreign currency. On the one hand, if loans are issued to borrowers who receive income in foreign currency (for example, companies exporting goods), then the increase in the exchange rate will not significantly affect them, and they will not have difficulties repaying the loans. That is, there is a negative relationship between the manat and the dollar exchange rate. On the other hand, if the borrower does not have foreign currency income, the depreciation of the manat may have the opposite effect, since he will need much more manat to convert it and pay off the loan. In this case, the risk of non-payment and overdue debt increases, and banks are forced to increase the amount of manat.

Our model reveals a positive dependence of reserves for possible losses on the dollar exchange rate. Figure 1 shows that during a period of rising dollar exchange rates, the share of overdue loans in foreign currency increases, which means that banks create additional reserves for them.

GDP growth rate (GDPGR) is one of the important indicators of the state's economic activity. As we said earlier, banks reduce the amount of reserves for possible losses during periods of economic recovery, that is, when GDP growth rates increase, and increase them during periods of economic recession. The model confirms the negative relationship

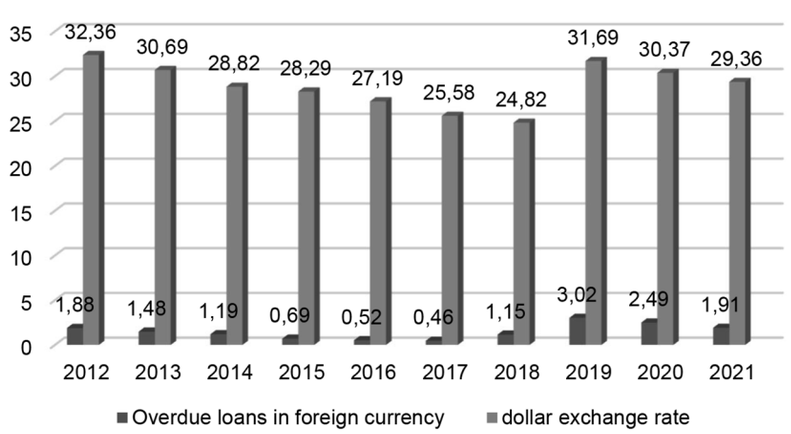

Рис. 1. Доля просроченных кредитов в иностранной валюте (%)
Fig. 1. Share of overdue loans in foreign currency (%)

Источник: [10]
Source: [10]

between the dynamics of GDP and reserves for possible losses. Together with the current value of the indicator, we included this lagged variable in the regression in order to determine the delay with which deteriorations in the real sector of the economy affect the quality of the loan portfolio.

As a result, the change in reserves is affected both by the current GDP growth rate and with a delay of 2 quarters, and the coefficient before L2GDPGR is significantly higher and has a higher level of significance. This fact means that GDP dynamics do not have an immediate impact on the state of the banking sector, but with some delay. The minus sign in front of GDPGR and L2GDPGR confirms that the decline in economic activity, manifested in the form of a decline in GDP, negatively affects the stability of the banking sector (Figure 2).

The fact is that when there is a shock in the economy, expressed by a drop in GDP, this is accompanied by a reduction in industrial production in the country, domestic and external demand for products. This leads to increased losses of enterprises, increased unemployment and reduced incomes of the population. As a result, the economic situation of borrowers worsens significantly and the level of credit risk increases, which is accompanied by an increase in reserves for possible loan losses. This is especially true for enterprises in the non-financial sector, the share of loans to which is the main component of the loan portfolio of the banking sector of Azerbaijan.

INW - outflow/inflow of capital, billion dollars. The crisis in global financial markets is accompanied by an outflow of capital; money and investments leave the country in conditions of macroeconomic instability. Capital outflows in Azerbaijan are caused not only by risk aversion in Azerbaijani markets, but also

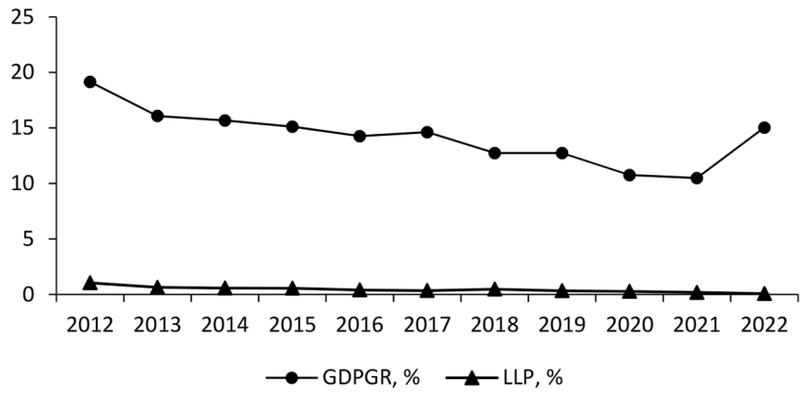

Рис. 2. Темпы роста ВВП и резервы на возможные потери банковского сектора Азербайджана

Fig. 2. GDP growth rates and reserves for possible losses of the banking sector of Azerbaijan

Источник: [11]
Source: [11]

by large external corporate debt, which enterprises are forced to repay. In these conditions, various sectors of the economy are faced with a cash shortage and a reduction in income from their activities, which negatively affects the assessment of their creditworthiness.

The removal of capital from the country leads to a slowdown in economic development and a weakening of the country's financial stability as a result of a lack of investment resources. The excess of capital outflow over inflow means a real reduction in financial resources for economic development. The annual leakage of a certain share of the gross domestic product abroad has a negative impact on national economic development, since it is a direct deduction from the resource base for domestic investment. Capital outflow destabilizes the system of macroeconomic regulation. Increasing the real interest rate to prevent capital flight has a negative impact on the domestic investment process, while simultaneously leading to a deterioration in the investment climate in the country and

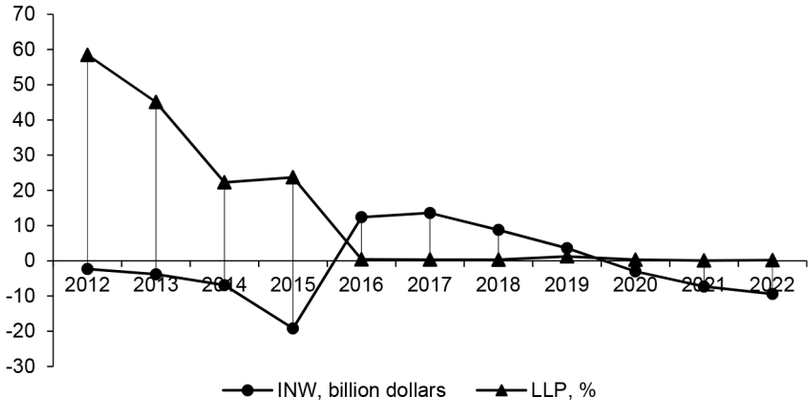

Рис. 3. Отток капитала в Азербайджане и резервы на возможные потери в банковском секторе

Fig. 3. Capital outflow in Azerbaijan and reserves for possible losses in the banking sector

Источник: [12]
Source: [12]

weakening the interest of foreign investors in Azerbaijan, which is increasingly classifying it as a "problem market." Capital flight from the country leads to a liquidity shortage in the banking system, which, in turn, affects the volume of lending to the real sector of the economy. In addition, capital outflow worsens the country's ability to service external debt.

In addition, the banking sector itself is faced with a lack of liquidity, and the costs of financing and raising funds are rising. To cover their expenses, banks are forced to increase the risk level of the loan portfolio, since an increase in risk is accompanied by an increase in interest rates on loans provided. Thus, there is a negative relationship between capital movements and the size of the manat (Fig. 3).

The resulting model confirms the negative impact of capital outflow from the country on banks with a one-period lag (L1INW). It follows from this that the shock from capital outflow does not spread to banks instantly, but after a certain period of time.

Based on the obtained static model, we found that macroeconomic shocks in the form of a decrease in oil prices, a fall in the manat and the level of GDP, as well as capital outflow negatively affect the banking sector through an increase in reserves for possible losses. Moreover, the effect of some appears immediately, while of others after a certain period of time.

In the previous model, only macroeconomic factors that were exogenous to the equation were included as explanatory variables. However, it is worth noting that the amount of reserves for possible losses may also depend on the corresponding value in the previous period, since quarterly trends rarely change, and if banks increased reserves in the previous period, then there is a high probability of this indicator increasing in the current period. In order to test this premise, we include in the regression the LLP indicator with a lag of one quarter. The equation will take the following form:

$$LLP_t = \beta_0 + \beta_1 * LLP_{t-1} + \beta_2 * x_{2t} + + \beta_3 * x_{3t} + ... + \beta_n * x_{nt} + \varepsilon_t$$

Where LLP_{t-1} is the growth rate of reserves for possible losses per manat of loans provided in the previous period, %, β_n is the coefficient in front of the corresponding macroeconomic variable, t is the quarterly values of the indicators.

The results are presented in Table 4.

$$LLP = 2.648 + 0.484 * * LLP1 - 0.005*OP + + 0.002 * DER - 0.014 * * GDPGR - 0.018 * * L2GDPGR - 0.007 * L1INW$$

The regression as a whole is also significant at the 1% level, since Prob (F-st) = 0.000000 < 0.01, the value of R^2_{adj} = 0.69, which is significantly better compared to the static model.

The lagged dependent variable in the model (LLP1) is significant at the 1% significance level and shows the expected sign. This means that an increase in provisions in the previous quarter causes an increase in provisions in the next quarter. That is, our assumption was confirmed, and the policy of forming reserves for possible losses is carried out taking into account the situation in the past and depends not only on macroeconomic indicators.

Next, we compare the results obtained for the static and dynamic models (Table 5).

From the table we see that all explanatory variables obtained in the first model remained significant and retained their original sign, but the degree of their influence became somewhat weaker. For example, a decrease in the price of oil by 1 dollar leads to an estimated increase in reserves for possible losses in the static model

Таблица 4 (Table 4)

Модель зависимости резервов на возможные потери от макроэкономических факторов

Model of dependence of reserves for possible losses on macroeconomic factors

Dependent Variable: LLP				
Method: Least Squares				
Date: 08/02/24 Time: 17:30				
Sample (adjusted): 2012Q2 2023Q1				
Included observations: 44 after adjustments				
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed				
bandwidth = 4.0000)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.648251	0.799545	3.318987	0.0032
LLP1	0.484843	0.138733	3.517280	0.0023
OP	-0.005301	0.002513	-2.983637	0.0063
DER	-0.072357	0.025652	-2.903451	0.0074
GDPGR	-0.014802	0.005971	-2.813810	0.0089
L2GDPGR	-0.018493	0.006395	-3.285879	0.0034
L1INW	-0.007800	0.002842	-3.962719	0.0004
R-squared	0.742895	Mean dependent var		0.389151
Adjusted R-squared	0.694894	S.D. dependent var		0.398224
S.E. of regression	0.254772	Akaike info criterion		0.242465
Sum squared resid	2.317690	Schwarz criterion		0.529172
Log likelihood	1.789476	Hannan-Quinn criter.		0.348193
F-statistic	11.25214	Durbin-Watson stat		2.303597
Prob(F-statistic)	0.000000			

Источник: Составлено автором

Source: Compiled by the author

Таблица 5 (Table 5)

Сравнение статической и динамической моделей оценки резерва на возможные потери по ссудам по макроэкономическим показателям

Comparison of static and dynamic models for assessing LLP from macroeconomic indexes

Designation	Static model		Dynamic model	
	Coefficient	Probability	Coefficient	Probability
OP	-0.007169	0.0027	-0.005301	0.0063
DER	0.006271	0.0298	0.002357	0.0074
GDPGR	-0.026927	0.0081	-0.024702	0.0089
L2GDPGR	-0.035245	0.0044	-0.028393	0.0034
L1INW	-0.018233	0.0011	-0.007800	0.0004

Источник: Составлено автором

Source: Compiled by the author

Таблица 6 (Table 6)

Макроэкономические факторы

Macroeconomic factors

Designation	Variable name	Inferred dependency with ROA
GDPGR	GDP growth rate, %	positive
INW	Inflow(+)/outflow(-) of capital, billion dollars	positive
OP	Oil price, $	positive
DER	Dollar exchange rate, $	positive
IIR	Interbank interest rate	negative
BSEI	Baku Stock Exchange Index	positive
CREDGR	Credits issued (growth rate, %)	positive

Источник: Составлено автором

Source: Compiled by the author

by 0.006%, in the dynamic model by 0.005%. A similar trend can be observed for other indicators. In other words, if the banking sector is consistent and takes into account the trends of the previous period, then it becomes less vulnerable to the effects of negative macroeconomic factors.

In addition, the shock of a decrease in GDP growth rates and capital outflow from the country does not affect the quality and risk of the loan portfolio immediately, but with a delay, which allows banks, if such a dependence is identified, to prepare and take the necessary measures to smooth out the negative consequences of the spread of shocks in the economy.

Assessment of the dependence of the return on assets of the banking sector on macroeconomic factors.

The purpose of this model is to identify the vulnerability of the banking sector to changes in the economy, manifested through changes in the profitability of banking assets. To analyze the relationship between return on assets, the following explanatory variables are included (Table 6)

As can be seen from the table, two more factors have been added to the variables analyzed in previous models: the growth rate of loans issued and the interest rate on the interbank market, which, in my opinion, also affect return on assets in conditions of macroeconomic instability.

The pairwise correlation matrix based on the available quarterly data confirms the expected sign of the explanatory variables (Table 7).

Based on the available data, a regression was constructed to explain the impact of the included factors on the return on assets of the banking sector (Table 8).

Таблица 7 (Table 7)

Рентабельность активов банковского сектора – коэффициенты корреляции

Return on assets of the banking sector – correlation coefficients

	ROA	OP	DER	CREDGR	GDPGR	INW	IIR	BSEI	SPREAD
ROA	1.000000	0.219223	-0.381555	0.602195	0.437133	0.111568	-0.177895	0.401424	-0.283222
OP	0.219223	1.000000	-0.161392	0.118949	0.309352	0.229411	-0.491189	0.645844	-0.681745
DER	0.381555	-0.162392	1.000000	-0.647995	-0.144314	-0.133898	0.303188	-0.472806	-0.056828
CREDGR	0.602195	0.118949	-0.657895	1.000000	0.159872	0.168417	-0.208320	0.474693	-0.029848
GDPGR	0.437133	0.309352	-0.144314	0.159872	1.000000	0.436186	-0.301422	0.306400	-0.314224
INW	0.111568	0.229411	-0.133898	0.168417	0.436186	1.000000	-0.453361	0.629609	-0.269190
IIR	-0.177895	-0.491189	0.303188	-0.208320	-0.301422	-0.453361	1.000000	-0.796874	0.566314
BSEI	0.401424	0.645844	-0.472806	0.474693	0.306400	0.629609	-0.796874	1.000000	-0.598406

Источник: Составлено автором

Source: Compiled by the author

Таблица 8 (Table 8)

Модель зависимости доходности активов банковского сектора от макроэкономических факторов

Model of dependence of the return on assets of the banking sector on macroeconomic factors

Dependent Variable: ROA				
Method: Least Squares				
Date: 08/02/24 Time: 21:44				
Sample (adjusted): 2012Q2 2023Q1				
Included observations: 44 after adjustments				
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 3.0000)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.022618	1.042682	-3.596224	0.0038
DER	0.096829	0.029863	3.306358	0.0063
CREDGR	0.054723	0.023536	2.391131	0.0326
L2GDPR	8.85E-15	3.04E-15	2.918230	0.0124
L1INW	0.015588	0.003308	6.562407	0.0000
L2INW	0.009890	0.003718	3.358738	0.0058
L2IIR	-0.086258	0.032329	-2.727824	0.0175
BSEI	0.001677	0.001465	1.578815	0.0481
R-squared	0.798515	Mean dependent var		1.158859
Adjusted R-squared	0.682753	S.D. dependent var		0.669434
S.E. of regression	0.378189	Akaike info criterion		1.174603
Sum squared resid	1.991850	Schwarz criterion		1.618927
Log likelihood	-4.496382	Hannan-Quinn criter.		1.286349
F-statistic	6.889465	Durbin-Watson stat		2.988161
Prob(F-statistic)	0.001838			

Источник: Составлено автором

Source: Compiled by the author

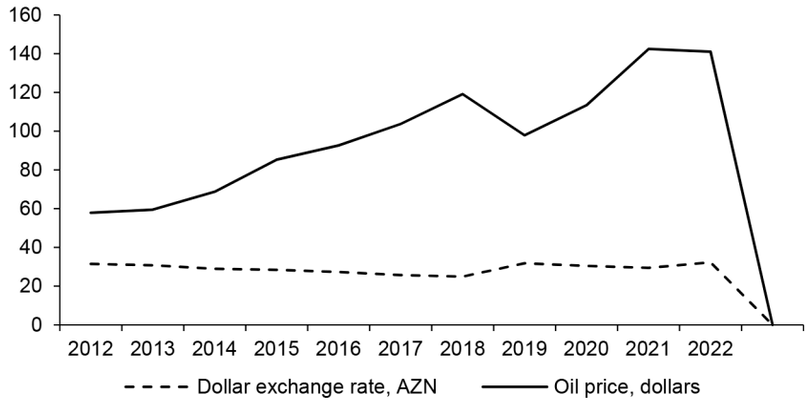

Рис. 4. Цены на нефть и курс доллара США

Fig. 4. Oil prices and the US dollar exchange rate

Источник: [13]

Source: [13]

$$ROA = -3.022 + 0.096829 * DER - 0.054723 * CREDGR + 8.85E-15 * L2GDPGR + 0.015588 * L1INW + 0.00989 * L2INW - 0.186258 * L2IIR + 0.001677 * BSEI$$

Overall, the regression is also significant since Prob(f-st) = 0.001838 < 0.01. The quality of fit is characterized by a fairly high level of $R^2_{adj} = 0.68$.

During the construction, the oil price (OP) turned out to be insignificant, but the US dollar exchange rate is significant at the one percent level. As is known, the dollar to manat exchange rate directly depends on the situation on the international oil market (Fig. 4).

This confirms the crisis of 2015, when the price of oil fell by 70% compared to the July maximum and reached $40/barrel by the end of 2015, as a result of which the dollar exchange rate over the same period increased from 23.45 to 29.38 manat/dollar. Thus, the price of oil affects the exchange rate, which in turn affects the financial position of banks. The impact of exchange rate dynamics can be ambiguous. It all depends on what banks have more on their balance sheets – foreign currency claims or foreign currency liabilities. If requirements in foreign currency exceed liabilities, then with the growth of the dollar, banks will receive additional income. If, on the contrary, obligations are greater than requirements, then an increase in the exchange rate in conditions of macroeconomic instability will entail an increase in costs and a decrease in profits. In our case, a positive coefficient in front of the dollar sign means a direct dependence of return on assets on the dollar exchange rate.

In 2015, the share of foreign currency assets of the banking sector in the context of the weakening of the manat (mainly in the 4th quarter) increased from 23.1% to 32.3%. The growth rate of foreign exchange claims outpaced the growth rate of foreign exchange liabilities, which ultimately led to a threefold increase in the net foreign exchange position from 30.2 billion manats. in 2014 to 1077.4 billion manats in 2015. As a result, the share of banks' net income from operations with foreign currency and foreign currency assets, taking into account exchange rate differences, in the total volume of net income amounted to 8.2% (2.4% in 2014), primarily due to operations in the second half of

2015. This allowed the banking sector to some extent compensate for the decline in income from other types of activities. As we emerged from the crisis in 2016, against the backdrop of a gradual strengthening of the manat in the second half of the year, the share of foreign currency assets in the total assets of the banking sector decreased to 27.6%, which led to a decrease in the impact of net foreign exchange earnings in total profit as of 01/01/2017 to 7.5% (in 2015-13.1%). Thus, the weakening of the manat in the context of macroeconomic instability has a positive impact, allowing the banking sector to increase income from foreign currency transactions, which, in turn, can to some extent compensate for the reduction in profits and return on assets.

One of the main indicators characterizing economic activity and the current state of the economy is the dynamics of GDP. During a period of macroeconomic instability, there is a decrease in the growth rate of gross domestic product, since a decrease in investment in fixed assets, rising prices, internal and external debt, a shortage of funds for activities and an increase in the cost of financing sources leads to a reduction in production volumes in the country.

Subsequently, as we mentioned earlier, a decrease in aggregate demand and an increase in unemployment cause a decrease in income for both enterprises and the population. All this ultimately leads to a deterioration in the economic situation of borrowers, a decrease in demand for loans and, as a consequence, a decrease in interest income of the banking sector. In addition, in conditions of instability, the population tends to withdraw their deposits from banks. As a result, banks have increased costs for attracting deposit sources to maintain the liquidity of their activities, increasing the bank's costs for financing raised funds. Taken together, this leads to a decrease in profits and profitability of banks.

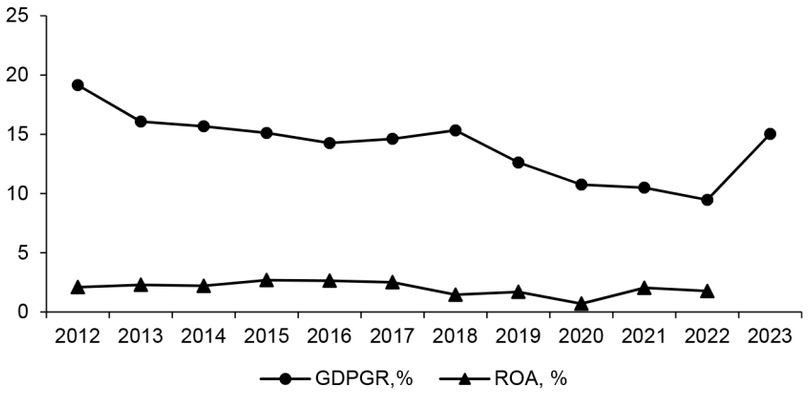

Рис. 5. Рентабельность активов банковского сектора Азербайджана и динамика ВВП

Fig. 5. Return on assets of the banking sector of Azerbaijan and GDP dynamics

Источник: [11], [13]
Source: [11], [13]

Based on our model, the GDP growth rate (L2GDPGR) is significant with a lag of 2 quarters, which means that a decrease in the GDP growth rate has a negative effect not in the same period, but after some time. That is, the banking sector reacts to a fall in GDP during a crisis with some delay, since it takes time for its decline to affect the state of the population and their expectations (Fig. 5).

The growth rate of loans provided by the banking sector (CREDGR) also turned out to be a significant coefficient with a positive sign. This is understandable, since an increase in the amount of loans provided is, as a rule, accompanied by an increase in interest income, which has a positive effect on the profit of banks, and therefore on the profitability of their assets. In 2015, the deterioration of general economic conditions, a decrease in income of the population and enterprises, as well as a more conservative approach to assessing the risks and creditworthiness of potential borrowers caused a slowdown in the growth rate of lending to both legal entities and individuals. In 2015, the growth rate of loans to non-financial organizations amounted to 34.3% (in 2014 - 51.5%), to individuals - 35.2% (in 2014 - 51.8%). Since loans are the main source of income for Azerbaijani banks, credit compression leads to a reduction in the growth rate of interest income, which negatively affects the return on assets. As a result, the share of interest income received during this period decreased from 15.4% to 11.5% of total income. Thus, we see that a fall in credit supply from banks in the context of a deteriorating economic situation negatively affects bank profits. The efficiency of asset portfolio management deteriorates significantly, which leads to a decrease in ROA.

The outflow of capital from the country (INW) has a negative impact on the return on assets of the banking sector, and, as in the case of GDP dynamics, this shock does not spread immediately, but with some delay (Fig. 6).

As a rule, capital outflow is observed during a crisis, when risks in emerging markets begin to grow, which leads to problems of funding and maintaining liquidity at a sufficient level in the banking sector, and, consequently, to an increase in the cost of financing their activities and a decrease in profitability.

The Baku Stock Exchange index indicator is also significant and has a positive sign, however,

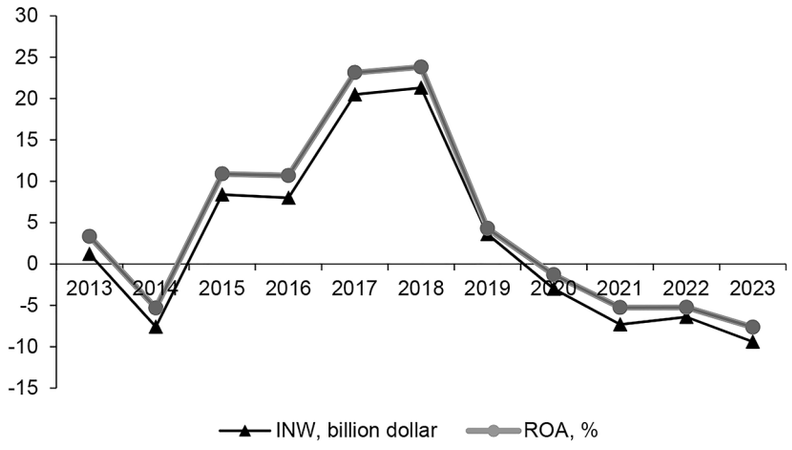

Рис. 6. Рентабельность активов и чистый импорт/экспорт капитала
Fig. 6. Return on assets and net import/export of capital

Источник: [12], [14]
Source: [12], [14]

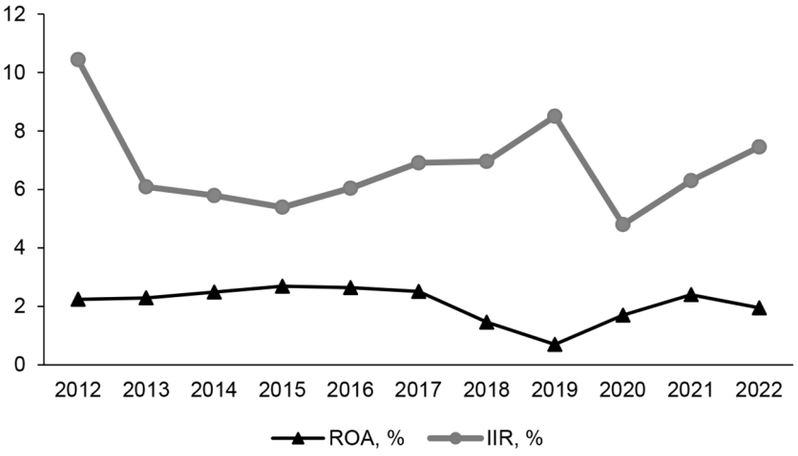

Рис. 7. Рентабельность активов банковского сектора и уровень межбанковской процентной ставки
Fig. 7. Return on assets of the banking sector and the level of the interbank interest rate

Источник: [12]
Source: [12]

the coefficient in front of it 0.00057 shows that the dynamics of this indicator have little impact on the return on assets of the banking sector. This is explained by the fact that banks are weakly active in the stock market. The share of securities in the banks' portfolio is quite low; in addition, the bulk of them are debt securities with a low level of risk, and only a small part consists of equity securities. During the crisis, there is a decline in stock prices, which is reflected in the fall of the index. That is, the dynamics of the Baku Stock Exchange index reflects the general trend in the stock market. A decrease in quotations leads to a fall in the value of equity securities as a result of negative revaluation and banks incur expenses. For example, during the development of the crisis in the second half of 2015, the Baku Stock Exchange index fell from its July maximum of 1,788.66 to 657.21 points by the end of the year. A sharp drop in securities quotations during the crisis and an increase in negative revaluation led to losses for banks on securities purchase and sale transactions. The loss amounted to 92.6 billion manat, which is 3.1% of the net income of the banking sector for 2015. In 2014, which was favorable for the Azerbaijani economy, when the Baku Stock Exchange index increased, income from this item of banking activity was received, the share of which was equal to 6.2% of the total net income of the banking sector. Thus, we see that a drop in the index in conditions of macroeconomic instability has a negative impact on the return on assets of banks.

The work revealed that interest rates in the interbank market negatively affect the return on assets of the banking sector. In the context of the global crisis, banks are faced with problems of lack of liquidity to carry out operations, while the source of external financing abroad becomes limited. This leads to money becoming more expensive, and the need for it from banks is growing. As a result, the country is experiencing an increase in interest rates in the interbank market, which is accompanied by an increase in deposit rates, which increases the interest costs of banks, thereby negatively affecting bank expenses and reducing return on assets. The model results are confirmed by figure 7.

The econometric analysis revealed that macroeconomic shocks in the economy have an impact on the stability and condition of the banking sector. The fall in the dollar exchange rate has an ambiguous effect on the stability of the banking sector, on the one hand, increasing the costs of creating reserves for possible losses, and on the other, increasing income as a result of a positive revaluation of investments in foreign currency.

Risks such as a sharp decline in oil prices, capital outflow from the country and a drop in GDP negatively affect the activities of banks through an increase in reserves for possible losses and

return on assets. In other words, risks in the economy increase risks in the banking sector, reducing banks' income, their activity and efficiency, as well as increasing their costs of financing and covering losses. In turn, problems in the banking sector in a deteriorating economic environment further increase the scale of the economic crisis, since banks are one of the main elements in the functioning of the entire financial system of the country. Moreover, it is worth noting that the negative effect of the export of capital from the country and the fall in GDP is reflected in banks and does not appear in their reports immediately, but after a certain period of time. Identifying this fact is very important, since it can help banks formulate a strategy that will somehow reduce the impact of shocks and get out of the current situation with the minimum possible losses.

In the course of practical work, two econometric models were built that assessed the dependence of the banking sector on the dynamics of macroeconomic factors.

Let us further assume that the country's economy is subject to a series of shocks. And our task is to see how this will affect changes in the level of reserves for possible losses and the return on assets of the banking sector.

As an initial assumption for the model for estimating reserves for possible losses, let us assume that the price of oil in the next period will drop to $60 per barrel. As a result, the manat exchange rate will fall by 20% against the dollar. The GDP growth rate will decrease by 2.9%. The values of the indicators that are taken into account in the model taking into account lags are taken from the available data. Thus, the initial conditions for analysis are presented in Table 9.

We substitute these values into the static and dynamic equations for the dependence of reserves on possible losses from macroeconomic factors. For the dynamic option, it is necessary to take into account the value of LLP in the previous period, its value was -0.0545%.

Таблица 9 (Table 9)

Исходные данные для анализа

Analysis background

Index	Meaning
OP	60 dollar/barrel
DER	37,379 manat
GDPGR	-2,8%
L2GDPGR	9,4598 billion manat
L1INW	-9,5 billion dollar

Источник: Составлено автором

Source: Compiled by the author

Static equation:

$$LLP = 2.847 - 0.007 * OP + 0.006 * DER - 0.0168 * GDPGR - 0.035 * L2GDPGR - 0.008 * L1INW$$

Dynamic equation:

$$LLP = 2.658 + 0.494 * LLP1 - 0.005*OP + 0.002 * DER - 0.024 * GDPGR - 0.028 * L2GDPGR - 0.007 * L1INW$$

During the substitution, the following results were obtained. Our assumptions are that the above factors negatively affect the level of credit risk, expressed in the dynamics of reserves for possible losses in the banking sector. The fall in oil prices, the rise in the dollar exchange rate and the slowdown in GDP growth under the given scenario led to a significant increase in the LLP indicator, which means the need for banks to increase reserves. This, in turn, can lead to increased costs, a decrease in bank profits, and, consequently, threaten their financial stability. It is important to emphasize that in the case of the dynamic model, which takes into account the previous value of changes in reserves, the final LLP indicator was lower than in the static model: 2.3% and 2.6%, respectively. This serves as further confirmation that the size of reserves accumulated in the previous period allows us to slightly smooth out the impact of macroeconomic shocks.

Next, using the resulting model, we will evaluate how the identified macroeconomic shocks can affect the return on assets of the banking sector. We also outline the prerequisites necessary for the analysis.

Suppose that in the next period the dollar exchange rate increases by 20%, the Baku Stock Exchange index will fall by 20% compared to the figures for the 1st quarter of 2023.

Таблица 10 (Table 10)

Предварительные условия для анализа

Prerequisites for analysis

Index	Meaning
DER	37,379 manat
Credgr	3,075%
L2GDPGR	9,469%
L1INW	-9,5 billion dollar
L2INW	-7,7 billion dollar
L2IIR	6,2%
BSEI	1008,85 b.p.

Источник: Составлено автором

Source: Compiled by the author

As for the growth rate of the loan portfolio, for the period 2012-2022. its average was 7.29%. The standard deviation from the mean is 4.23%. Let us estimate the increase in the risk of credit compression at 1 standard deviation.

We will take the remaining values from previous quarterly data, since in our model they appear with a delay. The initial values are presented in Table 10.

Next, we substitute the values simulating the situation of instability in the economy into the resulting return on assets equation.

$$ROA = -3.022 + 0.096829 * DER - 0.054723 * CREDGR + 8.85E\text{-}15 * L2GDPGR + 0.015588 * L1INW + 0.01979 * L2INW - 0.186258 * L2IIR + 0.001677 * BSEI$$

As a result of substituting values into the equation, we received that if the forecast scenario is implemented, the profitability of the banking sector in the next quarter could decrease from 1.95% in the 1st quarter of 2023 to 0.6%, which is a fairly critical level for maintaining the financial stability of the banking sector. sectors.

Thus, our model confirmed that an increase in risks in the economy has a negative impact on the stability of the banking sector through a deterioration in indicators characterizing the current position of credit institutions. This fact must be taken into account when developing policies to increase the resilience of banks to systemic risks in the economy in order to increase the reliability of the banking sector and reduce the degree of vulnerability to external shocks.

Based on the results obtained during the research work, we will summarize and formulate a number of conclusions regarding the financial stability of the banking sector in conditions of macroeconomic instability.

First, we were able to explore different perspectives on what is meant by financial sustainability. A key feature of the financial stability of the banking sector is the ability to withstand internal and external shocks, maintain a state of equilibrium and ensure the continuous implementation of its main functions as a financial intermediary.

Secondly, it was shown that the FSI (Financial stability indicators) coefficient method developed by the IMF, as well as stress testing models, are widely used in many countries as methods for analyzing and assessing the level of financial stability of the banking system. In the process of implementing banking and macroprudential supervision, the Bank of Azerbaijan also uses these approaches to monitor the condition of credit institutions and develop measures to maintain their financial stability.

A comparative analysis of FSIs showed that the basic ratios calculated by the Bank of Azerbaijan are almost completely consistent with the list recommended by the IMF. Some differences are explained by the specifics of the activity and functioning of the Azerbaijani banking sector, for example: a large share of loans in bank assets and the weak activity of banks in the stock market.

Stress tests conducted by the Bank of Azerbaijan confirm that the implementation of crisis scenarios in the economy has an impact on the condition of credit institutions. The impact of the crisis is estimated in the amount of potential capital losses of banks and the likelihood of not exceeding the minimum level of capital adequacy standard N1 of 10%. The results of stress testing in various years have shown that the most significant is credit risk, however, in general, the Azerbaijani banking system is quite stable and can overcome a moderate crisis without significant losses.

In addition, the study examined not only how the Central Bank of the Republic of Azerbaijan analyzes and controls the financial stability of the banking sector, but also what measures it takes in conditions of real macroeconomic instability in order to maintain stability and prevent collapse in the banking system . It was noted that a set of measures, such as expanding the possibilities for refinancing credit institutions, guarantees from the Bank of Azerbaijan, subordinated loans, a deposit insurance system and the financial recovery of economically significant banks, easing requirements for the accrual of reserves, really turned out to be effective and were able to support banks in a crisis.

As part of the practical research, we came to the conclusion that not only bank capital, but also reserves for possible losses and return on assets of the banking sector can act as an indicator reflecting the negative impact of macroeconomic shocks.

The results of the constructed econometric models confirmed our assumptions. The impact of the crisis in the economy is manifested in the banking sector in the deterioration of the quality of the loan portfolio, a decrease in income and an increase in expenses, which in turn leads to a sharp increase in reserves for possible losses and a drop in the profitability of the banking sector.

The country's banking system is vulnerable to GDP growth rates, oil prices, capital flows, foreign exchange rate dynamics and stock indices. These are the main macroeconomic shocks that are inherent to the economy. Moreover, some of them, such as capital outflow and the fall in GDP, do not have an immediate impact on banks, but after some time. Awareness of this fact is useful for developing measures to prevent crisis trends in the banking sector and strengthen the financial stability of the banking sector.

In conclusion, I would like to present a number of possible recommendations that, in our opinion, would reduce the vulnerability of the banking sector to the

impact of macroeconomic shocks in the economy, and thereby increase its stability.

One of the measures is to increase the capitalization of banks. Banks should continue to increase the amount of their own capital, since the results of stress testing show that the implementation of crisis scenarios can lead to significant losses of banks' own funds. During a crisis, the riskiness of assets increases significantly, the profit of credit institutions decreases, which is reflected in a reduction in the capital adequacy ratio. In order to prevent the standard from falling below the minimum acceptable level, it is necessary to increase the amount of own funds, which will compensate for possible losses. In addition, it is worth adding that capital growth should be carried out primarily through first-tier capital, which is of a higher quality and enhances the reliability and stability of the banking sector. During a crisis in the economy, a certain reserve of capital at credit institutions will ensure that banks are able to cope primarily with emerging risks on their own and will reduce the burden on the state in providing assistance to systemically important banks to maintain their stability.

The work confirmed that the most characteristic for the Azerbaijani banking sector is credit risk, which during the crisis is expressed in a sharp increase in reserves for possible losses, which negatively affects the condition of credit institutions. In these conditions, in order to smooth out this effect, it is necessary, in our opinion, to develop and implement a countercyclical reserve mechanism, in which dynamic reserves occupy a key place. The main point is that dynamic reserves take into account not only actual current losses, as is happening now, but also expected ones. As is known, during economic recovery, banks underestimate risks and increase the growth rate of the loan portfolio, without accruing practically any reserves. However, during a crisis, bank incomes are significantly reduced, the quality of the loan portfolio deteriorates, and banks are forced to rapidly build up reserves for possible losses, which further increases the size of bank losses. As a result, the current reserve mechanism further aggravates the financial instability of the banking sector, rather than helping to overcome it.

Dynamic reserves will help cope with this problem, since they should be accrued by credit institutions not at the time of crisis, but during a credit boom, when there is an excess of funds, thereby providing themselves with a kind of "buffer" that can reduce the size of potential losses in conditions of macroeconomic instability. The credit risk of banks during a crisis will be covered by reserves formed during the economic recovery, and banks will not need to "freeze part of the funds" when they need them most. Thus, this reservation will ensure smoother fluctuations in the financial results of banks, which are exposed to changing reserves and will help strengthen the financial stability of the banking sector.

In addition, given the sensitivity of the banking sector to the dynamics of capital flows, the Central Bank of the Republic of Azerbaijan needs to solve the problem of reducing banks' dependence on external sources of funding. Measures must be developed that will make it more accessible and efficient to raise funds in the domestic market through improving refinancing instruments and increasing the activity of the interbank lending market, which will reduce the likelihood of a threat of liquidity shortage in cases of crisis spread.

As part of the increased volatility of the manat exchange rate, in order to maintain the financial stability of the banking sector, it is necessary to exercise control over the size of the open foreign exchange position of banks, introduce a number of restrictions on the provision of loans in foreign currency to persons receiving income in manat, and strengthen reserve requirements for obligations in foreign currency.

Thus, monitoring the current state of the banking sector, analyzing potential risks, developing and implementing tools of the Central Bank of the Republic of Azerbaijan makes it possible to strengthen the financial stability of the banking sector and reduce the risks generated in the economy as a result of the crisis.

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