Analysis of Financial Stability in the Republic of Armenia

Kalantaryan Hayk L.
Master of Science in Economics of Globalization and European Integration, 2nd year
University of Bari Aldo Moro (Bari, Italy)
hayk.kalantaryan99@gmail.com

UDC: 336.7 **EDN:** WWLYVW
Keywords: Financial stability, insolvency, z-score, financial technology

Հայաստանի Հանրապետությունում ֆինանսական կայունության վերլուծություն

Քալանթարյան Հայկ Լ.
Գլոբալիզացիայի և եվրոպական ինտեգրման տնտեսագիտության մագիստրոս, 2-րդ կուրս
Ալդո Մորոյի անվան համալսարան Բարիում (Բարի, Իտալիա)
hayk.kalantaryan99@gmail.com

Ամփոփագիր. Վերջին տարիներին համաշխարհային բանկային ոլորտի ցնցումներն ապացուցեցին, որ ֆինանսական կայունության ապահովումը կենսական է քաղաքականություն մշակողների համար: Այս հոդվածը փորձում է վերլուծել Հայաստանի Հանրապետության ֆինանսական կայունությունը՝ օգտագործելով հեղինակի ընտրած գործիքները, մասնավորապես z-score և Herfindahl-Hirschman ինդեքսները: Հոդվածի նպատակն է հիմնավորել, որ ֆինանսական կայունությունը ոչ միայն ֆինանսական ցնցումների բացակայությունն է, այլ նաև բանկային ոլորտի արդյունավետ գործելու կարողությունը շարունակաբար աճող ռիսկերի պայմաններում, որոնք կարող են անմիջականորեն ազդել համակարգի վրա ճգնաժամային կամ նախաճգնաժամային իրավիճակում: Ընտրված գործիքները շեշտը դնում են բանկային հատվածում անվճարունակության և կենտրոնացվածության վրա՝ տրամադրելով գնահատված միավորների վրա հիմնված վարկանիշներ և ինդեքսներ: Թեև Հայաստանի բանկային հատվածը բավարարում է ԿԲ-ի կողմից սահմանված բոլոր նորմատիվային պահանջները, այնուամենայնիվ, կան բանկեր, որոնք ունեն ռիսկերի կենտրոնացվածության բարձր մակարդակ, ինչը կարող է ազդել տնտեսության կայունության վրա տնտեսական ցնցումների դեպքում: Բանկային համակարգի մրցակցության բարձր մակարդակը, որը սահմանափակում է փոքր բանկերի կարողությունները՝ ամրապնդելու կայունության միջոցները՝ ինտեգրելով ավանդական բանկային տեխնիկան, խնդրի լուծումը որոշակիորեն դժվար է դարձնում: Ելնելով վերլուծության արդյունքներից՝ մենք անդրադառնում ենք ֆինանսական տեխնոլոգիաների կարևորությանը բանկային հատվածի ֆինանսական ցուցանիշների բարելավման համար, հատկապես այն բանկերի, որոնք ունեն ռիսկերի ամենաբարձր կենտրոնացվածությունը:
Հանգուցաբառեր՝ ֆինանսական կայունություն, անվճարունակություն, z-score, ֆինանսական տեխնոլոգիա

Анализ финансовой устойчивости в Республике Армения

Калантарян Айк Л.
Магистр наук в области экономики глобализации и европейской интеграции, 2-й курс
Университет им. Альдо Моро в Бари (Бари, Италия)
hayk.kalantaryan99@gmail.com

Аннотация: Потрясения в глобальном банковском секторе в последние годы доказали, что обеспечение финансовой стабильности жизненно важно для политиков. В данной статье предпринята попытка анализа финансовой устойчивости Республики Армения с использованием выбранных автором инструментов, а именно z-score и индексов Херфиндаля-Хиршмана. Цель статьи – обосновать, что финансовая устойчивость – это не только отсутствие финансовых потрясений, но и способность банковского сектора эффективно функционировать в условиях постоянно возрастающих рисков, способных непосредственно воздействовать на систему в условиях кризиса или до кризисной ситуации. Выбранные инструменты сосредоточены на неплатежеспособности и концентрации в банковском секторе, предоставляя рейтинги и индексы на основе оценочных баллов. Несмотря на то, что банковский сектор Армении соответствует всем нормативным требованиям, установленным Центральным банком, все еще существуют банки, которые имеют высокий уровень концентрации рисков, что может повлиять на устойчивость экономики в случае экономических потрясений. Высокий уровень конкуренции в банковской системе, ограничивающий возможности небольших банков по усилению мер устойчивости за счет интеграции традиционных банковских технологий, несколько затрудняет решение проблемы. По результатам анализа мы обращаем внимание на важность финансовых технологий в улучшении финансовых показателей банковского сектора, особенно банков с наибольшей концентрацией рисков.
Ключевые слова: Финансовая устойчивость, неплатежеспособность, z-score, финансовые технологии

Introduction

Although monetary policy has a somewhat well-defined toolset and is therefore tied in large part to price stability, conceptual approaches to financial stability are always required. Additionally, the instability of the system might be hampered by constantly evolving instruments and laws, which limit the financial system's operational independence.

The paper conducts research and analysis on the financial stability of Armenia. The thing is that all banks can exceed the regulatory limits on financial stability indicators set by the Central Bank, but does that mean that these banks have the financial stock to ensure that the financial system is stable? After considering the discussions and opinions by the authors who analyse financial stability, we could not find the final answer for this matter.

However, the existing literature about the financial stability in the Armenian economy mainly focuses on the absence of financial instability rather than the existence of a stable financial sector, which is capable of performing properly in case of force major.

This is the primary research topic, and the article will undertake a more thorough study to show that there is a certain amount of risk concentration in the banking industry, which is difficult to infer from the financial stability measures provided by the authorities. Additionally, considering the paper's findings, the next area of investigation is how to improve the situation, particularly given the intense competition and risk concentration in some institutions. We believe that the Central Bank of Armenia should work on fintech regulations so that banks can benefit from its economic advantages based on their current level of financial stock.

Risk concentration was calculated using tools from the literature (mainly z-score analysis). The value of the paper lies in the fact that extensive data collection work has been carried out (238 interim financial statements), as well as their calculation to exhibit the stability issues in Armenia. As the literature is mainly focused on stability indicators set by the regulators, the task of the author is to find out the relevance of the indicators used for assessing financial stability and work with a more effective indicator (z-score).

According to the World Bank, "*The popularity of the z-score stems from the fact that it has a clear (negative) relationship to the probability of a financial institution's insolvency, that is, the probability that the value of its assets becomes lower than the value of its debt*" [**1**]. Thus, if a bank has a high z-score indicator, it indicates a lower level of risk concentration (insolvency). Therefore, this research paper can serve as a tool for learning from the case study from Armenia and seeing the patterns of financial stability.

Speaking about financial stability, Shekar Lekshmi notes that it is not the absence of a crisis, but the existence of conditions conducive to the efficient operation of the financial system. This is where the natural question arises: does the absence of financial crises impose financial stability? For continuous economic growth, financial stability is crucial, which cannot be achieved without a strong financial system. But in the context of permanent reforms in the financial sector, macroprudential policy is referred to as a paramount tool.

According to Shinasi, the key to most of the researchers' research is not the assessment of financial stability, but the approaches to evaluating financial instability. He concludes financial stability as "*Financial stability is a condition in which an economy's mechanisms for pricing, allocating, and managing financial risks (credit, liquidity, counterparty, market, etc.) are functioning well enough to contribute to the performance of the economy*" [**2**].

As for the z-score, according to Martin Čihák and Heiko Hesse, it is an objective assessment tool, as it carries out an insolvency risk assessment for the banking system. The calculation formula is such that even if "*an institution "chooses" to have lower risk-adjusted returns, it can still have the same or higher z-score if it has a higher capitalization. In this sense, the z-score provides an objective measure of soundness*" [**3**].

Analysis and Findings

We will consider two indicators for the banking system: market concentration and risk concentration. It was necessary to consider more periods and examine more data, leading to more reliable results.

To assess the competition and concentration levels of the banking system, we consider the Herfindahl-Hirschman index[1] analysis for 2020.

In comparison to 2019, the banks mainly maintained their position in terms of the volume of loans provided. Moreover, the volume of credit in the banking sector increased by about 12.6%, accounting for 4 trillion 24 billion 921.5 million AMD (calculations are done by the author based on the financial statements of the banks).

Referring to the Hirschman index (Appendix 1), it is noticeable that the banking system is at a

[1] The US Department of Justice states that when the rate is below 1500, the market is competitive - not centralized. 1500-2500 index is a mid-level centralized and in the case of higher than 2500, a highly centralized market with a pronounced monopolistic behaviour.

low level of concentration, recording only 1008.17 index points. However, the index is growing year by year for the banking system. In 2019, the index score was only 970 points, 870 and 860 index points in the years 2017 and 2016 respectively [**4**], and it should be considered that some authors also accept that an index score above 1000 is already a signal of some changes in the competition level. Particularly, in 2019 the market leader, Ameriabank, increased its share by 1 percentage point compared to 2010. The same applies to Ardshinbank. Meanwhile, the market share of other banks tends to decrease. This indicates that in the conditions of healthy competition, all banks can increase their loan portfolios, but the leading banks, having the largest share of profits in the banking system, are able to attract even more customers with the introduction of necessary digital products - in case of Ameriabank, an increase of more than 100 billion AMD on loan portfolio (18% increase compared to 2019) was recorded.

This helps us to perceive that the fierce competition in the industry is not favourable for the banks with relatively lower market shares and they need new incentives for balancing their financial stock. As an incentive, we consider the CB's policy to promote financial technologies, which will be discussed furthermore.

Now we consider the analysis of the z-score for the banking system based on the quarterly data from 2017-2020. The calculation methodology is as follows. Capital adequacy is taken from the banks' normative report for the 4th quarter of 2020, the ROA was calculated as the average value for the last 16 quarters, and the standard deviation was taken as the standard deviation of the ROA for the considered quarters. In total, 238 interim financial statements were analysed.

Table 1. *Z-score analysis of the Armenian banking sector for 16 quarters of 2017-2020*

	Capital adequacy	**ROA, average**	**ROA, standard deviation**	**Z-score**
Ameriabank	13.57%	0.32%	0.08%	**178.91**
Unibank	13.93%	0.08%	0.09%	**151.66**
Ardshinbank	13.08%	0.34%	0.10%	**131.00**
Armeconombank	13.92%	0.32%	0.18%	**79.91**
ACBA	15.03%	0.38%	0.21%	**74.60**
Armswissbank	19.22%	0.67%	0.27%	**72.39**
Converse bank	14.27%	0.37%	0.21%	**71.22**
Evocabank	19.78%	0.26%	0.30%	**67.47**
Inecobank	14.55%	0.63%	0.25%	**61.62**
Araratbank	15.09%	0.19%	0.34%	**45.53**
ID Bank	25.02%	0.29%	0.61%	**41.75**
Armbusinessbank	13.01%	0.24%	0.55%	**23.98**
VTB-Armenia bank	14.85%	-0.11%	0.68%	**21.78**
HSBC	**16.02%**	**-0.27%**	**1.07%**	**14.76**

Compilation of the Index and Banks' ratings were performed by the author, reviewing the interim financial statements of the selected banks for 2017-2020 (a total of 238 interim financial statements)

The decisive factor here is the denominator, as it usually ranges from 0-1 and the larger the standard deviation, the harder it is for a bank's capital to absorb banking shocks. Meanwhile, the higher the index, the higher the bank's risk resistance. As a result, banks are ranked according to the z-scores calculated, indicating the position of the most stable and unstable banks.

We did not conduct a rating of Mellat Bank, as it is able to provide several times higher z-score

index than the leading banks due to "over-capitalization", while the conservative policy of assets and negligible market activity in the sector prevents the bank from being comparable with other banks. Moreover, if the bank has few borrowers, even in the case of one default, its non-performing loans / gross loans indicator rises significantly. The indicators of Artsakh Bank and Biblios Bank were not considered due to the "inaccessibility" of the statements published for such a large amount of data collection.

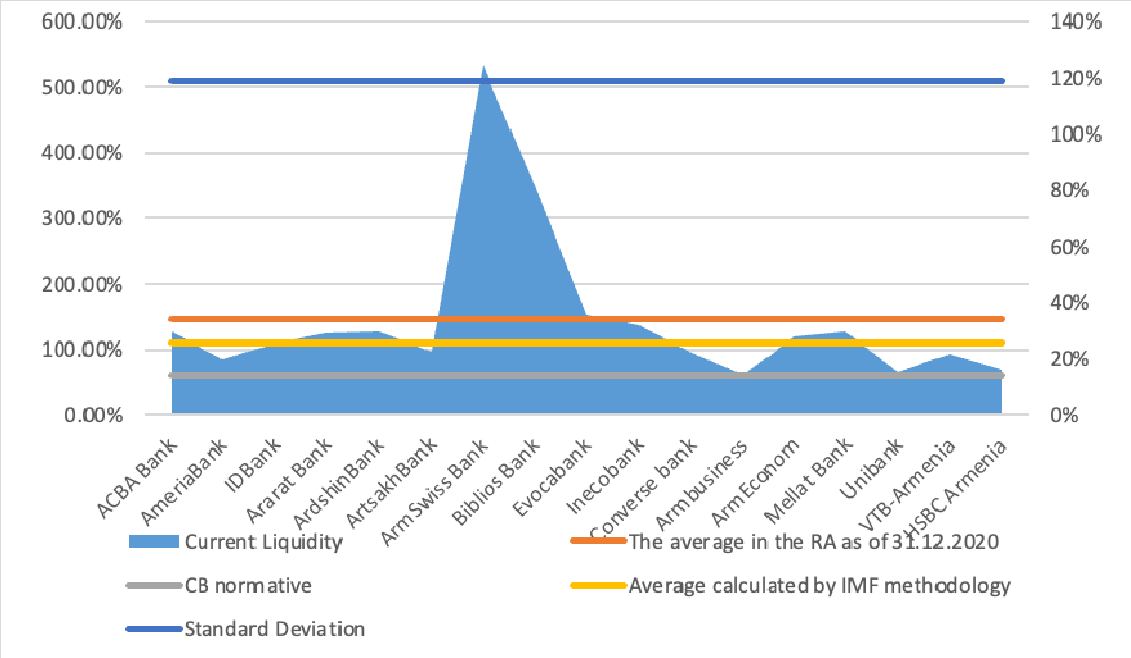
In the table, banks are classified into 3 rating levels, where. The z-score indicates the sensitivity and resilience of a bank's capital to profitability fluctuations and instability. In other words, a low score indicates the probability of the bank going bankrupt. The most important thing here is the standard deviation of profitability, because the smaller the deviation, the smaller the denominator, therefore, the fluctuation of profitability does not pose a risk in terms of capital absorption.

The analysis shows that HSBC Bank has the lowest score in the ranking- only 14.16 points, while Ameriabank, which falls behind in capital adequacy ratio - has 178.91 points. The reason is that for 16 quarters Ameriabank has been able to (I) record only positive profitability of assets (II) and most importantly, it manages to keep that indicator within the historical average, thus having a standard deviation close to 0. Whereas HSBC Bank recorded one of the lowest asset profitability rates in the 1st, 2nd, and 4th quarters of 2017, reaching - 2.58%. This was the reason why the bank's assets decreased significantly in 2017 and 2018, because of which the bank's profitability index became more sensitive.

Speaking of the HSBC bank's low score and its risk concentration, two important things are noteworthy. (I) the Bank has not paid dividends for the past 5 years to achieve a relatively stable level of capitalization; (II) In accordance with IFRS 9, the Bank classified securities at fair value through other comprehensive income, which resulted in a higher level of profit for the Bank. Thus, considering these facts and holding other things constant, the z-score of the bank may be even less at a later stage.

If we look at Figure 1, where we represent and compare the current liquidity ratio for the 17 Armenian banks, we can notice that the standard deviation in the whole banking sector in terms of current liquidity was more than 120%, while the HSBC Bank current liquidity rate was 70.45%. Moreover, it was significantly lower than the market averages calculated by both the Central Bank and the IMF methodology, indicating a certain inability of the bank to repay its demand deposits with liquid assets. The bank was able to record a high index only in comparison with the indicators of ArmbusinessBank and Unbank, while banks with almost the same level of capital adequacy as HSBC, such as ArdshinBank and Ameriabank, recorded current liquidity of 126.17% and 85.32%, respectively.

Figure 1. *The current liquidity ratio monitored by the Central Bank of Armenia for 17 Armenian banks in the 4th quarter of 2020*



The data were taken from the RA banks' normative reports for the 4th quarter of 2020, the rest of the data were calculated by the author based on the information provided by the Central Bank of Armenia.

This again indicates that even though financial stability indicators are higher than the regulatory requirements, we still need more information for evaluating the stability of the banks and banking sector rather than talking about the absence of financial instability.

We argue that banks need both an "interest-based" and a "fee-based" revenue model in the context of two key discoveries, namely the z-score analysis and market concentration study. The larger banks keep expanding their market shares, especially in an environment of intense competition where low market share institutions perform poorly because they do not have poor access to technologies compared to the big ones. Therefore, besides actively conducting macroprudential policy, the CB needs to focus on promoting financial technologies. To be more precise, CB needs to design fintech regulations and create the environment for development. Even though fintech companies are rare in Armenia, the regulation designing part will help the existing banks to rethink their policies and incorporate fintech in their products. The reason why banks may be the ones adapting the new technologies has some reasons behind, such as economies of scale, higher profitability, and the business models that the international accounting standards, which are discussed in more detail in the following paper "*P2P lending: Risks, opportunities and regulation perspectives*" (Kalantaryan, H.).

Conclusions

Because of Armenia's general macroeconomic position, banks are continually exposed to shocks. While this does not limit all banks' ability to withstand stress, it does affect some banks' ability to do so. According to the Herfindahl-Hirschman index, the banking industry in Armenia is highly competitive but decentralized, and banks with small portfolios should take the risk of utilizing technological opportunities rather than relying solely on conventional methods to improve their financial situation. The Central Bank should support this trend by developing and enforcing fintech regulations.

The Z-score analysis made it possible to score Armenian banks according to the profit instability and the risk of capital absorption. As a result, the least concentration of risk levels and the highest rating points have Ameriabank, Unibank and Ardshinbank whereas HSBC, VTB and Armbusinessbank have the highest risk of bankruptcy. This rating helped us to understand that the existence of indicators above the normative set by the CB does not yet give a comprehensive image of the bank's financial stability, as some low-scored banks had a higher capital adequacy ratio in the fourth quarter of 2020 than Ameria and Ardshin banks.

The strongly competitive banking system in Armenia makes it difficult to generate profits. The capacity to attract customers, then the reduction of non-interest costs should be a priority, which can be done with the introduction of robot consultants, offering digital products and most importantly, a more comprehensive risk analysis of the big data provided by the open banking system.

The reduction of interest and non-interest costs, a more effective scoring model, and, most importantly, the inclusion of high-risk borrowers in bank portfolios without accounting for that risk on the balance sheet will increase profitability and decrease volatility in profitability. This will also increase market segmentation.

As a concluding statement, the study assisted us in examining Armenia's financial stability by using other elements and methodologies in addition to the financial stability indicators used by the IMF or the CB of Armenia to gain a better understanding of actual financial stability. The goal of the article was to demonstrate that financial stability is not just about the absence of financial shocks, but also about the banking industry's capacity to operate effectively in the face of mounting risks that could affect it in the event of a crisis.

References

1. **The World Bank**, Global Financial Development Report 2019/2022 https://www.worldbank.org/en/publication/gfdr/gfdr-2016/background/financial-stability
2. **Schinasi Garry J.** Defining Financial Stability, 2004, p. 10
3. **Čihák M., Hesse H.,** Islamic Banks and Financial Stability: An Empirical Analysis, 2008, p. 7 https://www.imf.org/external/pubs/ft/wp/2008/wp0816.pdf
4. **KPMG**, General description of the banking sector of Armenia, p. 25
5. **Central Bank of Armenia,** 2017-2020 financial stability reports
6. **International Monetary Fund,** Financial Soundness Compilation Guide, 2019
7. **Qamruzzaman Md.,** Analysis of Performance and Financial soundness of financial institution (Banks): A Comparative Study, Research Journal of Finance and Accounting, 2014
8. **Jakubik P.,** Scoring as an Indicator of Financial Stability, 2010
9. **Doll M.**, Bank concentration, competition and financial stability, 2010
10. **European Central Bank,** Financial Stability Analysis, 2013
11. **Muraleedharan D.,** Modern Banking: Theory and Practice, 2014
12. **Lekshmy Sh.,** Banking Theory and Practice, 21st Edition, 2013

Appendix 1: *The degree of centralization of the Armenian banking system according to the Herfindahl-Hirschman index*

Bank	The volume of loans, One thousand AMD	Share, %	The square of the share
Ameriabank	696,495,523	17.30%	299.45%
Armbusinessbank	641,806,452	15.95%	254.27%
Ardshinbank	591,662,800	14.70%	216.09%
ACBA	297,883,711	7.40%	54.77%
Converse bank	229,317,136	5.70%	32.46%
Inecobank	216,462,240	5.38%	28.92%
VTB Armenia bank	200,747,026	4.99%	24.88%
Armeconombank	194,529,341	4.83%	23.36%
Unibank	156,793,269	3.90%	15.18%
Araratbank	148,106,248	3.68%	13.54%
HSBC Armenia bank	143,745,937	3.57%	12.75%
Armswissbank	123,185,926	3.06%	9.37%
Artsakhbank	116,542,309	2.90%	8.38%
Evocabank	111,716,348	2.78%	7.70%
ID Bank	97,427,551	2.42%	5.86%
Byblos bank	39,321,912	0.98%	0.95%
Mellatbank	19,177,781	0.48%	0.23%
Total	**4,024,921,510**		
Herfindahl-Hirschman Index	1008.17		

Compilation of the table and the calculation of the index was carried out by the author based on the interim financial reports of the Armenian banks for the 4th quarter of 2020.

Сдана/Հանձնվել է՝ 15.08.2022
Рецензирована/Գրախոսվել է՝ 29.08.2022
Принята/Ընդունվել է՝ 05.09.2022