The Impact of COVID-19 and 44-day Artsakh war on the dynamics of banking system stability indicators of Armenia

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Քովիդ-19 համավարակի և 44 օրյա Արցախյան պատերազմի ազդեցությունը ՀՀ բանկային համակարգի կայունության ցուցանիշների դինամիկայի վրա

Մինասյան Դավիթ Գ.
Ինֆորմատիկայի և վիճակագրության ֆակուլտետի ասպիրանտ
Հայաստանի Պետական Տնտեսագիտական Համալսարան (Երևան, ՀՀ)
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Ամփոփագիր. Սույն աշխատանքում կներկայացվեն Քովիդ-19-ի և քառօրյա պատերազմի ազդեցությունները բանկային համակարգի կայունության վրա:
COVID-ը լավ հայտնի է ամբողջ աշխարհում, բայց Արցախյան 44 օրյա պատերազմը միջազգային մակարդակով այդքան էլ հայտնի կարող է չլինել: 2020 թ-ի սեպտեմբերի 27-ից նոյեմբերի 10–ը Ադրբեջանը հարձակում է գործել պատմական Հայաստանի մաս հանդիսացող և Հայաբնակ Արցախի վրա: Պատերազմը աղետալի էր, քանի որ հազարավոր զոհեր եղան 2 կողմերից էլ (մոտ 4000 հայկական կողմից և շատ ավելի Ադրբեջանական կողմից), մշակութային ժառանգություններ ոչնչացվեցին Թուրքիայի և Ադրբեջանի ագրեսիվ և նացիստական դիրքորոշման պատճառով և Արցախի տարածքների ահռելի հատվածներ անցան ադրբեջանի կազմ:
ՀՀ բանկային համակարգում առհասարակ նկատվում է կայունության բավականին լավ ցուցանիշներ և եթե դիտարկենք ՀՀ ԿԲ բանկային համակարգի ցուցանիշների վերլուծությունը, կտեսնենք, որ բանկերը կատարել են իրենց պարտականությունը, տրամադրել են վարկային արձակուրդներ, ապահովել են եկամտաբերություն: Սակայն հետաքրքրական կլինի առանձին ու կարևոր ցուցանիշների դինամիկայի վերլուծությունը և դրանց փոփոխության խորքային ուսումնասիրումը: Բանկերի կայունության դիտարկման համար ուսումնասիրվել է համախառն վարկերի ու ավանդների, փոխարժեքի դինամիկան, ինչպես նաև բանկային կայունության ցուցանիշները՝ շոկերից առաջ և հետո: Օգտագործվել է միջին ամսեկան աճի տեմպերը՝ որպես համեմատության հիմնական ցուցանիշ:
Բացի ՀՀ ցուցանիշների վերլուծությունից, աշխատանքում ընդգրկվել է նաև ՀՀ նորմատիվային ընդհանուր կապիտալի հարաբերությունը ռիսկով կշռված ակտիվների ցուցանիշի համեմատությունը այլ երկրների միևնույն ցուցանիշի հետ և դրանց հիման վրա կառուցվել է կոռելյացիոն մատրից:
Շոկերի ազդեցությունը բոլոր ցուցանիշներում ակնհայտ է, և՛ պատերազմի, և՛ քովիդի հետևանքով գրեթե բոլոր ուսումնասիրված աճի տեմպի ցուցանիշները ունեցել են նվազման միտում:
Վարկերի բոլոր տեսակներում գրանցվել է նվազում՝ բացառությամբ Հիպոթեքային շուկայում, որտեղ քովիդի հետևանքով չնչին նվազում է եղել աճի տեմպերի միջին ցուցանիշում, իսկ պատերազմից հետո աճի տեմպը գրեթե չի թուլացել:
Հանգուցաբառեր՝ Բանկային համակարգ, կայունություն, Քովիդ-19, 44 օրյա պատերազմ

Влияние пандемии COVID-19 и 44-дневной войны на динамику показателей устойчивости банковской системы Армении

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Аннотация. В этой статье будет представлено влияние 44-дневной арцахской войны и COVID-19 на стабильность банковской системы Армении.
Пандемия COVID-19 хорошо известена во всем мире, но 44-дневная арцахская война на международном уровне, увы, малоизвестна. Ранним утром 27 сентября 2020 года Азербайджан без объявления войны напал на Арцаха, который является исторической армянской территорией и населён более чем на 98% армянами. Война продолжалась до 10 ноября и была катастрофической, так как тысячи людей были убиты с обеих сторон (около 4000 с армянской стороны, гораздо больше со стороны агрессора), разрушена инфраструктура, из-за нацистской армяноненавистнической позиции Турции и Азербайджана было уничтожено культурное наследие, а значительная часть Арцаха отошла под контроль Азербайджана.

Если мы посмотрим на анализ показателей банковской системы Республики Армения, то увидим, что банки выполнили свой долг, предоставив кредитные каникулы и обеспечив рентабельность во время пандемии COVID-19. Однако индивидуальный динамический анализ отдельных индикаторов позволяет более глубоко изучить их изменение. Для мониторинга стабильности банков изучалась динамика валовых кредитов и депозитов, динамика обменного курса, а также показатели стабильность банков до и после шоков. Среднемесячный темп роста использовался в качестве основного показателя сравнения.
Помимо анализа показателей Республики Армения, работа также включает соотношение совокупного нормативного капитала Республики Армения к отношению активов, взвешенных с учетом риска, к аналогичному показателю других стран.
Влияние шоков заметно по всем показателям, и индикаторы по-разному реагируют на изменения до и после 44-дневной войны и COVID-19. В случае кредитного рынка, снижение произошло по всем видам кредитов, за исключением ипотеки, где наблюдалось небольшое снижение средних темпов роста за счет COVID-19, а после войны темпы роста даже не ослабли.
Ключевые слова: Банковская система, стабильность, COVID-19, 44-дневная война

Introduction

The assessments of the stability of the banking system are presented in the report of the Central Bank of Armenia. They are very important for building the country's banking system, confidence in the financial market in general, as well as for monitoring banking stability. In the last 2 years, the strongest shocks took place both for Armenia and the whole world, one of which was the coronavirus, and the other was the 44-day Artsakh war. It will be interesting to find out how the Armenian banking system reacted to the banking shocks and showed flexibility, as a result being able to ensure profitability.

It is also possible to understand what factors influenced the banking system to be able to withstand such shocks, to secure the demand for credit and liquidity.

Literature review

Decision-makers in financial development often have to make choices in the development of sustainability. For many reasons, there are limitations that often prevent us from expanding our access to credit, as not all of us are creditworthy and can bear credit. This has been proven many times during financial crises. However, banks do not have to have restrictions on the expansion of deposits and insurance, on the contrary, the diversity of deposits and more financial inclusion can be a guarantee in times of crisis and increase confidence in banks.

In times of financial stress, depositors, especially large depositors, are the first to come to the banks in a panic and withdraw their deposits. In accordance with the law of large numbers, large write-offs of deposits can be mitigated if bank deposits are more diversified, and for that it is necessary to ensure greater involvement of the adult population in bank deposits.

A country survey was conducted, and digital analysis of panel series in 95 countries also showed that the availability of bank deposits could significantly reduce the withdrawal of bank deposits from banks. In addition, the banking stability index calculated from the studied models with a z-score was the next most significant factor. As a result, it is very important for banks and states to realize that the wider use of bank deposits can be a powerful weapon to increase the flexibility of bank financing, and strengthen financial stability[**4**].

According to the results of the Central Bank's financial stability report, which includes the data as of 30.04.2021, an economic and financial decline was registered in Armenia due to the impact of two main shocks: war and coronavirus epidemic, which resulted in a 7.7% decline in the Armenian economy.

At the same time, the banking system was able to maintain the continuity and smoothness of lending to the economy. As a result, the loans / GDP ratio was 63.2% and loans increased by a total of 15%.

Coronavirus also carries with it a number of credit risks, as mortality and disease rates rise among the population, and many people lose their jobs or become temporarily unemployed, which is a great stress for banks. That is why the credit rating, according to the Central Bank's annual report, has increased in 2020.

The activity of the banking system is assessed as stable, i.e. banks are able to absorb potential risks, and capable of lending to the economy [**2**].

The impact of COVID-19 on the financial position of the economy and enterprises is quite different from country to country, and is especially strong in countries and regions where the revenue structure is focused on tourism and services that are directly supplied to customers, micro, small and medium-sized enterprises that are managed or run by minorities (including women). It is true that the impact of COVID-19 is gradually diminishing, but this does not mean that the extraordinary losses caused by non-performing loans will disappear. There is still a danger that due to the increase in mortality, the application of new restrictions, the restriction of economic activity, as well as the early or late withdrawal of local assistance policies, their

volumes may increase. Numerous studies have been conducted on whether banks are able to maintain capital limits (TCR, CET1), one of which was conducted in Central and Eastern European countries (CESE). Research shows that most of these countries are able to meet capital requirements, have adequate capital, and are willing to withstand a 12% increase in non-performing loans. However, there is a difference in the regions, how the countries respond to the shocks. The countries in the European Union are less sensitive to the excessive growth of non-performing loans, as a result of which they are better and have less non-performing loans during the repayment period. In countries outside the European Union, banks also maintain capital limits, but in this case there is already a risk that they will not be able to attract new loans in the future, and will not be able to eliminate the effects of non-performing loans. It, in turn, will cause new credit risks.

The impact of non-performing loans is particularly large on the profitability of banks, which is the reason why many banks record negative income. For large banks it is easier to maintain their profitability than for smaller banks [**5**].

Research Methodology

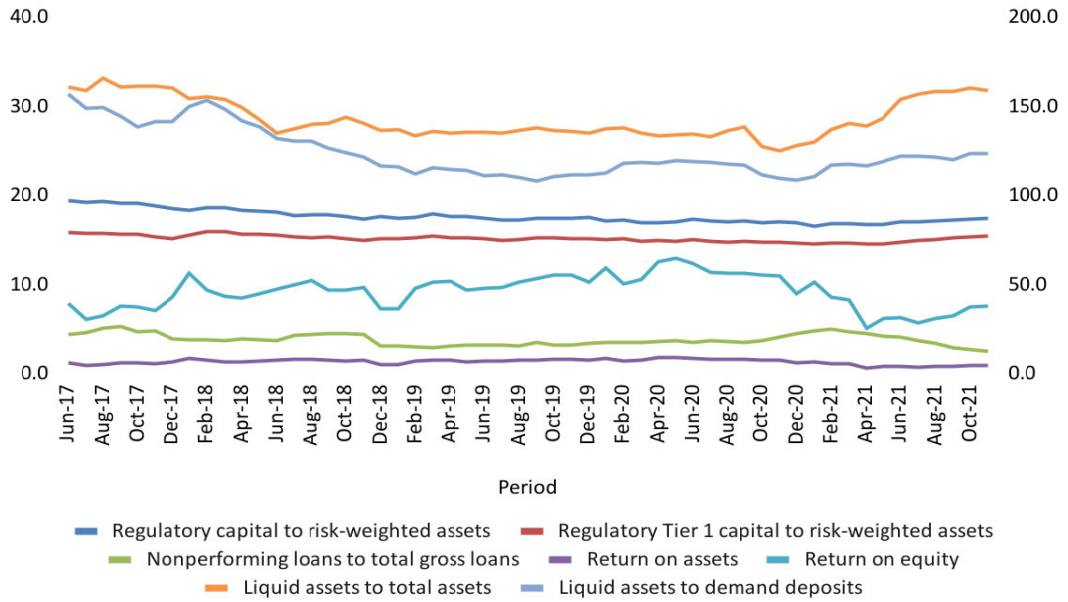
The study was conducted on the basis of comparative analysis by comparing the average growth rates before and after COVID-19 and 44-day Artsakh war, by comparing equal periods before and after the shocks. The data is collected from the websites of the Central Bank of Armenia and International Monetary Fund. To study the change in the growth rates of banking stability, the period from January 2017 to October 2021 was considered. In the second stage of the analysis is observed the ratio of total regulatory capital to risk-weighted assets, which is taken from the IMF website. The comparison was made both by studying the graphs of the dynamics of the indicators and by constructing a correlation matrix with the Python.

The coronavirus crisis hit the world economy very unexpectedly and aggressively, leaving unspeakable consequences that continue to this day and will continue to have an impact for a long time. Financial institutions face large-scale risks, both transactional and financial, as well as in terms of labor retention [**7**]. According to the Wall Street Journal, banks have not had as many logistical challenges since the 2001 terrorist attacks as they did under COVID-19. The large-scale closure of businesses dealt a severe blow to the credit market, as did other corporate debt businesses. Reducing interest rates will also reduce revenues [**6**].

To understand globally the dynamics of the banking system of the Central Bank of Armenia during the shock months, let us take the indicators of financial stability [**1**] monitored by the Central Bank of Armenia and study their dynamics before and after COVID-19, as well as before and after the 44-day Artsakh war.

1. I001-Regulatory capital to risk-weighted assets
2. I002-Regulatory Tier 1 capital to risk-weighted assets
3. I0042-Nonperforming loans to total gross loans
4. I0061-Return on assets
5. I0071-Return on equity
6. I010-Liquid assets to total assets
7. I011-Liquid assets to demand deposits

Chart 1: *The dynamics of banking stability indicators* [**10**]



Here we see the change and dynamics where in the right axis is presented only Liquid assets to demand deposits ratio, as it has higher rates than others.

Let's calculate the monthly average of the above-mentioned indicators before COVID-19 and compare the results after COVID-19 from January 2020 to October 2021, i.e. we have 19 months and we have to compare with the results from March 2018 to see the change of indicators.

Table 1: *Banking Stability Indicators Before and After COVID-19* [**10**]

Indicator	Before COVID	After COVID	Before War	After War
Regulatory capital to risk-weighted assets	17.7	17.1	17.1	17.0
Regulatory Tier 1 capital to risk-weighted assets	15.3	14.9	14.9	14.8
Nonperforming loans to total gross loans	3.6	3.9	3.6	4.0
Return on assets	1.5	1.3	1.6	1.5
Return on equity	9.6	9.4	11.6	10.6
Liquid assets to total assets	27.7	28.0	27.1	26.0
Liquid assets to demand deposits	121.0	117.3	118.1	111.9

The period from January 2020 to October 2021 was considered for calculation of these indicators, and for the comparison, the period preceding the same number of months was taken (23). As a result, we see a decrease in the indicators: I001: -0.7, I002: -0.4, I0042: +0.3, I0061: -0.2, I0071:-0.4, I010: + 0.3, I011: -2.8. These results show that the COVID-19, however, had an impact on banking stability, which indicates that the fluctuations in the indicators are mainly decreasing. Growth was registered only in I0042, which is also negative indicator and shows the growth of non-performing loans, but at the same time, the relative ratio of highly liquid assets has increased in the list of total assets. During the three months following the war, the negative dynamics of all indicators was registered, including the index of highly liquid assets.

Let's also explore the dynamics of credit indicators by sectors:

As it is known, mortgage and consumer loans have the largest share of loans. The share of consumer loans has risen considerably in recent years and continues to rise, but with the coronavirus, some declines have been registered, at least in some specific types of loans. As for the types of loans where no decline was registered, we had a decrease in the growth rates of crediting volumes, that is, some of the changes can be concluded by studying the growth rates. In order to make the comparison of lending clearer, let us consider the growth according to the types of loans, as well as the growth according to separate indicators taken at the average value.

Chart 2: *Historical Dynamics of Loans per Segment* [**12**]

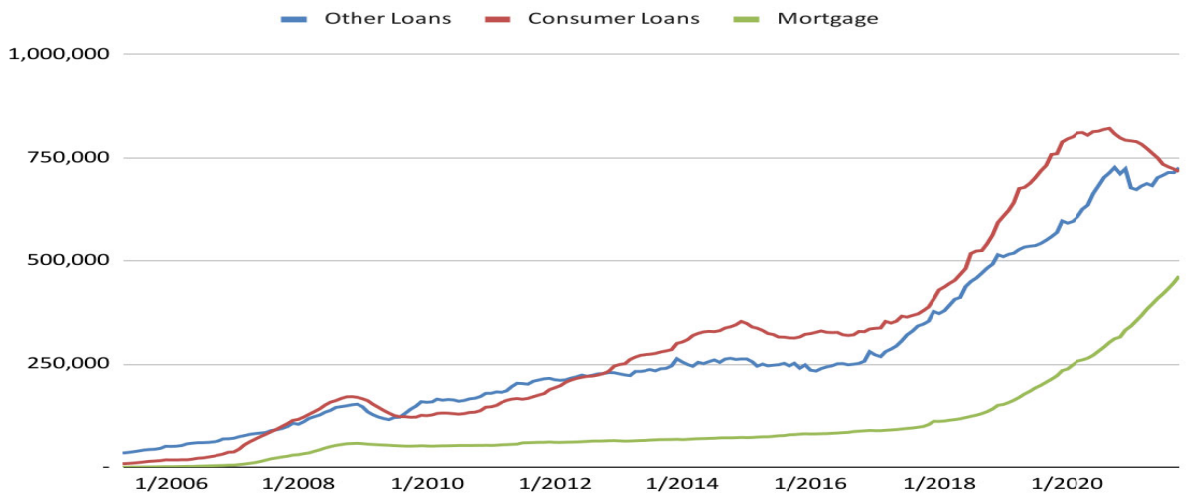


Chart 3: *Aggregate Loans per Segment* [**12**]

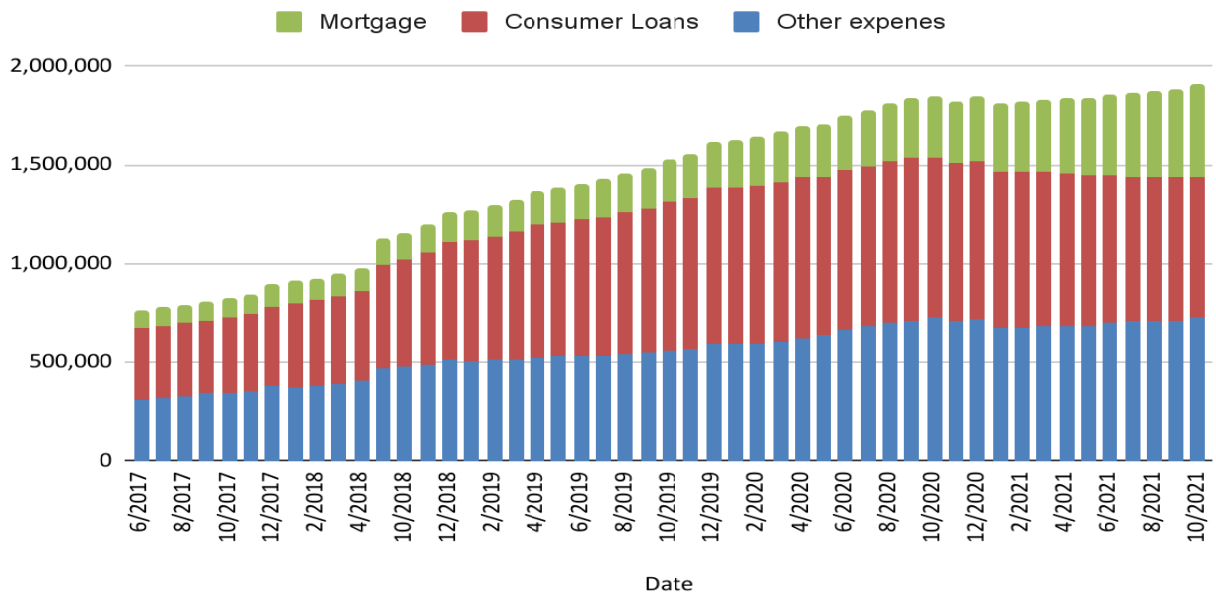


Table 2: *Change in average loan growth rates before and after the COVID-19* [**12**]

	Consumer loans	Mortgage	Other loans
Before COVID	2.88%	3.34%	2.13%
After COVID	-0.41%	3.13%	0.88%

It is clear from the table that there have been significant changes in lending, and credit growth rates have decreased in the post-Covid period, the average monthly growth rate has decreased by 3.29 percentage points for consumer loans, by 0.21 percentage points for mortgages and 1.25 percentage points for other types of loans.

Before the war, the average monthly growth rate also shows that we had a decrease in consumer loans by 2.18, in other loans by 1.9 percentage points, while in mortgage loans, on the contrary, there was an increase, which can be linked to financing through state income tax and increased demand for housing due to the war.

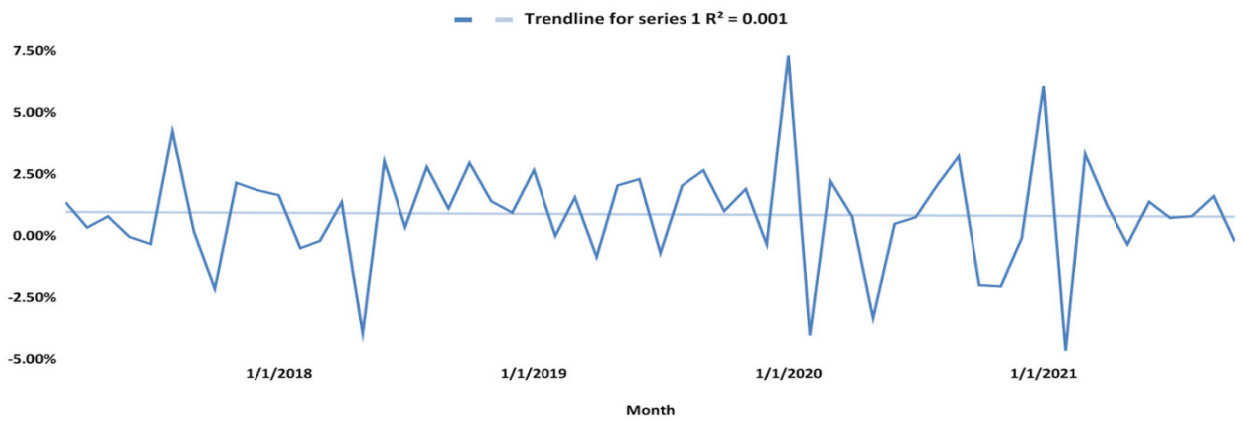
Table 3: *Change in average loan growth rates before and after the War* [**12**]

	Consumer loans	Mortgage	Other loans
Before War	1.14%	3.30%	2.06%
After War	-1.04%	3.34%	0.16%

The analysis of deposits is also quite significant, as it will become clear from the dynamics of deposits how much the population has withdrawn their cash from the banks, i.e. whether the demand for cash has increased.

To find out, let's look at the dynamics of deposits using the same methodology.

Chart4: *The growth rates of Armenian deposits from 2017* [**12**]



It is obvious from the above graph that we have obvious changes in the structure of deposits and from January 2020 downwards fluctuations are increasing, and the general trend is downward as well.

Table 4. *Decrease in the average monthly growth rate of deposits after Covid* [**12**]

	Deposits
Before COVID	1.19%
After COVID	0.43%

Table 5. *Decrease in the average monthly growth rate of deposits due to the war* [**12**]

	Deposits
Before War	0.77%
After war	0.70%

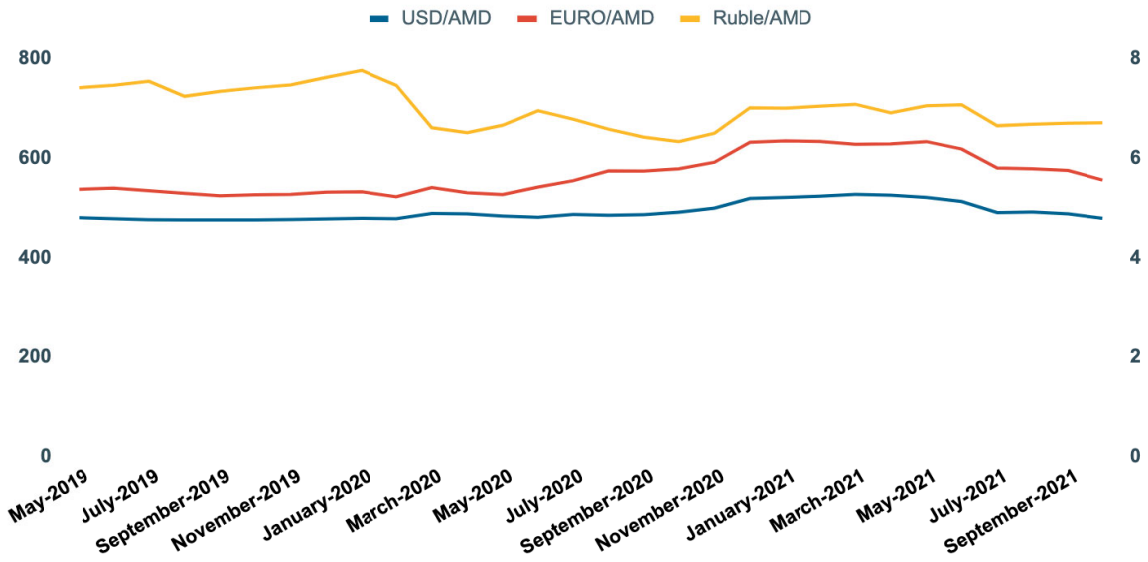
The average monthly growth rate of deposits decreased by 0.76% in the following months of COVI-19.

After the war, the growth rate of deposits also decreased, but not so much, as many shocks had already been registered in 2021 due to the influence of COVID-19.

During the war period a lot of shocks have been registered for the banking system among which are the number of deaths, the creditworthiness of the war participants, the demand for their own funds from the depositors in case of the failure of the banking system. Presumably, these are the main factors that can affect banking stability.

The next important indicator of banking stability is the stability of the country's currency therefore, it is important to observe its behavior under the influence of two major shocks.

Chart 5: *The Dynamics of the Exchange Rates in Dram for 3 Major Currencies* [**11**]



In the left axes are presented exchange rates for EUR and USD, and in the right axes is presented exchange rate of RUB.

A study of the dynamics of these indicators shows that the Ruble exchange rate reacted more to the shocks, while in the case of the Euro and Dollar, everything was relatively more stable. Only in 2021 we had very little fluctuation, and since October the devaluation of the dram has started to be registered in all currencies. This speaks to the negative economic consequences of the war, as well as the loss of confidence in the country's currency as a losing country.

After the COVID, the growth rate of the exchange rate increased in case of the USD and EUR, which indicates the devaluation of the AMD during COVID-19, i.e. the dram exchange rate against the mentioned currencies started to grow on average 0.06% faster in case of USD, and 0.15% in case of EUR.

In case of the RUB, on the contrary, the AMD valuated against the ruble at a faster rate, as the ruble was also quite volatile during the COVID-19 period.

After the war, the average growth rate of the exchange rate of AMD affected more than during COVID-19, as the average growth rate of the devaluation against the dollar increased by 1.21, and against the euro by 1.14 percentage points, i.e. the

dram began to depreciate faster against those currencies;

If during the COVID-19 the devaluation of the dram against the Russian ruble was slower than after the COVID-19, then after the war the dram began to depreciate 2.85 percentage points faster.

Table 6: *Average Monthly Change in Foreign Exchange Rates Before and After COVID-19* [**11**]

	USD	EUR	RUB
Before COVID	-0.04%	0.09%	-0.14%
After COVID	0.02%	0.24%	-0.62%

Table 7. *Average Monthly Change in Foreign Exchange Rate Rates Before and After the 44 day Artsakh War* [**11**]

	USD	EUR	RUB
Before War	0.18%	0.77%	-1.03%
After War	1.39%	1.91%	1.82%

In order to have a more comprehensive and complete picture of banking stability, it will be interesting to study the changes in the banking stability indicators of other countries as well, to understand whether there is a correlation or not.

Chart 6: *N1 I001 Comparison of norms by countries through correlation matrix* [**9**]

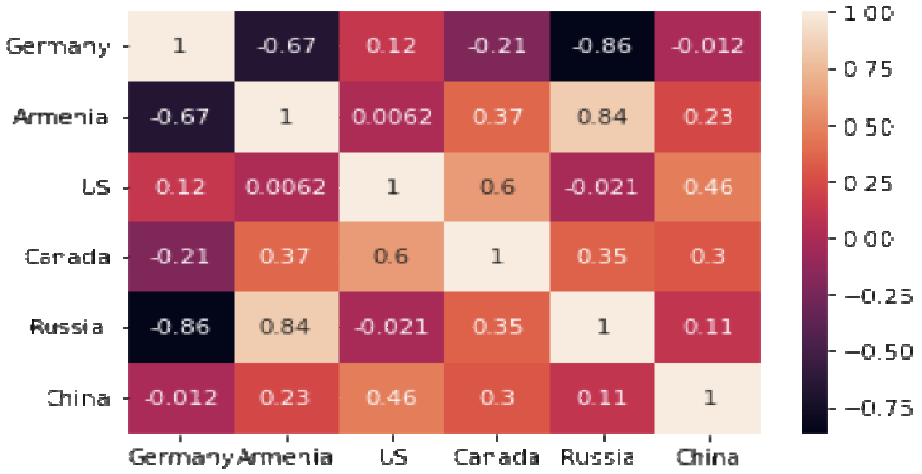
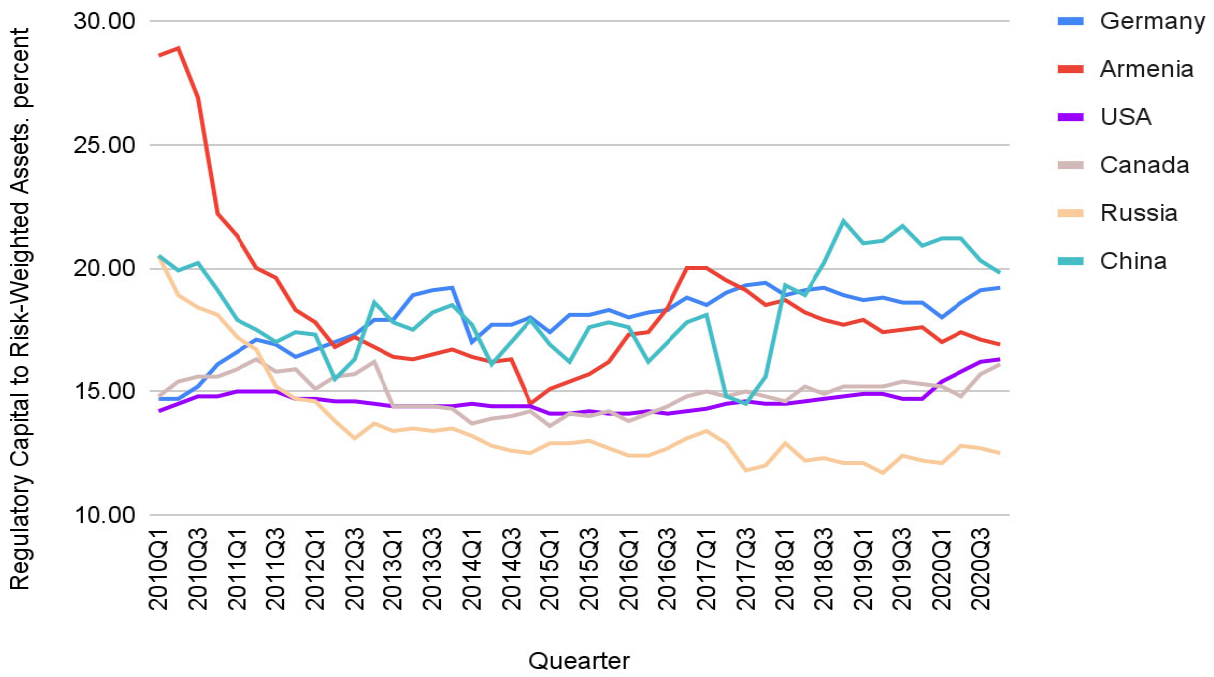


Chart 7: *Ratio of regulatory total capital to risk-weighted assets* [**13**]



In the above graph, the ratio of total regulatory capital to the risk-weighted assets of Armenia is compared with the indicators of observed countries. The data is taken from the website of the International Monetary Fund.

We see that in Armenia the index has started to decrease more sharply from the second quarter of 2017 than in other comparable countries, and in the observed period there has been no recovery, while in other countries it has taken place. The index of Armenia most often repeats the dynamics of the index of Russia, and with the time series of the index of Germany there is a significant negative correlation, which can be connected with the devaluation of the dram against the euro. The other correlations are not significant.

Conclusions:

The banking system of the Armenia was able to maintain its stability during the war and COVID-19, but the strong shocks nevertheless had a major impact on all the indicators of the banking system and there were shocks and declines.

There were shocks in the growth rate of loans and deposits, and growth rates have started to slow down, the exchange rate began to depreciate against the dollar and euro after COVID-19, and gained value compared to the ruble due to sharp fluctuations in the ruble, and after the war dram depreciated against the ruble as well.

Comparison of financial stability with the indicators of Germany, Russia, China, USA and Canada shows that the banking system of Armenia is less stable than in developed countries and follows the dynamics of Russia and China, also is affected by shocks more: showing low recovery phase.

According to the correlation matrix, the stability index of the Armenian financial system is mostly connected with Russia, and was in reverse dependence with Germany.

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