

THE ROLE AND IMPORTANCE OF FINANCIAL RISK INDICATORS

HAGIU ALINA*¹, BĂRBULESCU MARINELA¹, OPREA ALINA GEORGIANA¹

¹ *University of Pitești, Faculty of Economics and Law, Pitești, Romania*

Corresponding author's e-mail: alina.hagiu@upit.ro

Abstract: *Commercial, private and state banks perform universal operations related to lending to industrial, commercial, etc. enterprises, mainly from the account of funds, obtained in the form of deposits. There are four groups of banking operations: passive operations, active operations, banking services and banks' own operations, all of them having associated some risks. This paper was built on a number of two major sections, preceded by a short introduction and followed by a few brief conclusions. The first of the sections is dedicated to the definition and analysis of risk indicators, while the second section is of an applicative type and refers to a case study on the analyzed topic. In the case study we used the BRD - GROUPE SOCIÉTÉ GÉNÉRALE indicators to emphasize the financial risk indicators.*

Key words: *financial risk, interest, company, performance*

INTRODUCTION

It is extremely important to have timely and effective measures of systemic financial risk assessment because they are central to macro-prudential supervisory and regulatory policies [10]. This means that there is the need for tools and models able to monitor, capture and evaluate potential risks that can build up financial instabilities within the financial system [5]. Usually, the notion of systemic financial risk is associated with assessing the total size of the risk present at a certain point in time within the financial system, namely the time-varying probability of a systemic event. It is characterised by both crosssectional (how risks are correlated across financial institutions) and time-related dimensions (how systemic risk evolves over time given a change in certain business and market conditions) [6].

In the atmosphere of volatility, all financial institutions are faced with financial risks such as credit risk, liquidity risk, interest rate risk, foreign exchange risk, market risk, operational risk as well as other business risks [2]. Liquidity risk arises due to a bank incompetence to meet its due liquidity obligation, that is, the danger of being unable to liquidate a portion at reasonable price and [16]. A viable banks activity involves engaging in financial intermediation, provision of service, provision of loans to customers, and overall management of risk. This sounds for financial system to be evaluated from an efficient perspective other than the institution. Financial risk management supports financial institution to put in place to reduce the potential losses that comes as a result of reservations in the financial market [8].

The risk can be defined as an event with negative consequences on the economic agent [3]. It is influenced by events or phenomena that act on the business of companies, being the expression of failure to achieve the desired gain or loss in economic transactions. Banking risks are the risks faced by banks in carrying out current operations. Banking risk is the degree of loss suffered by a bank, if the customer goes bankrupt without being able to pay its obligations to it.

Depending on the activities carried out by banks, the strategies they adopt and the policies they apply, they are exposed to various risks specific to banking, which is why they are known as banking risks [1].

MATERIALS AND METHODS

In realising this paper we combined the theoretical part of the financial risk with the practical one using the calculation of the main financial risk indicators at the level of BRD-GROUPE SOCIÉTÉ GÉNÉRALE for the period 2016-2018 using the financial statements provided by the bank, in order to emphasize this indicators importance in the banking system and the need of their knowledge by every financial institutions who wants to maintain its stability and to increase its financial performance. In order to emphasize the importance of this indicators we calculated them for a period of 3 years and observed their evolution and their influence on the bank activity.

RESEARCH RESULTS

Liquidity risk

Bank liquidity represents the bank's ability to make payments from the holders' accounts at any time, at their request, the bank needing have sufficient reserves and assets that can be used as means of payment or that can be operatively transformed into such means, these reserves directly influencing the degree of liquidity of the bank [7]. The minimum limit of the liquidity indicator is 1 and is calculated as the ratio between the actual liquidity (total assets + total off-balance sheet commitments received) and the required liquidity (total obligations + total off-balance sheet commitments). Bank liquidity can also be assessed by other indicators: The liquidity of loans shows the degree of liquidity of loans, respectively the ability to repay them, the loans being appreciated with a low degree of liquidity. The indicator is calculated as a percentage ratio between total loans and total assets, its high level indicating a low active liquidity.

Table 1.

The main indicators used in the bank risk assessment – Thousands lei

Indicators	2016	2017	2018
Credits	27,384,110	29,011,925	28,893,343
Total Assets	50,657,583	53,490,923	54,089,354
Provisions	97,663	102,754	85,474
Net profit	728,281	1,380,384	1,545,988
Total income	2,634,172	2,641,499	2,980,915
Cash	1,800,506	1,924,188	2,236,018
Deposits	531,601	885,970	297,817
Government securities	41,620	41,661	15,235
Equity	6,367,183	7,028,387	7,327,409
Attracted sources	138,451	48,530	16,582

Source: made by the author based on BRD financial situation from the period 2016 – 2018 [11-16]

$$2016: \frac{27,384,110}{50,567,583} * 100 = 54.05\%$$

$$2017: \frac{29,011,925}{53,490,923} * 100 = 54.24\%$$

$$2018: \frac{28,893,343}{54,089,354} * 100 = 53.42\%$$

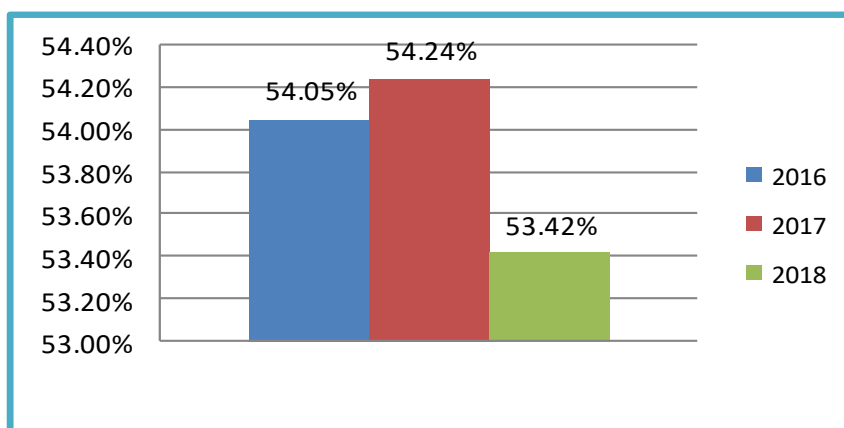


Figure 1. The evolution of credit liquidity (%)

Source: made by the authors based on own calculation

Following the calculations, we can see an increase in loan liquidity from 54.05% in 2016 to 54.2% in 2017, followed by a decrease of about one percent in 2018. Loans have the lowest liquidity for banks, so it is found from the evolution of this indicator an improvement in the bank's liquidity, i.e. a decrease in liquidity risk.

The liquidity of safe assets if it has a high value means that the liquidity risk is low. [3]. This indicator is calculated as a percentage ratio between cash, deposits, government securities and total assets.

$$2016: \frac{1,800,506 + 531,601 + 41,620}{50,657,583} * 100 = 4.69\%$$

$$2017: \frac{1,924,188 + 885,970 + 41,661}{54,089,354} * 100 = 5.33\%$$

$$2018: \frac{2,236,018 + 297,817 + 15,235}{54,089,354} * 100 = 4.72\%$$

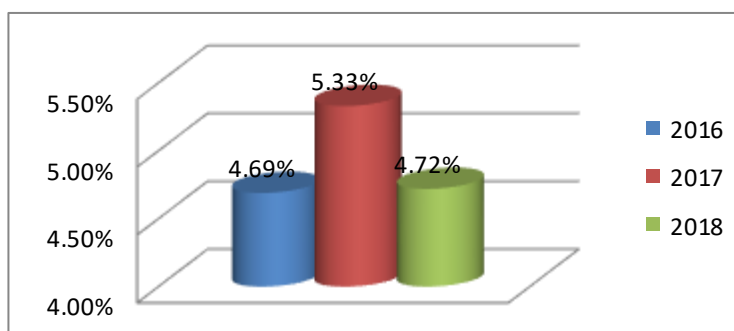


Figure 2. Safe assets liquidity evolution

Source: made by the authors based on own calculation

Following the calculations, there is an increase in the share of liquid assets in total investments from 4.69% in 2016 to 5.53% in 2017, after which there is a decrease to 4.72% in 2018.

The solvency indicators reflect the bank's ability to support the entire activity with the help of capital, calculated as a percentage ratio between equity and total assets (or loans or attracted sources).

$$2016: \frac{6,367,183}{27,384,110} * 100 = 23.25\%$$

$$2017: \frac{7,028,387}{29,011,925} * 100 = 24.23\%$$

$$2018: \frac{7,028,387}{28,893,343} * 100 = 25.36\%$$

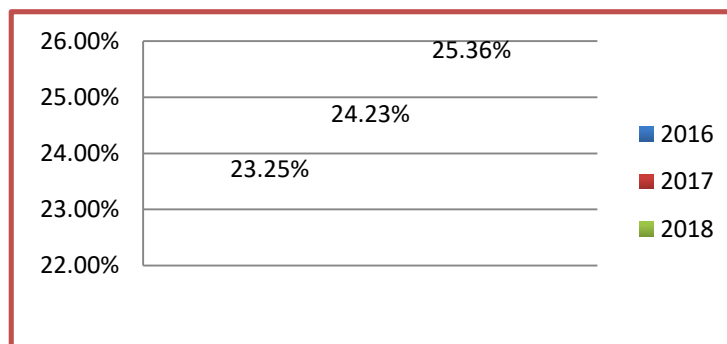


Figure 3. The degree of loans coverage through equity
 Source: made by the authors based on own calculation

Following the calculations, there is a noticeable increase in the degree of coverage of loans through equity from 23.25% in 2016 to 25.36% in 2018

Thus, there is an improvement in solvency in the period 2016-2018.

$$2016: \frac{6,367,183}{138,451} * 100 = 23.25\%$$

$$2017: \frac{7,028,387}{48,530} * 100 = 24.23\%$$

$$2018: \frac{7,327,409}{16,582} * 100 = 25.36\%$$

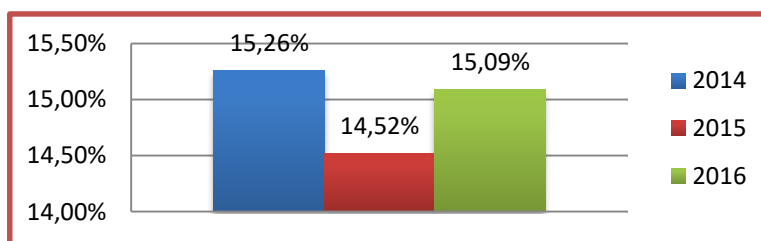


Figure 4. Degree of financial autonomy
 Source: made by the authors based on own calculation

Following the calculations, there is a decrease in the degree of financial autonomy from 15.26% in 2014 to 14.52% in 2015, followed by an increase in 2016 to 15.09%.

$$2016: \frac{6,367,183}{50,657,583} * 100 = 12.57\%$$

$$2017: \frac{7,028,387}{53,490,923} * 100 = 13.14\%$$

$$2018: \frac{7,327,409}{54,089,354} * 100 = 13.55\%$$

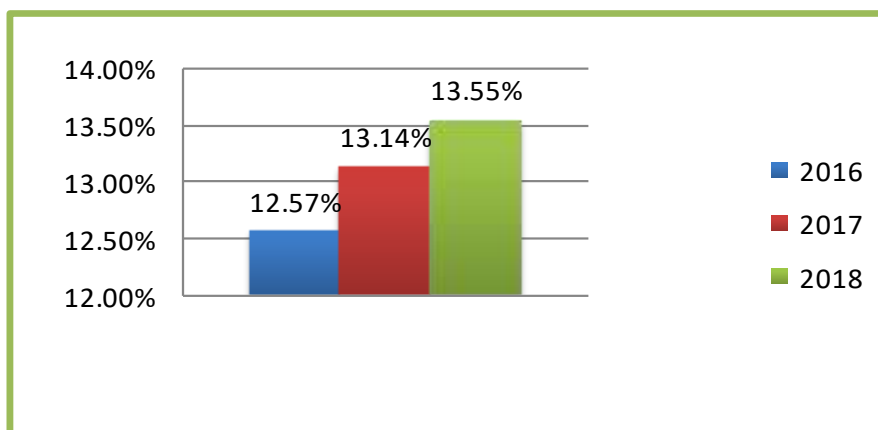


Figure 5. Gross bank exposure

Source: made by the authors based on own calculation

Following the calculations, there is a constant increase of the indicator, from 12.57% in 2016, to 13.55% in 2018.

Credit risk

2016: $3,502,346 / 23,881,764 \times 100 = 14.66\%$

2017: $3,534,248 / 24,002,789 \times 100 = 4.72\%$

2018: $2,799,865 / 23,968,856 \times 100 = 11.68\%$

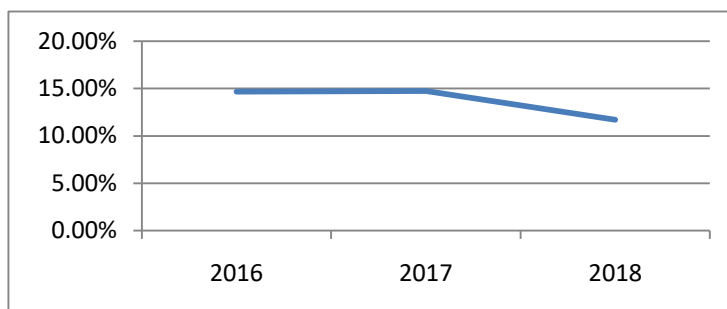


Figure 6. Share of outstanding loans in total loans

Source: made by the authors based on own calculation

From the calculation of the indicator, the volume of outstanding loans in total loans shows a decrease of their share from 14.66% in 2016 to 11.68% in 2018.

2016: $763,333 / 23,881,764 \times 100 = 3.19\%$

2017: $1,988,968 / 24,002,789 \times 100 = 8.28\%$

2018: $4,567,752 / 23,968,856 \times 100 = 19.05\%$

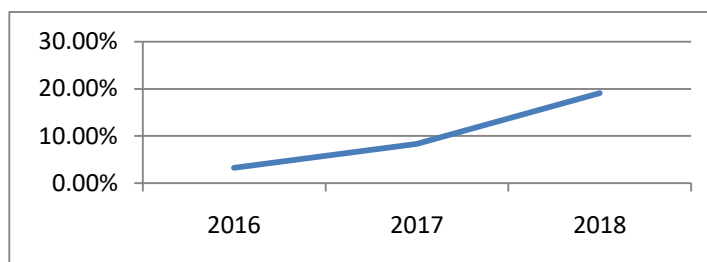


Figure 7. The share of non-performing loans in total loans

Source: made by the authors based on own calculation

This indicator is increasing, which means that it has a major impact on the bank's activity and financial results, generating the appearance of credit risk.

2016: $1,038,122 / 23,881,764 \times 100 = 4.34\%$

2017: $1,048,608 / 24,002,789 \times 100 = 4.36\%$

2018: $1,046,070 / 23,968,856 \times 100 = 4.36\%$

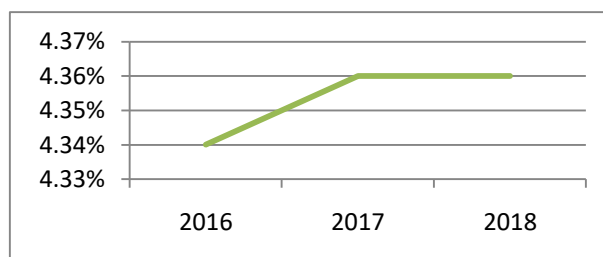


Figure 8. Share of reserves for loan losses in total loans

Source: made by the authors based on own calculation

This indicator synthetically expresses the managerial expectations regarding the evolution of the quality of the loan portfolio. The indicator has an inadequate evolution, the decrease of reserves for credit losses leading to the occurrence of credit risk.

2016 : $1,756,546 / 19,251,623 \times 100 = 9.12\%$

2017 : $2,111,413 / 20,698,782 \times 100 = 10.20\%$

2018 : $2,472,671 / 23,621,369 \times 100 = 10.46\%$

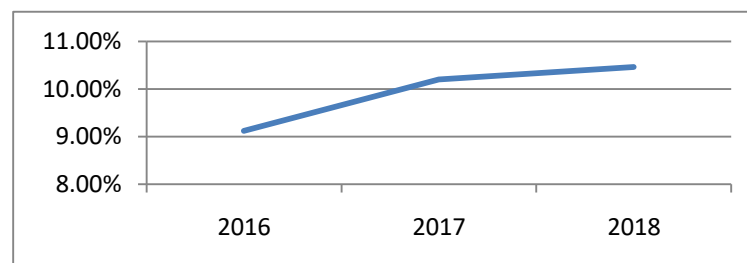


Figure 9. Share of provisions for loan losses in total net losses

Source: made by the authors based on own calculation

For the indicator outlined above, its share is increasing from year to year, which is an alarming fact for the bank.

2016 : $887,488 / 1,756,546 \times 100 = 50.52\%$

2017 : $1,951,668 / 2,111,413 \times 100 = 92.43\%$

2018 : $1,110,699 / 2,472,671 \times 100 = 44.92\%$

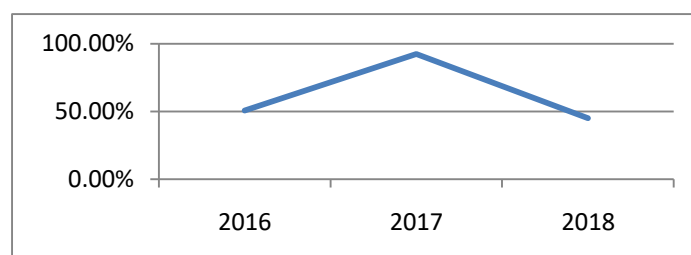


Figure 10. Share of gross profit in provisions for loan losses

Source: made by the authors based on own calculation

This indicator reflects the cost of hedging the credit risk assumed by the bank. It is observed the increase of this indicator from 50.52% in 2016 to 92.43% in 2017 and then decreases to 44.92% which means that this cost of hedging the credit risk oscillates being influenced by the level of provisions for credit losses.

Interest rate risk

Interest rate risk is traditionally measured, either by the ratio of interest-sensitive assets and liabilities, or by the difference between them [4].

The interest rate risk indicators used in banking practice are the following:

a) The interest rate risk indicator which is determined as the ratio between productive assets and interest-bearing liabilities;

2016: $50,657,583 / 44,290,400 = 1,14$

2017: $53,490,923 / 46,462,536 = 1,15$

2018: $54,089,354 / 46,761,945 = 1,15$

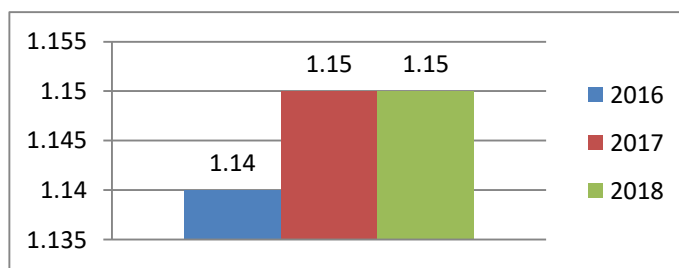


Figure 11. Interest rate risk

Source: made by the authors based on own calculation

As can be seen from the graph above, this indicator increased in 2017 by 0.01 compared to 2016, remaining constant in 2018.

b) The absolute margin of the bank interest, expressed by the net interest income, reflects the bank's capacity to cover the expenses with the interest subsidized on deposits, certificates of deposit from the income obtained by collecting the interest on the granted loans. The interest margin must be set so as to ensure the support of the banking burden (the difference between other banking expenses and other banking income), as well as obtaining a satisfactory profit.

Absolute bank interest margin: bank charges - other income

2016 : $207,735 - 15,924 = 191,811$

2017 : $130,611 - 26,402 = 104,209$

2018 : $151,126 - 31,829 = 119,297$

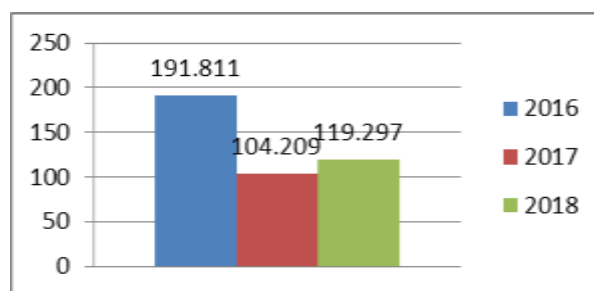


Figure 12. Absolute bank interest margin

Source: made by the authors based on own calculation

From the chart above we can see a sharp decrease in the absolute interest margin in 2017 compared to 2016, with a slight increase in 2018 of about 15,000.

This reflects the improvement in the bank's ability to cover interest expenses in 2018 compared to 2017, when there was a sharp decrease of approximately 87,000 compared to 2016.

c) Gross percentage margin of bank interest, resulting from the ratio of the absolute margin to productive assets * 100

2016: $191,811 * 100 = 19.18\%$

2017: $104,209 * 100 = 10.42\%$

2018: $119,297 * 100 = 11.92\%$

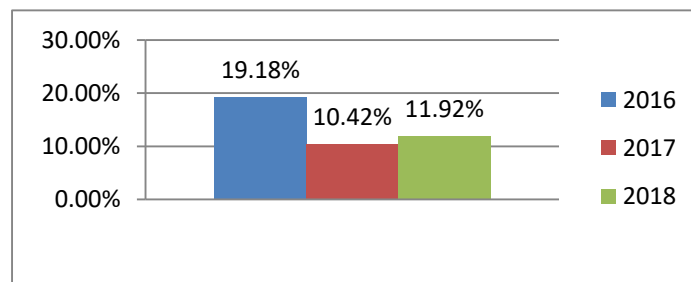


Figure 13. Percentage margin of bank interest

Source: made by the authors based on own calculation

From the chart above you can see a sharp decrease in the percentage interest margin in 2017 compared to 2016, with a slight increase in 2018 of about 1.5 percentage points.

This reflects the improvement in the bank's ability to cover interest expenses in 2018 compared to 2017, when there was a sharp decrease compared to 2016.

d) Net percentage margin of bank interest, which is calculated as the ratio between the average level of the active interest rate and the average level of the passive interest rate * 100 [9].

The main indicator for assessing the interest rate risk is **the degree of sensitivity** is calculated as the ratio between sensitive assets and liabilities as follows:

$R_{gs} = ASD / PSD * 100$

2016 : $50,657,783 / 50,657,583 * 100 = 100\%$

2017 : $53,490,923 / 53,490,923 * 100 = 100\%$

2018: $54,089,354 / 54,089,354 * 100 = 100\%$

A level equal to 100 of the indicator shows a perfect concordance of assets and liabilities, while the supra-unit value expresses a state in which assets predominate liabilities, which can ensure higher income to the bank. The subunit rate expresses the bank's dependence on sensitive liabilities, which can generate an increase in interest expenses.

Solvency risk

The solvency indicators reflect the bank's ability to support the entire activity with the help of capital, calculated as a percentage ratio between equity and total assets (or loans or attracted sources).

2016: $\frac{6,367,183}{27,384,110} * 100 = 23,25\%$

$$2017: \frac{7,028,387}{29,011,925} * 100 = 24,23\%$$

$$2018: \frac{7,327,409}{28,893,343} * 100 = 25,36\%$$

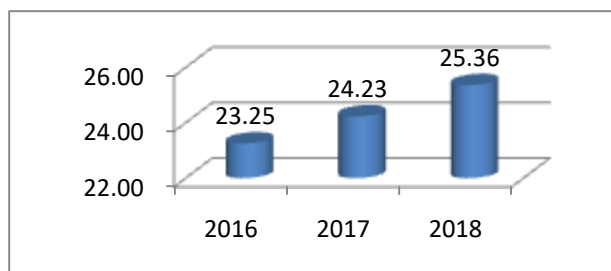


Figure 14. The evolution of solvency in the period 2016-2018 reported to total assets

Source: made by the authors based on own calculation

As the volume of loans decreased, the solvency indicator calculated as a ratio between equity and loans increased in 2018 compared to 2017.

$$2016: \frac{6,367,183}{50,657,583} * 100 = 12,57\%$$

$$2017: \frac{7,028,387}{53,490,923} * 100 = 13,14\%$$

$$2018: \frac{7,327,409}{54,089,354} * 100 = 13,55\%$$

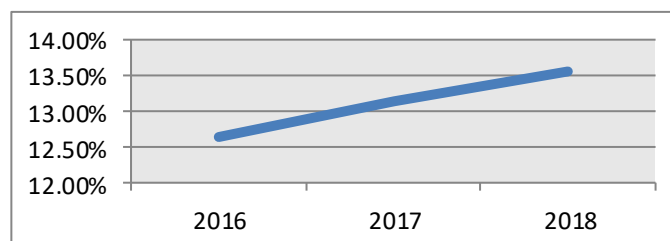


Figure 15. The evolution of solvency related to loans

Source: made by the authors based on own calculation

Given the increase in the bank's assets in the period 2016-2018, there is an increase in the bank's solvency highlighted by this indicator.

$$2016: \frac{6,367,183}{43,856,953} * 100 = 14,51\%$$

$$2017: \frac{7,028,387}{44,051,602} * 100 = 15,95\%$$

$$2018: \frac{7,327,409}{44,968,357} * 100 = 16,19\%$$

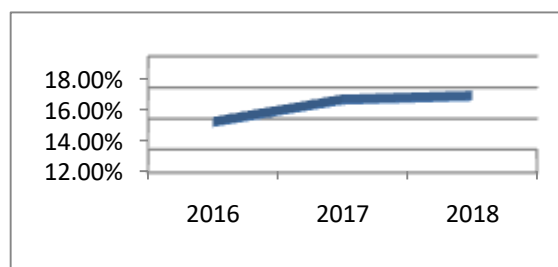


Figure 16. The evolution of solvency related to attracted sources

Source: made by the authors based on own calculation

Given the increase in the bank's equity in the period 2016-2018, there is an increase in the bank's solvency highlighted by this indicator.

CONCLUSIONS

Risk management is one of the main functions of the modern banking system focused on the activity of the economic market. Problems that arise in the banking system due to poor management of resources on the one hand and investments on the other, occur in all economies.

Bankruptcies of banks also jeopardize the stability of the financial system in countries where the supervisory system is well established.

Institutions operating in global markets are dealing with increased volatility with the effects of crises that may be transmitted between various financial centers due to systemic risk [16]. This phenomenon has been closely related to the increase in the volume of transactions with derivative financial instruments such as futures, swaps, options. Risk is those situations where external or internal factors of a credit institution act in a way that cannot be predicted effects on market values.

The results of the study emphasize that financial risk indicators used in our paper have an important impact on the performance of the banks.

The study also shows an important long run cointegrating relationship between the capital adequacy of banks and their financial performance in the long run. This means that the indicators of financial risk strongly and actively stimulate, improve and even grow the performance and especially the bank financial performance.

The results of the analysis also show that there is also long-run equilibrium relationship between financial risk indicators and bank financial performance, return on assets. This supposes a proper diversification of banks' total assets that can result in an improved financial performance of banks through the window of efficient portfolio management, efficient asset selection and the application of matching principles to reduce risk.

Taking into account the empirical results of this study we recommend the improvement of management of all financial risk variables in order to better fulfill institution's objectives.

REFERENCES

- [1]. ANGHELACHE C., MANOLE A., ANGHEL M.G., STANCIU E., SOARE D.V., 2015, Significant aspects regarding the analysis of the bankruptcy risk, ART ECO - Journal of Economic Studies and Research, Vol.6/No.3
- [2]. ANTONIO DI CESARE, ANNA ROGANTINI PICCO, 2018, A Survey of Systemic Risk Indicators, Questioni di Economia e Finanza (Occasional Papers) 458, Bank of Italy, Economic Research and International Relations Area

- [3]. **DUMITRU M. MIHALAȘCU R., OPREA I.A.**, 2012, Banking risk management, ProUniversitaria Publishing House
- [4]. **IOSOF S., GAVRI T.**, 2013, Risk Management, ProUniversitară Publishing House, Bucharest
- [5]. **MAZZOCCHETTI ANDREA, LAURETTA ELIANA, RABERTO MARCO, TEGLIO ANDREA, CINCOTTI SILVANO**, 2018, Systemic Financial Risk Indicators and Securitised Assets: an Agent-Based Framework, MPRA Paper 89779, University Library of Munich, Germany
- [6]. **MAZZOCCHETTI ANDREA, LAURETTA ELIANA, RABERTO MARCO, TEGLIO ANDREA, CINCOTTI SILVANO**, 2020, Systemic financial risk indicators and securitised assets: an agent-based framework, Journal of Economic Interaction and Coordination, Springer; Society for Economic Science with Heterogeneous Interacting Agents, vol. 15(1), pg. 9-47
- [7]. **SILVA WALMIR, KIMURA HERBERT, SOBREIRO VINICIUS AMORIM**, 2017, An analysis of the literature on systemic financial risk: A survey, Journal of Financial Stability, 28(C), pg 91-114
- [8]. **TAN ZHONGMING, FRIMPONG SAMUEL, DING GUOPING**, 2019, Impact of Financial Risk Indicators on Banks' Financial Performance in Ghana, Business and Economic Research, Vol. 9, No. 14
- [9]. **TREAPAT L.M.**, 2012, Banking risk management and insurance in Romania, Economic Publishing House, Bucharest
- [10]. **XINGXING YE, RAPHAËL DOUADY**, 2019, Risk and Financial Management Article Systemic Risk Indicators Based on Nonlinear PolyModel, Université Paris1 Panthéon-Sorbonne (Post-Print and Working Papers) hal-02488592, HAL
- [11]. *** **BRD**, Annual financial report, 2016
- [12]. *** **BRD**, Annual financial report, 2017
- [13]. *** **BRD**, Annual financial report, 2018
- [14]. *** www.brd.ro
- [15]. *** www.bvb.ro
- [16]. *** www.bnr.ro