

# “Forecasting the level of financial security of the country (on the example of Ukraine)”

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# FORECASTING THE LEVEL OF FINANCIAL SECURITY OF THE COUNTRY (ON THE EXAMPLE OF UKRAINE)

## Abstract

In the conditions of functioning of economic relations, which arise between subjects of the financial system of Ukraine, the question of creating safe conditions for their activity is increasingly being raised. Attention is paid to the investigation of the state of financial security of the country as a component of economic security, in terms of its key elements, which allows attention to the most important indicators and to develop measures to prevent existing threats.

The purpose of the paper is to forecast the level of financial security of the country based on regression analysis of impacts factors. The object of the study is the financial system as a mechanism, which is aimed at the activities of financial security subjects of the country to ensure its proper level. As a result of the regression analysis, it was found that changing in the country's banking security by 1% will decrease the overall financial security index by 0.04 points, while the non-banking market will grow by 0.07 and the monetary component will decrease by 0.51.

Based on the calculation of the arithmetic mean of absolute deviations of independent variables, the estimated value of Ukraine's financial security level is calculated, which is 40.09% in 2018.

Proposals for improving the "Methodological Recommendations for Calculating the Level of Economic Security of Ukraine" will help to solve the problem of mathematical substantiation of the choice of indicators for assessing financial security, minimize risks, eliminate subjectivity and improve the efficiency and the quality of the country's financial security assessment methodology.

The article deals with the issues of the financial component of economic security as the main element of ensuring sustainable financial development of the country.

**Keywords** financial security, money market, forecasting, country rating, indicators

**JEL Classification** P21, P43, O20

## INTRODUCTION

Globalization of the world financial system significantly affects the state of the financial security of individual countries, especially the transition economies significantly depend on international public and private capital flows. Financial security, as an integral part of economic security, has a significant impact on the level of economic growth in the country. The key to financial security is the transparency of the processes occurring in public finances and banking sector. Traditionally low rates of transparency of the Ukrainian economy according to the most international rating assessments, high levels of corruption of officials and political instability create the basis for applied research aimed at raising the level of financial security of the country, especially in terms of its budgetary and monetary components.

## 1. LITERATURE REVIEW

The country's financial security is a multifaceted phenomenon: first, it is a component of economic security, and, second, it is a subsystem of national security. At the same time, financial security is a complex multi-level system, which is formed by several subsystems, each of which has its own structure and logic of development.

At the current level of development of market relations, the proper level of financial security is a guarantee of sustainable development of any country. In economic literature, financial security is seen as a complex phenomenon, which is influenced by several factors. It is a key component of not only economic, but also national security and security of every person (Hacker, Rehm, & Schlesinger, 2010). The research, based on the data available at the NUTS level, proves the existence of a relationship between the level of economic development of national economies and the state of health of a separate economic entity (Jakubowska & Horvathova, 2016). This relationship describes the state of health of the society in individual states and regions, which is directly related to economic security in the country.

Along with the existing Methodology for Assessing the Level of Economic Security of Ukraine, developed in 2015 on the initiative of the President of Ukraine, the Strategy for Sustainable Development "Ukraine 2020" was adopted within the National Security Strategy. The analysis of the interim results of the economic part of this Strategy was investigated by Hanna Sytnyk in "Preliminary assessment of implementing the economic part of the National Security Strategy of Ukraine" (Sytnyk, 2017). The project is based on mathematical models of forecasting and professional expert assessments of Ukrainian and international scholars, namely, NATO, EU and US. In Ukraine, lately, scientists are increasingly trying to intensify the methodological basis for ensuring the level of financial and economic security, but it was discovered that the Ukrainian practice of evaluating the country's financial security is not comprehensive, since financial security is a complex multi-dimensional category, which is characterized by close interdependence and interaction of its com-

ponents. Therefore, inaccuracies and mistakes in the evaluation of some indicators are immediately reflected on others.

Today, in Ukraine, the Ministry of Economic Development and Trade developed a methodology for assessing the level of financial and economic security in the country, which includes the components of banking, non-bank, debt, budget, currency and monetary security. Thus, modern banking segment in Ukraine activates European integration and at the same time involves additional risks in the security context in all spheres (Kurylo, 2018).

Budget security is a state of ensuring the solvency and financial sustainability of public finances, which enables state authorities to perform their functions as efficiently as possible (Ministry of Economic Development and Trade of Ukraine, 2013). According to the results of the calculations, fiscal security of Ukraine is not only in a threatening, but also in a pre-crisis condition. There is a mismatch between the balance of incomes and expenditures of the state and local budgets, and the state funds are used inefficiently. The main problem in this context is the inappropriate nature of the use of budget funds, ineffective distribution, theft, ineffectiveness of the mechanism of state control, and in fact its absence.

An important component of financial security is currency security, the stability level of which is one of the important characteristics for any developed country. The analysis of currency security of Ukraine presents that its state is also not optimal and there are certain imbalances and problems, because the exchange rate plays an important role in ensuring the stability of the foreign exchange market. Therefore, special attention is paid to its change. The index of the official exchange rate of the hryvnia to the US dollar, although within the permissible limits, is increasingly close to the critical threshold and has low values, that is, over the past five years, there has been a decrease in the hryvnia against the world currency and, accordingly, a decrease in its purchasing power on the foreign market during trade in goods, services and in the process of capital and credit movement. Considering currency security, it's necessary to mention foreign

cryptocurrency, which today is not officially recognized as a means of payment in Ukraine, and various states treat it differently, but the speed of its circulation is gaining momentum not only in Ukraine. Sharov (2018) states that if certain specific requirements are fulfilled, cryptocurrency may become a new global currency of the world. However, there are still many questions regarding the real nature of cryptocurrency and its place in the monetary system, therefore, in view of the development process of cryptocurrency, the security of the currency market of the state should envisage all threats to the stable economic development of the state (Sharov, 2018).

Along with this, financial security is inextricably linked to investment processes, which also requires the development of methods aimed at creating effective tools for determining risk factors and monitoring the effectiveness of investment projects (Ostapiuk, 2017). In this context, it is worth emphasizing the effectiveness of investment funds, since investment funds are financial intermediaries between depositors and debtors, which are the ones that generate demand for financial instruments traded on financial markets (Mentel & Horvathova, 2016). But the Ukrainian methodology for evaluating the financial and economic security of the state does not take into account the aspects of investment, innovation, customs tariff system and tax burden in the country, does not take into account the activities of non-financial organizations, which are now becoming more popular, and already occupy a significant position in the financial processes of the state.

Modern Ukrainian approaches to assessing the country's security level are based on integral estimates and the application of quantitative indicators (Blakyta, 2017). In foreign practice, the developed management criteria are based on a comprehensive analysis of the provision of a proper level of financial security (canons of safety), which are effective and can be used in Ukraine. It is worth to mention papers of Cihak, Munoz, TehSharifuddin, and Tintchev (2012), Demirguc-Kunt, Detragiache, and Tressel (2006), Edwards (2007), where, besides the problems of financial instability, also shows the role of international organizations in the development of indicators of financial security that could be used in Ukrainian practice.

However, despite the large number of scientific papers in the field of assessing the level of financial security of the country, the issue of its qualitative and mathematically significant forecast for the subsequent periods remains open and needs further research.

*Aims.* Forecasting the level of financial security of the country based on regression analysis of the factors of influence.

## 2. METHODS

The article uses a statistical summary and a statistical analysis to summarize the research, analysis and synthesis material used for the selection of evaluation indicators, calculation and analytical methods for determining individual values of safety indicators and the general level of financial security, the method of comparisons for the analysis of indicators of financial safety in the dynamics and for comparison of rating methods for assessing the level of financial security, economics and mathematical methods, namely, regression analysis allowed to determine the dependencies of key indicators affecting financial security.

## 3. RESULTS

Today, in Ukraine, at the legislative level, the methodology for assessing financial and economic security is based on "Methodological Recommendations for Calculating the Level of Economic Security of Ukraine", approved by the Order of the Ministry of Economic Development and Trade of Ukraine dated October 29, 2013 No. 1277, based on quantitative research of indicators, which characterize the level of economic security of the country and its main components, by calculating the integral index of security in each sphere. In accordance with this methodology, financial security is the state of the financial system of the country, which creates the necessary financial conditions for a stable social and economic development of the country, ensures its resilience to financial shocks and imbalances, creates conditions for preserving the integrity and unity of the financial system of the country.

Ukraine’s financial security has the following components: banking security, security of the non-banking financial sector (represented by stock and insurance market), debt security, fiscal security, currency security and monetary security. To assess the overall level of financial security, it is recommended to evaluate the security of its components, which include several indicators.

In accordance with the approved methodology, it is expedient to use a system of indicators with the definition of their permissible limit levels. The deviation of the actual levels from the limit values will indicate the discrepancy to the optimal value. The standardization of integral indicators that characterize the state of security is carried out by measuring them on a scale from 0 to 1, or in percentage from 0% to 100%.

It is important that the definition of an integral indicator of the security level of each sector and the overall security value of the country is carried out using weighting factors that determine the degree of contribution of each indicator to the integral security index. The important role of the financial component in ensuring economic security is confirmed by the importance of the weighting factors of the components of economic security, which are determined by expert evaluation. And financial security has the highest weighting factor (0.1294) among all other components of economic security (Figure 1).

In accordance with the requirements of the methodology, considering the weighting coefficients, the financial security of Ukraine was assessed as a significant component of economic security. The results of the author’s research, namely the evaluation of first two segments of financial security, namely, the security of the banking sector and the non-bank financial market of Ukraine, are presented in Table 1.

The banking sector of the state is characterized by exceeding the number of credit operations over deposits. According to international practice, this amount should be approximately the same, since bank deposit operations are the basis of its activities, from which the bank accumulates funds and loans to the population, otherwise banks are forced to take interbank loans, which negatively affects their credit and solvency. That is why it can observe a negative profitability, that is, the loss-making assets of banks in Ukraine since 2014. The bulk of active operations for Ukrainian banks is the provision of loans, so, in 2016, UAH 1 that was invested in assets resulted in UAH 15.55 loss. However, in 2017, the situation slightly improved and UAH 1 invested in assets brought UAH 1.91 loss.

The overall value of Ukrainian banking security for the period from 2013 to 2017 tended to slightly increase, but there are still risks that are associated with several economic, political and social prob-

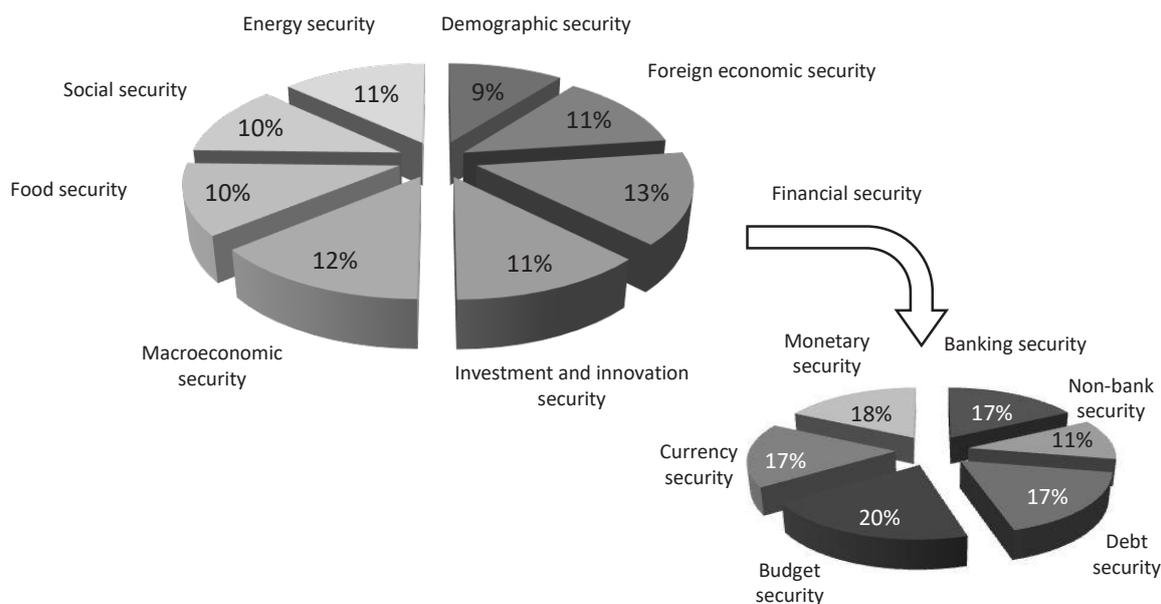


Figure 1. Weighted coefficients of the components of economic and financial security

**Table 1.** Indicators of banking security and security of the non-bank financial market of Ukraine in the period 2013–2017

No	Indicators and security values	Year					
		2013	2014	2015	2016	2017	
<b>Banking security</b>							
1	Share of arrears on loans in the total volume of loans granted by banks to residents of Ukraine, %	2-7	13.4	18.5	31.6	41.8	49.1
2	The ratio of bank loans and deposits in foreign currency, %	50-180	135.9	151.1	136.9	125.8	113.1
3	Share of foreign capital in the authorized capital of banks, %	10-60	35.4	32.5	43.3	56.2	40.8
4	Ratio of long-term (over 1 year) loans and deposits, times	1-3	1.7	2.8	3.8	4.1	3.2
5	Return on assets, %	-1-3.5	0.1	-3.9	-6.2	-15.5	-1.91
6	Ratio of liquid assets to short-term liabilities, %	≈100	89.1	86.1	92.8	92.0	97.4
7	The share of assets of the five largest banks in total assets of the bank's securities, %	30-60	40.0	43.4	53.6	55.6	59.7
Security value			44.0	46.2	49.7	50.2	50.6
<b>Security of the non-bank financial market</b>							
1	Level of insurance penetration (insurance premiums to GDP), %	1-8	1.9	1.6	1.5	1.4	1.4
2	Level of capitalization of listed companies, % of GDP	15-150	19.6	23.7	29.2	3.2	0.8
3	Volatility level of the PFTS index, the number of critical deviations (-10%)	0-400	300.5	386.9	240.7	265.1	315.0
4	Share of insurance premiums of the three largest insurance companies in the total amount of insurance premium receipts (except life), %	10-30	10.5	14.3	13.6	17.4	21.3
Security value			47.6	60.6	43.5	38.8	45.1

lems in the country. In general, to ensure bank security, the National Bank of Ukraine and the government should coordinate their actions and take measures to improve the financial state of the banking system of the country.

According to the methodological recommendations for assessing the level of economic security, indicators of the security of the non-banking financial market are indicators of the insurance and stock market. The investigation showed that this component of security is characterized by a very low level of insurance penetration in the country. In the stock market, there was a significant reduction in the level of capitalization of listed companies over the past 2 years. First, it relates to the entry into force of the amendments to the "Regulations on the operation of stock exchanges", which National Securities and Stock Market Commission significantly increased the requirements for issuers to stay on the list at the organizers of trade.

As for the security of the non-bank financial market of Ukraine, in 2014, its value was the highest, and in the future the situation worsened. Despite several problems in this segment, so, on average, the banking and non-bank security indicators have similar positions. Results of the security assessment of the following three components,

namely, debt, budgetary and currency security, are given in Table 2.

It should be noted that the indicators of debt security characterize the appropriate level of domestic and external debt, considering the cost of its services and the efficiency of use of domestic and external borrowing. One of the most important factors that has affected the level of financial security of this sector in recent years is the increase of public debt. However, the results of the calculations present that the indicators of debt security identified by the Ministry of Economic Development and Trade show an adequate level of satisfaction of urgent socio-economic needs and on average over the whole period are at a level of more than 40%.

Gross international reserves for the entire period also show quite small volumes of foreign trade turnover and capital flows of Ukraine. The balance of sale of foreign currency by the population has a negative tendency. In countries with developed economies, the volume of sales of foreign currency should be approximately the same, and, in Ukraine, there is a sharp deviation initially in favor of the sale of foreign currency, and then in favor of the purchase of foreign currency by banks from the population, which causes a high level of dollarization of the money supply in the country.

**Table 2.** Indicators of debt, budget and currency security of Ukraine in the period 2013–2017

No	Indicators and security values	Year					
		2013	2014	2015	2016	2017	
<b>Debt security</b>							
1	The ratio of the state and state-guaranteed debt to GDP	20-60	39.87	69.35	79.06	80.97	71.80
2	The ratio of gross external debt to GDP	40-70	77.51	94.61	130.43	121.84	103.94
3	The average weighted yield of T-bills (government bonds) in the primary market	4-11	14.19	13.44	13.07	9.16	10.47
4	The ratio of official international reserves to the volume of gross external debt	20-50	14.37	5.96	11.20	13.67	16.13
Security value			31.36	39.81	50.84	49.14	43.89
<b>Budget security</b>							
1	The ratio of the deficit / surplus of the state budget to GDP	-6-10	-4.42	-4.92	-2.27	-2.94	-1.60
2	Deficit/surplus of budget and extrabudgetary funds in the sector of the state administration	-3-5	0.05	-0.23	-0.11	0.13	0.34
3	Level of GDP redistribution through consolidated budget, %	18-37	30.22	28.74	32.79	32.84	34.09
4	The ratio of aggregate payments for servicing and repayment of state debt to the state budget revenues	6-16	-3.01	-5.62	13.90	-1.07	-3.67
Security value			4.70	3.48	10.26	6.20	6.19
<b>Currency security</b>							
1	The index of the change in the official rate of the national currency to the US dollar, the average for the period	90-130	100.0	148.7	183.77	116,97	104.09
2	Gross international reserves of Ukraine, months of import	1.5-5	3.5	1.8	3.1	3,1	3.7
3	The share of loans in foreign currency in the total amount of loans granted, %	20-50	33.82	46.31	55.81	49,43	43.87
4	Balance of sale and purchase of foreign currency by the population, billion US dollars	-8-10	41	47	-121	-38	-40
5	Dollarization of the money supply, %	15-30	27.24	32.16	33.85	32.87	31.90
Security value			35.05	47.14	27.51	28.25	24.76

This, in its turn, indicates a significant level of use of foreign currency as a means of payment on the territory of Ukraine, since the higher the dollarization rate, the lower the weight of the national currency in circulation and the more acute problems of non-payment and bankruptcy in the real sector of the economy.

The total value of Ukraine's currency security over the entire period under review decreased by more than 10 points, indicating that its condition is worse than in the banking and non-banking markets, but better than in the budget sector.

The last segment of the country's financial security is the indicators of the monetary and credit market of Ukraine as components of the capital market (Table 3).

According to the results of the calculations, the situation with monetary and financial security

of Ukraine is much better than budgetary security, but worse in comparison with foreign currency. The main factor that negatively affected the overall level of monetary and financial security of Ukraine is the excessively high share of the share of cash outside the banks in the total amount of money, for example, in the period 2013–2017, this indicator ranges from 26.16% to 27.51%. In general, the optimal value of this indicator should not exceed 20%. The money supply in Ukraine is characterized by high rates of growth and excessive large share of cash.

In recent years, the process of lending to households in the national currency is gaining momentum. In the period 2013–2017, the share of consumer loans provided to households in the overall structure of loans granted to residents is high, but there is a gradual downward trend. The optimal value of this indicator is a specific gravity of 5-9%, but its excess can be considered positive since the

**Table 3.** Indicators of monetary security of Ukraine in the period 2013–2017

No	Indicators and security values		Year				
			2013	2014	2015	2016	2017
1	Specific weight of cash outside banks in the total amount of money supply (M0/M3), %	20-35	26.2	29.6	28.4	28.5	27.5
2	The difference between the interest rates on loans granted by deposit-taking corporations and interest rates on deposits attracted by deposit-taking institutions (except NBU), %	-1-11	4.9	4.6	5.9	5.5	6.3
3	The average weighted interest rate on loans provided by deposit-taking corporations (except the NBU) in national currency of the country, in relation to the consumer price index, %	-7-15	16.1	-7.3	-21.5	6.1	3.4
4	Share of consumer loans granted to households in the general structure of loans granted to residents	1-21	21.3	20.7	17.8	16.4	17.1
5	Share of long-term loans in the total amount of loans granted (corrected for the exchange rate difference), %	25-60	77.2	63.2	52.1	62.7	71.5
Security value			24.2	18.2	13.5	19.7	20.8

indicator is a stimulant of monetary and security of the country.

Based on the calculations, the general level of financial security of Ukraine was determined, considering the weighting coefficients (Table 4).

The results of Ukraine's financial security assessment show that the security of all components is below the average level of optimum value, resulting in the level of overall financial security of Ukraine can be estimated as low. The situation over the past five years has not changed, and the national economy is only one-third protected from financial threats, that is, only a minimum level of security of the financial sector of the economy is ensured. The greatest threats were identified in external debt, inefficient use of budget funds, high cost of bank loans and a significant level of dollarization of the economy.

The economy of Ukraine is not unstable to financial shocks and imbalances. However, after con-

ducting research only by this methodology, it cannot be argued that the result is a final and valid reflection of the real situation with the financial sector in the country, as the methodology has certain disadvantages. Namely, there is no orientation towards a promising financial forecast; it is unclear how the weighting factors that participate in the calculations (determined by expert assessments) are unclear, which leads to an increase in the level of subjectivity and a reduction in the practical and scientific value of the results. Also, the methodology is aimed at quantitative analysis and includes only a certain number of indicators, ignoring other equally important indicators and the quality of statistical information and its impact on the level of security of individual components and financial security in general.

Therefore, today in Ukraine the urgent task is to improve the mechanism for assessing financial and economic security, which can be realized through the development of an additional system of indicators of all financial components that

**Table 4.** Dynamics of the general level of financial security of Ukraine and its components in the period 2013–2017

No	Indicators and security values		Year				
			2013	2014	2015	2016	2017
1	Banking security	0.1723	44.05	46.20	49.75	50.27	50.65
2	Security of the non-bank financial market	0.1068	47.60	60.63	43.54	38.83	45.16
3	Debt security	0.1746	31.36	39.81	50.84	49.14	43.89
4	Budget security	0.2023	4.70	3.48	10.26	6.20	6.19
5	Currency security	0.1686	35.05	47.14	27.51	28.25	24.76
6	Monetary security	0.1753	24.17	18.18	13.45	19.72	20.84
The value of financial security of Ukraine			29.24	33.22	31.17	30.86	30.29

would complement the methodology for calculating the level of economic security and made it possible to comprehensively assess the level of financial security and realistically assess the situation in country.

For further research, it is necessary to represent the position of Ukraine in international ratings and compare it with the results of calculations received. The definition of the country's place in the world system is based on the ratings or indices of leading rating agencies and institutions that have the appropriate reputation, and the results of their research present a high degree of reliability. Yes, we selected the main rating systems that determine the place of countries by the degree of security in the world market (Table 5).

The main rating systems, the ratings of which are represented by a single scale, allow to determine the level of economic security and the level of integration of the country into the world community. The ratings of these ratings are grouped according to the following categories:

- A – the highest category, stable security characteristics, very low risk;
- B, C – satisfactory level of security, acceptable risk;
- D, E – unsatisfactory level of security, very high risk.

According to the Country Risk Assessment or the strategic risk rating of the French insurance

company for foreign trade, Ukraine has a very vague political and economic view and a business environment with many weaknesses, and even there is a high probability of corporate default. The Business Climate Rating also defines a complex business environment in Ukraine: corporate financial information is often unavailable, and in the presence of often unreliable, unpredictable collection of debts, the institutional structure has many unpleasant shortcomings. That is, the level of financial security in Ukraine is characterized as unsatisfactory and has high risks.

Other suggested rating types are based on the calculation of a rank and, according to its result, each country is assigned a corresponding position in the rating. The ranking of the most successful countries in terms of security (Safety and Security Index) published by the World Economic Forum, relates Ukraine to 127th place, and under the terms of the Index of Safe Business (Safety and Security Index), our country is 124th out of 136 countries under study.

One of the most famous ratings today is Doing Business, or the World Bank Business Conduct Benchmark Rating. This is a comprehensive ranking of countries with 190 positions and the higher the country's position in the ranking, the more favorable environment for doing business in the country. The position of each country in this rating is determined by streamlining the aggregate score obtained in ten directions. According to the results of 2017, Ukraine has the following positions:

**Table 5.** Ukraine in the system of international ratings in 2017

No	Name	Responsibility	Place of Ukraine
1	Country Rating	Company of Allianz, insurance company, Germany	D4
2	Country Risk Assessment	Cofase for trade, a credit insurance company, France	C
3	Business Climate Rating		C
4	Index of Financial Freedom	The Heritage Foundation, Analytical Center, Washington	30 D
5	Business environment ranking	The Economist, Media Company, London	score – 5.27 place – 72/82
6	Safety and security index	World Economic Forum, Non-Governmental Organization, Switzerland	score – 3.51 place – 127/136
7	Index business environment		score – 3.71 place – 124/136
8	Doing business	The World Bank, International Financial Institution, Washington	score – 65.75 place – 76/190
9	Global Peace Index	Institute for Economics and Peace, International Expert Group, Sydney	score – 3.18 place – 154

- business registration – the 20th place in the world;
- dealing with construction permits – 140th place;
- connection to power supply system – 130th place;
- registration of property – 63rd place;
- getting loans – 20th place;
- protection of minority investors – 70th place;
- taxation – 84th place;
- international trade – 115th place;
- enforcement of contracts – 81st place;
- resolving insolvency – 150th place.

Overall, Ukraine ranks 76th in the world, which is better than in the previous year in only four of the ten indicators considered in the study.

The Global Peace Index also examines countries in a comprehensive manner and provides a comprehensive analysis of the state of peace in the country. He points out that today, in conditions of constant social and political upheaval, the world continues to spend huge resources on the creation and spread of violence, and the key to peace renewal is the creation of a Peaceful Peace, an integral basis of key attitudes, institutions and structures that create peace in the long-term perspective. Each country worldwide can build and develop the world. Ukraine in this rating also holds 154 positions.

The Economics journal, published by an international panel of experts from the Sydney Institute of Economics and Peace, notes that regional worsening rates have occurred in Ukraine, which ultimately affected the world average. Due to the deterioration of relations with the Russian Federation, the growth of levels of corruption in the political sphere, the traditionally high level of income inequality.

Considering that it is impossible to determine the place of Ukraine on a worldwide scale, using the

national methodology among other countries, for conducting a comparative analysis of international rating assessments of Ukraine's security with the calculated values of an integrated assessment of financial security, there is a need for a qualitative interpretation of the results. Based on international standards for assessing the country's financial security, the distribution of indicators describing the overall financial security value of Ukraine was divided into four groups:

- A – 81-100;
- B – 61-80;
- C – 31-60;
- D – 0-30.

The level of financial security and the rating of Ukraine on the results of the calculations is presented in Table 6.

**Table 6.** Rating of financial security of Ukraine according to the Ukrainian methodology for assessing the financial and economic security

Year	The value of financial security	Rating
2013	29.24	D
2014	33.22	C
2015	31.17	C
2016	30.86	C
2017	30.29	C

Thus, the results obtained in the Ukrainian methodology for assessing financial and economic security are fully in line with the international ratings that Ukraine has been assigned to the "C" rating. However, during the analysis, it was discovered that the Ukrainian methodology for determining the country's financial security has several shortcomings that give rise to certain problems during settlement. So, the technique does not consider many aspects, both in quantitative calculations and in qualitative characteristics, and the criteria chosen in the method characterize the economy from different directions, forming a single integral assessment, but do not reflect the real state of financial security. Therefore, it is necessary to make certain adjustments in the mechanism of

the methodology, which will bring the value of the integral indicator in line with the actual state of financial security in the country.

As a direction of improvement methodology, it can use an additional regression analysis of the most influential indicators used to calculate the level of financial security of the country. The proposed regression analysis will provide an opportunity to evaluate the impact of individual components on the integral security indicator and identify ways to increase the level of security by improving the relevant indicators.

The advanced methodology is to determine the STATISTICA economic and mathematical tools of the influence of factor factors on the resultant, considering the determination coefficients and the results of the multi-factor multivariate regression model, that is, the indicators that determine the most integral indicator of financial security of the country are determined most.

As a result of applying a correlation-regression model for assessing the overall level of financial security, the following results were obtained (Figure 2).

Consequently, the regression analysis was carried out by those components whose calculations revealed some difficulties indicators of debt, budget and currency security, the indicators of which do

not reflect the real situation in the country. As a result, the most important components of financial security of the country for the analyzed period were banking security, security of the non-banking financial sector, i.e. insurance and stock markets and monetary or monetary security. This is confirmed by the system of indicators of the model, namely, the coefficient of multiple correlation, which is 0.99, indicates a very high correlation between dependent and independent variables. The determination coefficient is 0.98, i.e., financial security has a strong connection with the selected factors and 98.7% is explained by the change in the selected variables. The uncorrected coefficient of multiple determination R<sup>2</sup> in this case is close to 1, that is, the model explains almost all variation of the corresponding variables. Adjusted coefficient of multiple determination R<sup>2</sup>= 0.94, which indicates the high determination of the result of the model with the factors.

The resulting multiple regression model describing the dependence of the overall importance of the country's financial security on banking, non-bank and monetary security has the following form:

$$Y = 39.78 - 0.04x_1 + 0.07x_2 - 0.51x_6 + \varepsilon, \quad (1)$$

where  $Y$  – integral indicator of financial security,  $x_1$  – security of the banking sector,  $x_2$  – security of the non-bank financial market,  $x_6$  – monetary security.

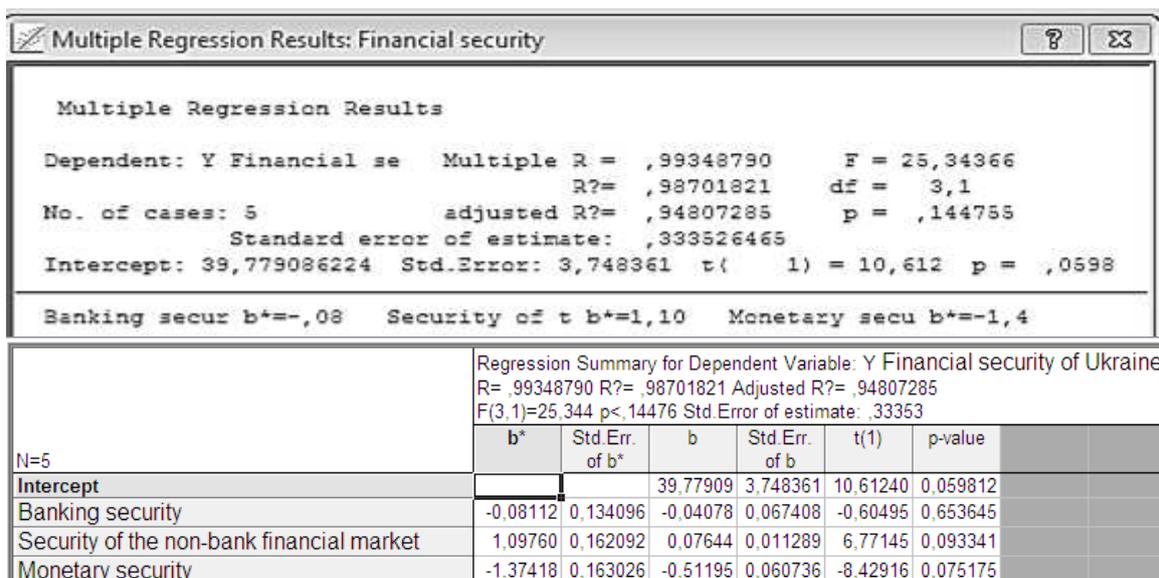
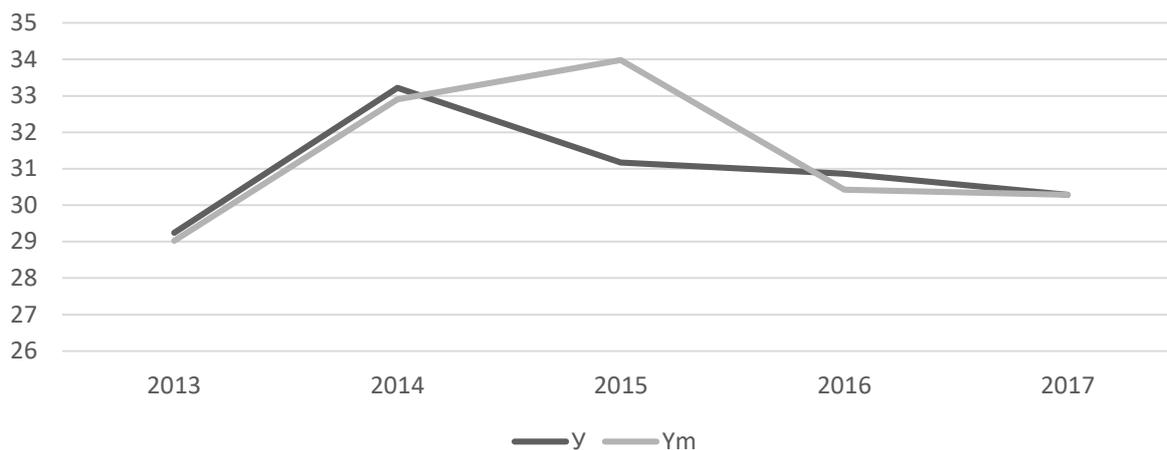


Figure 2. Results of construction of a multiple correlation-regression model of financial security of the country



**Figure 3.** Graphic representation  $Y$  and  $Ym$  of the total financial security of the country in the period 2013–2017

It could be observed the influence of factors on the investigated feature. So, with the change in banking security by 1%, the overall financial security index will decrease by 0.04, with the change in the nonbank market index will grow by 0.07, and with the change in the monetary component index will decrease by 0.51. The quality of the constructed model can be checked by calculating the difference between the real ( $Y$ ) and the simulated value ( $Ym$ ), which is presented graphically in Figure 3.

Since the actual values of  $Y$  have no significant differences with the  $Ym$  modeled variables, we can assume that the equation obtained is adequate, the model parameters are statistically significant, and the resulting regression model can be used in further studies.

Also, the analysis of the current methodology for calculating the level of financial security as a com-

ponent of economic security of the country approved by the Ministry of Economic Development and Trade, found that the feature of the methodology is the orientation, as a rule, to conduct a retrospective analysis with a promising financial forecast is absent. Since the constructed regression model adequately reflects the real state of the Ukrainian economy, it is possible to make a forecast of the level of financial security considering the influence of the selected factors on the future. The value of the forecast of the dependent variable as the total value of the country's financial security (Figure 4) was obtained.

Based on the calculation of the arithmetic mean of absolute deviations of independent variables, the projected value of the level of financial security in 2018 is 40.09%. However, the forecast shows that the level of financial security will increase. But we see that non-bank and monetary security will decrease by 0.61 and 0.83 points, respectively.

Variable	Predicting Values for (Financial security) variable: $Y$ Financial security of Ukraine		
	b-Weight	Value	b-Weight * Value
Banking security	-0,040778	1,650000	-0,06728
Security of the non-bank financial market	0,076441	-0,610000	-0,04663
Monetary security	-0,511952	-0,832500	0,42620
Intercept			39,77909
<b>Predicted</b>			<b>40,09137</b>
-95,0%CL			-6,47618
+95,0%CL			86,65893

**Figure 4.** Results of the forecast of Ukraine's financial security level in 2018

## CONCLUSION

Problems of estimation and qualitative forecasting of the level of financial security of the country are becoming more and more relevant. Existing normative and methodological provision of Ukraine in this area is more theoretical and recommendatory. The application of the Methodology for calculating the level of financial security as a component of economic security of the country, approved by the Ministry of Economic Development and Trade, revealed that the indicators of the banking security of Ukraine in 2013–2017 tend to slightly improve. In turn, the assessment of the state of monetary and financial security of Ukraine indicated an excessive large share of the share of cash outside banks in the total amount of money supply – at the level of 26-27%. According to the results of the calculations, we can state that the indicators of debt security are adequate to meet socioeconomic needs, which is false and indicates the need for a more responsible definition of indicators that reflect the real situation with the debt situation in the country. Namely, we can state that the budgetary security of Ukraine is not only in a threatening but pre-crisis state. There is a mismatch between the balance of incomes and expenditures of the state and local budgets, and the state funds are used inefficiently.

The overall level of financial security in Ukraine has been identified as unsatisfactory and, in accordance with international standards, it was proposed the distribution of indicators describing the overall financial security of Ukraine into four types on the scale: A, B, C and D, according to which Ukraine has a C rating. That is in line with the ratings of Ukraine, exhibited by international rating agencies.

The proposed method of forecasting the level of financial security of the country is to determine the indicators that have the greatest impact on the integral indicator of financial security. Regression analysis has made it possible to identify the most significant indicators that best determine financial security and eliminate significant disadvantages of the Methodology – an extremely broad list of indicators (less significant components are being screened) and impossibility of forecasting for future periods. As a result of the analysis, it was revealed that Ukraine's financial security mostly depends on banking security, security of the non-bank financial sector and monetary security. The security of these segments has the greatest impact on the overall financial security of the country and is the most significant, and the predicted level of financial security of Ukraine by 2018 is 40%.

The investigation provides the basis for further scientific developments in assessing the level of financial security of the country and ensuring transparency of processes of public finances.

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