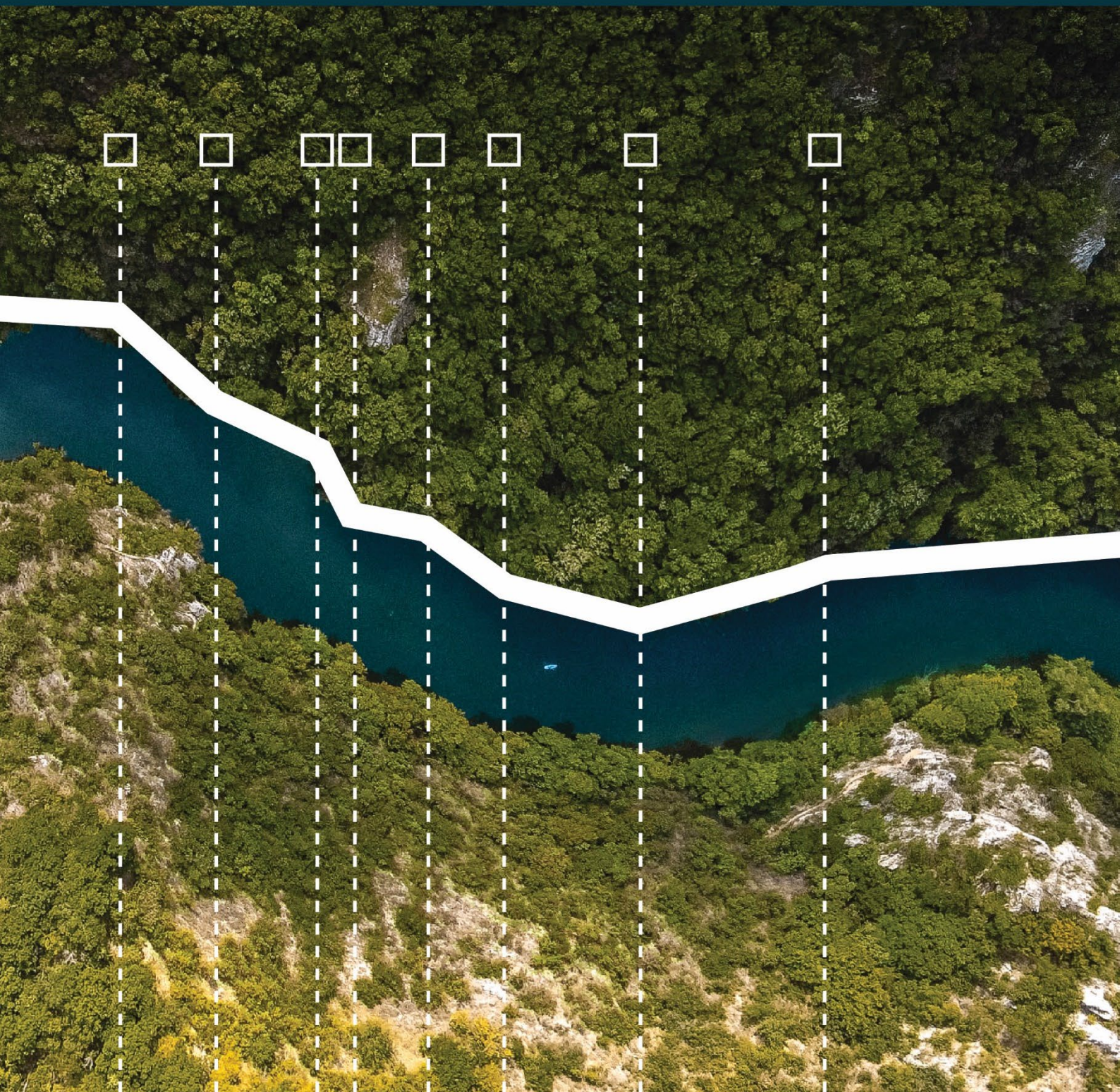
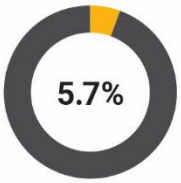
Central bank
of the Republic of Armenia

Financial Stability Report 2021



Financial Stability Report 2021

Armenia records economic growth, amid the recovery of aggregate demand.



Real economic growth

The loan portfolio of the banking system decreased, while the number of new loans granted increased.

Loans/GDP

Loan portfolio

Growth in new loans

The quality of the loan portfolio improved significantly.

Share of non-performing loans

The countercyclical capital buffer remained at 0%, allowing the banks to ensure lending continuity.

The banking system is stable, able to absorb the probable risks and maintain the continuity of lending.

17.2%
Capital adequacy

32.0%
Total liquidity

194.3%
LCR (Liquidity coverage ratio)

This Financial Stability Report presents an assessment of potential risks that could threaten the financial system stability of the Republic of Armenia, risk impact directions and assessments, as well as the capacity of the financial system to absorb or mitigate such risks.

More detailed information on Armenia's macroeconomic environment is available in the Status Report on Monetary Policy Implementation.

Previous publications of the Financial Stability Report as well as Monetary Policy Implementation Status reports are available on the official website of the Central Bank of Armenia: www.cba.am.

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Financial stability is one of the primary objectives of the Central Bank of Armenia along with price stability. Financial stability is a crucial element of overall macroeconomic stability and an essential precondition for stable long-term economic growth.

Financial stability can be characterized as the concurrence of financial and macroeconomic conditions at a time when the financial system (i.e., financial institutions, markets and infrastructure) is capable of withstanding probable shocks and instability, minimizing the probability of interruption of intermediation function.

In defining financial stability, the potential risks endangering the stability of the financial system because of internal and external macroeconomic developments, as well as their possible sources are monitored and assessed. As a result of the comprehensive analysis of these risks and assessment of their potential impact on financial stability, an appropriate policy is developed and implemented.

INTRODUCTION

The ***Financial Stability Report*** of the Central Bank of the Republic of Armenia is published annually and incorporates the assessment of risks that might potentially threaten the stability of financial system as well as hamper the capacity of the financial system to withstand such risks. Through the publication of information on financial stability developments, the Central Bank aims at soliciting the attention of the stakeholders on those risks and eventualities that might jeopardize the financial stability of the Republic of Armenia, as well as present the policy to manage and reduce those risks.

Financial stability and price stability are components of overall macroeconomic stability and effectively complement each other. Volatility of the financial system can hamper the implementation of effective monetary policy and impede long-term and sustainable economic growth. Concurrently, macroeconomic stability, including price stability, helps to reduce the risks to financial stability. The financial system plays an important role in the overall economic system, and it is essential that the financial system maintains the continuity and stability of its processes, thus contributing to the natural/normal growth of the economy.

In order to identify risks endangering financial stability timely, the Central Bank of the Republic of Armenia conducts continuous monitoring and analysis of both the financial system and general macroeconomic developments. The report presents the risks in the macro-environment and the financial system, their impact on the development of various sectors of the economy and financial system, as well as the implemented macro prudential policy.

Economic and non-economic risks affecting the financial stability of the Republic of Armenia may arise in the domestic macro-environment, in the external economy, and in the financial system itself.

Based on the above, the potential risks threatening the financial stability of the Republic of Armenia are presented in the report in the following main directions:

- risks derived from developments in the global economy,
- risks derived from developments in the macroeconomic environment of Armenia,
- risks derived from developments in the financial market of Armenia,
- risks derived from the financial institutions of Armenia,
- risks derived from the financial infrastructure of Armenia.

The report presents accumulation of risks in these areas and their possible impact on the development of all sectors of the economy and financial system, as well as macroprudential policy of the Central Bank of Armenia, the regulation and infrastructure surveillance, aimed at addressing the above-mentioned risks. Furthermore, financial stability report mainly emphasizes the risks and development directions of the banking system, as the substantial part about 84% of the assets of the financial system are the assets of commercial banks, therefore, the state of the banking system mainly determines the level of general financial stability and development directions.

NOTICE

The annual Financial Stability Report presents the main patterns of the stability of the financial system of the Republic of Armenia in 2021, the risks and the macroprudential policy measures implemented to ensure the financial stability.

The Russia-Ukraine military and political conflict, as well as the sanctions imposed on the Russian Federation have created unprecedented uncertainties in terms of both global and regional financial and economic developments, jeopardizing the prospects for global economic growth outlined at the beginning of the year. The adverse effects on the world economy will largely depend on the duration of hostilities and sanctions. The world economy that has just entered the stage of overcoming the negative effects of the COVID-19 pandemic, is today on the verge of new challenges. This will further deepen the disruption of world trade chains. Rising prices for energy, grain, metals, and a number of other commodities will contribute to the general inflationary environment in the world economy, while the growing uncertainties in the financial and business environments will impact negatively the global economic growth.

In the current situation of rapidly shifting developments and uncertainties, the Central Bank of the Republic of Armenia has undertaken a more operative monitoring and analysis of financial and economic developments, while implementing the necessary policy tools.

Regarding the access to infrastructure, a challenge was the disconnection of some Russian banks from the SWIFT system. In this given situation, the Armenian commercial banks have started conducting their transactions through Russian banks that still have access to the SWIFT system. At the same time, commercial banks can exchange information on financial transactions through alternative means, which can ensure the processing of financial transactions in the future.

In terms of the impact on the economic growth of the Republic of Armenia and on the developments of the financial system, the potential risks are derived from the global and regional macroeconomic outlook and the related uncertainties. If materialized, the possible consequences can be the reduced external demand for goods and services produced in Armenia, as well as the decrease in cash inflows. However, in recent years, the dependence of the Armenian economy on remittances from individuals has significantly decreased, accompanied by a substantial reduction in the share of remittances from Russia in total.

In the given situation, due to the high level of uncertainty and the possible adverse effects on the economic activity of the Republic of Armenia, credit risk of the financial system may increase. It should be noted that the financial system of the Republic of Armenia is characterized by a high level of liquidity at present and is able to ensure the usual course of financial intermediation.

EXECUTIVE SUMMARY

In 2021, the financial system of the Republic of Armenia managed to ensure the continuity of the financial intermediation function, in the context of economic recovery and the uncertainty due to the spread of new waves of the pandemic. During the year, the volume of new loans provided to the economy by the banking system increased compared to the previous year. Deposits grew with relatively high pace, completely recovering to the pre-war level already in the first quarter of the year. No significant tightening of lending conditions by the financial system was recorded during the year.

The credit portfolio of the banking system has decreased, mostly due to the relatively weak demand for credit in the economy. The shrinkage in the loan portfolio was also facilitated by the reasoned materialization of credit risk driven by the shocks of the previous year, and by the decrease of the loan portfolio equivalent in AMD as a result of the appreciation of the Armenian dram. If the exchange rate effect is excluded, the annual growth rate of the total loan portfolio is near to zero.

The share of mortgage loans in the structure of total loan portfolio provided to households has increased as a result of continuous high growth rates of mortgage loans in recent years. Given the decreasing consumer loans and high growth of mortgage loans, the share of the latter in the structure of the households' loan portfolio has increased significantly. The steady high growth rate of mortgage loans in recent years is mainly due to the implementation of state program of loan interest refunds from the income tax of the borrowers. Concurrently, those high growth rates of mortgage loans contain signals of possible excess of lending or risky lending, which was addressed by the Central bank with the introduction of Loan-to-value (LTV) ratio instrument.

The quality of the loan portfolio improved, along with the recovery of economic activity and the reduction of credit risk. The share of non-performing loans in total loans has decreased significantly by the end of the year and is now at a historically low level. Moreover, a decrease in the share of non-performing loans was registered in all major types of loans. The average credit losses decreased, compared to the previous year, nevertheless remaining at a high level compared to the non-stress years.

The capital adequacy and liquidity indicators of the banking system improved during the year. The banking system has continuously maintained its capital adequacy higher than the required minimum levels, providing preconditions for absorbing possible losses and ensuring continuity of operations. As a result of the progressive growth of the deposit portfolio compared to the loan portfolio, the banking system's liquidity has been continuously improving.

The record of the banking system yields was quite low in the beginning of 2021, conditioned by the adverse effects of the previous year's shocks. The profitability of the banking system started to somehow recover during the second half of the year. The low level of profitability of the banking system in recent years is due to the reduction of the net interest margin conditioned by deepening competition, as well as the more frequent recurring shock events, which lead to increased credit losses.

The low level of profitability remains one of the main challenges of the Armenian banking system, having a restraining effect on the investment potential of the system development and capacity expansion. Given the rapid growth of financial intermediation in recent years and the ever-deepening

competition, the improvement of profitability through the extensive growth of banking portfolios and scale effect can no longer be considered as the only basic direction necessary to ensure return. Therefore, it is critical that the financial system of the Republic of Armenia implements qualitative and tangible changes in intermediation, ensuring continuous enhancement of the system digitization, the proposed toolkit and risk management systems.

The macroprudential policy pursued by the Central Bank was aimed at maintaining the continuity of lending to the economy and further improvement of the currency liquidity buffers. The countercyclical capital buffer was maintained at 0% during the year, which was based on the developments in the credit market and the position of the Armenian economy on the financial cycle. During the year, the developments in lending by main sectors were not homogeneous, rather obviously high growth rates of lending were recorded only in the field of mortgage loans. To effectively address the risky developments in the mortgage and real estate market, the Central Bank has introduced a macro-prudential instrument of the Loan-to-value (LTV) ratio, which has been in force since April 2022.

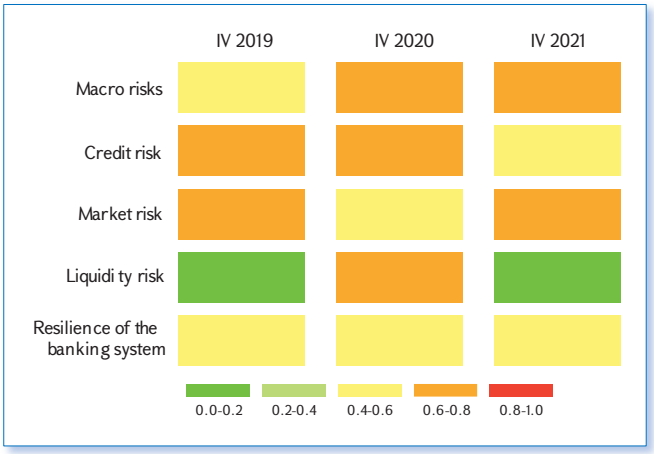
To further strengthen the currency liquidity buffers, the foreign exchange component of the reserve requirement continued to increase, because of which the currency liquidity of the financial system was at an unprecedentedly high level at the end of the year.

1. MACROPRUDENTIAL DASHBOARD

The macroprudential dashboard[1] consists of two main sections, namely, risk sources threatening the financial stability and the system's risk resilience: the risk absorption capacity.

The section describing the risks *represents systemic risks by sources and their accumulation, given that in case of risk materialization, the stability of the system will be threatened. The section that characterizes* ***risk resilience of the system****, represents the ability of the system to absorb risks, i.e., the availability of liquidity and capital buffers.*

Macroprudential Dashboard



Compared to the end of the previous year, a decrease in the accumulation of risks in some risk groups was recorded in this year, which was largely conditioned by the economic recovery in the world and in Armenia, as well as the materialization of accumulated risks.

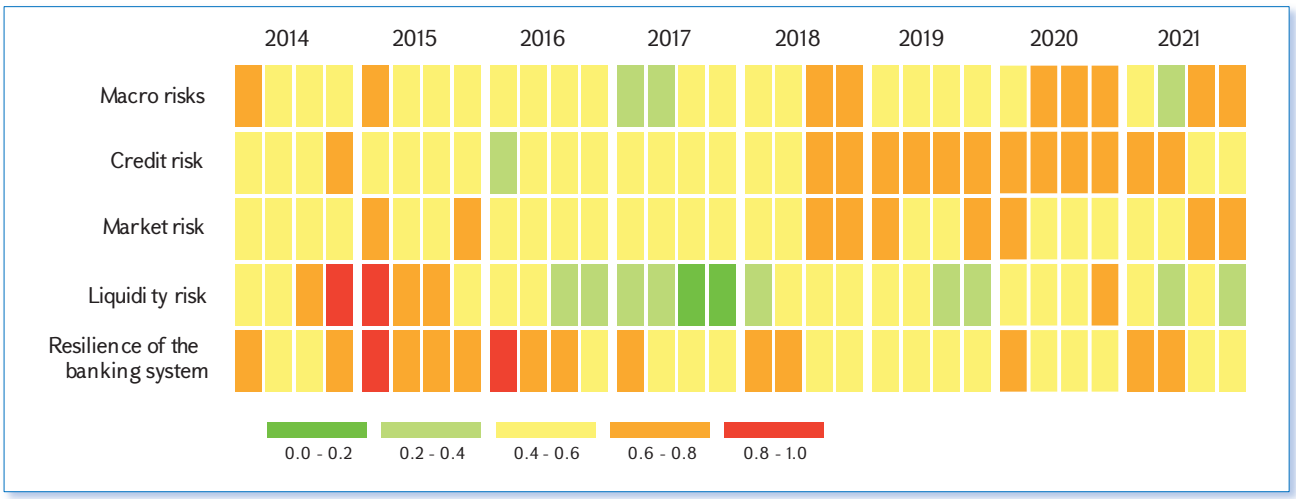
The ***macro risk composite indicator*** remained unchanged. The economic recovery recorded during the year, the improvement of the current account under the increase of remittances and external demand indicates a decrease in the accumulation of risks. On the other hand, the acceleration of inflation and the growth of public debt offset the positive impact of the above factors on the composite index of macro risk. (For details, please see "Macroeconomic Developments" chapter).

A decrease in the accumulation of risks was observed for the composite ***credit risk*** indicator, which was conditioned by the decrease in the growth rate of corporate credit investments and consumer loans. It is noteworthy that the growth rate of consumer lending continued to be in the green zone, reflecting the materialization of risks accumulated in previous years, as well as the still relatively low level of new

[1] *The macroprudential dashboard consists of 23 indicators (See Annex 1) aggregated in 2 main groups: the sources of risks and the risk-absorption capacity. The indicators have been equated by comparable moderation; the harmonization of the indicators has been achieved through the Gaussian kernel function of cumulative distribution, so that normalized indicators lie between the range of 0 to 1. The 5 colors of the dashboard represent the division of (0,1) range to 5 equal portions. Red color indicates the highest risk, while closer to the green color indicates risk reduction. The evaluations are updated and calculated quarterly.*

accumulations. However, the accumulation of credit risk has been maintained in mortgage lending because of continuing high growth rate of mortgage loans. The household loans to gross national disposable income and the banking system leverage ratios also signal high risk accumulation. The persistent growth in banks' leverage ratio parallel to the slow recovery of incomes in the economy, ceteris paribus, can contribute to the increase in the debt burden of borrowers (for details, please see the section "Household debt and risks").

During the year a decline in the accumulation of some risks was observed



The increase in the accumulation of the ***market risk*** was conditioned by the raise in real estate prices and growth rates of foreign exchange loans during the second half of the year (for details, please see the section "Real Estate Market Trends and Risks").

The improvement of the ***liquidity risk*** accumulation indicator is mainly conditioned by the growth of liquidity prudential indicator, which, in its turn was due to the increased investments in liquid assets in the conditions of decreasing credit growth rates. (For details, please see "Risks of the Financial System and Infrastructure" subchapter "Liquidity Risk" section).

The composite indicator of risk-absorption capacity of the financial system did not change. Given the materialization of risks accumulated in previous years, the profitability ratios of banks decreased. The negative impact of the decline in profitability ratios on the composite indicator of risk absorption was offset by the positive impact of the contributions to non-performing loans ratio. As a result of several shocks in 2020, the credit risk losses accumulated in previous years materialized. Therefore, no new wave of credit losses is expected in the short term. Due to the recovery of credit growth in the future, some improvement in banks' profitability ratios and further strengthening of risk absorption capacity are expected. (For details, please see "Risks of the Financial System and Infrastructure" subchapter "Capital Adequacy and Profitability" section).

The macroprudential dashboard comprehensively reflects the main observations and findings of the following chapters of the report.

2. MACROECONOMIC DEVELOPMENTS

2.1. DEVELOPMENTS IN THE EXTERNAL ENVIRONMENT

During the year, despite the recurring waves of the pandemic, the world economy recovered, which was accompanied by disruption of production chains and longer-than-expected maintenance of supply constraint factors. The fiscal and monetary measures of the countries to stimulate the economic recovery and mitigate the negative effects of the shocks have provided a positive result this year, being more tangible in the countries where the vaccination process was successful.

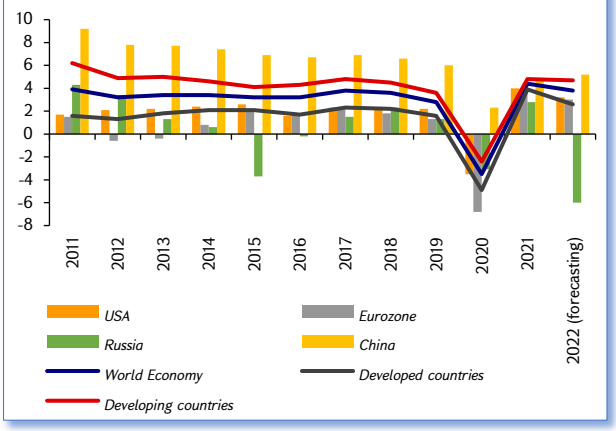
The course of the development of the world economy in the short term will be conditioned by the timestamp of hostilities and the applied sanctions, as well as by the appropriate resolutions of the fiscal and monetary policies implemented by the countries.

The upturn of the global economy[2] , in its turn, has had a positive impact on the Armenian economy in terms of strengthening households, household income balances, and the debt service.

According to the latest IMF estimates, the global economic growth in 2021 reached 5.9% (See Chart 2.1). It should be noted that the economic growth rate is lower than the forecast done in the first half of the year, mainly due to the rapid spread of new waves of the pandemic, as well as uncertainties in overcoming it. During the year, the expansionary policy tools of fiscal and monetary policies were constrained, while the possibility of their further use is restricted. The limited opportunities to implement expansionary fiscal and monetary policies reduce the further positive impact of these policies on economic growth. For 2022, the global economic growth is assessed to be 3.6%, which was downgraded by the IMF in April, considering the effects of the Russian-Ukrainian conflict.

Positive economic developments were recorded for the main partner countries of the Republic of Armenia compared to the previous year, however, uncertainties related to further developments remain. The economic recovery was mainly conditioned by the factors of the positive impact of the active vaccination process, as well as the implemented expansionary fiscal and monetary policies. According to estimates, in 2021 the economic growth of the USA was 4.7%, the Eurozone; 2.6%, and Russia; 6.7%[3].

Chart 2.1. Economic growth indicators by regions



Source: IMF.

[2] *For more detailed information, please see the Inflation Report. https://www.cba.am/Storage/AM/downloads/parberakan/DVQ/Monetary%20policy_I_2021.pdf*

[3] *For details see: https://www.imf.org/en/Publications/WEO/Issues/2022/04/19/world-economic-outlook-april-2022*

According to the CBA forecasts, economic recovery in 2022 in the main partner countries of Armenia, will be largely conditioned by the duration of the military conflicts and sanctions thereof.

In the context of the economic recovery in the partner countries of the Republic of Armenia, the inflow of remittances to the Republic of Armenia has grown, a significant increase in the volume of exports of goods and services has been recorded as well.

The recovery in global demand, along with supply constraints, has contributed to higher international energy and commodity prices. Prices have risen to high levels given the continuous growth of demand conditioned by expansionary economic policies, as well as by slow growth of supply amid production chain disruptions in the commodity markets.

The upward trend in commodity prices continued in the first half of 2021, due to optimistic expectations on the recovery of the world economy, which slowed down in the second half of the year due to specific factors in certain markets. Copper prices have recorded a similar behavior. In the first half of the year, the high demand of the Chinese industry contributed to the rise in prices in the copper market. The rise in prices slowed somewhat in the second half of the year, conditioned by the control of the Chinese government over copper reserves, because of which excess copper entered the market. The rise in international oil prices has been fueled by OPEC statements on supply, as well as the slowdown in US oil production and the slow growth in supply.

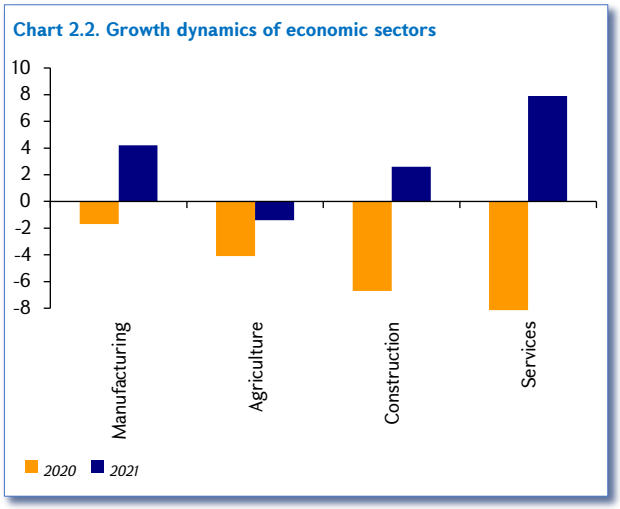
In terms of responding to the crisis, the monetary authorities have continued to take measures to maintain a low interest rate environment, provide liquidity, and acquire assets. It should be noted that the expansionary monetary policy has been applied mainly by all countries, however, already at the end of the year the announcements of tightening monetary conditions prevailed. Developed countries have maintained large-scale economic sustenance through fiscal policy throughout the year, while many developing countries reduced fiscal support along with a slowdown in the spread of the pandemic.

The presented developments of the external sector in 2021 have reduced the risks for the internal macro-financial environment of the Republic of Armenia, contributing to the growth of the external demand. The high level of uncertainty about the further development of the world economy continues to prevail, given the current geopolitical developments.

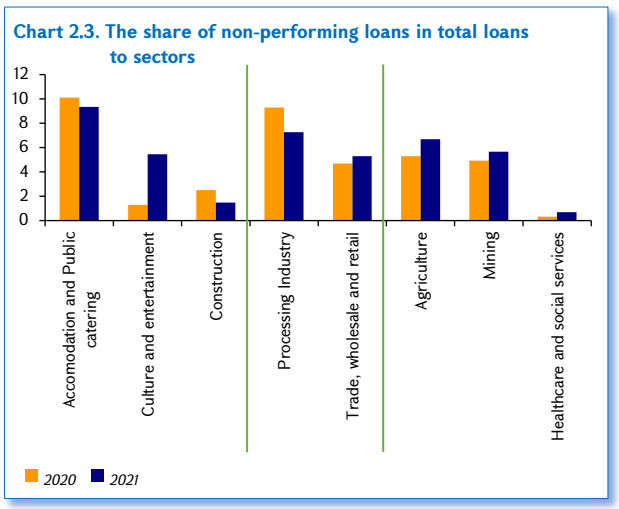
2.2. DOMESTIC DEVELOPMENTS

The economic growth was restored in Armenia in 2021, after the economic downturn of the previous year. The economic developments of the Republic of Armenia were formed in the conditions of continuous recovery of the world economic activity, growth of the external demand, as well as the maintenance of the high level of the international copper prices. Given the active process of vaccination against COVID-19, as well as avoidance of strict anti-pandemic restrictions, the impact of successive waves of the pandemic on the Armenian economy was weaker. In the conditions of relatively favorable external and internal developments in 2021, the economic growth of Armenia made 5.7%.

In the first half of the year, economic growth was mainly due to the rapid recovery of domestic demand, which was due to the acceleration of private consumption and the reduction of private savings. In the second half of the year, the growth was due to the external demand, which, in its turn was conditioned by the restoration of tourism and the growth of exports.



Source: SCRA.



Source: CBA.

The biggest positive contribution to the economic growth was the growth of the service sector, which was again due to the weakening of anti-pandemic conditions, the abolition of restrictions on movement and the growth of tourism. Growth was also recorded in manufacturing and construction sectors. The manufacturing sector recorded a rather high growth in the first half of the year, but due to uncertainties of policies and investments in the sector, a decline was registered in the second half of the year. The decline in the agricultural sector continued due to the reduction of the crop sector, which in its turn was based on unfavorable weather conditions.

The recovery of lending to the economy by the financial system is still lagging the previous years' volumes for two main reasons. The first is that the risks accumulated in previous years materialized in 2020 due to the shocks, because of which a decrease in the loan portfolio was observed. Secondly, though lending was restored to some extent in the conditions of economic growth, the existing uncertainties have still a restraining effect on both the supply by banks and the demand for lending by the economy. The growth rates of lending in the current year will depend on the recovery of the economic activity of the Republic of Armenia, and the impact of uncertainties related to the geopolitical developments.

As a result of the materialization of losses from credit risks, as well as maintaining the continuity of lending, the quality of loan portfolios was improved in all sectors of the economy. No accumulation of new risks is observed in the conditions of weak growth in lending.

In terms of gross demand, the annual economic growth was mainly supported by the growth of private consumption in the first half of the year, and by the state expenditures and the high rates of net exports in the second half.

In 2021, under the recovery of global demand, the current account was improved: the growth rates of exports of goods and services of the Republic of Armenia exceeded the growth rates of imports of goods and services.

Current account deficit / GDP ratio remained low and amounted to 3.7% during the year.The latter was conditioned by accelerated growth of export volumes in relation to imports in the context of the economic recovery in partner countries and the elimination of migration restrictions, as well as the maintained growth of net remittances of individuals.

The state support measures to neutralize the economic and social consequences of the pandemic and of the war, along with the slow recovery of economic activity continued to contribute to the growth of public debt.

During the reporting year, the public debt increased by 6.4%, amounting to 63.4% of GDP, while the public debt / GDP ratio decreased compared to 67.4% ratio of 2020. It should be emphasized, that the volume of domestic debt increased at a higher rate (24.3% year-on-year), while the external debt increased by 1.5%, which is in line with the announced public debt management strategy. However, the current debt portfolio of the Government of the Republic of Armenia carries a relatively high foreign exchange risk, as most of the debt is borrowed in foreign currency, which contains additional risks in terms of a possible increase in debt service costs[4].

2.3. HOUSEHOLD DEBT AND RISKS

The debt burden of households slightly decreased during the year. On the one hand, this was resulted by the increase in incomes in the conditions of economic activity recovery, on the other hand, by the modest growth of lending to households. A structural change has taken place in the loan portfolio of households. As a result of the decline in consumer loans and the growth of mortgage loans, the share of the latter has increased significantly.

The indicators of unemployment and average monthly wages have both improved amid economic activity, job recovery in tourism sector, and extenuation of severe restrictions on international travel. The unemployment fell by about 3 percentage points to 15.3[5]%, while average nominal wages increased by 7.6%, with the private sector growing faster than the public sector at 8.4% and 5.2%, respectively.

Chart 2.4. Structure of household liabilities

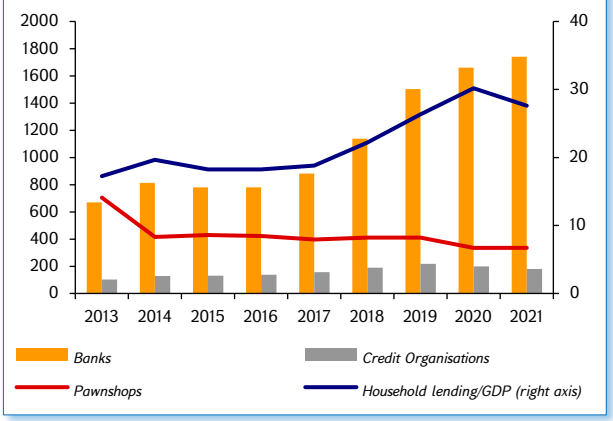


Chart 2.5. Changes in remittances, migrant workers' remuneration, wages and unemployment

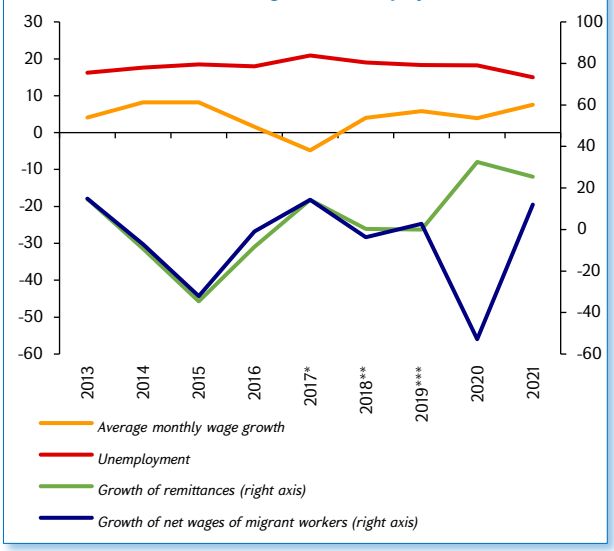
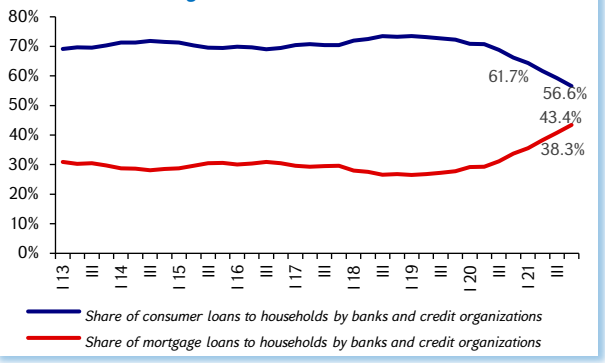


Chart 2.6. Structure of lending to households by banks and credit organizations



** Calculated using the new methodology,*
*** 2018 Since January 2010, the Statistical Committee of the Republic of Armenia has reviewed the methodology of labor market statistics, within the framework of which the values of a number of indicators have been changed. Accordingl to the last updates, the average nominal salary refers to entities with more than 1 employee.*
**** Unemployment rate, increase in net remittances and increase in net remuneration of outbound workers are given as of 30.09.2019.*

Source: CBA, Statistical Committee.

[4] *https://minfin.am/hy/page/partqi_razmavarutyun/*
[5] *The unemployment rate was revised to 18.2% in 2020 replacing the previous 17.9% estimate*

The decrease in the debt burden of households is due to the slower growth rates of lending compared to GDP growth. Due to the decrease of households' incomes conditioned by double shocks in 2020, as well as the non-repayment of loans after the credit deferrals, the credit losses partially materialized in the first half of 2021. The low growth rate of lending to households was maintained throughout the year, with some improvement in growth rates observed at the end of the year. During the year, the volumes of newly provided loans were merely equal to 2020 levels. However, this growth was almost offset by the growth of loan write-offs and the Armenian dram's revaluation. As a result, household debt to the financial system increased by 3.3%.

It is noteworthy that the slow growth of both supply and demand for lending was observed throughout the year, becoming more stable only at the end of the year (according to the survey conducted by the Central Bank). The easing of lending conditions, mainly in the second half of the year, was implemented gradually, based on some drop of uncertainties, and strengthening of economic growth expectations. Given this environment, the growth of consumer lending demand was observed mainly in the second half of the year, while the high demand for mortgage lending was maintained throughout the year.

The structure of household liabilities changed, as a result of the decrease in consumer loans and the increase in mortgage loans. Consumer loans fell by about 11% (see Chart 2.6, 2.7) mainly due to the materialization of risks caused by the last year's shocks. According to the survey, the growth rate of consumer loans is slowly recovering, mainly due to the deterioration of creditworthiness of customers, the tightening of conditions for some consumer loans by banks. In parallel with the easing of lending conditions for consumer loans, there was an expansion of the range of credit products, which contributed to the intensification of consumer lending at the end of the year. The demand for consumer loans was positively affected by the factor of overall economic activity and the growth of demand for durable goods, which is partly due to the growth of new housing purchases.

The high growth of mortgage loans[6] was maintained in 2021, making up 33.6% (31.5% in 2020), conditioned mainly by the factor of the state program of income tax refund in the amount of overpaid interest. In 2021, the turnover factor of the government's discontinuation of the state program has further increased the demand for mortgages. The latter is evidenced by the 39.2% increase in the number of mortgage permits for real estate construction.

Chart 2.7. Mortgage and consumer loand of banks and credit organisations

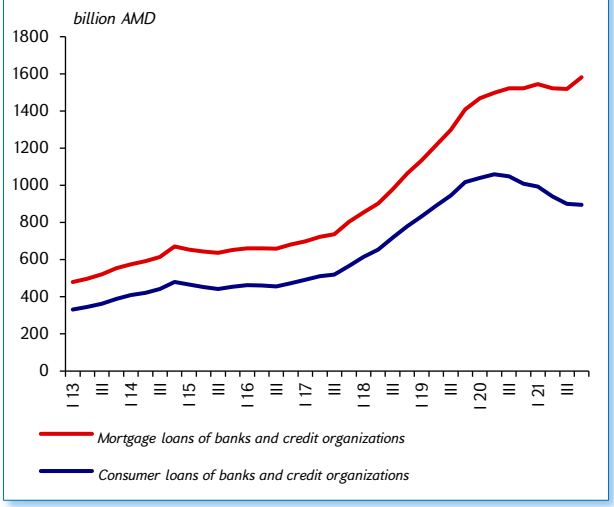
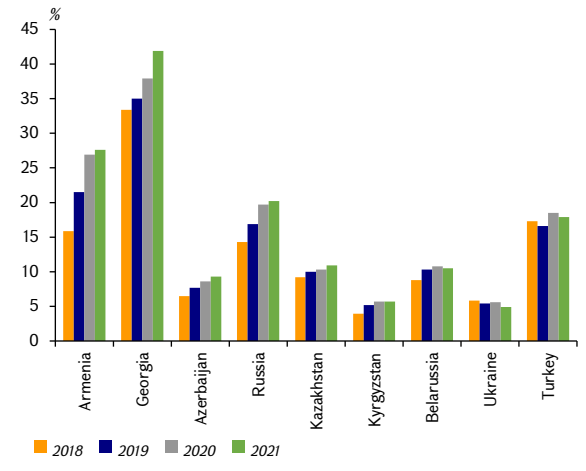


Chart 2.8. Household loans to GDP



** The value of the Household debt / GDP ratio in the chart may differ from the value of the same indicator presented in the report, as to ensure comparability the most recent figures available for the period are used instead of year-end indicators.*
https://www.ceicdata.com/en/indicator/belarus/household-debt--of-nominal-gdp

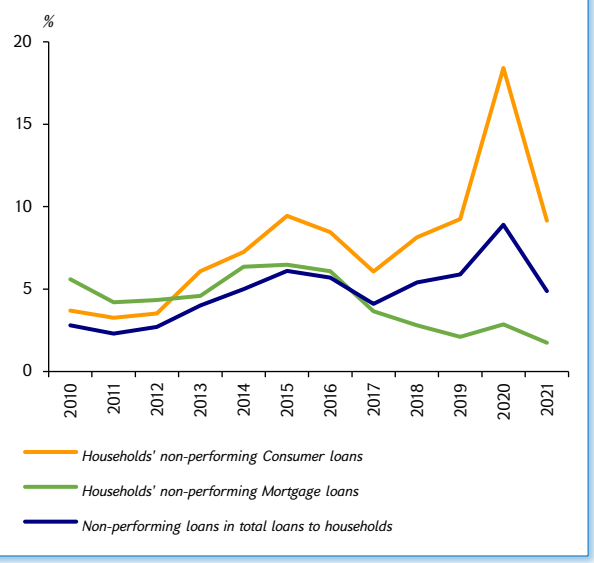
[6] *Including loans issued by commercial banks and credit organizations*

To effectively address the impact of possible risk developments in the real estate market and given the maintained high growth of mortgage loans, the Board of the Central Bank of the Republic of Armenia has decided to introduce a Loan-to-value (LTV) ratio requirement, which is effective from April 1, 2022.

In the case of moderate economic growth and adequate credit growth in 2021, the households' loan[7]-to-GDP ratio fell to around 28% (30.2% in 2020) (see Chart 2.8). This indicator remains high compared to the median of the countries in the region, yielding only to the level of 42% in Georgia.

The growth of mortgage loans in the household debt structure implies an improvement in debt service, in the medium term, as mortgages are longer-term instruments, with a relatively low interest rate, while the factor of the return of interest rate paid proportionately to the income tax persists. However, ensuring long-term sustainable economic growth and reducing the unemployment rate are again key to reducing the stability of the debt service burden in the long run.

Chart 2.9. Dynamics of households' non-performing loans

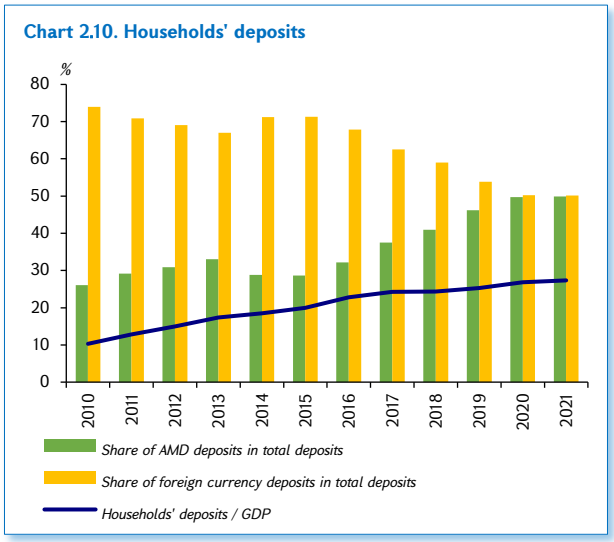


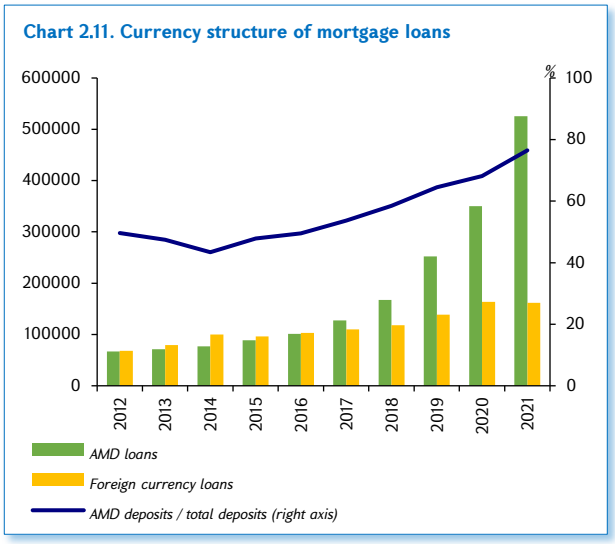
Source: CBA.

As a result of the materialization of risks accumulated in the conditions of high growth of lending in previous years, the quality of credit liabilities to households has significantly improved. The non-performing loans ratio for households decreased to 4.9%, compared to 8.9% in 2020 (see Chart 2.9). Compared to the previous year, the share of non-performing consumer loans in total consumer loans has halved to 9.2% (18.4% in 2020). The share of non-performing mortgage loans has decreased compared to other types of loans and remains low at 1.7% (2.9% in 2020). It is noteworthy that the loans provided after the recent shocks were available to borrowers with higher creditworthiness, who have already overcome the shocks of the previous year and are still considered creditworthy by financial institutions.

During the year, household deposits grew faster than liabilities, which contributed to the reduction of their debt leverage (see Chart 2.10). At the end of the year, the growth of deposits of resident households was 13.5% year-on-year, and the ratio of deposits to GDP was 27.3%. The increase in deposits is mainly due to the cancellation of expenses that could not be incurred under anti-pandemic restrictions and / or could not be postponed. It is noteworthy that this phenomenon is characteristic of almost all countries that have had local anti-pandemic long-lasting restrictions.

[7] *Household loans include mortgage and consumer loans provided to resident households by commercial banks and credit organizations.*





Source: CBA.

In recent years, a shift to dram-denominated savings and borrowings for households was observed, which is positive in terms of mitigating foreign exchange risk. It should be noted that according to the RA legislation[8], consumer loans must be provided in the national currency, and in general the growth of AMD-mortgage loans contributed to this shift (see Chart 2.11). The share of AMD mortgage loans within total mortgage loans was 76.5%, rising by 8.4 percentage points over the previous year. The share of AMD deposits has remained merely unchanged and made up 50% in total deposits at the end of the year.

Households are generally viewed as non-hedged foreign exchange risk borrowers since the share of national currency prevails in their income[9]. The presence of foreign exchange loans in the household debt makes the households vulnerable to the higher levels of debt entailed by exchange rate fluctuations and the risks thereof. The recent year's trend of de-dollarization of loans has had a positive impact on the overall balance of the household risks, contributing to the decrease in the risk entailed by the exchange rate fluctuations.

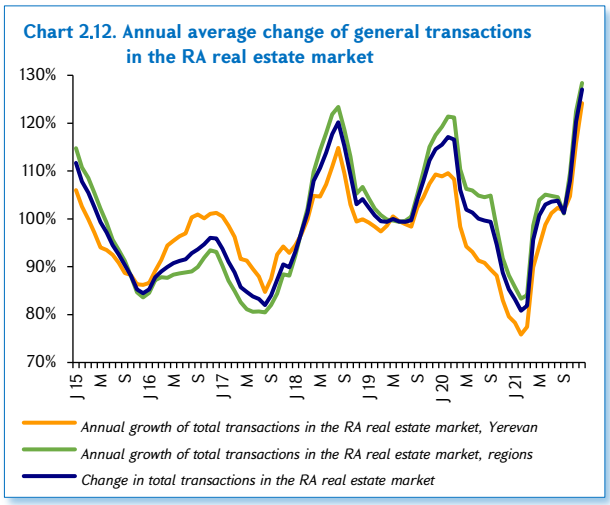
2.4. REAL ESTATE MARKET DEVELOPMENTS AND RISKS

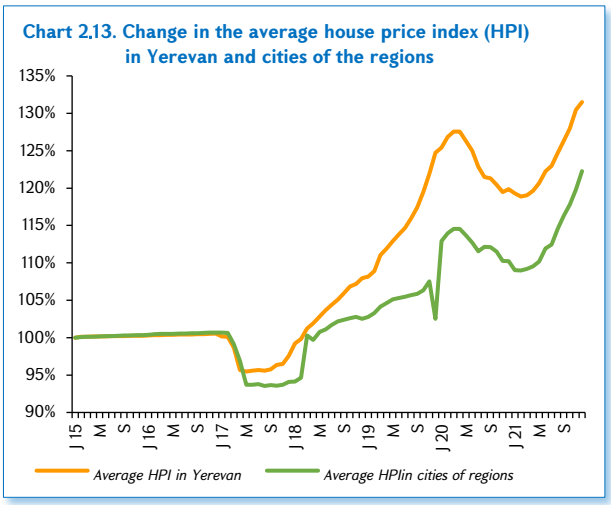
Vulnerability of financial stability to fluctuations in real estate prices is mainly derived from lending to construction and real estate mortgage loans and materialization of risks related to change in collateral value. Sharp fluctuations in real estate supply/demand, and severe price variations thereof, can harm banks' loan security and quality, generating risks to financial stability.

During the year 2021, in the real estate market of Armenia the growth rate of the price index accelerated due to the recovery of economic activity, as well as the factor of the phased termination of the income tax return mechanism. Compared to the previous year, in 2021 there was an increased activity in the real estate market, which was reflected by a 27.0% increase in total transactions, with the most significant increase in multi-apartment residential buildings, where the number of sales transactions increased by 21.4%[10] (see Chart 2.12). By the end of 2021, apartment prices in multi-apartment residential buildings remained

[8] *RA Laws on "Currency Regulation and Currency Control", and on "Consumer Lending".*
[9] *According to the SCRA 2021 Social Snapshot and Poverty in Armenia Report, in 2020, about 90.0% of the average monthly nominal income per capita was denominated in AMD.*
[10] *https://cadastre.am/storage/files/1-hodvac-122021.pdf*

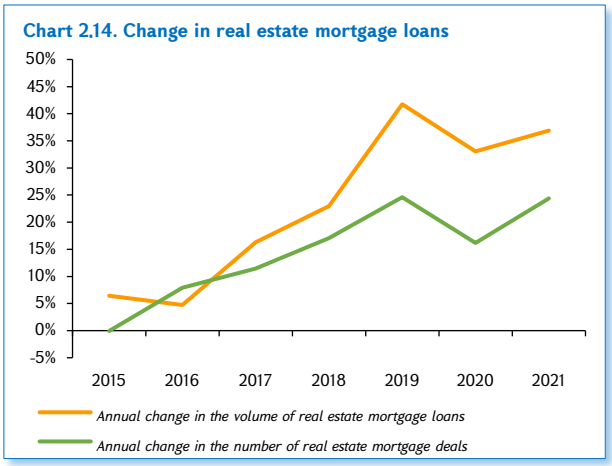
unchanged (see Chart 2.13). In particular, the decrease in the prices of apartments in multi-apartment residential buildings registered in Yerevan[11] in 2020 was maintained until June 2021, then it started growing again, recording 9.7% increase in December 2021.

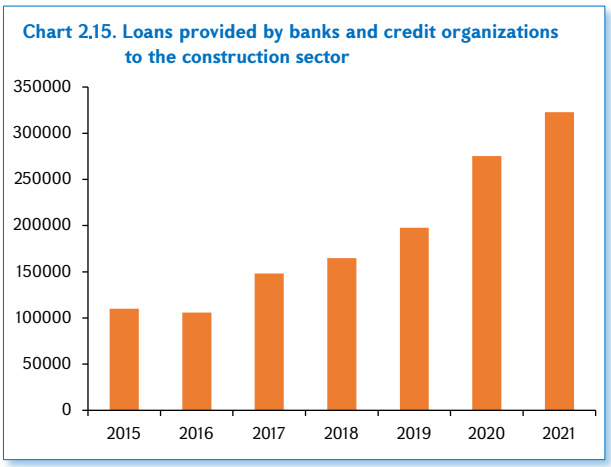




Source: CBA.

In parallel with the recovery of the economic activity and the circulation of news on the change in the mechanism used for income tax refunds, the high growth rate of mortgage loans has been maintained. The current mechanism of repayment of income tax amounts paid proportionate to the amount of interest on the mortgage loan and other implemented state refinancing programs[12] expand the availability and affordability of mortgage lending, not only facilitating lending terms, but also significantly reducing the current debt service burden (especially during the first years of debt service). In 2021, the growth of mortgage loans was further facilitated by the introduction of the initiative of phasing out the income tax return mechanism. During the year, the volume of mortgage loans provided by banks and credit organizations[13] for the purchase of real estate increased by about 37%, while in terms of number of loans the growth was by about 24%. The volume of loans for the construction of residential and non-residential buildings augmented by about 16% (see Charts 2.14 and 2.15).





Source: CBA.

[11] *As there is no single index of real estate average prices in Armenia, the real estate price developments are approximated by the average price index of apartments in Yerevan.*

[12] *The amendments to the RA Law on Income Tax came into force in January 2015, and the state housing support programs for 2020-2023 for families with children have been in operation since 2020.*

[13] *Mortgage loans include the sum of mortgage loans for real estate acquisition, real estate renovation, and real estate construction.*

According to the surveys conducted by the Central Bank of Armenia on credit conditions, the decision to gradually terminate the paid interest rates' refund mechanism correspondingly contributed to the expectations of further price increases formulated in the second half of the year. There has been an acceleration of buyers' decision-making efforts to purchase housing under the existing interest-refund benefits, thus creating disproportionate demand in the real estate market. According to the results of the survey, the banks responded to the growth of demand. Mortgage lending has been facilitated on almost all terms except the lending rate.

The highest activity was recorded in the primary real estate market of newly built apartments, while in the secondary market the activity is still relatively low, especially in the non-residential real estate market. This phenomenon confirms the impact of the decision on phasing out the paid interests' return mechanism.

During the year, the real estate market was exceptionally active, manifested by the acceleration of the growth rate of both number of deals and prices in the sales transactions. The above-mentioned trends in real estate prices and mortgage lending can be considered as signs of possible underestimation of risks, excess (risky) lending, or possible overestimation of real estate prices.

3. DEVELOPMENTS IN THE FINANCIAL SECTOR

3.1. DEVELOPMENTS IN THE DOMESTIC FINANCIAL MARKET

In the conditions of economic and geopolitical uncertainties, and the low investment environment, the developments of the financial market were characterized by growth of interest rates that partially responded to the changes in the interest rate policy of the Central Bank. Along with the growth of demand for liquidity, interest rates on almost all market instruments increased, including those for government bonds. Regardless the depreciation pressures on AMD exchange rate in the first half of the year, the direction changed to revaluation trend in the second half of the year, given the positive economic tendencies and recovery of cash inflows. The Central Bank responded with appropriate tools to the developments in the financial markets, being diligent in its announcements to adequately respond to the cases of deviation from the projected inflationary direction, and the risks related to financial stability.

During the year, developments in financial markets reflected the change of direction of the monetary policy of the Central Bank. High demand for short-term liquidity was formed in the financial market of Armenia in the first half of the year. This was caused by banks' intention to add extra liquidity cushions given the economic and political uncertainties after the 2020 shocks, as well as interest rate growth expectations and changes in the reserve requirement ratio. The Central Bank of Armenia met the demand for liquidity through repurchase agreement (repo) and fine-tuning repo instruments. In addition, banks have benefited from standing facilities to use the Lombard repo instrument (see Chart 3.2).

Overall, the interbank rates were formed close to the Central bank's policy interest rate. However, during some months, short-term interest rates deviated from the policy interest rate because of high liquidity demand (see Chart 3.1).

Chart 3.1. Interest rates for short-term deposits and bonds and refinancing rates

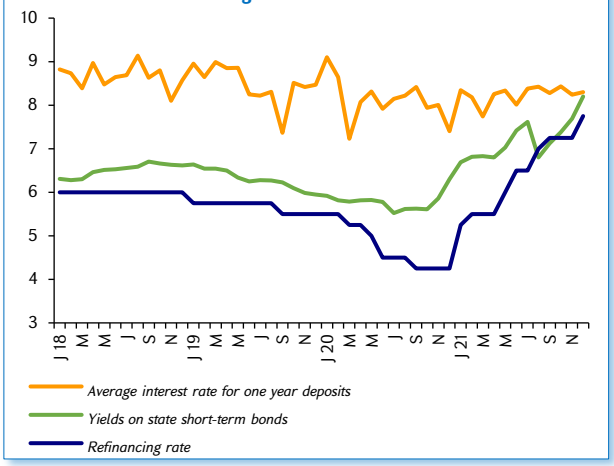
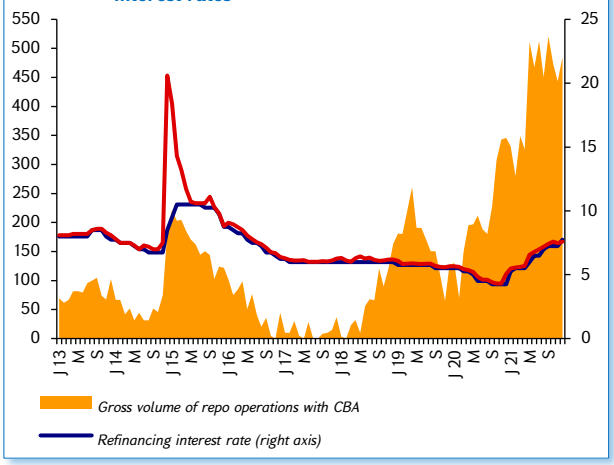


Chart 3.2. Repo agreements with the CBA and their interest rates

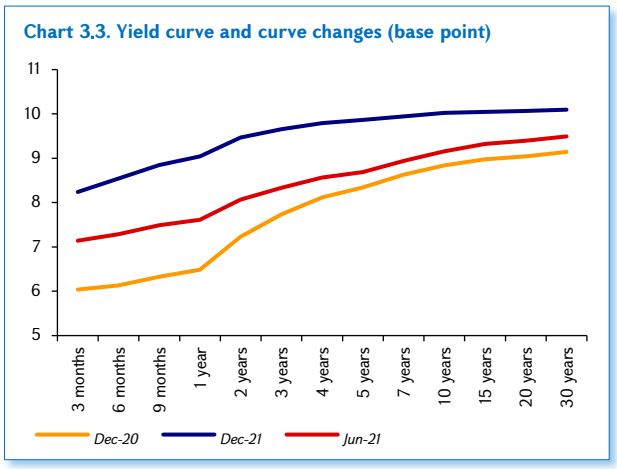


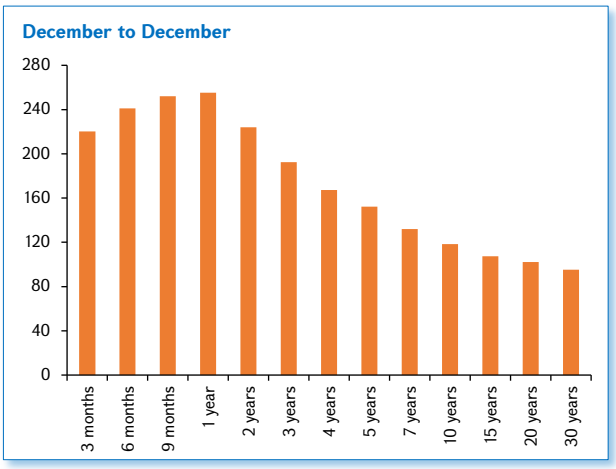
Source: CBA.

During the year, the Central bank of Armenia continuously increased the refinancing rate by a total of 2.5 percentage points to 7.75%, considering the current macroeconomic situation, as well as the expected inflationary impacts from the economy. Compared to December 2020, the monthly average interbank repo interest rate increased by 2.2 percentage points and amounted to 7.25%.

Under the economic and political developments of the year, the country's risk premium in the international capital markets has shown a relatively stable behavior, presenting an opportunity to enter the international financial markets on more favorable terms, if necessary. However, it should be noted that in the event of materialization of the US policy announcements of interest rate hikes, the conditions for developing countries, including Armenia, to attract liquidity from international financial markets may deteriorate.

The events of the year were also reflected in the changes of the yield on government bonds. Given the prudent policy of banks in the credit market, there was an increase in demand for government bonds (as alternative yield assets), but no significant change in the position of the yield curve was recorded during the first quarter. Later, the increase in government bond interest rates was conditioned by the continuous increase of the CBA policy interest rate, as well as by the growth of the supply of issuance. The latter is mainly due to the intention to increase the share of net domestic borrowings in the sources of financing the state budget deficit in line with the medium-term strategy of the Government.

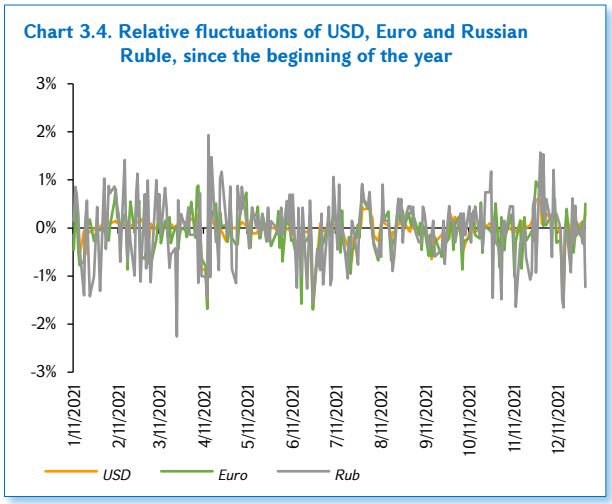




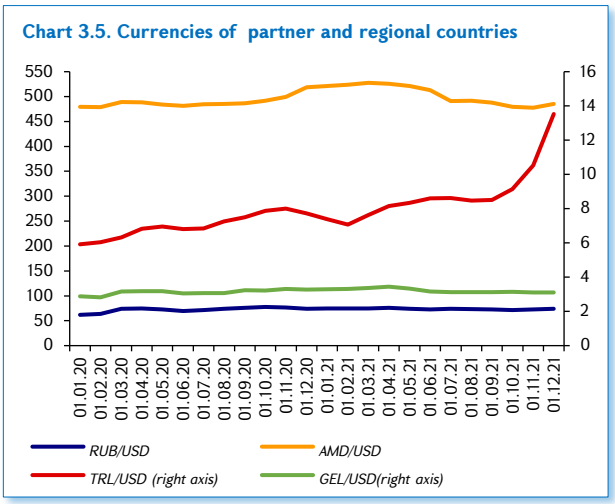
Source: CBA.

Uncertainties about the future developments and decreased remittances were formed after the 2020 shocks. This lead to a high demand for liquidity in the foreign exchange market, which reflected the continuation of dram depreciation pressures in the first half of the year.

During the second half of the year, in the context of the economic recovery, easing of political tensions and activation of currency inflow, a continuous revaluation of AMD was recorded.



Source: CBA.



Source: Central banks of countries.

Given these impermanent uncertainties, the Central Bank intervened in the foreign exchange market in order to neutralize the temporary disruptions in the currency market and ensure the normal operation of the market. The CBA made a net sale of almost USD 149 mln in the currency market, during the first half of the year. The policy rate was also augmented. During the second half of the year, the Central Bank made a net purchase of USD 15 mln. It can be highlighted that no significant expansion of foreing exchange spreads was recorded, with the exception of certain short periods (see Chart 3.5).

3.2. RISKS OF THE FINANCIAL SYSTEM AND INFRASTRUCTURE

In 2021, the financial system ensured the smooth functioning of financial intermediation. The financial intermediation decreased in the conditions of leading GDP growth.

At the end of the year, the financial system's assets / GDP and loans / GDP ratios made 121.0% and 57.7%, decreasing by 7.0 and 11.2 percentage points, respectively during the year. Among financial institutions, the pension funds grew excessively (see Charts 3.6 and 3.7).

During the year the nominal GDP growth exceeded the growth of financial system assets by 1.5 percentage points, while loans decreased by 4.6% in nominal terms. It is noteworthy that the downside impact of the revaluation on the credit reserves due to foreign exchange appreciation was approximately to the same extent. In 2021, the credit / GDP ratio decreased, which was a typical response to the developments, considering the high credit growth rate under the 2020 shocks and the resulting significant positive deviation of the credit / GDP ratio from its long-term trend (see Chart 3.8). Along with the decrease in demand for credit resources, the Armenian banks decreased their tolerance to credit risk.

The banking system continues to play the leading role in the financial system of the Republic of Armenia, accounting for 84.0% share of assets in total. The banking system assets/GDP and loans/GDP ratios decreased by 6.7 and 10.3 percentage points, respectively, to 101.5% and 53.0%. The deposits/GDP ratio decreased less, by 2.0 percentage points to 51.8%. Among non-bank financial intermediaries, a significant share belongs to pension funds. Recently, the gradual decrease in the share of credit institutions has already become a regular trend (see Chart 3.6).

Chart 3.6. The structure of financial system assets by financial institutions, 2021

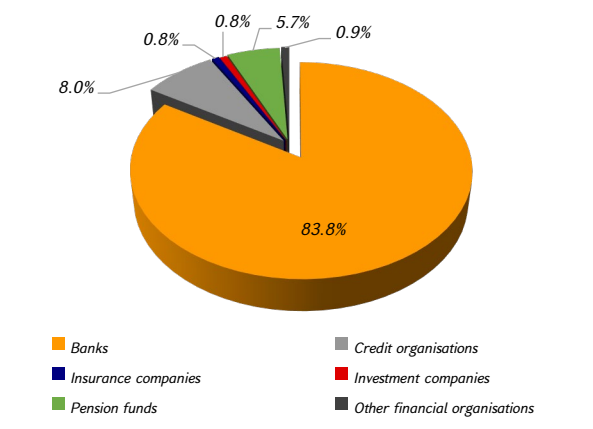
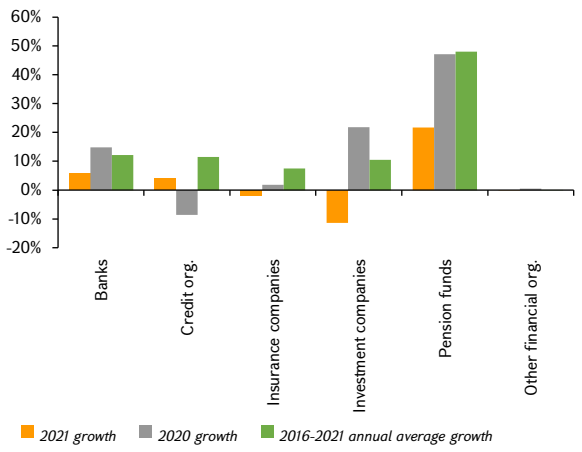
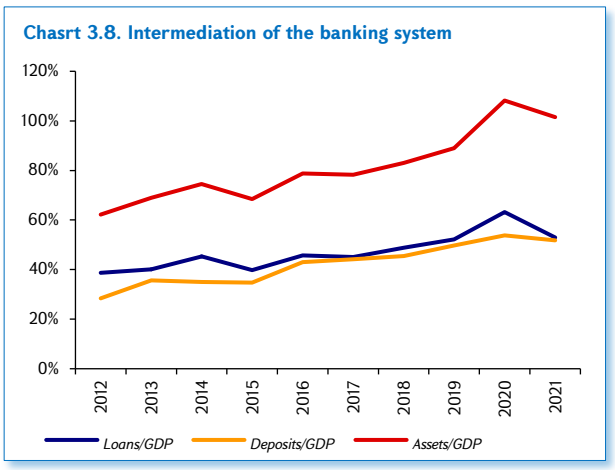


Chart 3.7. Growth rates of assets of the financial institutions



Source: CBA.



Source: CBA.

3.2.1. Commercial Banks

Armenian banking system withstood the stressful circumstances of 2020 and ensured an uninterrupted financial intermediation in 2021.

The capital and liquidity positions of the banking system remain stable. The results of stress tests show that the banking system can absorb losses derived from potential macroeconomic shocks, while generally maintaining a satisfactory level of regulatory requirements.

Capital Adequacy and Profitability

The banking system has always maintained a capital adequacy in excess of the required minimum providing the opportunity for absorbing possible losses and ensuring continuity of operations.

The total capital adequacy of the banking system was 17.2% in December 2021, increasing by 0.3 percentage point compared to December of the previous year (see Chart 3. for banks[14]): The capital adequacy was positively affected by capital growth, AMD-equivalent decrease in risk-weighted assets (loans) as a result of exchange rate appreciation, as well as the decrease in loan dollarization (RWA structure, see Chart 3.8). The regulatory capital grew by 4.3%, due to the almost equal increase in the statutory capital and retained earnings, including the allocation to the general reserve (see Chart 3.9).

The balance sheet capital / assets ratio decreased by 0.1 percentage point and amounted to 13.0% at the end of the year. The ratio of risk weighted assets to total assets has been steadily declining in recent years, mainly due to the gradual decline in the level of dollarization of both loans and total assets (see Chart 3.12).

In 2021, the decisions to distribute dividends by banks were made based on the conservative principle of maintaining combined capital buffer.

The requirement for capital conservation buffer has been increased by by 0.5 percentage point in January 2021, accounting for 1.0% of risk-weighted assets. The systemic risk buffer remained at 0.5%15. The countercyclical capital buffer was maintained at 0%.

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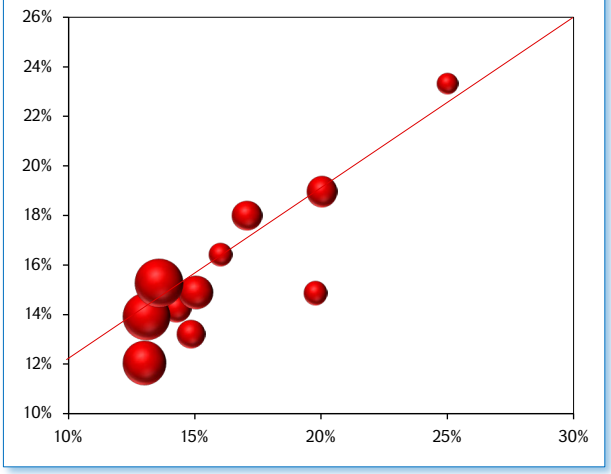
[14] The chart does not include banks that exceed the capital adequacy ratio (3 banks, the share of assets make 5.4% in the banking system). The abscissa axis in the Chart is the capital adequacy of 2020, the ordinate axis is that of 2021, and the point size is the share of assets in the banking system as of the end of 2021.

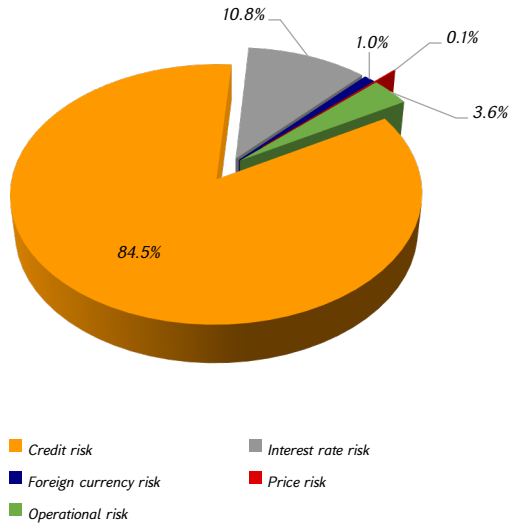
[15] Unlike capital adequacy ratios, banks may temporarily fail to meet the required buffer level to absorb losses in stressful situations. In case of using this opportunity, according to the regulatory requirements, the possibility of distribution of profits and provision of bonuses by banks is limited.

Chart 3.9. Capital adequacy by banks



** The chart does not include banks that exceed the capital adequacy ratio (3 banks, the share of assets make 5.4% in the banking system). The abscissa axis in the Chart is the capital adequacy as of December 2020, the ordinate axis is that of December 2021, and the point size is the share of assets in the banking system as of the end of 2021.*

Chart 3.10. Structure of risk-weighted assets as of 31.12.2021



Source: CBA.

The requirements for capital conservation buffer and systemic risk buffer have been increased by 0.5 percentage points each in January 2022.

Chart 3.11. Total regulatory capital structure

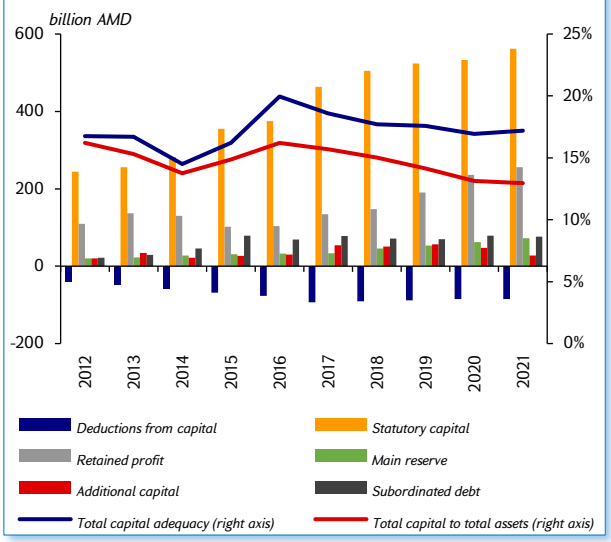
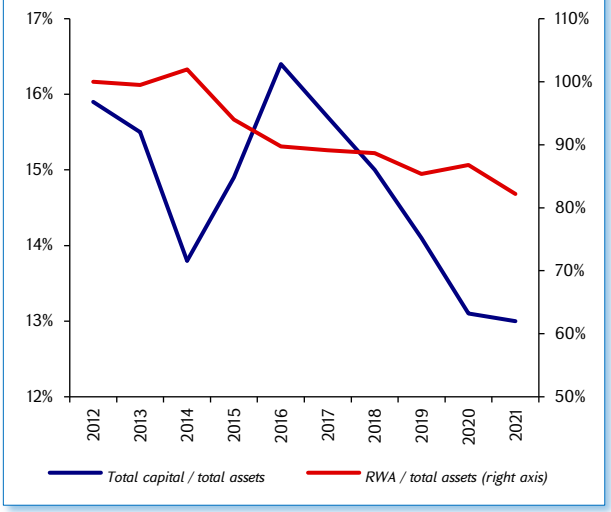


Chart 3.12. Banking system leverage

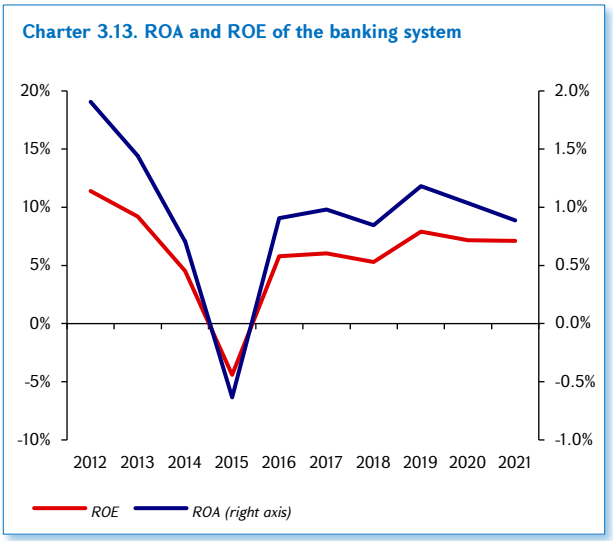


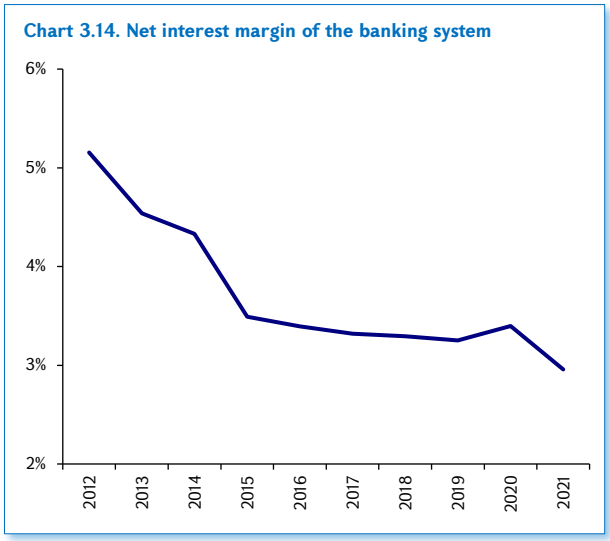
Source: CBA.

Impacted by the unfavorable shocks of the previous year, 2021 started with significantly lower profitability ratios in banks. The profitability of the system started to recover during the second half of the year.

According to the reports submitted by banks to the Central Bank of Armenia, in 2021 return on assets (RoA) and return on equity (RoE) of the banking system dropped by 0.1 and 0.3 percentage points compared to the previous year, totaling 0.9% and 7.1%, respectively (see Chart 3.13).

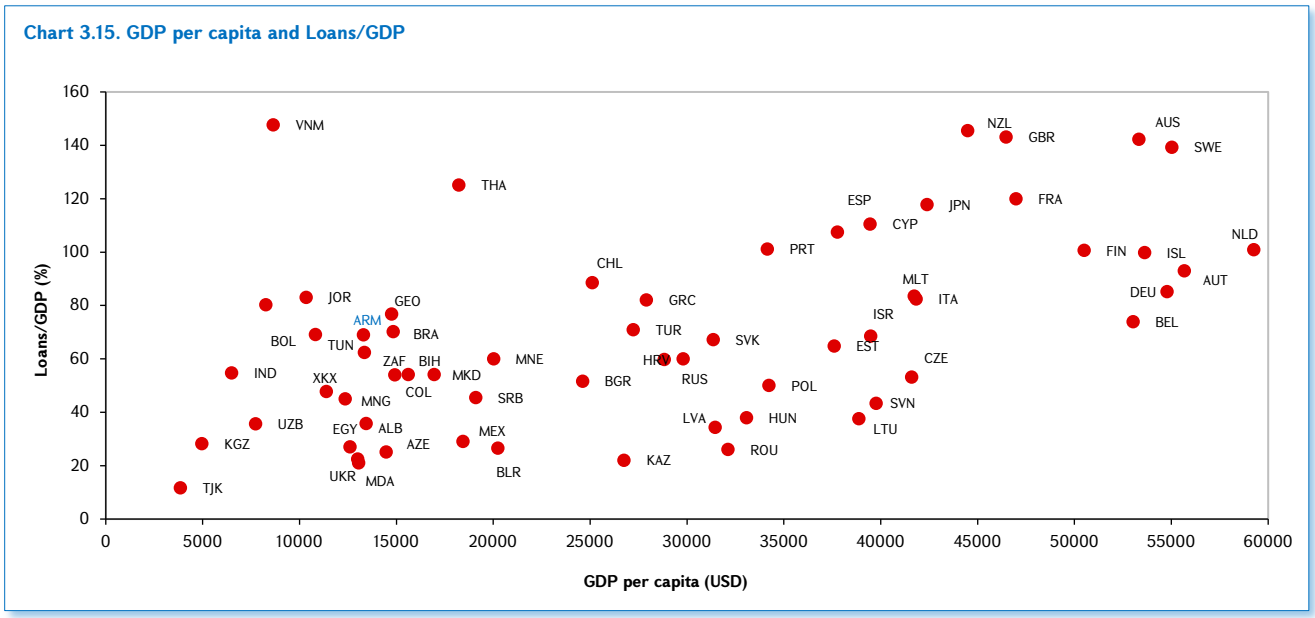
The decrease in the net interest income to assets ratio (the net interest margin) negatively affected the profitability, which has reached its historical lowest point. The net interest margin decreased by 0.4 percentage point compared to the previous year and amounted to 3.0% (see Chart 3.12). The decline was due to the redistribution of allocated funds into relatively low-risk, low-interest assets (e.g., less consumer loans, more government bonds), and growth of interest costs on repo agreements.





Source: CBA.

Low profitability will remain one of the main challenges to the Armenian banking system, restraining the investment potential necessary for the development of the system and the capacity building. Most likely a long-term "competitive" profitability may not be achieved even after absorbing the impact of shocks. The intermediation of the financial system in the Republic of Armenia, especially in terms of traditional instruments, is already at a level where the opportunities for simple quantitative growth are limited, in case if the system tries to keep the current level of credit risk relatively unchanged. The limited growth opportunities are evidenced by the comparative representation of credit to GDP and per capita GDP ratios by countries (see Chart 3.15).



Source: World Bank.

The current high level of competition will intensify the pressure on the yields and margins. At the same time, given the current trends in digitalization, the growth of competition will no longer be limited exclusively to the internal financial market of Armenia. The expansion of profitability based on extensive growth and scale effect can no longer be considered as a priority direction of development. It is necessary for the financial system to

ensure qualitative and tangible changes in its intermediation. The following opportunities are examples of possible qualitative development:

- *Expansion of the proposed financial instruments*, including those traditional instruments that are not yet widespread in Armenia, and the provision of more modern financial services. The banking system focuses mainly on attracting and providing liquidity now, and in fact, it is missing the opportunity of hedging the market risks of the real sector and gaining returns from that service.
- The system can contribute to the *growth of non-cash turnover* by continuously improving the customer service infrastructure. Such a development will increase the share of demand funds, because of which the cost will decrease, as well as the stability of the deposit base will increase (during the shocks of both 2014 and 2020, the demand funds in AMD were the most stable compared to other types of deposits, conditioned by their high diversification and operational nature).
- *Increase of financial inclusion*. Though the estimates in this regard are approximate, it is obvious that a large portion of the society has very limited access to or does not use financial services at all. It is also important to find ways to include the customers that used to have a "bad credit history" to the financial system.
- Regardless of the above, a direction of development can be considered the *improvement of management systems*, especially risk management, the increase of operational efficiency, as well as the relative reduction of costs through consolidation.

Credit Risk

Amid uncertainties on the future economic recovery and spread of new waves of pandemic, the volume of loans decreased by 5.5% in 2021 (the exchange rate appreciation contribution was -5.2 percentage points). Significant growth was observed in mortgage loans and lending for construction only, which is mainly conditioned by the program of income tax refund in the amount of interest paid for mortgage loans (see Charts 3.16 and 3.17). At the same time, the demand for mortgage loans has increased even more after the circulation of news on the phasing out of the program. In 2021, the growth of mortgage loans was 36.1%. The dollarization of both loans and deposits continued to decline in 2021 (see Charts 3.18 and 3.19).

Chart 3.16. Structure of loans to residents by main loan categories

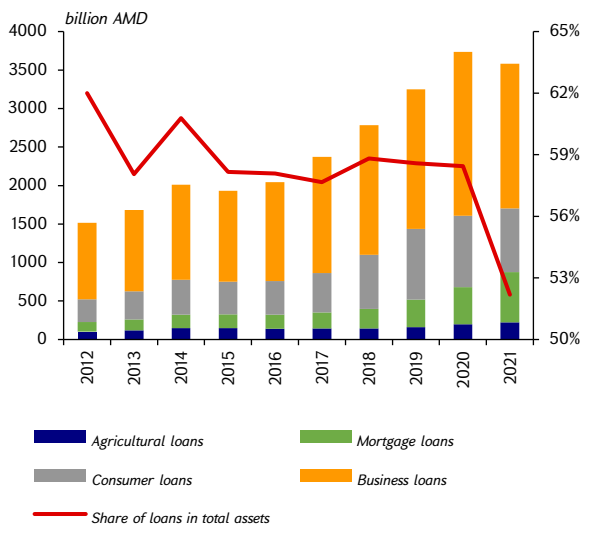
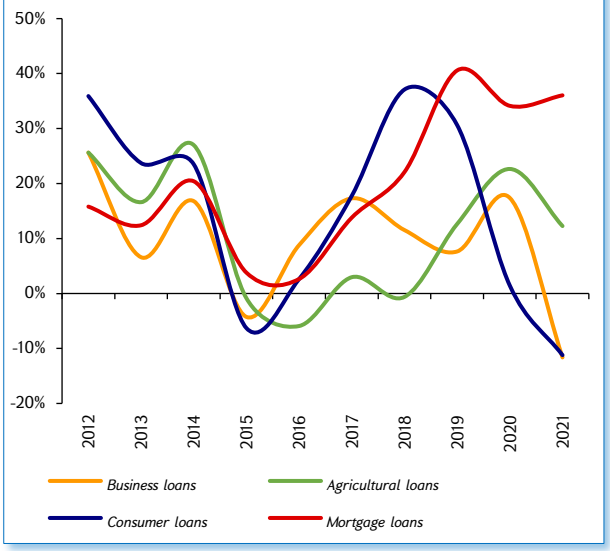
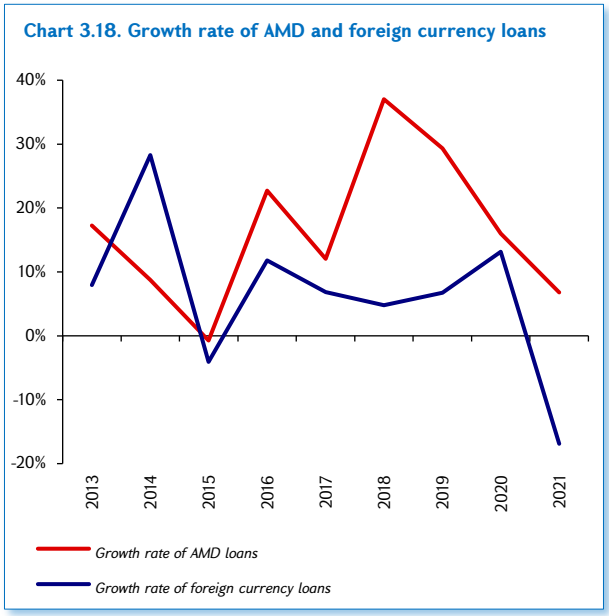
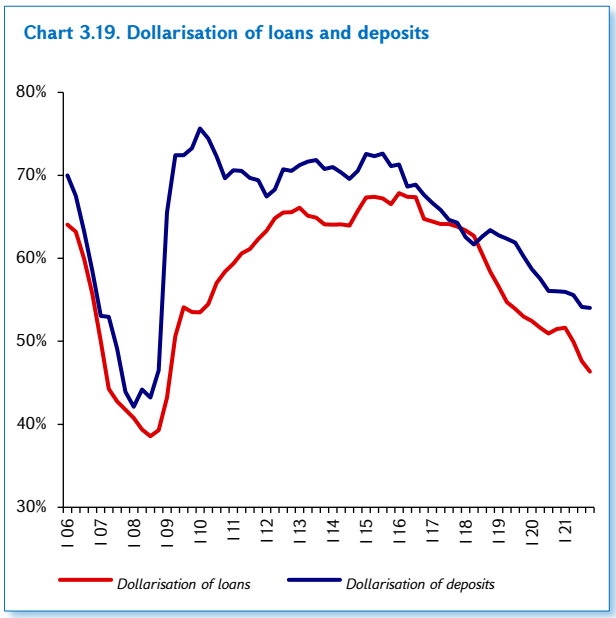


Chart 3.17. Growth rates of loans by main loan categories



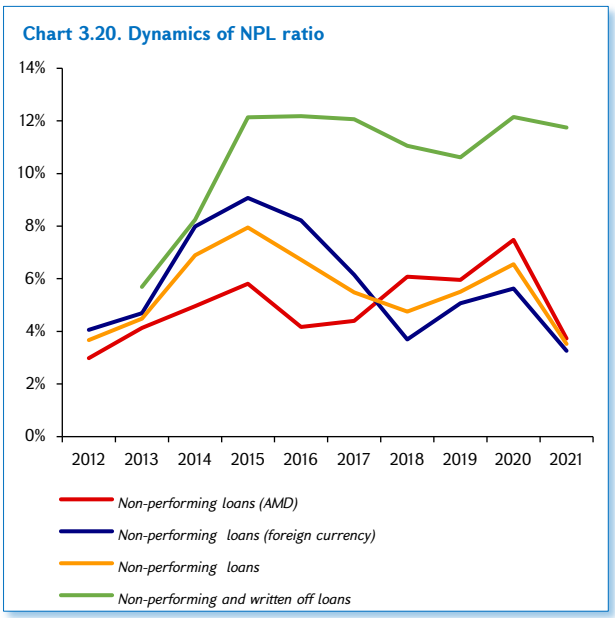
Source: CBA.

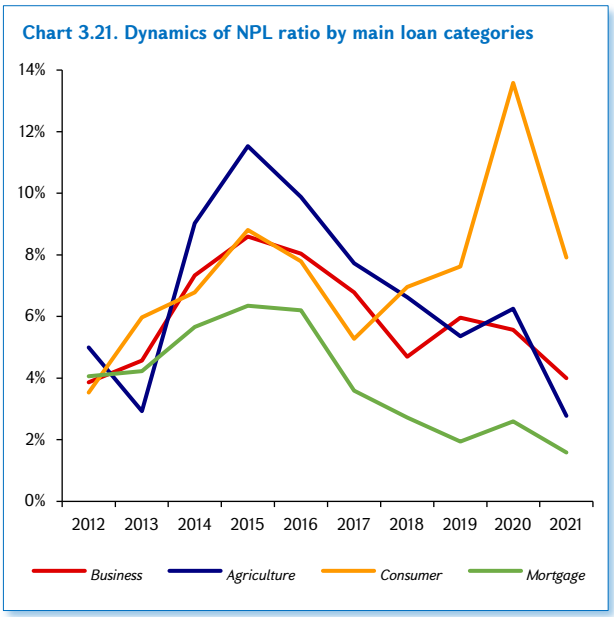




Source: CBA.

The indicators on credit risk tend to improve, in particular, the share of non-performing loans decreased in all major types of loans. The share of non-performing loans (including substandard loans) decreased by 3.0 percentage points in total loans to 3.5% at the end of the year. The decrease in the volume of classified loans was mainly due to the write-off of non-performing loans for consumer and business loans (see Charts 3.20 and 3.21).



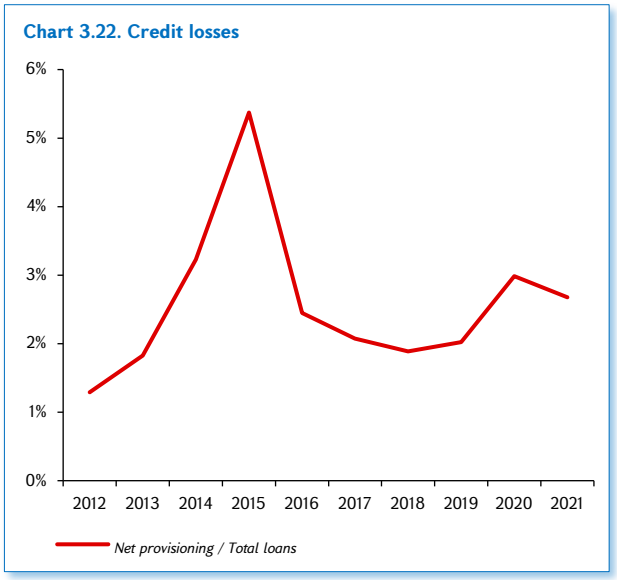


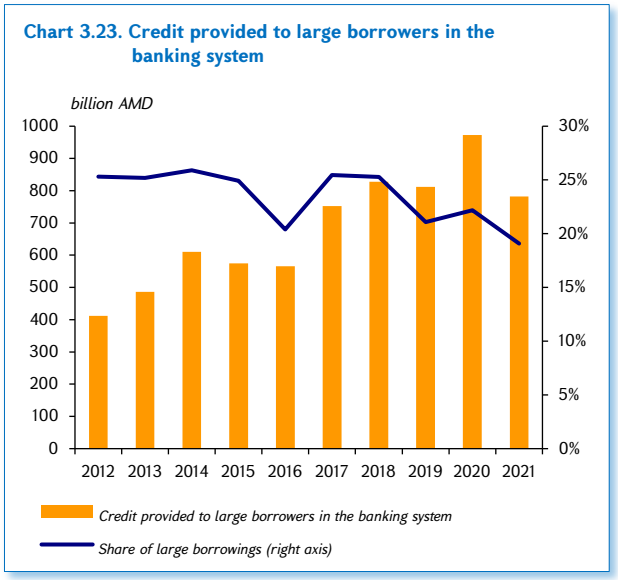
Source: CBA.

Compared to the previous year, the cost of credit risk (net provisioning) has decreased, however, the figure remains high compared to non-stress years (see Chart 3.22).

There were no risky changes in terms of loan portfolio concentration. The share of loans to large borrowers[16] was 19.1%, decreasing by 3.1 percentage points compared to the previous year (see Chart 3.23).

[16] *A borrower for which the bank's risk (including that of the affiliates) exceeds 5% of its average monthly total regulatory capital is considered large.*

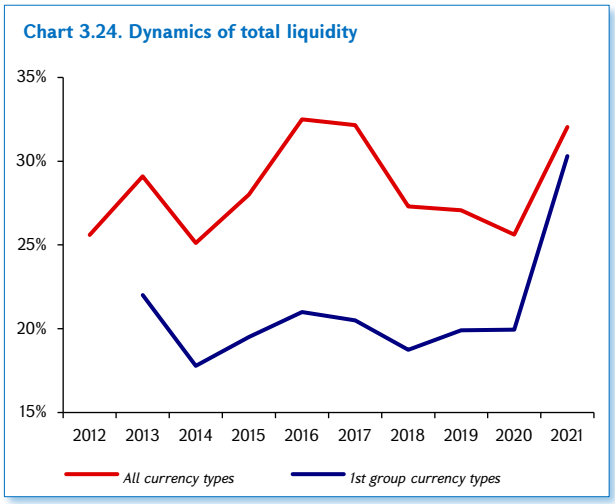


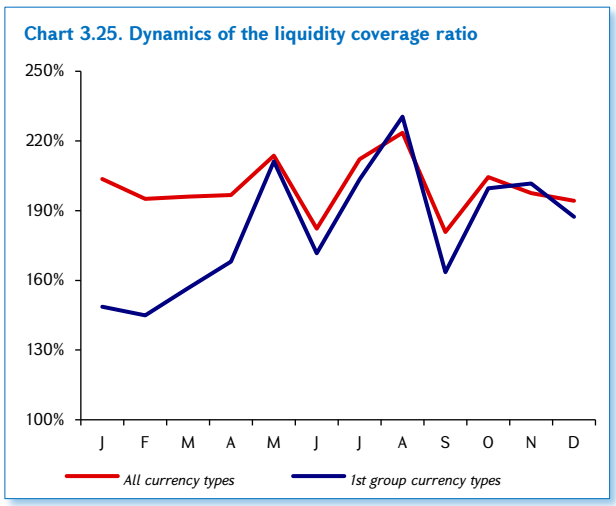


Source: CBA.

Liquidity Risk

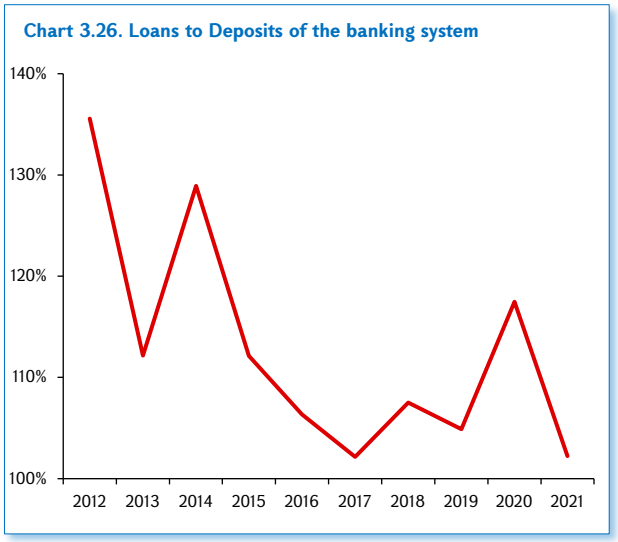
Given the growth in deposits and the nearly unchanged level of the loan portfolio, the liquidity of the banking system has increased significantly in 2021. Compared to the beginning of the year, the total liquidity of banks in all currencies increased by 6.4 percentage points to 32.0%. The foreign exchange liquidity of the sector was at an unprecedented high level. Total liquidity in the first group of currencies increased by 10.4 percentage points to 30.3% (see Chart 3.24). The sector meets the requirements of the new liquidity standards. In particular, the liquidity coverage ratio (LCR) and the total liquidity are twice higher than the regulatory requirement (see Chart 3.25).





Source: CBA.

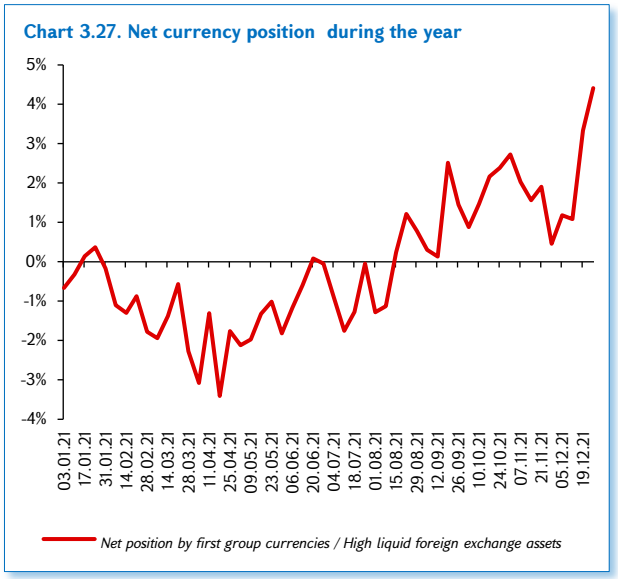
In 2021, deposits had a stable growth trend. At the end of the year, the growth of deposits was 14.8% (given that the impact of exchange rate changes is neutralized). As a result of the accelerated growth of deposits, the loan-to-deposit ratio improved and decreased by 15.3 percentage points compared to the beginning of the year, making 102.2% at the end of the year (see Chart 3.26).



Market Risk

Banks' sensitivity to changes in financial asset prices has increased, however, given the current structure of banks' balance sheets, the potential impact of the market risk on the capital is insignificant.

The net foreign exchange position of the banking system (the sum of long and short positions including derivatives) fluctuated somewhat during the year, reflecting the customers behavior in response to exchange rate expectations (see Chart 3.27). During the year, the return from currency revaluation and transactions with derivatives was merely equal to zero. The potential loss of the banking system due to open foreign exchange positions is not significant. The impact of credit risk of non-hedged borrowers is much more significant among exchange rate-derived risks.



Source: CBA.

Compared to the beginning of the year, the share of financial assets at fair value through profit or loss of the banking system in total assets increased by 0.8 percentage point to 8.4% in total assets (see Chart 3.28). The RA government bonds dominate in the portfolio.

To assess the sensitivity of the system to the changes in interest rates, the following were considered:

- the one-time impact of parallel shift by 1 percentage point of the government bond yield curve,
- the impact of interest expense increases on capital over a 12-month period because of a 1 percentage point increase in the term deposit interest rate (see Chart 3.29).

Chart 3.28. The volume and weight of financial assets at fair value

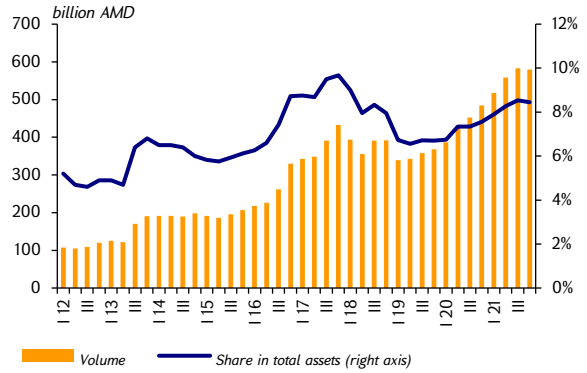
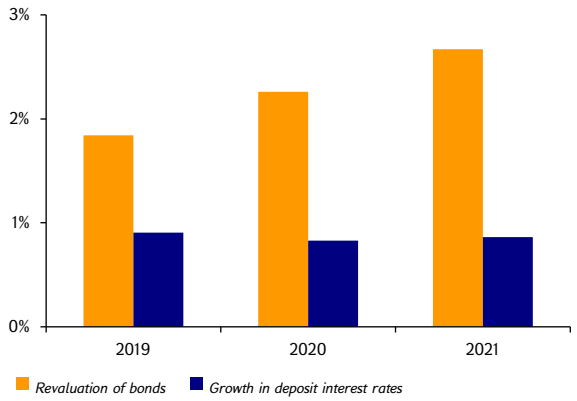


Chart 3.29. Impact of interest rate changes on equity



Source: CBA.

Box 1

Protection of Consumer rights

To support the rights of consumers, the Central Bank has implemented measures for the development of business conduct rules of financial institutions, ensured their implementation and facilitated the financial education.

Business Conduct

Supervision *Off site supervision was carried out on the information published on the websites of financial institutions, social networks, and on the "Your Financial Informant Fininfo.am" website. Mystery shopping was organized. The new financial digital services were examined, further measures aimed at mitigating the identified risks were highlighted.*

Regulation *– A guide on early repayment of loans has been developed. It sets common rules for financial institutions and supports a clearer and more reasonable arrangement of the early repayment process and calculations.*

Considering the new challenges, the Central Bank and the Financial System Mediator developed a new memorandum of cooperation.

As a result of cooperation between the State Revenue Committee and ACRA Credit Bureau, an automated system for the process of receiving income tax refunds on mortgage loans has been introduced.

Hotline

The hotline at the Central Bank operated as usually. In 2021, compared to the same period of the last year, the number of calls to the hotline declined twice to 8844 calls. Most of the calls were related to informational issues on loans, bank accounts, deposits, as well as foreign exchange purchase and sale.

Applications

The number of written applications from consumers decreased by 41% (or by 495 applications) compared to the previous year and made 699 applications. The decrease is mainly due to better pandemic conditions and reduced flow of applications caused by 2020 hostilities.

Most applications (61.2%) are requests, inquiries, or other types of notes, which are mainly related to the review of loan terms, debt forgiveness, and change of credit history.

The Central Bank took all the necessary measures to deal with the violations found during the examination of the applications.

Financial Education

The Central Bank continued to implement educational measures in the field of finances for different target groups. 2559 teachers from 378 schools have been trained to teach financial education in secondary schools, and the concept of an e-Learning platform has been developed to facilitate their continuous training. "Financial Education for Women" program was also tested in cooperation with the UNDP Armenia Office. Knowledge and skills to manage personal finances more effectively were transferred to the public through the educational website www.abcfinance.am, social networks, as well as various remote events, such as "Finshabti", other webinars and competitions. Throughout the year, the "Your Financial Informant Fininfo.am" website has been actively disseminated and used, which allows you to search, find, compare the main services offered by financial institutions (loans, deposits, payment cards, etc).

3.2.2. Nonbank financial institutions

The share of assets of nonbank institutions is still small in the financial system. The position of the pension funds among nonbank financial intermediaries continues to grow. Despite this growth, the impact of the activities of pension funds and other financial institutions is not significant on the stability of the financial system.

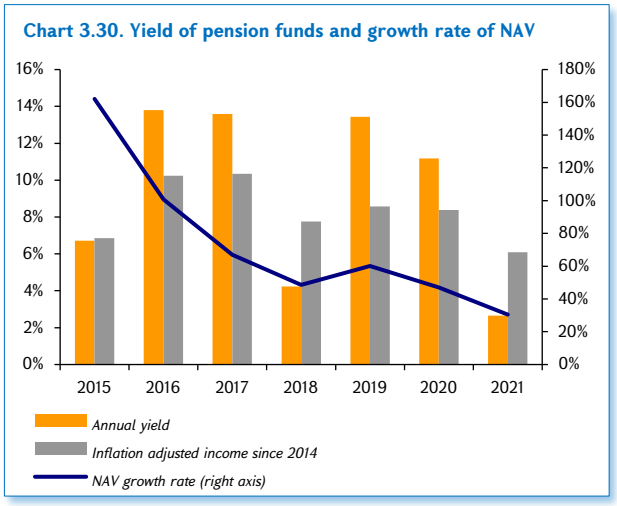
Pension Funds

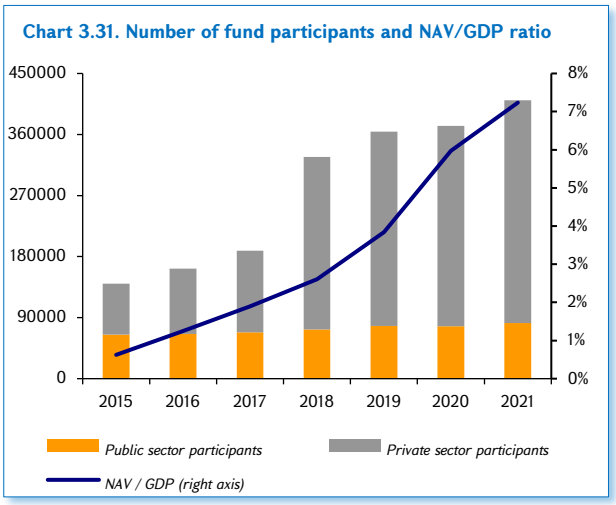
The yields of pension funds have decreased significantly in 2021 compared to previous years, mainly due to the revaluation of investments in government bonds.

In 2021, the net asset value (NAV) of pension funds increased by 31% (see Chart 3.30). The net asset value/GDP ratio was 6.9%, increasing by 0.9 percentage point (see Chart 3.31). Although the annual growth rate of NAV tends to decrease, since at present pension funds only receive contributions, the growth of funds will remain high.

The yield on the funds was 2.6%, which is lower by 6.9 percentage points than in the previous 3-year average. The reduced profitability is mainly due to negative revaluation of bonds included in funds' assets

caused by increased market interest rates. The AMD exchange rate appreciation had a negative impact on the profitability index, because of which the AMD equivalent of foreign currency investments decreased. The cumulative growth of funds since 2014 has made 91.8%, and the average annual yield was 8.5%. The number of active participants in pension funds was 410 thousand. 80% of which are from the private sector (see Chart 3.31).

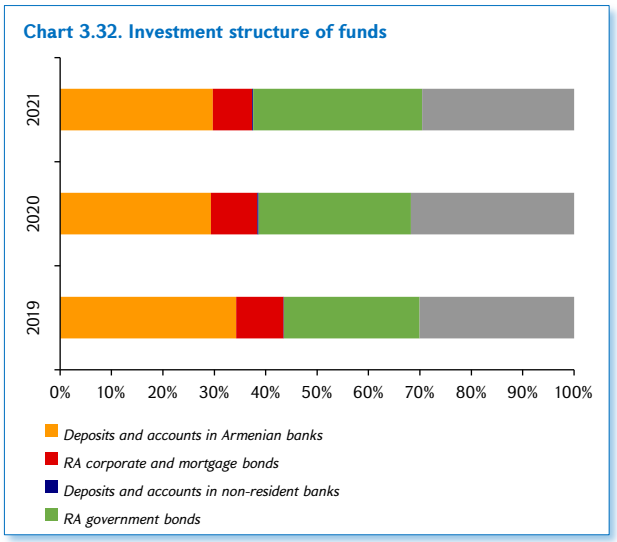


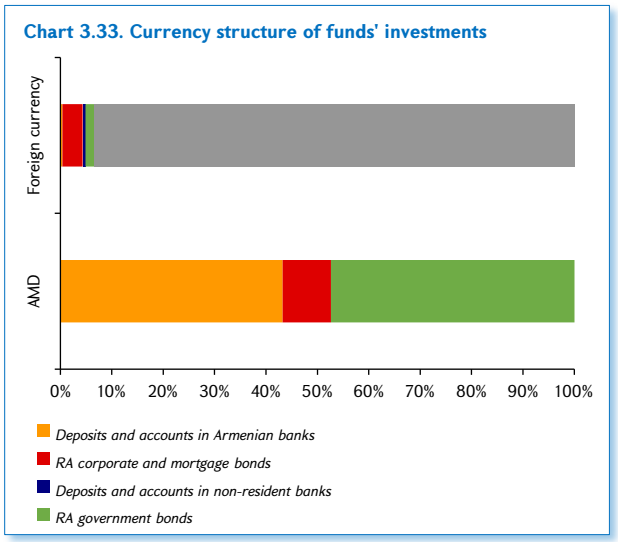


Source: CBA.

The share of investments in cash and deposits in the structure of pension fund investments remains merely unchanged, as compared to the beginning of the year. The investments in government bonds grew by 3.2 percentage points, while the share of securities of foreign investment funds decreased by 2.2 percentage points (see Chart 3.32).

The share of foreign exchange assets of the funds totaled to 31.6% at the end of the year (36.1% as of end of 2020). The majority of foreign exchange assets were securities of foreign investment funds (see Chart 3.33).





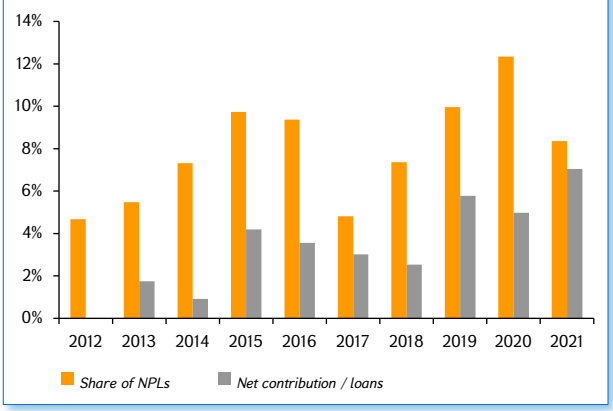
Source: CBA.

Credit Organizations

The share of assets of credit organizations in total assets of the financial system continue to decrease because of macroeconomic conditions and the challenges to existing business models.

The study of credit risk trends has shown a certain increase in the level of risk even before the impact of 2020 shocks (see Chart 3.34[17]). Such a trend can be interpreted by the intensifying competition in the credit market and the competitive advantages of banks. The rapid growth of credit intermediation in recent years, in other equal conditions, would lead to an increase in credit risk. On the other hand, scoring systems are constantly being improved in banks, and being tested on much larger databases, the system allows them to continuously improve the accuracy of risk assessment. In addition, the expansion of lending through automated mechanisms allows banks to take advantage of relatively low funding costs.

Chart 3.34. NPL ratio and credit losses



** The chart does not include the indicators of Varks.am credit organization.*

The potential competition of credit organizations with banks in the context of compatible price or efficient transfer to a higher risk and higher income balance level are unrealistic. Therefore, to ensure viability, microfinance organizations need to substantially change the nature of services provided, apply effective credit risk assessment systems and responsible lending principles. To compete effectively, the services provided by credit organizations need to be more personalized than those in banks, moving from simple financing to providing services that best meet the needs of the customer (businesses), such as the effective management of the customer's finances, business management consulting and information support.

Insurance Companies

The share of insurance companies in the financial system remains low. The growth rate of insurance premiums that is the main indicator of activities in the insurance market is less than the growth trends of non-crisis years, considering the 2020 shrinkage.

Insurance penetration (premiums/GDP) ratio totaled 0.71% in 2021, declining by 0.01 percentage point as compared to the previous year. Insurance density (premiums per capita) totaled AMD 16,855, in comparison with AMD 15,087 in 2020 (see Chart 3.35).

The amount of gross written premiums increased by 11.7% as compared to the previous year, and by 1.3% as compared to 2019 pre-pandemic year (see Chart 3.35).

The gross written claims recorded higher growth compared to the gross written premiums. The growth rate of gross written claims was 22.2% in 2021 as compared to 2020 and 13.8% as compared to 2019.

[17] *The chart does not contain the rations of Varks.am credit organization.*

The assets of insurance companies decreased by 1.8% to AMD 66.9 billion in the end of the year. No significant changes were registered in the structure of assets (see Chart 3.36). The liabilities grew by 1.45% to AMD 46.8 billion, while total capital decreased by 8.5% to AMD 20.1 billion.

Chart 3.35. Main indicators of insurance sector

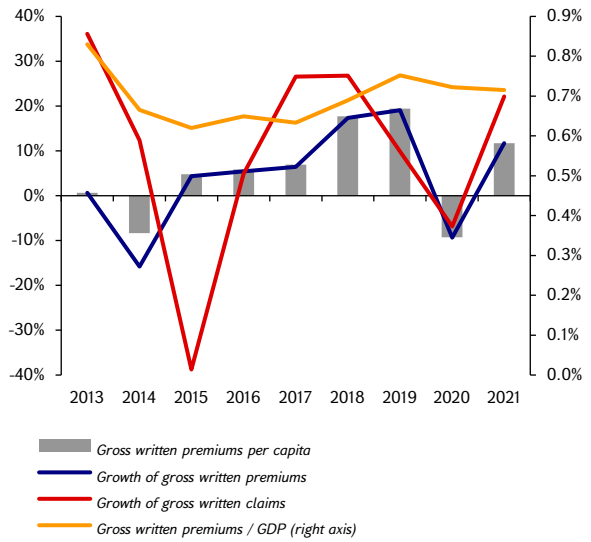
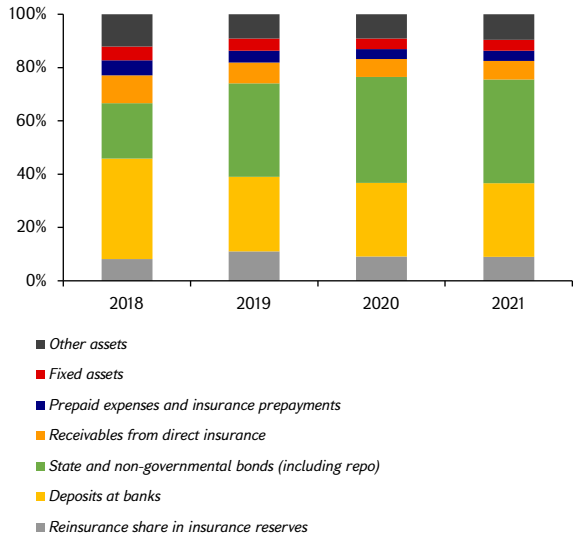


Chart 3.36. Structure of assets of insurance sector

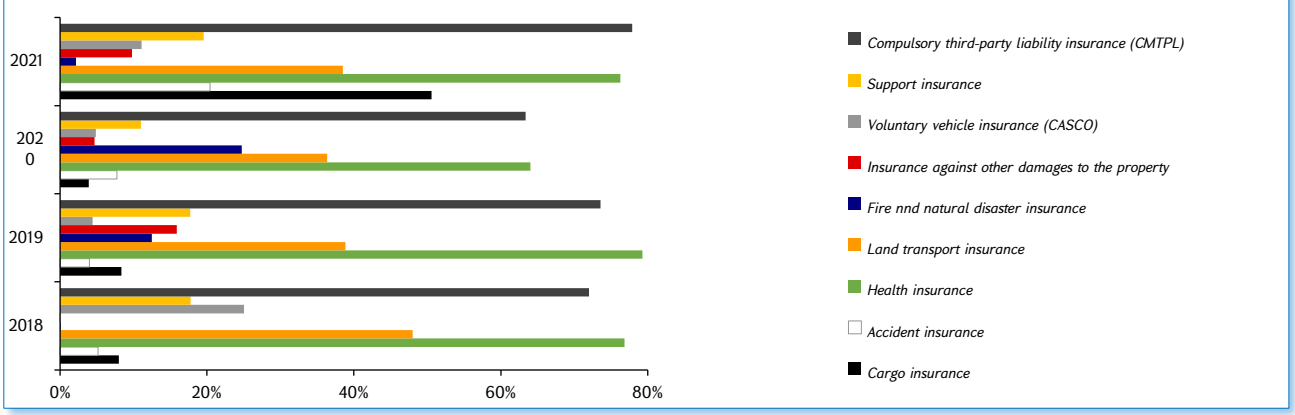


In 2021, the net profit amounted to AMD 1.3 billion, decreasing by 62.5% compared to the previous year. The expense ratio remained merely unchanged and amounted to 24.8%18 in 2021.

The loss ratio increased by 12.4 percentage points compared to the previous year and was 69.7%19 (see Chart 3.37).

Considering the trends of the loss ratio, as well as aiming to ensure the continuity of the development of the insurance system, there was a phased transition to the tariff liberalization in CMTPL system, which assumes an individual approach in the process of the calculation of insurance premiums.

Chart 3.37. Losses of insurance sector per products



The sensitivity of the insurance system to possible shock developments has not changed. There are no violations of regulatory requirements as per the scenarios considered below (see Table 1).

[18] *The expense ratio was calculated using the following formula: non-interest expenses / (net accrued insurance premiums - net refunds on terminated contracts - unearned insurance premium reserve change).*

[19] *The loss ratio was calculated using the following formula: (net accrued compensation + change in net claims reserves + settlement costs)/ (net accrued insurance premiums - net amounts refunded on terminated contracts - unearned insurance premium reserve change).*

Table 1. Sensitivity tests for assessing the solvency and liquidity of the insurance system

	Growth by 10% in the frequency of refunds			Shock growth by 25% of Reported but not settled (RBNS) Reserves		
	31.12.19	***31.12.20***	***31.12.21***	***31.12.19***	***31.12.20***	***31.12.21***
Loss or income decrease per scenario (bln AMD)	0.8	0.7	0.7	0.8	0.7	0.7
Loss or decrease in return on capital (%)	4.2	3.1	3.5	3.9	3.2	3.7
Change in liquidity level (percentage point)	-	-	-	-27.5	-51.4	-21.6
Change in total capital adequacy (percentage point)	-6.4	-5.6	-4.7	-5.9	-5.8	-4.8

Box 2

Changes made in the financial system regulation in 2021

Banking System

Starting from 2022, the reduction of the total capital adequacy ratio below 12.5% is no longer considered as a sign of deterioration of the financial situation, therefore it will not be a trigger for the conversion of subordinated loans into fixed capital.

Starting from 2022, the reserve requirement for the funds attracted by banks will be calculated at the following rates:

- *The reserve requirement rate for funds attracted in AMD is set at 4% of the funds attracted (instead of the previous 2%).*
- *The reserve requirement rate for foreign currency bonds and funds borrowed from international organizations in foreign currency is set to 18% of borrowed funds from January 1, 2022 (instead of the previous 0%, 2.25%, 4.5%).*
- *According to the long-term policy adopted by the Central Bank[20], there was an additional 2 percentage point shift from AMD reserves to foreign currency reserves held for foreign currency liabilities, which enters into force on January 12, 2022. In particular, instead of the previous decomposition of 10% in AMD and 8% in foreign currency of the total 18% mandatory reserve for funds attracted in foreign currency, the following will be implemented:*
- *For funds attracted in USD - 8% in AMD, and 10% in USD,*
- *For funds attracted in Euros - 8% in AMD, and 10% in Euros,*
- *For other currencies, as well as for funds attracted by metal accounts - 8% in AMD, and 10% in USD.*

The Central Bank has introduced the maximum value for Loan-to-Value (LTV) Ratio for the purpose of mitigating (preventing) systemic risks arising from the volume of loans secured by real estate provided to individuals in the financial system and (or) fluctuations in real estate prices. The maximum value for Loan-to-Value (LTV) Ratio for banks and credit organizations was set within N 51 և N 52 prudential standards, which entered into force on April 1, 2022. The decisions set out the following regulations on the marginal ratio of the LTV value:

- *The maximum amount of the loan-to-value ratio (prudential standard N 51) in the case of AMD loans secured by real estate is set at 90%,*
- *The maximum amount of the loan-to-value ratio (prudential standard N 52) in the case of foreign currency loans secured by real estate is set at 70%,*

[20] *For more details see the Financial Stability Report of the first half of 2020*

- *It is allowed to provide loans that do not meet the requirements of the established standards within a certain volume of the bank / credit organization's portfolio. In particular, banks may provide loans that do not meet the requirements of the N 51 and N 52 prudential standards for the 10% of the volume defined in the order for AMD-loans and 5% - for foreign currency loans.*

Securities Market

- *The Central Bank has decided to allow the trading of foreign currency and credit resources through over-the-counter platforms, as well as to expand the services provided to fund managers at the stage of registration of fund rules.*
- *Regulation have been set for the disclosure of information taking into account the specifics of the issuance and listing of loan participation notes (bonds).*

Insurance System

- *Agents' registration processes have been simplified. From now on, the insurance company will register the agents and the Central Bank will include the agents registered by the company in the register, based on the information provided by the company.*
- *In order to assess the risks of insurance companies more fairly and more accurately, the procedure for computing the regulatory requirements for insurance companies has been eased, stipulating that in case of activity of insurance companies in the warranty insurance class, the amount of liability may be reduced by the amount of reinsurance, in case if the reinsurance meets the defined conditions. As a result, insurance companies have the opportunity to carry out larger amounts of warranty insurance.*

Payment and settlement system

According to the decision made by the Central Bank Board:

- *The procedure and conditions for opening accounts in AMD, USD, EUR and RUB in the Central Bank of Armenia to ensure the final settlement of transactions made without opening a bank account through Armenian money transfer systems were settled (for example, through the "STAK" money transfer system).*
- *The exemplary form of the tripartite contract between the Central Bank of the Republic of Armenia, participating commercial bank and Armenian money transfer system operator "STAK" for opening a service account was defined.*
- *As a result of the joint efforts of the Central Bank and other interested state bodies, a legislative package aimed at promoting non-cash transactions has been adopted, which will increase the availability of non-cash payment services, and the citizens will be able to make payments handily in trade outlets. In addition, the adoption of the package will help increase the level of financial intermediation and productivity of measures to reduce the shadow economy.*

4. STRESS TESTS OF BANKS

This section presents the results of macro stress tests of Armenian banking system. Stress testing of the banking system is one of the most important components of the financial stability analytical toolkit. It aims to assess the banking system's ability to withstand various possible shock situations (scenarios). Stress testing makes it possible to better understand and analyze potential vulnerabilities of the banking system and take targeted steps to correct them.

The results of stress tests demonstrated the sector's resilience to withstand the shocks of the selected scenarios, despite the severity of the shocks presumed by the scenarios and the materialization of credit losses in 2021 because of the shocks of the previous year. A proof for this statement is that in the event of the considered scenarios, the system has a high level of capital adequacy and liquidity to ensure further normal operation.

SOLVENCY MACRO STRESS TESTS

Solvency stress tests assess the ability of the banking system to absorb risks threatening the stability of the financial system in various shock situations. Credit risk has a prominent role in the macro stress testing framework, being one of the most important risks inherent in the activities of banks. Solvency stress tests were conducted over a three-year horizon and assume two scenarios: baseline and adverse.

Baseline Scenario

The baseline scenario reviews the main developments described in the inflation report of the Central Bank of Armenia[21] of the 4th quarter of 2021. According to this scenario, a relatively low economic growth of 1.6% is expected in Armenia in 2022, given the Russian-Ukrainian conflict, the growing uncertainty, and the economic sanctions against Russia. The economic growth will increase in the coming years, amounting to 3.6% in 2024.

Adverse Scenario

The stress scenario presented below is an extremely adverse version of the hypothetical development of events, which in no way is the Central Bank's projection and shall not be construed as such.

The stress scenario assumes the worsening of the already established geopolitical situation, in particular, the prolonged Russian-Ukrainian war, the long-term disruption of normal economic relations due to the sanctions imposed on Russia, and the significant decline in Armenia's main partner countries' economies. The impact of the described events on the Armenian economy may be accompanied by a slower overcoming of economic problems accumulated due to 2020 shocks, reduction of total demand and maintaining the high inflation rates registered during the 2020-2021.

Such developments may lead to a reduction in income in the economy, and consequently to a decline in private consumption and investment. In the context of reduced foreign trade turnover, an increase of the AMD /

[21] *For details see "Inflation Report": https://www.cba.am/Storage/AM/downloads/parberakan/DVQ/Monetary%20overview_IV_2021.pdf*

USD exchange rate was also assumed, which will be aggravated with possible reduction of the foreign investments under the growing uncertainties.

The events described above will lead to a decline in economic growth of up to -3% in the first year, which will gradually improve during the coming years, reaching 4.7% at the end of the stress scenario. A more detailed description of the scenario is presented in Table 2.

Solvency stress test results

Under the baseline scenario, the banking system remains highly capitalized. According to the baseline scenario, the total losses of the banking system will gradually decrease over the horizon, which is due to the gradual reduction of the probability of default (PDs) and the loss given default (LGD) in the given macroeconomic developments. Along with the reduction of losses, there will be some increase in the profitability of the banking system, because of which the capital adequacy ratio of both the banking system as a whole and of individual banks will continue to exceed the required minimum level.

Under the adverse scenario, credit losses in the banking system increase sharply. The financial system of the Armenia will still suffer from the consequences of the 2020 shocks, accompanied with a new wave of non-fulfillment of credit obligations, which will be due to the reduction of income in the economy, relatively high inflation and exchange rate shock. This, in turn, will lead to an increase in the components of credit risk in various areas of lending, such as probability of default (PD) and loss given default (LGD), which will lead to an increase in credit losses and a further reduction in yields. At the same time, it should be noted that according to the results of stress testing, the process of materialization of credit loss will continue and will reach its maximum point in the second year of the stress horizon.

In the current situation, the participants of the financial system will show more risk averse behavior, because of which a certain reduction of the loan portfolio will occur in the first year of the observed period. This will lead to a reduction in banks' net interest income, which will not be enough to cover credit and market losses. Despite maintaining a high level of credit risk losses, positive profitability will be registered in the second year. In the last year of the stress horizon, the system's profitability will start to recover and approach its pre-stress level, as a result of a significant reduction in credit risk losses (see Table 3).

Table 2. Values of key variables in different scenarios

	Actual	Baseline scenario			Adverse scenario		
	2021	*2022*	*2023*	*2024*	*2022*	*2023*	*2024*
	un/un						
GDP	5.7%	1.6%	3.0%	3.6%	-2.9%	2.9%	4.7%
Inflation	8.4%	6.4%	5.5%	4.9%	10.4%	8.7%	7.6%
Credit growth	-5.5%	5.0%	10.0%	15.0%	-3.0%	5.0%	8.0%
Probability of default (PD)							
of Consumer loans	9.1%	6.6%	6.2%	6.0%	10.0%	13.9%	12.6%
of Mortgage loans	3.4%	2.6%	2.6%	2.6%	4.4%	5.7%	5.2%
of Business loans	3.8%	5.0%	4.9%	4.7%	6.7%	9.4%	8.7%
Loss given defaults (LGD)	40.0%	40.0%	37.0%	35.0%	45.0%	42.0%	40.0%

*Table 3. The main results of stress testing **

	Actual	Baseline scenario			Adverse scenario		
	2021	*2022*	*2023*	*2024*	*2022*	*2023*	*2024*
Withdrawals from credit portfolio (AMD billion)	-110.5	-99.5	-95.3	-89.1	-137.8	-177.7	-142.2
weight in assets (%)	1.56	1.38	1.23	1.02	2.09	2.70	2.09
Market risk** (AMD billion)		-34.8	10.8	14.5	-82.5	30.7	15.9
Total losses (AMD billion)	110.5	134.3	84.5	74.7	220.3	147.0	126.3
weight in assets (%)		1.86	1.09	0.86	3.34	2.24	1.86
Net interest income (AMD billion)	209.6	215.2	227.1	248.4	200.6	198.3	197.6
Net profit (AMD billion)	62.8	64.7	114.1	139.0	-19.7	41.1	57.0
weight in assets (%)		0.90	1.47	1.60	-0.30	0.63	0.84
Capital adequacy (%, as of the end of period)	17.20	17.39	17.76	17.61	16.18	16.74	16.88
Necessary capital injection (AMD billion)		0			32.7		
weight in GDP (%)		0			0.53		
Number of banks with less than 12% of capital adequacy		0			3		

** Losses are expressed with (-) sign*

*** Losses from market risk include losses due to interest rate changes and direct exchange rate effects. In particular, for the baseline scenario, it was assumed that the market interest rate grows by 1 percentage point in the first year and decreases by 0.5 percentage point in each subsequent year. In the case of a stress scenario, market interest rates are expected to grow by 2 percentage points in the first year and decrease by 1 and 0.5 percentage points in the following years, respectively.*

In case of adverse scenario, the capital adequacy of the banking system decreases, but does not breach the required minimum level of 12%. In particular, the capital adequacy of the banking system remains at a high level, decreasing to a maximum of 16.18% during the observed stress period (see Table 3). However, the capital adequacy ratio of 3 banks is falling below the required minimum level, which will require about AMD 32 billion of additional capital to be injected. In the following years, along with the gradual improvement of the situation and the restoration of the profitability of the banking system, the capital adequacy ratios will increase.

Overall, the conducted stress testing shows that despite the shock events of 2020, the Armenian banking system remains sufficiently capitalized to be able to withstand the situation assumed by the adverse scenario. Moreover, most of the banks, even after the materialization of the risks of the hypothetical scenario, still have sufficient capital reserves to absorb further possible losses and ensure the continuity of lending to the economy.

BANKING SYSTEM LIQUIDITY STRESS TESTS

Commercial banks' ability to resist liquidity risk is assessed through liquidity stress tests. In particular, the existence of a sufficient stock of liquidity buffers in the banking system is assessed under the conditions of the hypothetical stress scenario(s). The main parameters of the liquidity stress test and the result based on the actual indicators as of December 31, 2021, are described below.

Stress test scenario and methodology

The liquidity stress test is based on the following main assumptions:

- systemic liquidity risk (outflow of deposits from all banks at the same time) over a period of 6 months is considered, with the expected shock being stronger in the first 2 months and relatively mild in subsequent months;
- the possibility of banks to attract new funds and conversions to foreign currency or vice versa is neglected (static balance sheet assumption);
- expected inflows from loan portfolio are included with 50% (conforming the assumption under the Liquidity Coverage Ratio (LCR) requirement), potential inflows from classified loans are ignored, and haircuts are applied to highly liquid securities[22];
- it is assumed that both claims and liabilities to financial institutions will be renewed;
- the potential outflow of funds for other items (for example, undrawn credit card balance) is ignored, given their insignificant balance and historical behavior under different shock situations;

The hypothetical scenario of deposit outflow was designed based on developments of 2020[23] under more conservative assumptions. In the scenario, the deposit outflow rates vary by bank and reflect the difference in the sensitivity of customers to possible shocks, as well as the effect of concentration.

Outflow rates were assigned based on the following breakdown of depositors:

- deposits of resident legal entities;
- on-demand deposits of resident individuals;
- AMD term deposits of resident individuals;
- foreign currency term deposits of resident individuals;
- deposits of non-residents.

Chart 4.1 presents the minimum, maximum and average (banking system) outflow rates applied for banks over the first 2 months of the stress period[24].

Liquidity stress test results

The stress test assesses the change in the liquidity position of each bank over the stress period, i.e., the post shock ratio of available liquidity buffer/deficit to total assets was estimated as of the last day of each month (see Chart 4.2).

The stress test results show that available liquidity buffers of both the banking system and individual banks are sufficient to cover the stress outflow of the funds involved. The result of the stress test of this year is overall similar to the result of the previous year, with the difference that the liquidity level in all currencies is 5-6 percentage points higher than that of the previous year.

Compared to previous years, the foreign exchange liquidity of the system has significantly improved, which, in addition to 2021 developments, is due to the long-term policy of the Central Bank to improve liquidity. Starting from 2019, for funds attracted in foreign currency there has been a gradual change in required reserves from AMD into foreign currency, and in 2021, new liquidity requirements have been introduced, which are designed to better address liquidity risk.

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[22] *In case of AMD bonds 10%, and in case of foreign currency bonds 5% haircuts were applied.*

[23] *The year 2020 was chosen as a historically adverse scenario, considering the degree of actual shock.*

[24] *The accumulative outflow scenario for total deposits for the next four months is 5.0% - average; 7.3% - maximum; and 4.1% - minimum.*

There is no significant decline in the level of AMD liquidity. At the system level even 50% of the expected inflow of loans is sufficient to cover liquidity stress outflow. This is due to the higher stress resilience of AMD-denominated deposits on the one hand, and relatively short maturity of AMD loans on the other.

Chart 4.1. Cumulative outflow of deposits in the first 2 months

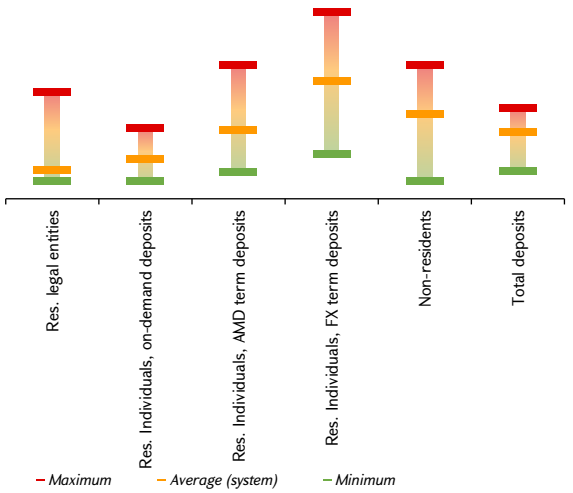
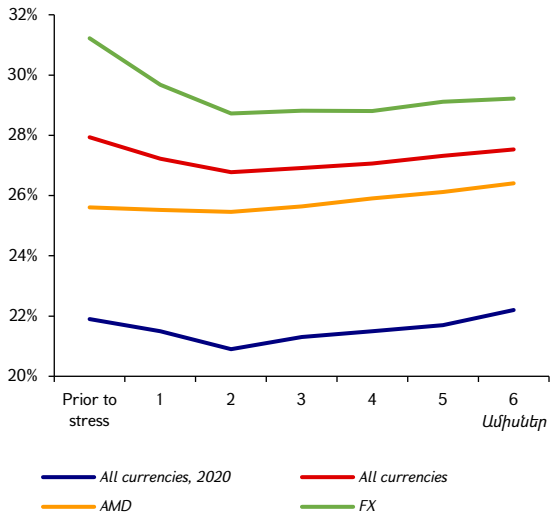


Chart 4.2. Change of liquidity position



5. MACROPRUDENTIAL POLICY[25]

In 2021, the macroprudential policy of the Central Bank of Armenia was aimed at mitigating the impacts of the 2020 shocks on the financial sector, as well as on finding and addressing the potential risk sources. The priority of the macroprudential policy was to facilitate the process of overcoming the 2020 shocks in the financial sector of Armenia and to ensure the uninterrupted lending to economy.

During 2021, the Central Bank of Armenia kept the countercyclical capital buffer (CCyB) unchanged at 0%. The CCyB can be changed (raised or lowered) over time and used by policymakers as a key macroprudential tool to address risky developments in financial or credit cycles. The Central Bank of Armenia reviews the CCyB on a quarterly basis and publishes its findings thereof on the CBA website.

Despite the recovery of economic activity, in 2021 the financial system continued to operate under the adverse effects of the shocks of the previous year. Uncertainties surrounding the outbreak of new COVID19 waves persisted throughout the year. In these conditions, the lending market continued to show relatively conservative behavior, which was mostly reflected in the weak demand for credit resources by businesses and individuals.

A comprehensive analysis of the early warning indicators of credit market trends implies that the recovery trends in the credit market are not yet fully reflected. The early warning of loans / GDP indicator[26] grew significantly in 2020 because of declining GDP ratio. In 2021, loans to GDP ratio predictably reduced and adjusted to its long-term trend, due to the gradual recovery of the economy and moderate credit growth during the year (see Chart 5.1). At the same time, the Financial cycle index (FCI), which shows the credit market trends, indicates that the Armenian economy is in the process of credit cycle recovery (see Chart 5.2). According to the calculations, the FCI has crossed the turning point and improved slightly. However, this improvement is solely due to the developments in the mortgage lending and the real estate market, and cannot indicate a full homogeneous upward trend in the overall lending sector. Taking into account the abovementioned facts, as well as the importance of consistency and continuity of lending to the economy by the banking system, the Central Bank continued to keep the CCyB unchanged at zero level (see Chart 5.3).

Chart 5.1. Loans / GDP ratio and its longterm trend

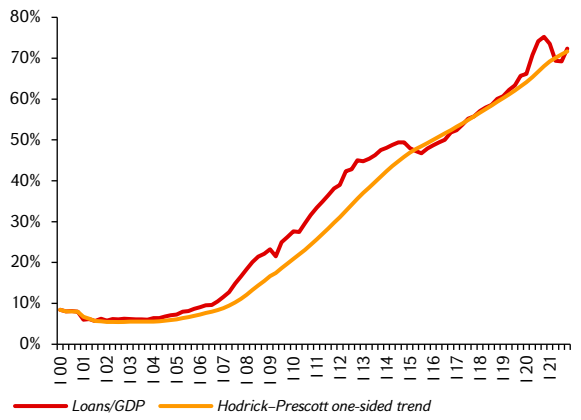
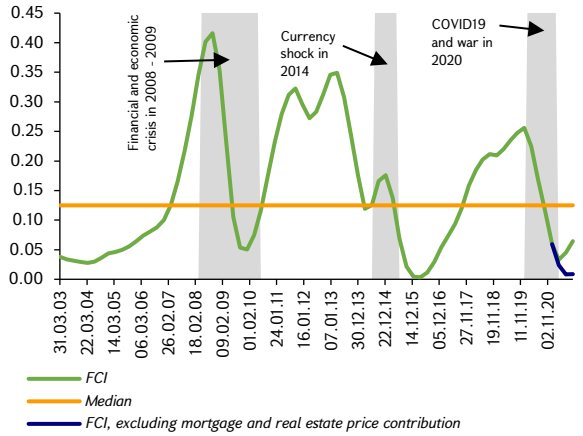
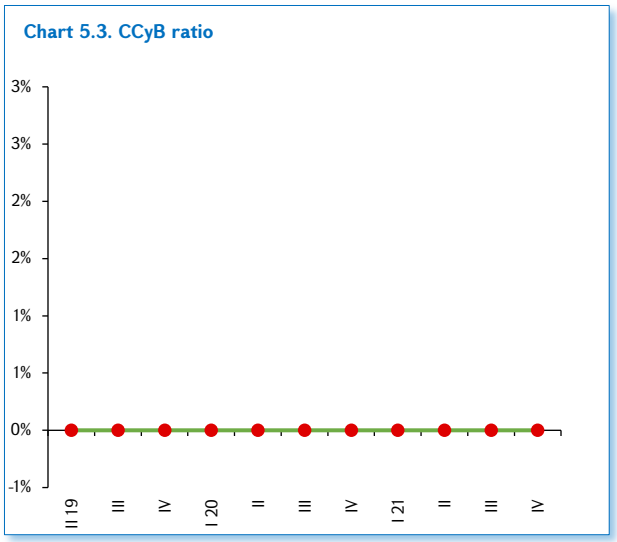


Chart 5.2. FCI in Armenian Economy

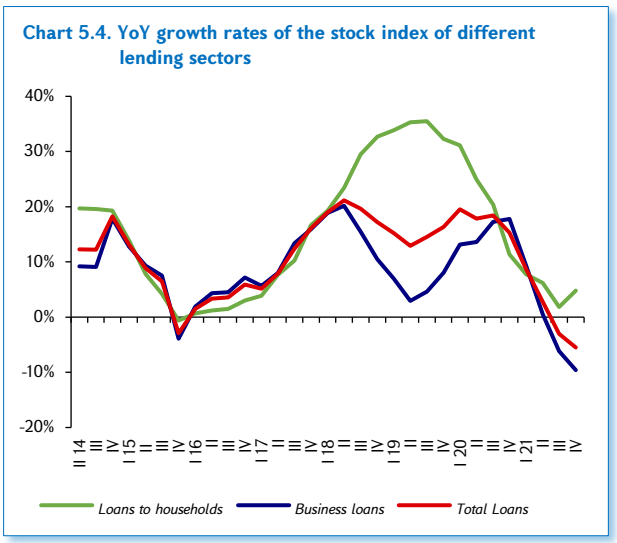


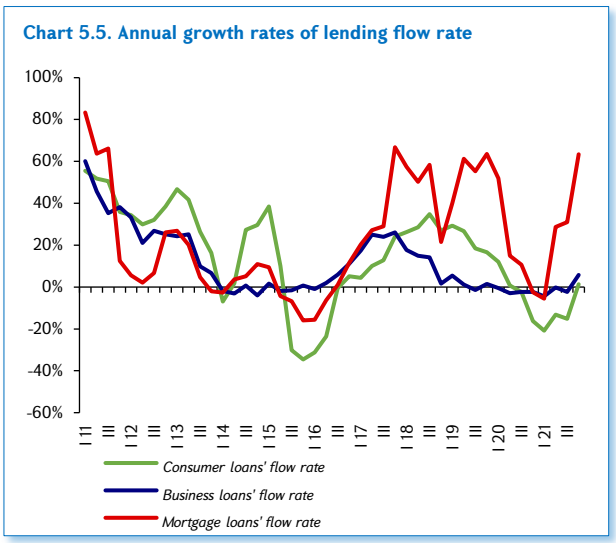
[25] *https://www.cba.am/Storage/AM/downloads/finstability/Decision_26.07.21.pdf*

[26] *The calculation of the ratio includes the loans provided to the economy by banks and credit organizations, including those that are classified as doubtful.*



During the year, the decreasing trend of bank lending continued, which was especially significant for consumer and business loans. The volumes of the latter continued to decrease, compared to the previous comparable periods. Weak growth trend was registered at the end of the year (see Charts 5.4 and 5.5). Such a decrease in the flow of loans was predictable, taking into account the scale and the longevity of the shocks of 2020, uncertainties of which were partially present in 2021. The full recovery of the usual functioning of the credit market may proceed more slowly than expected, given the geopolitical tensions caused by the Russian-Ukrainian conflict and the growing uncertainty associated with it.

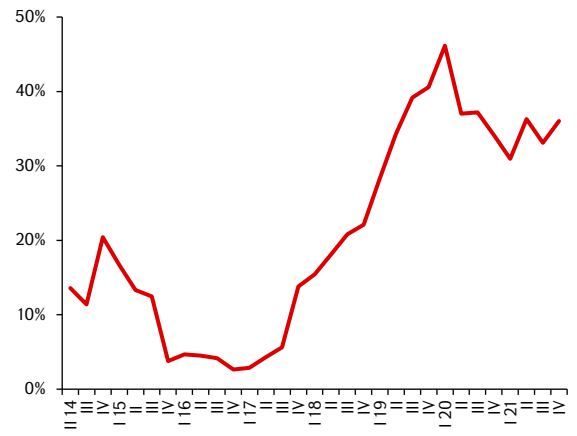




The high growth rates of mortgage lending were maintained. The growth rate of the mortgage loan portfolio was close to the pre-crisis level in 2021, and the volume of new loans continued to grow steadily, after a short decline at the beginning of the year (see Chart 5.6). It should be noted that such developments in the mortgage market were accompanied by the growth in prices of the real estate market in the second half of 2021. As a result, the average representative real estate price27 has already exceeded the pre-crisis level by the end of 2021 (for details, see the section "Real Estate Market Developments").

[27] *The cost of 1 square meter of apartment in a multiapartment building in Yerevan. Source: RA Real Estate Cadastre Committee*

Chart 5.6. YOY growth of stock ratio of mortgage loans



Mutually reinforcing increases in mortgage lending and real estate prices may indicate a possible accumulation of systemic risk in this sector (for details see Box 3). In order to effectively address the possible accumulation of systemic risks in the mortgage market, the maximum cap for the macroprudential instrument of loan-to-value ratio was introduced during the year. The thresholds for the maximum value of loan-to-value ratio are subject to mandatory application starting from April 2022. The rates of this instrument may change depending on further changes in the risk outlook of the mortgage market.

Box 3

Estimation of fundamental prices in real estate market of the Republic of Armenia

The macroprudential policy is aimed at limiting the excess growth of lending, among other intermediate goals. In this regard, special attention is paid to the excessive growth of mortgage lending, which can create serious accumulations of systemic risk along with the rising prices in the real estate market. In the long turn, this may threaten the stability of the financial system and regular economic development. In addition to the analysis of the real estate market presented in Appendix 2.2 of the Financial Stability Report of 2020, which showed the relationship between the increasing preferred demand for commercial real estate and real estate prices, this box provides a brief analysis of the fundamentals of real estate prices and the extent of possible deviation from it.

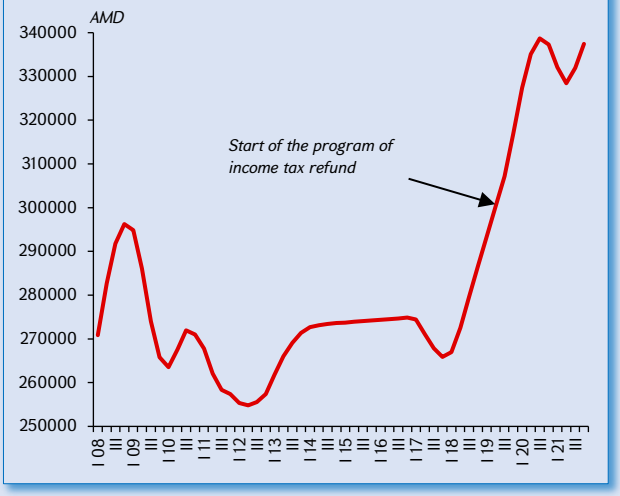
Chart 5.7 presents the actual movement of real estate prices in the Republic of Armenia in 2008-2021. A significant increase in prices was registered in 2017-2020, compared to the previous period. The purpose of this analysis is to determine whether this growth is in line with the fundamentals of the economy or there is a risk of "overheating" prices in the real estate market. In order to answer these questions, we estimated the price of real estate subject to economic conditions and to compare the actual prices[28] with it.

*For the abovementioned analysis **two groups of methods** are widely used in the professional literature. It is noteworthy that all the methods considered assume that **the increase in prices for real estate does not yet indicate "overheating"** like for all the other financial assets. In order to reach the appropriate conclusion, it is at least necessary to normalize the real estate prices (to compare real estate price growth with some other basic indicator). **The first group of methods, which we will conventionally call price-rent method**, assumes normalization of real estate prices through rent payment. **The second one is the price-income group,** which assumes that the normalization is carried*

[28] *Source: RA Real Estate Cadastre Committee*

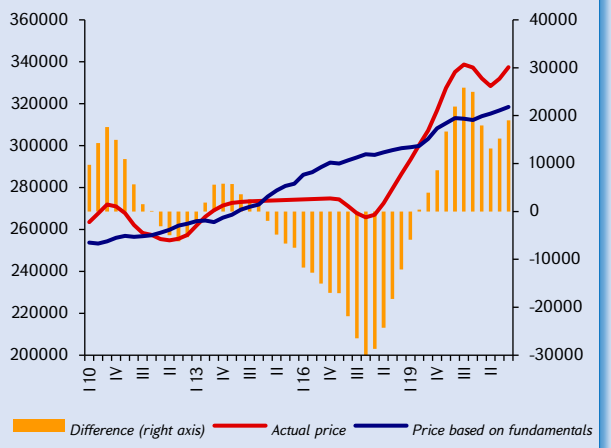
out with the help of household disposable income. In other words, in the case of the first method, the reason for asserting the possible deviation of the real estate price from the basic level is the rent, in the second case, it is the income in the economy.

Chart 5.7. Dynamics of real estate actual prices in Armenia [29]



The model range of price-rent methods has been largely formulated in the works of Hott, Monnin[30] (2008) and Bergman, Sorensen[31] (2021). It generally has the following logic: the key concept is the demand price of real estate, which is defined as the net present value of current and expected rent payments. A vector autoregressive method is used to estimate expected rent payments. Moreover, the current value of these rents is calculated based on the mortgage interest rate. The amount obtained, in fact, represents the demand price of real estate. The next step is to evaluate the simplest model to explain the actual price of real estate by the price of demand received. The estimated value of this model is therefore the price of real estate conditioned by the fundamentals, and the surplus value is an indicator of the degree of "overheating".

Chart 5.8. Dynamics of actual and fundamental prices of 1 square meter of real estate in Armenia according to the price-rent model



The Chart 5.8 summarizes the results of the application of the above model, according to which, starting from the first quarter of 2019, the actual prices of real estate are significantly higher than the fundamental prices.

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[29] *Source: RA Real Estate Cadastre State Committee.*

[30] *C. Hott, P. Monnin, "Fundamental Real Estate Prices: An Empirical Estimation with International Data", The Journal of Real Estate Finance and Economics, Vol. 36, N. 4, 2008.*

[31] *M. Bergman, P. Sorensen, "The Interaction of Actual and Fundamental House Prices: A General Model with an Application to Sweden", Journal of Housing Economics, Vol. 54, 2021*

*The approach formulated in the work of Plasil, Andrle[32] (2019) stands out among the **price-income methods**. In this case, the demand price of real estate is determined by the following logic: it is assumed that the normal level of real estate, conditioned by the fundamentals, directly depends on the size of the normal debt burden of the economic entities. The model is evaluated in the following order. First, assuming a debt service-to-income ratio (DSTI) of 30%, the average monthly annuity of a mortgage is deducted from the average monthly disposable income of households. Second, taking into account the actual interest rates on mortgage loans and considering the contractual term of the representative mortgage as 20 years, the amount of the monthly annuity is changed to the size of the mortgage loan corresponding to the size of the given annuity. Third, considering the loan-to-value ratio (LTV) of 80%, the demand price of real estate is deducted from the loan amount. Finally, as in the previous method, the fundamental price of real estate is estimated under the actual and demand price interaction.*

Chart 5.9. Dynamics of actual and fundamental prices of 1 unit of real estate in Armenia according to the price-income model

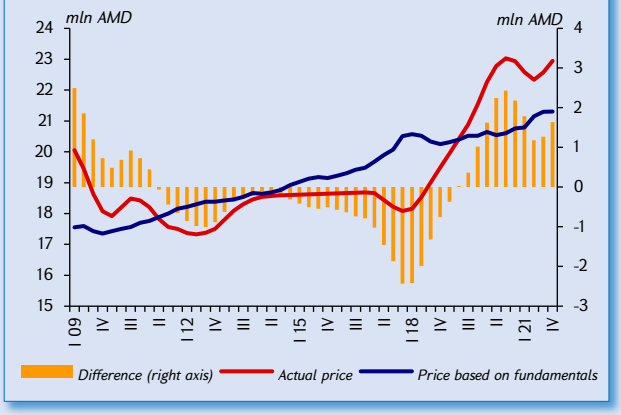
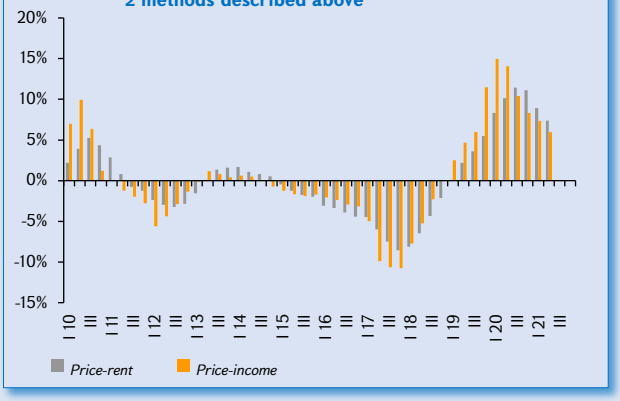


Chart 5.9 summarizes the results of the application of the above method, which almost coincide with the results of the previous method. According to the chart, the actual prices of real estate were significantly higher than the fundamental prices, starting from the fourth quarter of 2018.

*In conclusion, according to the calculations made by the two methods described above, **the actual prices of the real estate market are exceeding the "normal" prices based on fundamentals in the last three years**. To paraphrase, we can assume that there are certain "overheating" tendencies in the RA real estate market. Such developments are in the focus of the Central Bank of Armenia. For the purpose of addressing these developments, the Central Bank of Armenia established certain macroprudential policy mechanisms in 2021. In particular, the maximum threshold for loan-to-value ratio was established, the application of which will contribute to a more effective management of these risks.*

Chart 5.10. The difference between actual price of real estate and prive based on fundamentals, according to 2 methods described above



[32] M. Plasil, M. Andrle, "Assessing House Price Sustainability", Czech National Bank / Thematic Article on Financial Stability, 2019.

6. STABILITY OF FINANCIAL MARKET INFRASTRUCTURE

Given the importance and the impact of the payment and settlement systems on the monetary policy and the financial stability of Armenia, the Central Bank pays distinct attention to the systematically important payment and securities' settlement systems and the telecommunication networks supporting their activity.

6.1. INTERBANK PAYMENTS VIA ELECTRONIC PAYMENT SYSTEM OF THE CENTRAL BANK

During the reported period, 4.5 million payments (payment messages) of AMD 23,390.1 billion were made via Electronic Payments System (EPS) of the Central Bank of Armenia, increasing by 20.8% and 12.7%, respectively, over 2020. The growth of the value of interbank payments totaled 11.9% as compared to the same period of the previous year (while in 2020, growth of 2.6% was recorded as compared to 2019). The growth of pure budget payments was only 14.8% (compared to 4.9% growth of the previous period).

In the system, risks are observed in the below-mentioned directions.

Credit Risk

Credit risk to the settlement bank (i.e., the Central Bank of Armenia) in the system is non-existent since the repo instrument is used to provide intraday liquidity to the participant, which is secured by highly liquid assets and the amount of the borrowed asset is calculated at the market value of the bond, reduced by the haircut.

The receiving participant too has no credit risk as it receives the notice of the payment only after the payment is final and irrevocable.

Liquidity Risk

The average daily rate[33] of own liquidity indicator used for liquidity risk assessment was 3.2 in the reporting period (3.1 in the same period of 2020). It reached its maximum of 3.8 in August (in 2020 the maximum was 3.8 in February)[34]. The average daily payments and average daily opening balances remained almost unchanged during all the months of the year.

Thus, the average opening balance exceeds the average daily payments by 3 times and even more, which is a very high indicator. It should also be considered that calculation of the indicator does not include incoming payments (account credits) and/or funds from other sources, which further neutralizes the liquidity risk.

In addition, the share of rejections due to insufficient liquidity in EPS is also insignificant both in terms of value (0.1%) and number (0.0003%).

The same indicator was also monitored by individual banks, based on which the probability of liquidity risk is assessed to be minimal.

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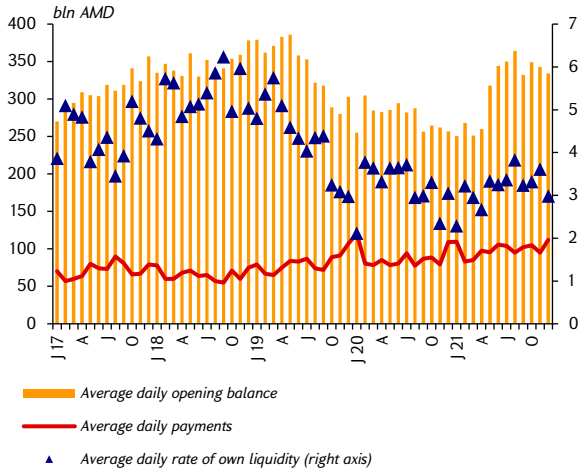
[33] The daily own liquidity indicator is calculated based on the ratio of opening liquidity on AMD correspondent accounts of commercial banks to debits (payments) through the account. Incoming payments are not included in the indicator so that a stress-scenario can assess the likelihood of bank projections if additional liquidity is not available within a day, namely to which extent would banks generate their payments using only opening balances of their funds. The calculation does not include cash enhancements through the accounts of commercial banks. The indicator is calculated for a system-level (aggregate for all banks).

[34] Since June 2019, banks have been able to make reserves in foreign currency, as a result of which the balances on AMD accounts have decreased, and consequently, the above-mentioned indicators have decreased respectively, maintaining a general high level.

Chart 6.1. Comparative analysis of average daily payments, average daily liquidity opening balance, and average daily rate of own liquidiaty indicator (system based)



Source: CBA.

Intraday distribution of payments

The peak hour for the number of payments in the reporting period was the 10:00-11:00 interval of the day, during which an average of 19.4% of the number of payments were made. However, the quantitative distribution of payments is smoothened throughout the day.

Chart 6.2. Intraday distribution of the number of payments on an average semiannual basis

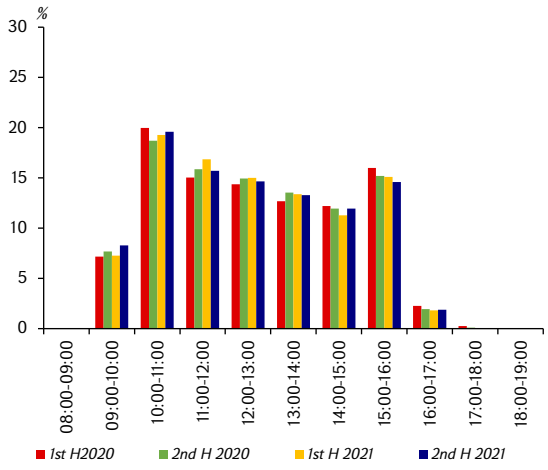
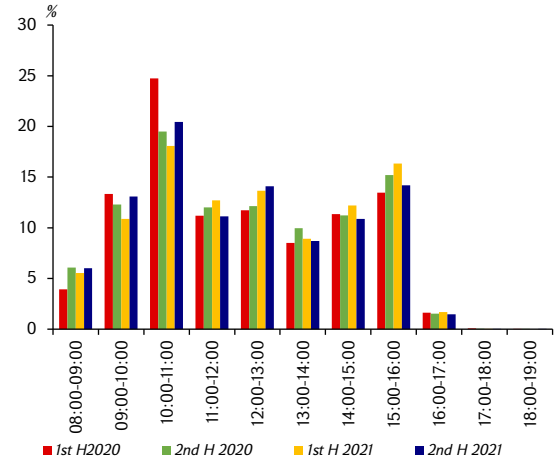


Chart 6.3. Intraday distribution of the value of payments on an average semiannual basis



Source: CBA.

The peak hour for the value of payments was also recorded for the time 10:00-11:00, when 19.2% of total value of payments was made. The peak hour was in the first half of the day, which reduces the concentration risks, as in case of problems, participants have enough time to take the necessary measures to settle payments on the given day.

Considering the sufficient level of system capacity, the positive outcomes of liquidity and operational availability indicators, and a negligible share of rejections in total payments, the concentration of payments during certain hours of the day did not lead to problems. Therefore, the likelihood of the emergence of risks to the system is generally low.

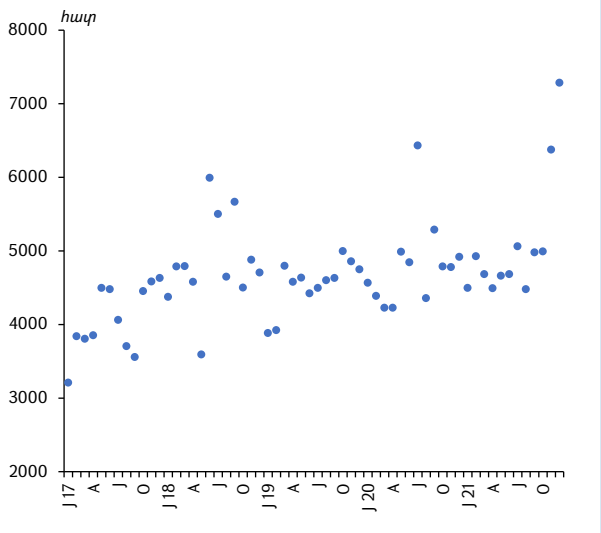
System capacity

The dynamics of the maximum hourly number of payments (the maximum number of payments per hour for each month) remained merely unchanged compared to 2020. An increase in the number of hourly payments was recorded during the last months of the year. This was due to changes in one of the software modules of the system, because of which the speed of payment processing has increased, and therefore, the overall bandwidth of the system grew.

The maximum hourly indicator in 2021 was 7,283 payments per hour (6,429 in 2020). The peak hour was the time range of 10:00-11:00 in December, totaling 40.0% of the number and 32.7% of the value of payments for that day. This maximum indicator was due to a large flow of payments in the given time range of that day. Due to changes in the system software module, payments were quickly performed by the system, and the business day was closed on time, creating no problems for participants.

During the reporting period, certain marginal indicators describing payments per hour increased somewhat (showing the significance of the flow of payments per hour). This again was due to the above-mentioned software changes and the overall increase in the number of payments. At the same time, the share of mentioned indicators remains insignificant. The indicator of 4300 and more payments per hour is 4.8% (1.6% in 2020), for 3500-4300 payments it is 8.3% (5.0% in 2020), and for 2500-3500 payments it is 22.0% (14.2% in 2020) of general operational hours.

Chart 6.4. Maximum number of payments per hour by months



Source: CBA.

The maximum daily indicator (the number of payments per day) grew by 13.7% over 2020 to 32,400 payments (in 2020, the maximum was 28,487). The peak day was in September, and it was preceded by 4 non-working days. The large flow of payments has led to an overload in the system during that day. Despite this, the system completely absorbed that flow, and the operating day was closed at the set time.

Given that the share of the abovementioned marginal indicators is still small in total payments flow and as a result of the changes, the bandwidth of the system has significantly increased[35], the probability of the emergence of capacity-related risks is deemed to be low.

[35] *For example, the share of payments over 3,500 per hour was 13.1% yearly.*

Operational availability of the system

During the reporting period, no significant incident (lasting 1 hour or more) affecting the availability of the EPS was recorded, as a result of which the operational availability of EPS for the year was 100%[36].

6.2. SECURITIES SETTLEMENT SYSTEM

In Armenia, the settlement of securities is implemented through two systems; the Unified System of Securities Accounting and Settlement of the Central Depositary of Armenia (hereinafter, CDA's SSS) and the Government Securities Accounting and Settlement System of the Central Bank of Armenia (hereinafter, GSASS).

In 2021, secondary market transactions totaling 17,486.2 AMD billion were carried out through GSASS (AMD 13,679.6 billion in 2020). The transactions grew by 27.8% compared to the previous year. Such growth was mainly conditioned by the so-called "free delivery" operations. In 2021, secondary market operations totaling AMD 1,292.8 billion were carried out through CDA's SSS (AMD 918.9 billion in 2020), growing by 40.7% over the previous year. The growth is conditioned by the growth of over the counter (OTC) transactions with corporate bonds, Government bonds, including Eurobonds issued on behalf of the RA, as well as stock exchange transactions of the CDA. Compared to the previous year, in 2021, the OTC transactions of local corporate bonds grew significantly.

In 2021, the share of operations executed through the GSASS in the secondary market transactions was 93.1% (93.7% in the previous year). In terms of financial stability, GSASS remains systemically important.

Table 4. Transfer of Securities through the Government Securities Accounting and Settlement System of the Central Bank Pertaining to the Operations with Securities in the Secondary Market [37]

Transfers	2019	2020	2021
Value of OTC transactions (trades, repo, reverse repo) (billion AMD nominal value)	10,794	13,616	17,416
Number of OTC transactions (trades, repo, reverse repo)	31,061	33,847	33,893
Value of stock exchange transactions (billion AMD nominal value)	51.9	62.7	69.7
Number of stock exchange transactions	902	993	616
Total value of transfers of securities (billion AMD nominal value)	10,846	13,679.6	17,486.2
Total number of transfers of securities	31,963	34,840	34,509

In both the GSASS and the CDA's SSS, the settlement of OTC transactions is subject to the principle of DVP (Delivery versus Payment), while stock exchange transactions are executed through a procedure of pre-depositing of securities and cash, thereby excluding counterparty risk. No credit risk may emerge due to the usage of gross settlement and irrevocability principles in the system.

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[36] *According to the EPS participation agreement, operational availability of the system should be at least 98.0% yearly.*

[37] *The statistical information provided includes the GSASS-executed settlements and excludes transfers via CDA nominee account and internal transfers made by sub–custodians for their clients.*

Table 5. Transfer of Securities through the Securities Account and Settlement System of the Central Depository of Armenia pertaining to the operations with securities in the secondary market [38]

Transfers[39]	2019	2020	2021
Value of OTC transactions (trades, repo, reverse repo) (billion AMD nominal value)	666.4	832.3	1,139.8
Number of OTC transactions (trades, repo, reverse repo)	4,088	2,557	4,020
Value of stock exchange transactions (billion AMD nominal value)	55.7	86.7	153.0
Number of stock exchange transactions	2,711	4,058	4,382
Total transfers of securities (billion AMD nominal value)	722.1	918.9	1,292.8
Total number of transfers of securities	6,799	6,615	8,402

In 2021, there were no significant (with duration of more than 1 hour) incidents, which could impact the uninterrupted functioning of the GSASS.

The operational availability of the modules of the primary and secondary markets of the GSASS was 100%.

Given the aforementioned, GSASS is assessed as reliable and safe.

Box 4

The peculiarities of payment card transactions

Payment card is the most popular payment instrument used in the retail sector in Armenia. Therefore, the indicators of transaction made via payment cards can clearly reflect the changes in the volume and number of non-cash transactions. In Armenia the number of contactless payment cards is growing rapidly starting from 2020, conditioned also by COVID19 pandemic. As of end of 2021, there were 1.5 million contactless payment cards, which is 54% of the total payment cards issued by Armenian banks. The total number of payment cards issued by Armenian banks grew by 8.3%.

The RA Law on "Non-Cash Transactions" is aimed at increasing the non-cash transactions. It was adopted by the National Assembly in January 2022 and will enter into force starting from July 1st, 2022.

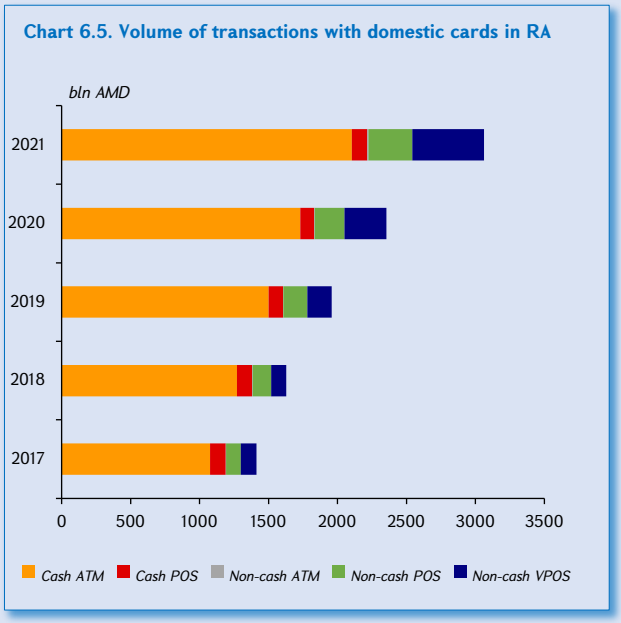
Due to the increased demand for non-cash transactions, the number of physical-virtual POS-terminals has increased, respectively, by 41% and 30%. This is the main infrastructure for servicing the non-cash transactions.

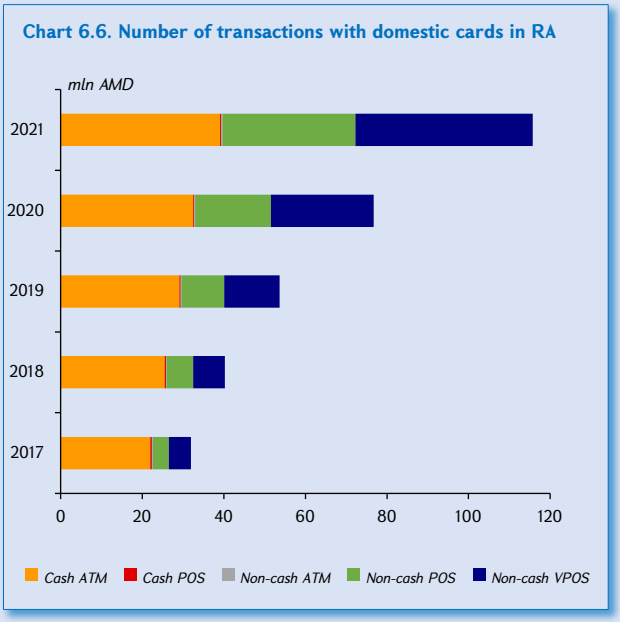
Transactions with Domestic Cards in Armenia

In 2021, the value of transactions with domestic cards in Armenia grew by 30% to AMD 3,063 billion, compared to the previous year. The growth of non-cash payments (61.4% compared to 2020) significantly exceeds the growth of cash transactions (21.0% compared to 2020). As a result, the share of non-cash transactions has increased by 5.4 percentage points compared to the previous year, making 27.7% (see Chart 6.5).

[38] *The statistical information provided includes the CDA's SSS-executed settlements. both with corporate securities and Eurobonds issues by the RA and government bonds held as sub-custodian.*

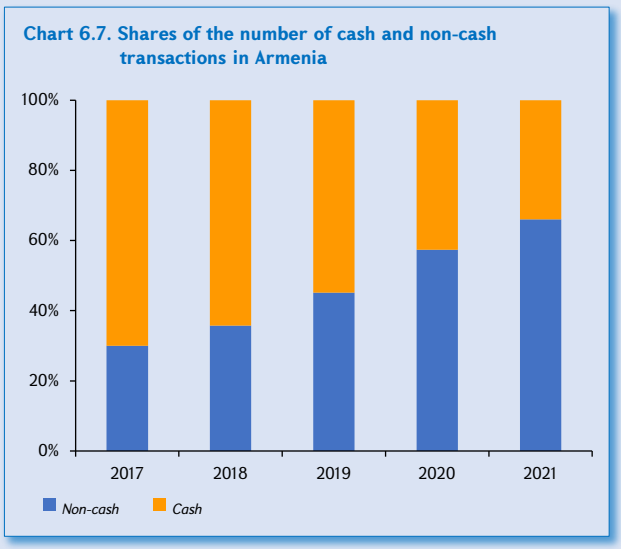
[39] *OTC transactions for 2019 and 2020 were adjusted based on the adjustments made by the CDA.*





The number of transactions in Armenia with domestic cards has increased by 50.8% compared to the previous year, due to 73.5% increase in the number of non-cash transactions. From 2020, the number of non-cash transactions exceeds the number of cash transactions. In 2021, 66% of the total payments were non-cash transactions, making up 76.4 million transactions (see Chart 6.6).

The above-mentioned facts and the growth rate of non-cash payments indicate the strengthening of the culture of non-cash transactions in Armenia (see Chart 6.7).



The value and the number of transactions made in the Internet environment is growing year by year.

International Transaction

As expected, both volumetric and quantitative indicators of transactions with Armenian cards abroad and with foreign cards in Armenia increased, compared to the previous year. The increases make up 30% in terms of value and 51% in terms of number for transactions with Armenian cards abroad, and 70% in terms of value and 113% in terms of number with foreign cards in Armenia.

8.8 million transactions worth AMD 225.6 billion were made with RA cards abroad, and 10.9 million transactions worth AMD 254 billion were made with foreign cards in Armenia.

ArCa Card system

The key infrastructure for card payments in the Republic of Armenia is the "ArCa" card system, through the processing of which the majority of card transactions are carried out in the Republic of Armenia. ArCa Processing Center is a third-party processor for international card systems operating in Armenia (Visa, Mastercard, AMEX, JCB, Unionpay, DinersClub). Due to the established cooperation between "ArCa" and Russian "MIR" card systems in 2017, the acceptance of "ArCa" cards in Russia and the acceptance of "MIR" cards in the Republic of Armenia became possible. These transaction values are growing yearly. Compared to the previous year, the value growth of "ArCa" card transactions in Russia was 122.5% and "MIR" card transactions in the Republic of Armenia was 100.4%. In December 2021, the pilot operation was completed for cross-border card to card transfers between ArCa and MIR, which will be introduced in 2022 and will expand the possibilities of transferring funds between individuals residing in Russia and Armenia.

According to its indicators, "ArCa" is a retail payments system of public (prominent) importance, so its operational reliability and security are subject to monitoring by the Central Bank of Armenia, and the significant incidents in the system (with a duration of 1 hour or more), their impact and mitigation measures are in the center of attention of the Central Bank of Armenia.

In 2021, one of the significant incidents in the system lasted for several days (October 1-5), the other: for about 2 hours (on December 13). During the incidents, the system worked unstable, the major card transactions (cash and non-cash card transactions, including those through bank mobile applications and ArCa's website) were accessible with interruptions. The Central Bank of Armenia was in constant contact with the ArCa team and monitored the steps taken. The causes of the incidents were revealed, and "Armenian Card" CJSC has taken measures to exclude such type of incidents in the future. Given the key importance of proper risk management in "ArCa" system, within the framework of payment systems oversight, the Central Bank of Armenia regularly monitors the system-specific risk indicators. An assessment of compliance of ArCa system's operational risk management with the requirements (principles) set by the Bank for International Settlement (BIS) is also envisaged to be carried out.

ANNEX 1
Indicators entering the macroprudential dashboard

Group	Indicator
Macro risks	Real GDP annual growth
	12-month inflation
	Growth of remittances (year on year)
	Current account balance/GDP
	Foreign debt/GDP
Credit risk	Loans to non-financial corporations / GNDI
	Growth of loans to enterprises (year on year)
	Growth of mortgage loans (year on year)
	Growth of consumer loans (year on year)
	Interest payments by Households / GNDI
	Bank leverage ratio
Market risk	Increase in apartment prices (year on year)
	Apartment price / average annual salary
	Interest rate margin
	Gross foreign exchange position
	Growth of foreign currency loans (year on year)
	Government bond yields
Liquidity risk	Quick assets / Total assets
	Interbank financing / Total liabilities of the banking system
Resilience of banking sector	Capital in excess of total capital requirement
	NPL coverage of banks
	Return on assets
	Return on equity

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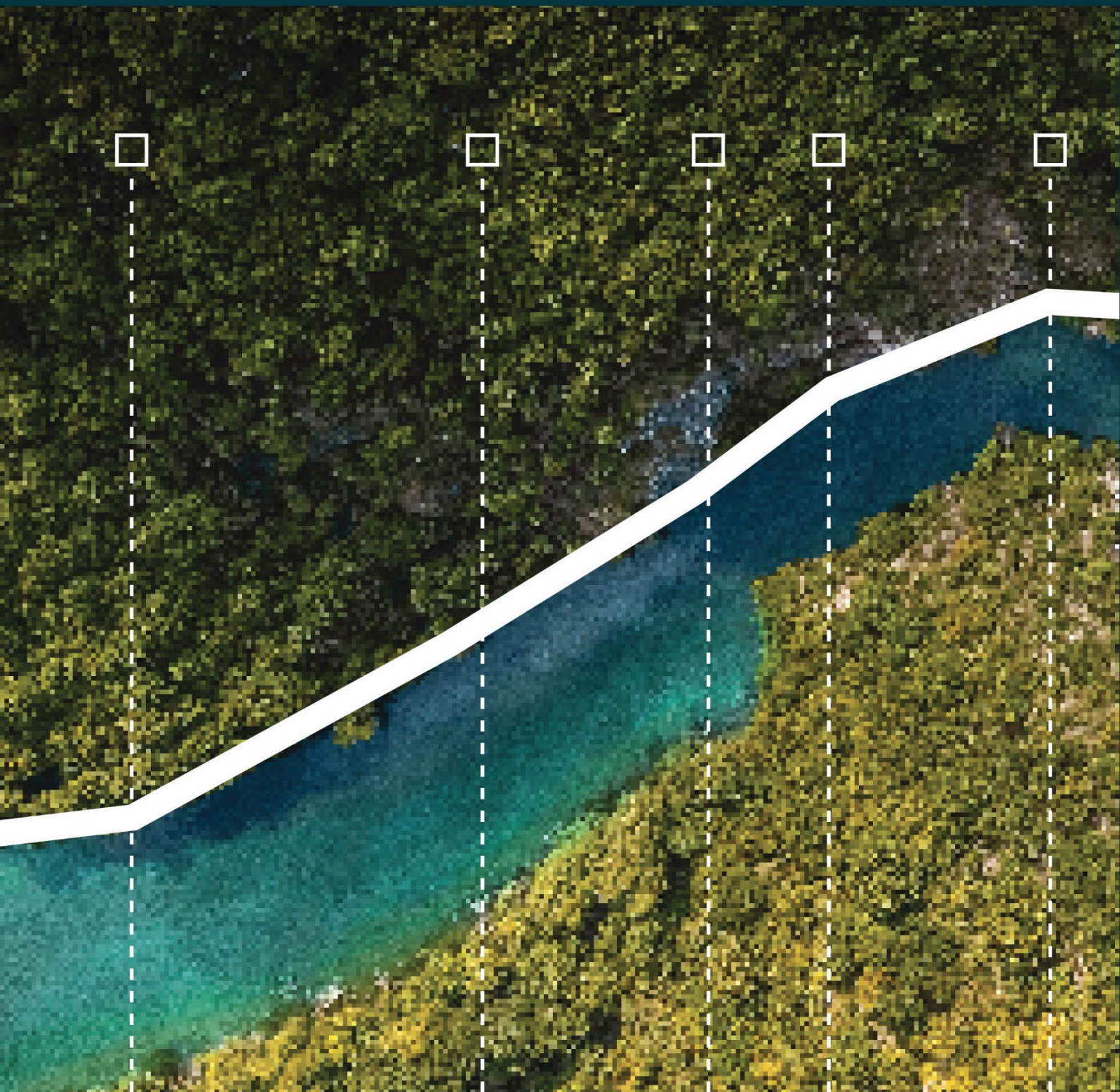
Transfer of Securities through the Securities Account and Settlement System of the Central Depository of Armenia pertaining to the operations with securities in the secondary market 51

GLOSSARY OF TERMS

Balance of payments	A system of recording of all economic transactions of Armenia (residents and nonresidents) with the rest of the world over a reporting period (a quarter, a year).
Capital adequacy	A ratio of total regulatory capital to risk weighted assets.
Credit risk	Credit risk refers to the risk that a borrower will default on any debt by failing to make payments which it is obligated to do. The risk is primarily that of the lender and includes the lost principal and interest, disruption to cash flows, and increased collection costs.
Consumer Price Index (CPI)	The Consumer Price Index is a measure of the average change over time in the prices paid by urban consumers for a market basket of consumer goods and services.
Doubtful asset	An asset the contractual obligations towards which are not performed; it is more problematic, making its collection at the given time very difficult or impossible.
Debt service to income (DSTI)	The amount of debt service payments relative to total disposable income of the borrower.
Economic growth	The growth of the volume of goods and services produced in the economy during a certain period.
Economic cost of capital	The difference between the present value of total assets and the present value of total liabilities.
Foreign currency risk	Foreign currency risk is the risk that a change in the exchange rate in the market will adversely affect profits and/or capital of the financial institution.
Foreign trade	This involves an exchange of capital, goods, and services across international borders or territories, in the form of exports and imports.
Gross foreign currency position	This position measures the sum of absolute values of positions of various currencies.
Gross external debt	Gross external debt, at any given time, is the outstanding amount of those actual current, and not contingent, liabilities that require payment(s) of principal and/or interest by the debtor at some point(s) in the future and that are owed to nonresidents by residents of an economy.
Herfindahl-Hirschman index	This index is defined as the sum of the squares of the market shares. It varies between 0 and 1, characterizing the level of concentration (values near to 0 denote lower concentration).
Inflation	An increase in the general level of prices of goods and services.
Interest rate risk	Interest rate risk is the risk that interest rate volatilities in the market will adversely affect profits and/or capital of the financial institution.
Liquidity coverage ratio (LCR)	A ratio of liquid assets to potential stressful outflow ratio within 1 month
Large liability	A liability, that itself constitutes 5% and more of the total liabilities of the bank, without taking into account interdependence.
Leverage	A ratio of total assets to total capital.

Liquidity risk	Liquidity risk is the risk that a given security or asset cannot be traded by the financial institution quickly enough in the market to prevent a loss (or make the required profit).
Loan to Value (LTV)	A ratio of a loan to the value of an asset purchased.
Loss asset	An asset non-collectible and fully impaired uncollectible, so that its recording on the balance sheet is no longer reasonable.
Loss given default (LGD)	Loss given default is the estimated amount of money a bank or other financial institution loses when a borrower defaults on a loan.
Major borrower	An entity on which the risk exceeds 5% of the total capital of the bank.
Net foreign currency position	The difference between assets and liabilities in FX assets and local currency assets containing FX risk.
Net provisioning	The difference between provisions to loss reserve fund and recoveries from assets.
Net stable financial ratio (NSFR)	The marginal ratio of the bank's available stable funding to its required stable funding within 1 month.
Nonperforming asset	An asset which has been classified by the bank as watched or substandard or doubtful or bad.
Off-balance sheet contingent asset	Off-balance sheet contingent assets include outstanding credit lines, credit cards, and overdrafts, as well as letters of credit, guarantees, and warranties provided.
Price risk	Price risk is the risk that a change in the price of securities in the market or price of similar financial instruments on balance sheets will adversely affect profits and/or capital of the financial institution.
Probability of default (PD)	Probability of loans to become non performing within 1 year.
Regulatory total capital	The difference between total capital, as shown in the statement on financial standing and deductions as specified in Central Bank «Regulation 2 on Banks and Banking»
Return on assets (RoA)	A ratio of net annual profit to average annual total assets.
Return on equity (RoE)	A ratio of net annual profit to average annual total capital.
Spread	The difference between deposit and credit interest rates.
Standard asset	An asset that is serviced under a contract and is not problematic.
Substandard asset	An asset the contractual obligations towards which are not performed due to the borrower`s fragile financial standing or inability to repay the debt.
Total liquidity	A ratio of highly liquid assets to total assets.
Watched asset	An asset that is serviced under an original contract, yet certain circumstances have emerged that may jeopardize the borrower`s ability to serve that asset,

ABBREVIATIONS

AMD	Armenian Dram
ARMSTAT	Statistical Committee of the Republic of Armenia
CBA	Central Bank of the Republic of Armenia
CDA SSS	Securities Accounting and Settlement System of the Central Depositary of Armenia
CMTPL	Compulsory Motor Third Party Liability Insurance
CJSC	Closed Joint Stock Company
CIS	Commonwealth of Independent States
DVP	Delivery versus Payment
ECB	European Central Bank
EPS	Electronic Payments System
FDI	Foreign Direct Investments
Fed	Federal Reserve System
GB	Government Bonds
GDP	Gross Domestic Product
GNDI	Gross national disposable income
GSASS	Government Securities Accounting and Settlement System
IFRS	International Financial Reporting Standards
IMF	International Monetary Fund
NMC	National Mortgage Company
NPL	Non-performing Loans
OTC	Over the counter
RA	Republic of Armenia
RF	Russian Federation
ROA	Return on assets
ROE	Return on equity
TB	Treasury bills
UNDP	United Nations Development Programme
USA	United States of America
USD	United States Dollar
YOY	Year on Year