National Bank of the Republic of North Macedonia
Financial Stability and Macroprudential Policy Department

FINANCIAL STABILITY REPORT FOR THE REPUBLIC OF NORTH MACEDONIA IN 2022

October 2023

Contents

Summary

During 2022, the global environment was marked by the geopolitical turmoil, which escalated with the war in Ukraine and deepened the energy crisis, causing high inflation growth globally. The prospects for the global economic growth deteriorated, and the post-pandemic recovery was slower than initially expected. The strong external shocks that were transferred to almost all economies did not miss the domestic one, creating risks for the financial stability, which were limited. **The domestic financial sector coped well with the challenges and once again showed that it is resistant to shocks and has the capacity to deal with crises.** There were limited effects of the developments in the banking systems of the USA and Switzerland from the beginning of 2023, which is primarily due to the predominantly domestic orientation of the activities of the financial sector, the application of the traditional business model by banks based on lending to households and to the corporate sector amid stable and diversified financing structure (with a predominant share of household deposits) and the public confidence in the financial sector.

In response to the high inflation, which reached several-decade maximum in the developed countries, central banks around the world, including the National Bank, were focused on tightening of the monetary policy. This further complicated the environment, where low interest rates prevailed for a longer period. Price stability is an important precondition for the stability of the financial sector, whereby the tightening of the monetary policy is to support the financial stability in the medium and in the long term. However, financial institutions and their clients may face challenges during the transition to higher interest rates. Banks are more exposed through the indirect channel of credit risk, if the higher borrowing costs deteriorate the creditworthiness of their clients. For institutional investors, mainly from the non-banking financial sector, the exposure to economic losses which may arise from the portfolios of debt securities is greater. These risks are limited for the time being, but there is a need for vigilance and in-depth risk assessment, further strengthening of good risk management practices and prudent planning of capital positions which will provide greater capacity of financial institutions to absorb possible risks.

The risks for the financial stability from the household sector are limited for the time being, amid growth of disposable income which contributes to maintaining the solid ability for regular settlement of liabilities. Household debt continues to grow, but is still moderate and below the usual internationally established vulnerability thresholds. Households' solvency and liquidity ratios currently indicate a relatively limited systemic vulnerability of this sector. However, the risks are pronounced through the higher inflation which affects real income and the exposure to interest rate risk. The macro-prudential measures, that the National Bank undertook from the beginning of 2023 in the domain of the quality of credit demand of natural persons, contribute to prevention of the risks from high indebtedness and occurrence of excessive indebtedness of households, which mitigates the risks for the banking sector.

The indebtedness of the corporate sector continued to increase, but it is still within moderate frames and currently does not point to risks for debt sustainability. The non-resident sector remains the main creditor of the domestic corporate sector, and the indebtedness to domestic banks also increased, amid increased liquidity needs of the companies with higher energy prices and in general, growth of the costs in the operations. A significant portion of the portfolio of the debt is with variable interest rates, which emphasizes the exposure to interest rate risk, which becomes especially important in the current context of growth of interest rates.

The corporate sector is also exposed to currency risk, amid higher debt with currency component, which is limited due to the exchange rate targeting strategy. The further maintenance of an adequate capacity for repayment of liabilities is important for the corporate debt sustainability, which was due to the improved profitability. The strong post-pandemic recovery increased the revenues which mitigated the effects of the higher costs in the operations due to the price shock, whereby the net profit from the operations of the corporate sector continues to grow, but at a slower pace compared to the previous year. The corporate sector maintained its liquidity position at a relatively stable level, although it is traditionally low, amid further improvement of financial discipline and regularity of settlement of liabilities. However, the uncertainty remains high, and the economic outlook of the country is sensitive to the risks from the environment, which together with the growth of financing costs may increase the vulnerability of the corporate sector. This points to the need for greater vigilance when managing debt and planning new borrowings in accordance with the financial capacities of the companies. Risks are especially pronounced for micro entities, which remain the most vulnerable group of entities with the highest level of indebtedness and low operational efficiency.

On the real estate market, the price growth accelerated, reaching a several-year maximum, affected by factors on both the supply and on the demand side. However, the market activity started to slow down, which is evident from the slower growth of the volume of transactions with real estate. At the same time, from the end of 2022, there is a slower growth of apartment prices which is also registered in the first half of 2023, although they remain at a higher level. Real estate market developments currently do not point to risks of a larger and sudden price adjustment, which could affect the materialization of the credit risk in the banks' balance sheets. However, there is a need for vigilance and close monitoring of the developments in this market segment.

The banking sector maintained the stability of its balance sheets even in complex conditions of intertwined risks from the environment that 2022 has brought. Moreover, it registered growth of the activities and contributed to mitigating the consequences of the energy crisis through increased credit support to the corporate sector and the households. The banking system solvency is stable and registered further improvement, and banks continue to realize profit from operations. Banks coped well with the challenges at the beginning of the year with short-term pressures on the deposit base due to the temporarily deteriorated expectations from the uncertain environment. This is due to their good liquidity position, which was maintained despite the challenges. The credit portfolio is stable and there are no signs of materialization of the credit risk for the time being. **The banking sector resilience is also confirmed by regular stress testing that shows that banks are resilient to shocks.** According to the results of the stress test, the capital adequacy ratio of the banking system would remain above the requirement of 8% even in a hypothetically worsened macroeconomic scenario with an assumed stagflation in two consecutive years. However, the environment is uncertain and may increase the risks, whereby the constant strengthening of the resilience of the banking sector and the ability to mitigate the possible risks, remain a priority. **For that purpose, the National Bank adopted macro-prudential measures in the domain of the countercyclical capital buffer, as a preventive measure for further strengthening of the capital strength of domestic banks, which is in the basis of the resilience of the banking sector to risks. Also in the following period, the National Bank is ready to take appropriate measures if necessary for maintaining the stability of the banking sector and the overall financial system.**

During 2022, the performances of the **pension funds** were influenced by the complex macroeconomic environment, which as in most other countries, was reflected through negative rates of return. This contributed to reducing the rates of return measured for several-year periods. However, these are short-term market shocks, while pension funds are long-term investors, which in the domestic economy are still in the process of collecting funds, which opens them an opportunity to offset their losses in the next period if they achieve better investment results. The structure of the pension funds' assets is still predominated by the investments in debt financial instruments, with a relatively long average maturity of the domestic government securities. With such a structure of the portfolio, and in circumstances of growth in interest rates, the interest rate risk is pronounced, which imposes a need for its careful management when making investment decisions and assessing the expected investment results. The structural profile of the exposure to other financial risks by the pension funds registered no significant changes during the year.

Risks from the environment had no significant impact on the **insurance sector**, whose operating results improved and it maintained its solvency at an appropriate level. The investments of the insurance sector remain focused on less risky and liquid instruments, with a very low exposure on the international financial markets. The insurance sector is sensitive to the interest rate risk, due to possible losses in the portfolio, although positive effects are possible through higher returns on new investments. The profitability of the insurance sector continues to be under pressure from the low operational efficiency, which is a long-term characteristic of the domestic insurance sector. An additional risk factor is the level of consumer prices, which is still high, if it spills over through increased costs for claims and possibly worsened availability of insurance.

Other financial institutions (savings houses, leasing companies, investment funds and financial companies) still have a small volume of activities and for the time being of very limited importance as a source of systemic risk for the financial stability. The unfavorable environment had a significant impact on the operations of investment funds through a pronounced downward trend of the rates of return, with the exception of money market funds. The amendments to the legislation that were adopted in July 2023 are important for the operations of financial companies. The aim of the amendments is to provide larger protection for the citizens - users of the services of financial companies, to increase the confidence in these companies, as well as to establish greater control of the risks that may arise from their operations.

In conditions of strong shocks from the environment, the National Bank remains committed to the analysis of the long-term structural vulnerabilities the domestic financial sector is exposed to, primarily in the field of climate changes and digital security. Within these frames, the National Bank made a preliminary analysis of the exposure of the domestic banking sector to physical and transitional risks related to climate changes and an assessment of the possible losses in the value of the real estate that serves as collateral for bank loans in case of adverse scenarios of materialization of natural disasters. In September 2023, the first Medium-Term Plan for the National Bank activities in the area of climate risk management for the period 2023 - 2025 was adopted, which concerns several segments of the operations of the National Bank, such as financial stability, banking regulations and supervision, monetary policy, research, financial markets and strengthening of the National Bank's capacities. The activities in the Medium-Term Plan are especially aimed at raising the banks' awareness about the importance of climate risks and starting activities for the establishment of a regulatory and supervisory framework that will provide adequate recognition and prudent management of climate risks by domestic banks. It is expected that the implementation of the Plan will contribute to better understanding of climate risks, their incorporation into the analyses of the banking system and building of a resistant banking system that will be able to support the transition of the economy to a green and sustainable development.

Financial stability is a joint priority and obligation of all financial regulators in the system, for which the coordinated approach to the strengthening of the financial stability is important, which was further strengthened with the adoption of the Law on Financial Stability, in August 2022. With the adoption of this law, the Financial Stability Committee becomes legally established and institutionalized as an inter-institutional body responsible for monitoring the implementation of macroprudential policy in the Republic of North Macedonia and for coordinating activities for identification and monitoring of systemic risks to each financial system segment, which can affect those segments and the financial system as a whole when taking macroprudential measures and during the preparation for and management of the financial crisis. The Law established the institutional framework for the setup of macro-prudential policy in the country, and the adoption of the first Strategy for the implementation of macro-prudential policy in the Republic of North Macedonia, in April 2023, also set the operational framework for the implementation of macro-prudential policy by the Financial Stability Committee and the competent authorities. The constant improvement of the macro-prudential framework is important for further strengthening of the resilience of the financial sector and timely prevention and reduction of vulnerabilities, especially in the current conditions when the monetary policy is geared towards inflation stabilization, which is an important precondition for the maintenance of financial stability in the long term.

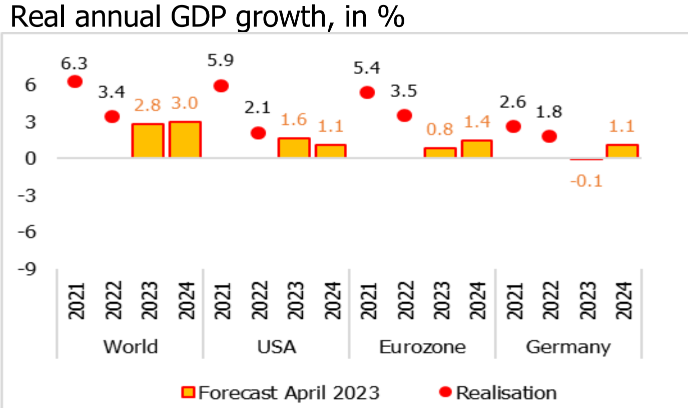
I. INTERNATIONAL AND DOMESTIC ENVIRONMENT

1.1. International macroeconomic environment

During 2022, the global macroeconomic environment was affected by yet another strong shock of a non-economic character, Russia's military invasion of Ukraine, which increased the global uncertainty and reflected on the prices of primary products in the world market. This contributed to accelerating the growth of global inflation, which in the developed countries reached the highest level in the last forty years. In response to the rising inflation and inflation expectations, central banks in the developed economies gradually and constantly tightened the monetary policy. At the beginning of 2023, the global economic environment was relatively more favorable, and the global inflation growth moderately slowed down. The global uncertainty again temporarily increased in March, driven by the developments in the banking systems of the USA and Switzerland. To overcome this situation, policy makers acted in a fast and coordinated manner, by providing liquidity support to banks and protection for depositors. This contributed to maintaining the general confidence and limited the possibility for risks to spill over into systemic, which would jeopardize the global financial stability and the stability of the European banking system. In the euro area, banks' capital and liquidity positions remained solid, providing resilience to different shocks. Risks for the global financial stability remain high and are further pronounced by the prolonged uncertainty from the environment, amid growth of interest rates and inflationary pressures that still exist, as factors that can affect the balance sheets of economic agents and the debt sustainability in the period ahead.

In 2022, the global economy faced yet another strong shock of a non-economic character, caused by Russia's military invasion of Ukraine, which had economic implications globally. In circumstances when the global supply chains are still slower as a result of the pandemic, the Russian-Ukrainian military conflict caused further growth of the prices of primary products in world markets, primarily the prices of energy and food products. This accelerated the growth of global inflation, which in the developed countries reached the highest level in the last forty years. In response to the prolonged inflation, central banks tightened the monetary conditions, which restricted the conditions on the financial markets. Given increased uncertainty, the growth of the global economy in 2022 is estimated at 3.4%, which is significant slowdown compared to 2021 (6.3%). The slowdown in economic activity is predominant in all countries, and especially pronounced in the developed economies, which on average registered twice lower growth rates compared to 2021.

Chart 1
Economic growth
Real annual GDP growth, in %

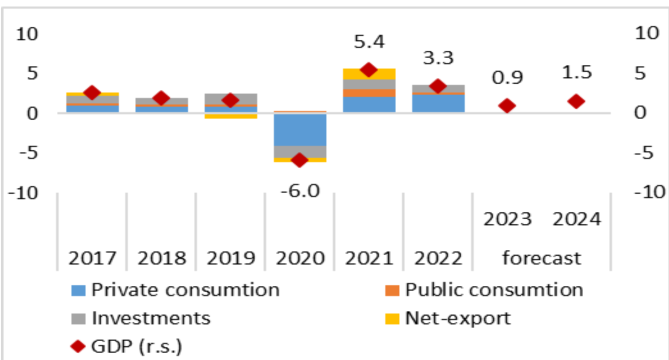


Source: IMF.

From the beginning of 2023, the global inflation growth moderately slowed down, but remains at a relatively high level, which was the reason behind the continuation of the cycle of tightening of monetary policy by central banks. The uncertainty associated with the war in Ukraine continues to impose risks in terms of the impact on supply chains and prices. The latest estimates for the global economy indicate a further slowdown in the economic growth, which in 2023 and 2024 would be 2.8% and 3.0%, respectively[1]. The global growth forecasts are accompanied by extreme uncertainty and predominantly downward risks for the growth, which are mainly associated with the risk of geo-economic fragmentation (deglobalization), the possibility for longer-term endurance of the high inflation levels and possible pressures from tighter financial conditions on the debt burden of the countries and the private sector, which highlights the risks for the financial stability and economies as a whole.

The economy of the euro area increased by 3.5% in 2022, which is a slowdown compared to the growth in the previous year (5.3%). As seen through the GDP structure, the growth mostly results from private consumption, and to a lesser extent from investments. Within the euro area, Germany, as the largest EU economy and the country with the largest share in the foreign trade[2] of the Republic of North Macedonia, went up by 1.9% in 2022, which was significantly lower than expected at the beginning of the year (3.8%), and also lower compared to the previous year (2.6%). Observations for the economic growth of the euro area for the coming period so far point to further economic recovery, but at a slower pace. The economic growth in the euro area is expected to slow down also in 2023 (growth of 0.8%), after which its certain acceleration is expected in 2024 (growth of 1.4%)[3].

Chart 2
Contribution to the real annual GDP growth in the euro area, in percentage points

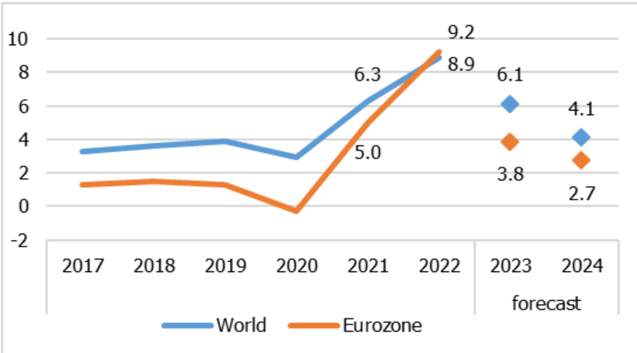


Source: EUROSTAT, World Economic Outlook, April 2023.

The inflation rate in the euro area in 2022 accelerated significantly and at the end of the year equaled 9.2% (5.0% at the end of 2021). In 2022, inflation reached historically the highest levels almost in all economies, and especially in the less developed economies. The acceleration in the price growth is mainly influenced by factors on the supply side, i.e. the increase in the world prices of primary

[1] Source: World Economic Outlook, April 2023.
[2] Foreign trade to GDP of the Republic of North Macedonia with Germany for 2022 is 37.0% of GDP and has increased compared to 2021 (36.1% of GDP).
[3] Source: World Economic Outlook, April 2023.

Chart 3
Inflation rate
annual growth rates, in %



Source: IMF.

products, especially food and energy, given the disturbances on the energy market and the global supply chains, and amid solid recovery of demand. With the gradual exhaustion of the effects of these factors, from the beginning of 2023 the inflation rate slows down, but remains at a relatively higher level. For the next period, the inflation rate in the euro area in 2023 is expected to reduce to 3.8%, and in 2024 it will continue to decrease and will reduce to 2.7%[4]. However, the risks are still present which creates uncertainty associated with the price changes in the period ahead.

Developments in international financial markets during the year were influenced by the dynamics of tightening of monetary policies of developed economies. Amid rising inflation and inflation expectations, central banks of the developed economies increased the interest rates which affected investors' expectations and their investment approach. Volatility in the markets was present during the entire year. In such conditions, government bond yields in the United States significantly rose and were maintained at a high level. The yields on the safest government bonds from the euro area also increased, while share prices registered significant downward movements. At the beginning of 2023, yields on government securities remained at a relatively high level, while the stock exchange indices changed their direction.

Chart 4
Bonds and shares market volatility index
in points

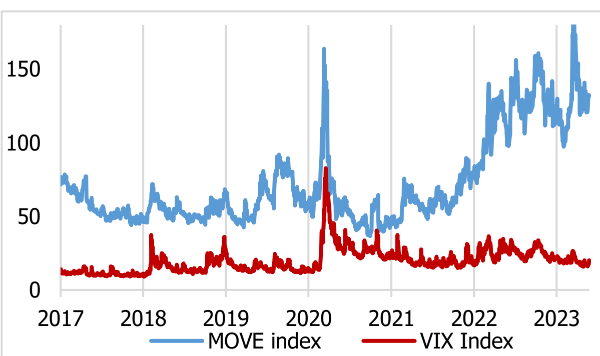
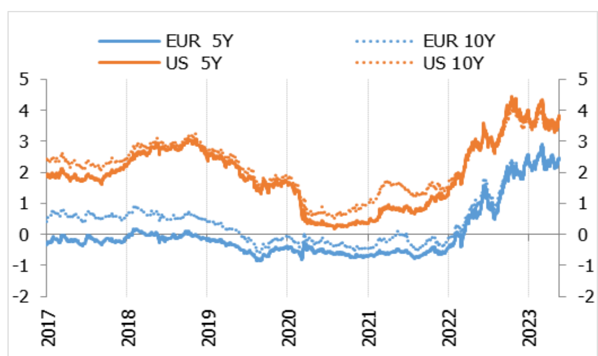


Chart 5
Yields on government bonds in the United States and the euro area
in %

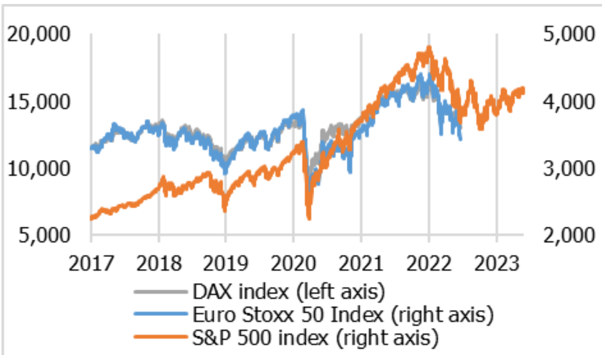


Source: Online publishing service.
Note: The MOVE index (MOVE-Merrill Lynch Option Volatility Estimate) shows the implicit volatility of US government bonds over the next 30 days. It is calculated as a weighted average of bonds with different maturities, with the highest representation of 10-year government bonds. The VIX index (Volatility Index) is constructed based on the implied volatility of S&P500 index options. Downward index path indicates a decrease in volatility of trading terms.

[4] Source: World Economic Outlook, April 2023.

During 2022, the value of the stock exchange indices in the United States and the euro area registered downward movements, which comes after the substantial growth in the past almost two-year period. The downward movements were conditioned by the increased uncertainty as a result of the Russian-Ukrainian conflict, the high inflation and the tightening of the financial conditions globally, amid increased policy rates of central banks. Since the beginning of 2023, amid relatively more favorable economic environment, at global level, the stock exchange indices changed their direction and witnessed a trend of growth, which was more pronounced in the European stock exchange indices compared to the stock market share indices in the United States. However, their movement remains volatile, mostly influenced by the developments in the banking systems of the United States and Switzerland. Movements in stock market indices affect the assets of domestic financial institutions that invest in foreign markets[5].

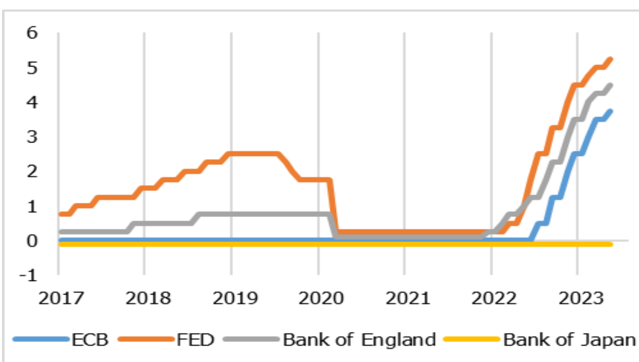
Chart 6
Movement of stock market share indices
in index points



Source: Online publishing service.

In 2022, central banks of developed countries conducted tighter monetary policy in order to reduce inflation and stabilize inflation expectations. At the beginning of the year, central banks responded through reduction of the portfolios of securities in their balance sheets and with announcements for interruption in certain securities purchase programs, which reduced the liquidity in systems. During the year, the cycle of tightening of monetary policy continued by increasing interest rates by the largest leading central banks, which was also monitored by the other smaller central banks. Also at the beginning of 2023, amid slower, but still high inflation, central banks tightened the financing conditions, by further raising their policy rates.

Chart 7
Interest rates of leading central banks



Source: Internet sites of banks.

[5] More details about the placements of the domestic financial institutions on the foreign market can be found in the sections concerning the individual financial institutions of this Report.

The value of US dollar against the euro continued to increase. At the end of 2022, the euro/US dollar currency pair stood at 1.0666, compared to 1.1326 at the end of 2021. The trend of strengthening the US dollar against the euro was largely due to the faster tightening of monetary policy by the Fed relative to the ECB and the increasing interest of investors in the US dollar, amid high uncertainty and pronounced geopolitical risks (the Russia-Ukraine war). In the domestic context, given the policy of nominal denar/euro exchange rate peg and the largest representation of the euro among foreign currencies in the banks' balance sheets, changes in the euro/US dollar currency pair do not have a significant impact on the currency structure of the balance sheets of the Macedonian banks.

Chart 8
Euro/US dollar

Source: EUROSTAT.

The economic recovery further reduced budget deficits in almost all euro area countries, which subsequently affected debt positions. Amid improved budget revenues, budget deficits in most of the euro area member countries decreased. The budget deficit across euro area in 2022 was 3.6% of GDP and decreased on an annual basis (5.3% of GDP in 2021). Government debt in the euro area was estimated at 93.2% of GDP at the end of 2022 (97.3% of GDP in 2021), and expected to further decline over the next two years to 89.9% of GDP in 2024[6]. However, the tightening of financing conditions, amid high uncertainty surrounding the developments of the Russia-Ukraine war, increases the risks for sustainability of public finances within the euro area, which, given the high public debt, emphasizes the fiscal vulnerability.

Chart 9
Budget deficit, euro area
in % of GDP

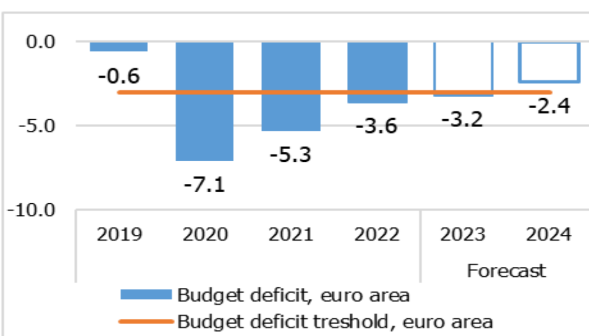
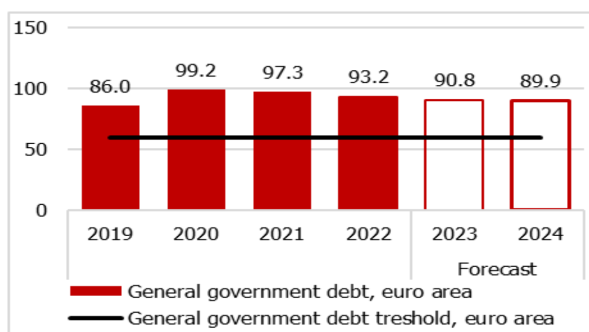


Chart 10
Government debt*, euro area
in % of GDP

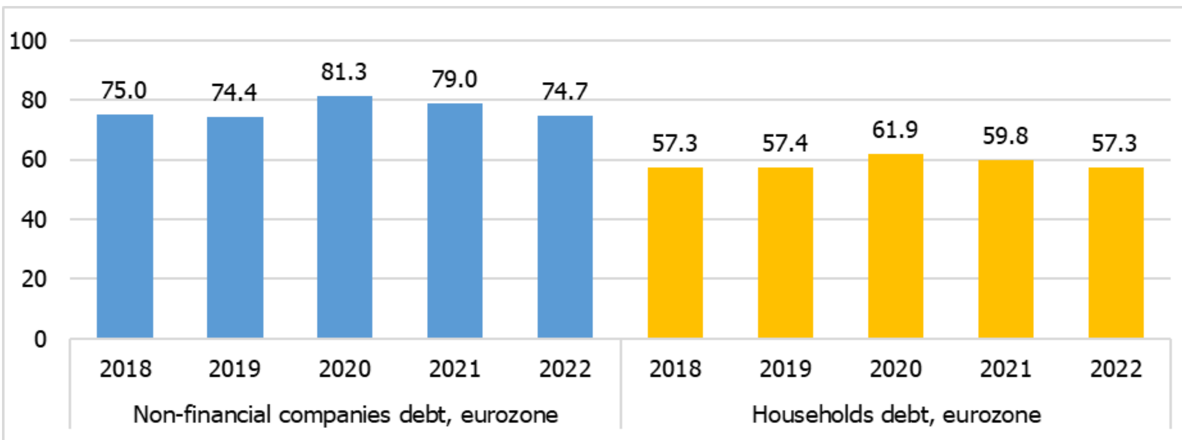


Note: 3% threshold for budget deficit to GDP and 60% threshold for government debt to GDP under the Stability and Growth Pact.
* General government debt.
Source: European Commission, Spring 2023 Economic Forecasts.

[6] European Commission, Spring 2023 European Forecasts.

The indebtedness of the private sector remained relatively stable. The corporate debt across euro area remained relatively stable compared to the previous year and at the end of 2022 was 74.7% of GDP (79.0% of GDP in the previous year). Household debt also remained stable and at the end of 2022 was 57.3% of GDP (59.8% of GDP in the previous year). Such data point to improved debt positions of the corporate sector and households at the levels from before the start of the pandemic. However, having in mind the tightening of financial conditions, which is expected to continue also in the following period and the extreme uncertainty associated with the forecasts for the global economic growth, private sector debt remains a possible source of vulnerability and an important challenge for financial stability.

Chart 11
Private non-financial sector debt (corporate sector and households)*, euro area
in % of GDP



* Private non-financial sector debt.
Source: ECB.

The banking sector in the euro area maintained its resilience to shocks and continued to support the economy in the euro area. Euro area banks provide credit support to the real sector smoothly throughout 2022, which was made possible by solid capital and liquidity positions. The capital adequacy ratio of the banks in the Euro area remained relatively stable and at the end of 2022 was 19.3% (19.6% at the end of 2021). Liquidity Coverage Ratio (LCR) decreased on an annual basis and equaled 161.3% at the end of 2022. Return on equity and return on assets in 2022 (7.7% and 0.5%, respectively) improved and increased compared to the pre-pandemic levels. There is similar situation also at the end of the first quarter of 2023. The developments in the banking systems of the United States and Switzerland had limited effects on the European banking system which reflected through short-term instability in the financial markets and developments of the prices of shares of European banks. Expectations quickly stabilized thanks to the fast and coordinated response of policy makers which contributed to maintaining the general confidence and limited the possibility of spillover of risks into the European banking system and jeopardizing its stability. However, amid extremely uncertain landscape that can affect the creditworthiness of households and the corporate sector, ensuring sustainable profitability is still one of the key challenges for the euro area banks, with possible risks to financial stability.

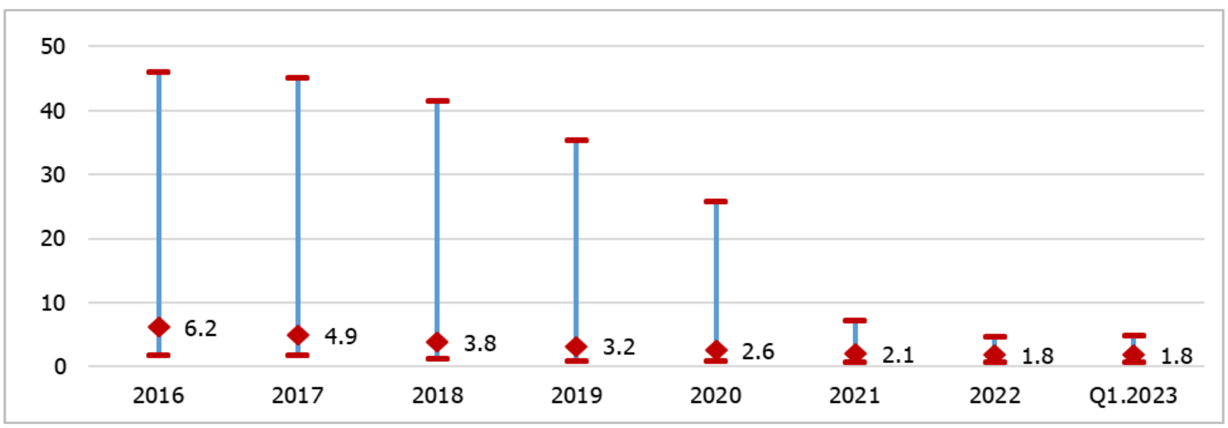
Table 1
Main indicators for the performance of euro area banks

		Q4.2018	Q4.2019	Q4.2020	Q4.2021	Q4.2022	Q1.2023
Profitalbility	Cost efficiency*	65.9%	65.8%	66.0%	64.3%	61.2%	60.4%
	ROE	6.2%	5.2%	1.5%	6.7%	7.7%	9.6%
	ROA	0.4%	0.4%	0.1%	0.4%	0.5%	0.6%
Asset quality	Non-performing loans coverage	45.2%	44.0%	43.3%	43.0%	41.9%	42.0%
	Non-performing loans	3.8%	3.2%	2.6%	2.1%	1.8%	1.8%
Capital adequacy and leverage	Total capital ratio	18.0%	18.6%	19.5%	19.6%	19.3%	19.6%
	Tier 1 ratio	15.6%	16.1%	17.0%	16.9%	16.6%	16.9%
	CET 1	14.4%	14.9%	15.6%	15.6%	15.3%	15.5%
	Leverage ratio	5.3%	5.6%	6.0%	6.0%	5.6%	5.5%
Liquidity	Liquidity coverage ratio	145.0%	146.0%	171.8%	173.4%	161.3%	161.3%
Funding	Loan-to-deposit ratio	118.7%	116.0%	106.7%	104.4%	103.5%	105.0%

* Cost to income.
Source: ECB.

At the end of 2022, the rate of non-performing loans in the euro area continues to decrease and equals 1.8%, a level that was maintained also at the end of the first quarter of 2023 and is the lowest level from 2008 onwards. Overall, the quality of assets of the euro area banks does not show significant signs of deterioration after the termination of the support of the authorities during the pandemic and amid increased uncertainty arising from the global macroeconomic environments. However, risks to the quality of the credit portfolio remain pronounced, which can affect the profitability of the European banking sector.

Chart 12
Non-performing loan rate of banks in the euro area
in %



Note: The chart shows the lowest and highest value of indicator across the euro area banks and average value of the indicator for the banking system in the euro area.
Source: ECB.

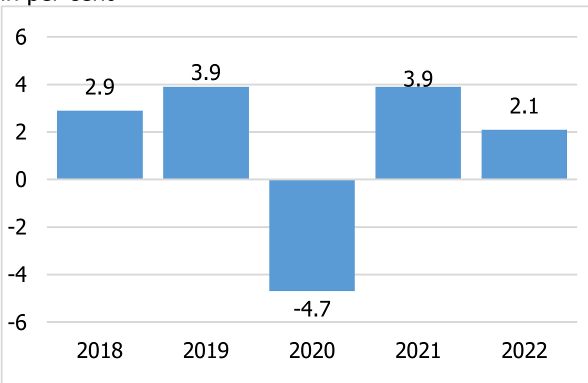
1.2. Domestic macroeconomic environment[7]

The domestic economy during 2022 was largely influenced by the adverse effects of the war in Ukraine, as well as the economic sanctions and trade restrictions imposed by the European countries against Russia. Such developments caused price shocks on the global markets of energy and food products, and reflected on the Macedonian economy through inflation growth, pressures on the balance of payments and occasionally on the foreign exchange market. The growth of the price level is mainly a reflection of the changes on the supply side, amid significantly higher import prices of food and energy, and to a lesser extent of the increase in core inflation. In order to stabilize inflation and inflationary expectations, the National Bank responded by tightening the monetary policy, first through the liquidity management instruments, and then by gradually increasing interest rates. Also, fiscal measures aimed at mitigating price pressures were taken. From the beginning of 2023, the tightening of the monetary policy continued in circumstances when the inflation rate started to slow down, but is still at a higher level. The uncertainty from the environment remains high and mainly results from the geopolitical developments, which emphasizes the risks to the financial sector that can be materialized through deterioration of the creditworthiness of the households and the corporate sector and materialization of the credit risk in the balance sheets of financial institutions. The National Bank closely monitors the developments and is ready to take appropriate measures if necessary for maintaining the stability of the banking sector and the overall financial system.

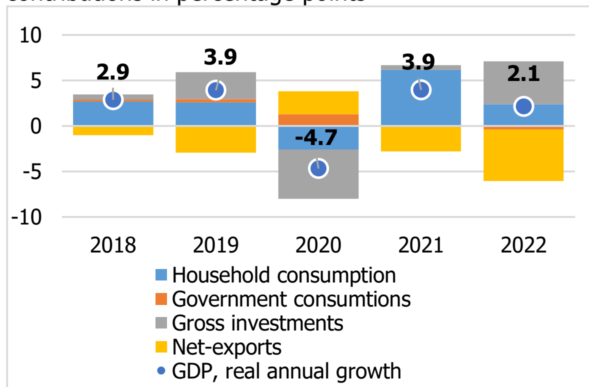
Economic activity during 2022 registered slower growth as a result of the effects of the war in Ukraine, so the real GDP growth rate was 2.1%. The main driver of the growth are the high investments, which grew at the highest real growth rate in the last ten-year period, and were especially pronounced in the first half of the year, mostly as a result of the increase in inventories. Private consumption also makes a positive contribution to the growth, although there is a slowdown in its growth amid real fall in wages and slower growth of consumer loans. The contribution of net exports to the growth of GDP is negative and expanded compared to the previous year amid higher growth of the import compared to the growth of the export of goods and services, affected by the increase in inventories. The analysis of the production side of GDP indicates that the growth is largely a result of the further recovery of the services sector (especially the activities related to trade, transport, tourism and catering), which was most affected by the pandemic. On the other hand, amid increased import prices and disturbance of the supply chains, the contribution of industrial output and construction is negative, and the fall is especially pronounced in the more intensive industrial branches (e.g. production of metals and fabricated metal products).

[7] For more information on the domestic macroeconomic environment see the Annual Report of the National Bank for 2022.

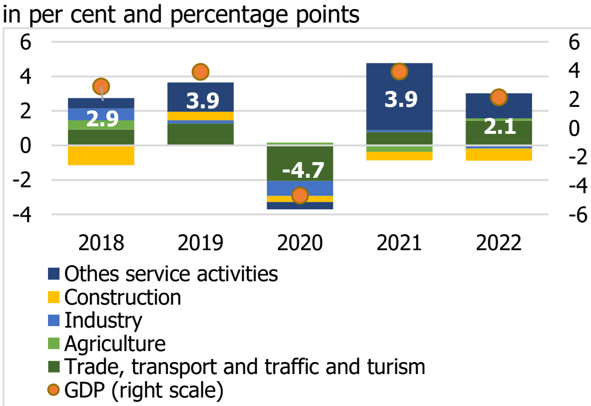
Chart 13
Real GDP growth
in per cent



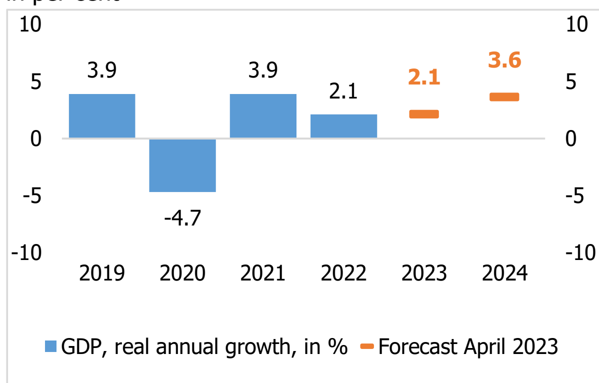
GDP structure, by component
contributions in percentage points



Contributions of individual activities to the real annual GDP growth
in per cent and percentage points



Real GDP growth, actual and forecast
in per cent



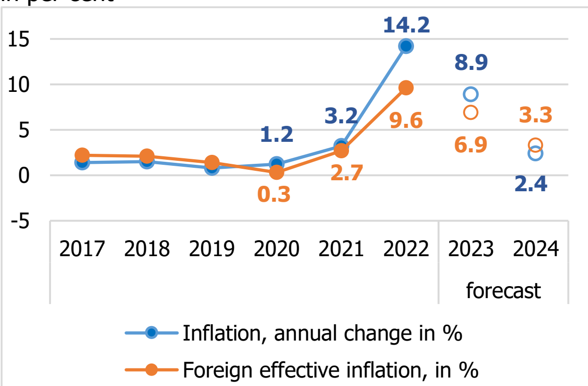
Source: State Statistical Office and National Bank for GDP forecast.
Note: GDP data for 2021 are preliminary, and data for 2022 are estimated.

The medium-term prospects for the domestic economy are strongly influenced by the downward risks which arise from the external environment. In accordance with the macroeconomic forecasts of the National Bank from the April forecasting round[8], the growth of the economy during 2023 is expected to be at the same level as in 2022 (growth of 2.1%), while a more significant recovery is expected in 2024 (growth of 3.6%). Risks from the external environment in the short and medium term are unfavourable. Geopolitical turmoil and its possible effects on the supply chains and global prices, the possible stronger tightening of the global financial conditions, as well as the developments in the financial systems in certain economies can limit the global growth. The possible materialization of these risks on the Macedonian economy would be indirect, but it could be transferred through the corporate and the household sectors on the financial sector, hence it is important to ensure precaution in the risk management by financial institutions.

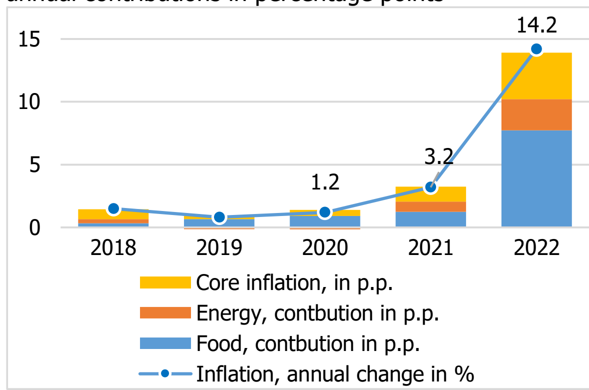
[8] The latest National Bank forecasts from April are published within the Quarterly Report in May 2023.

Chart 14

Domestic inflation and foreign effective inflation, annual growth rates and forecast
in per cent



Volatile (food and energy) and long-term component of inflation
annual contributions in percentage points

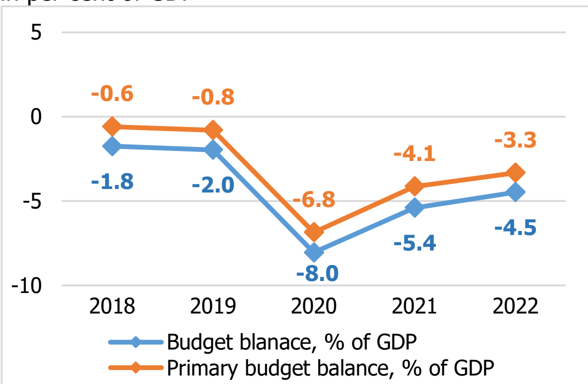


Source: SSO, Eurostat and National Bank assessments.

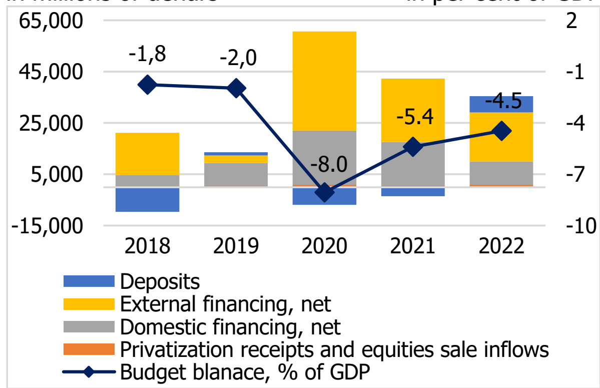
In 2022, the inflation rate accelerated and equaled 14.2% on an annual basis, which comes after a longer period of maintaining low and stable inflation. The high growth of the general price level was registered in conditions of global price shocks on the supply side, caused by the insufficiently recovered global supply chains after the COVID-19 pandemic and the adverse effects of the war in Ukraine whose impact on the domestic economy was mostly reflected through the global prices of primary products and foreign demand. Thus, the high inflation mainly results from the historically high growth of the import prices of energy and food raw materials (the growth of food and energy prices contributes with almost three quarters to the total price growth). The effect of the high prices of food and energy to a lesser extent spilled over also on the prices of other products and services, so core inflation registered slower growth.

The forecasts for the movement of inflation in the forthcoming two-year period point to a gradual price stabilization. According to the April forecasting round of the National Bank, the inflation rate in 2023 is expected to decrease to a one-digit number and range from 8 to 9%, and for 2024 it is expected to stabilize and reduce below 3%. The forecasts are in line with the expectations of the international financial institutions for stabilization and fall in food and energy prices amid tighter monetary policy. However, risks are still present and mainly result from geopolitical developments and their effects on import prices.

Chart 15
Total and primary budget balance
in per cent of GDP



Total budget balance funding structure
in millions of denars in per cent of GDP



Source: Ministry of Finance and National Bank calculations.

The new non-economic shock that hit the Macedonian economy imposed a need for a response through the fiscal policy with support mainly to the most vulnerable sectors of the economy in dealing with the price pressures and the energy crisis. As a result, budget expenditures increased, primarily due to the higher current expenditures, but growth was also registered in capital expenditures. The growth of budget expenditures was also accompanied by growth of budget revenues, whose main driver was the substantial increase in the income from taxes and contributions. Hence, the budget deficit decreased and equaled 4.5% of GDP, which is less by 0.9 percentage points compared to 2021. A similar tendency was also registered in the primary budget balance[9], which in 2022 decreased to 3.3% of GDP. The budget deficit was mainly financed through external government borrowing[10], but to a lesser extent through issuance of government securities on the domestic market[11], as well as through the use of government deposits. Public debt nominally increased at a lower rate than the nominal GDP growth rate, which reduced its share in GDP to the level of 59.7%, i.e. less by 1.3 percentage points compared to 2021.

For fiscal stability and public debt sustainability in the medium run, it is important to continue the fiscal consolidation, which is in line with the fiscal strategy of the Ministry of Finance. In accordance with the Strategy, the budget deficit is expected to gradually decrease in the forthcoming five-year period and reduce to 3.0% of GDP in 2025, and in 2028 to 2.5% of GDP. The main risks related to the fiscal consolidation arise from the uncertainty associated with the movement of the economic activity, the collection of tax revenues and the realization of capital expenditures[12]. The Public Debt Management Strategy[13] determines the level of public debt relative to GDP of 60% as a threshold in the medium and long term so that it is expected that

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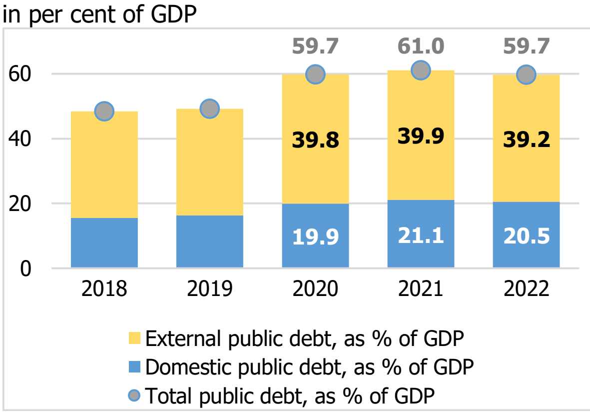
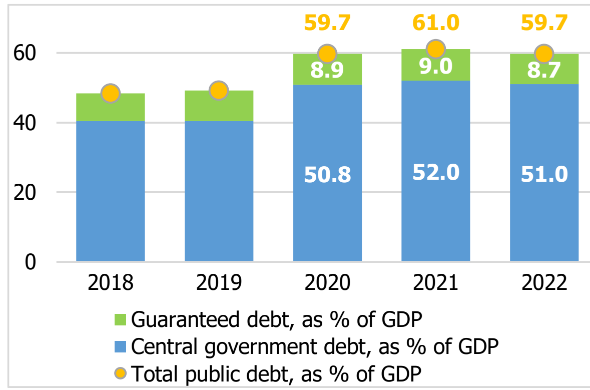
[9] The primary budget balance does not include repayments of current loan liabilities (interest). This fiscal indicator is considered more appropriate because it does not contain the fiscal costs that affect public debt related to the implementation of the fiscal policy in the past period.
[10] External borrowing includes funds from the approved Prudential and Liquidity Instrument of the International Monetary Fund, as well as loans from international financial institutions, and a bond has also been issued on the German market.
[11] The financing of the budget deficit during 2022 on the domestic primary government securities market increased by Denar 7,013 million, whereby the stock of issued securities reached Denar 153,322 million. The most significant growth of the stock was registered in the 15-year bonds, which is due to the new issuance of these securities at the expense of those with lower maturities, thus increasing the average maturity of the issued government securities. From the standpoint of investors, a significant increase was recorded in the investments of non-bank institutions (especially pension funds).
[12] Fiscal Strategy of the Republic of North Macedonia for 2024 – 2026 (with prospects until 2028), June 2023.
[13] Public Debt Management Strategy of the Republic of North Macedonia for 2024 – 2026 (with prospects until 2028), April 2023.

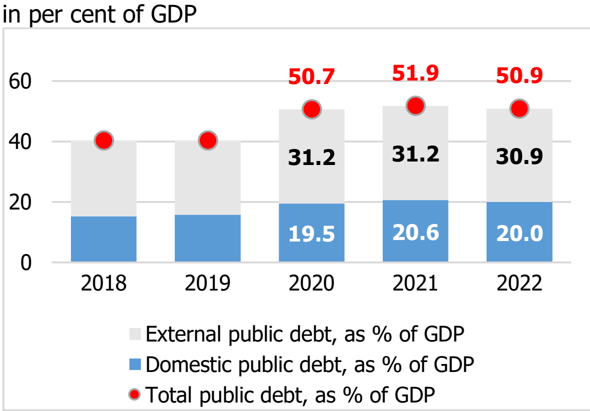
this level will be exceeded in the period 2023 – 2025, and in the period 2026 – 2028 it will return within the prescribed frames as a result of the fiscal consolidation measures. In addition, the Strategy also provides for diversification of the sources of financing in the medium term by issuing green, project and civil bonds[14]. Amid increased uncertainty on the international financial markets and rising interest rates, the public debt sustainability is sensitive to the interest rate risk.

Chart 16
Dynamics and structure of total public debt
in per cent of GDP

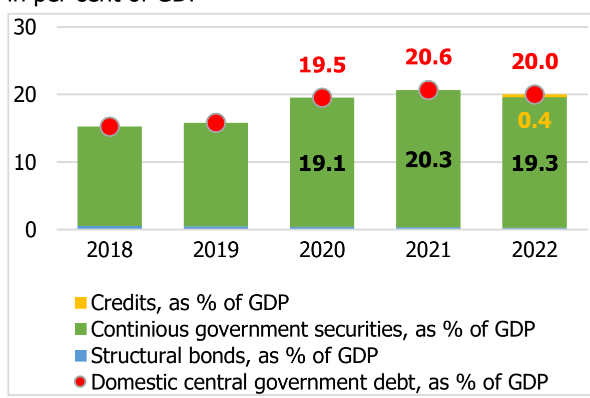




Dynamics and structure of central government debt by residency
in per cent of GDP



Structure of domestic central government debt
in per cent of GDP



Source: Ministry of Finance and National Bank calculations.

The external position of the economy deteriorated as a result of the high growth of the market prices of primary products and the growth of quantity of imports when creating inventories by companies amid uncertainty and rising prices. Pressures were especially pronounced in the first half of the year, when the foreign reserves decreased, but their stock stabilized in the second half of the year and the foreign reserves increased at the end of the year. The current account deficit of the balance of payments expanded compared to the previous year and equaled 6.0% of GDP. The deficit mainly expanded as a consequence of the significantly increased trade deficit, which resulted from the increased value of imports as a result of the rising prices of imported primary products. However, the pressures from the disturbance in the foreign trade were mitigated by the further growth of

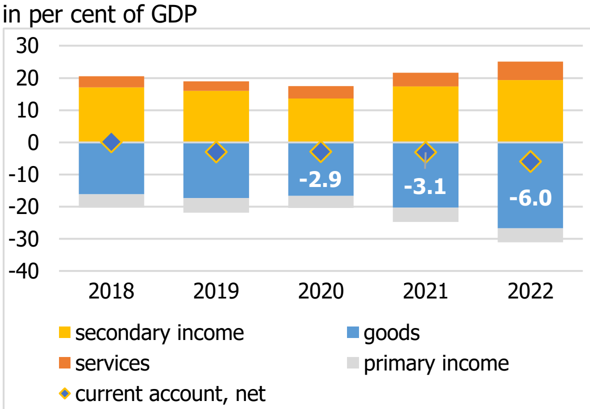
[14] In July 2023, a civil bond was issued in a total amount of Denar 1,448,030,000, with a maturity of two years and at a coupon interest rate of 5% on an annual basis.

private transfers, amid growth of net cash purchased on the currency exchange market, partly due to the full abolition of the restrictive measures against the pandemic, which in the previous two years affected the international movement of passengers. In 2022, the financial account of the balance of payments registered net inflows of 7.6% of GDP, mainly driven by the increased foreign direct investments, which equaled 5.2% of GDP and increased by 1.9 percentage points from 2021. This is also due to the increased inflows from loans and trade credits amid government borrowing with international institutions[15], and there was also a positive net inflow from portfolio investments as a result of the issuance of a bond on the German market.[16]

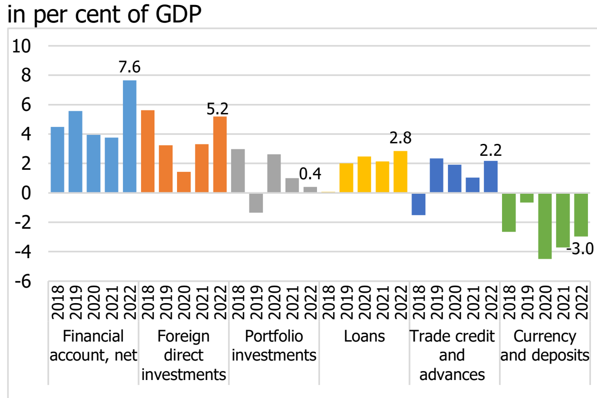
The net inflows in the financial account of the balance of payments enabled full financing of the current account deficit and growth of the foreign reserves. The National Bank intervened on the foreign exchange market with net sales of foreign currency, mainly due to the increased demand for foreign currency in the first half of the year, mainly influenced by the energy crisis, and partially due to the propensity to hold foreign currency. During the second half of the year, these pressures significantly reduced, supported by the solid movements in the balance of payments, amid growth of the inflows from foreign direct investments and loans. This is also due to the measures that the National Bank took to stabilize the expectations and ease the inflationary pressures. **Despite the uncertain environment, the stability of the exchange rate was successfully maintained, and the foreign reserves remained at an appropriate level in accordance with the international standards and are in the safe zone. The stability of the exchange rate is critical for financial stability, given the significant share of the currency component in the debt of the non-financial sector.**

Chart 17

Current account and main components
in per cent of GDP



Financial account and main components
in per cent of GDP



Source: National Bank.

In order to reduce inflation and stabilize inflation expectations, the National Bank in 2022 continued to tighten the monetary policy and increased its policy rate on several occasions, which from 1.25% in March increased to 4.75% in December 2022. Consequently, interest rates on overnight and seven-day deposit facilities also increased several times. In order to encourage denarization of the banks' balance sheets, the National Bank increased the reserve

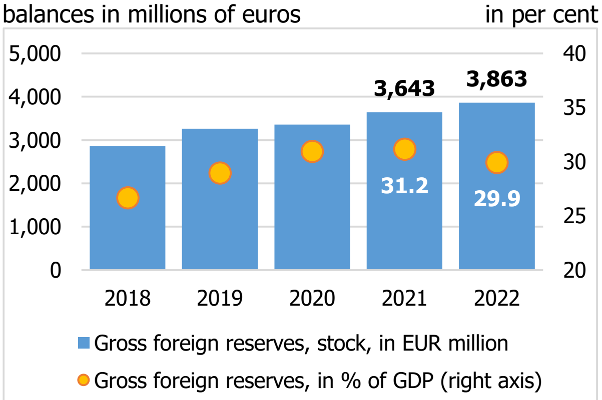
[15] In the fourth quarter, the first tranche of the approved Prudential and Liquidity Instrument (PLL) from the International Monetary Fund was withdrawn in the amount of Euro 110 million (out of a total of Euro 530 million approved by the arrangement).
[16] In September 2022, a bond was issued on the German market in the amount of Denar 250 million with a maturity of 3 years and at an interest rate of 6-month EURIBOR increased by a commission of 3.75%.

requirement rate of foreign currency liabilities from 15% to 18% at the expense of the decline in the rate of denar liabilities from 8% to 5%. In addition, to encourage the production of electricity from renewable sources, the National Bank changed the reserve requirement calculation base through its reduction for the amount of newly approved loans for support of projects in this sector. Also, the National Bank defined a package of macro-prudential measures for further strengthening of the resilience of the banking system for mitigating the potential risks. Thus, in addition to the regular determination of the required capital buffer for systemically important banks, toward mid-2022, the National Bank introduced a countercyclical capital buffer rate of 0.50% (applicable from August 2023), which during the year increased to 0.75%. From the beginning of 2023, inflation slowed down, but remains at a higher level, which was a reason for the further increase in the policy rate, which reached 6.15% in August 2023. Interest rates on deposit facilities also increased accordingly, the reserve requirement rate of foreign currency liabilities increased from 18% to 19%, and the countercyclical capital buffer rate increased to 1.00% (applicable from July 2024).

Chart 18

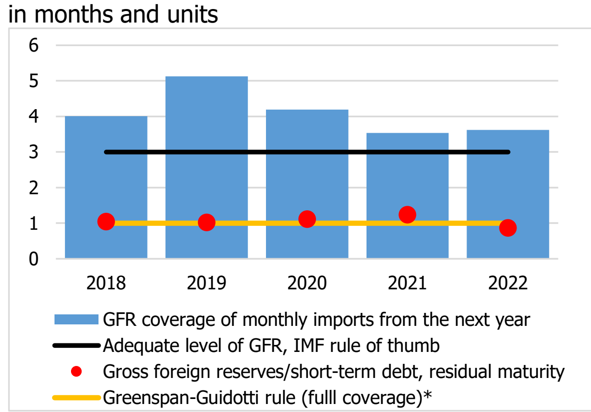
Gross foreign reserves, balances and share in GDP

balances in millions of euros / in per cent



Foreign reserves adequacy indicators

in months and units



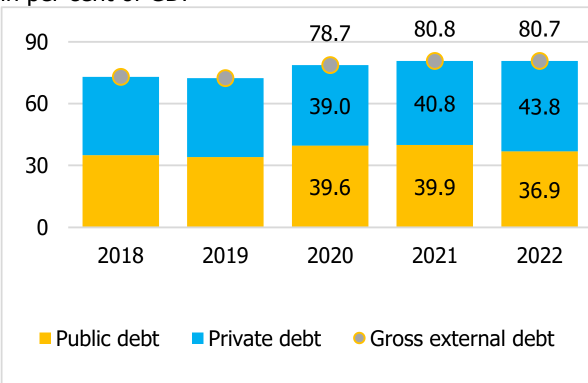
Source: National Bank.

Note: According to the Greenspan-Guidotti rule, the country has to keep full coverage of short-term debt (residual maturity) with foreign reserves.

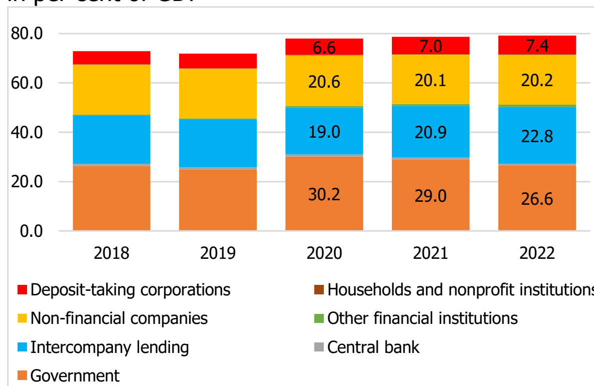
Gross external debt[17] relative to GDP in 2022 was maintained at an almost identical level as in the previous year and equaled 80.7%. This performance was noted in conditions of a reduced public debt in the absence of significant liabilities based on debt securities, amid simultaneous growth of private debt which mainly results from the higher intercompany lending and to a lesser extent from the increased debt of non-bank institutions as a result of trade credits, as well as of private banks as a result of the growth of short-term liabilities based on currency and deposits. Moreover, the share of intercompany lending in total gross external debt continued to increase and reached 28.3%, with a solid share of trade credits of about 10%, which contributes to reducing the vulnerability from excessive external indebtedness because these two categories are relatively less risky forms of debt.

[17] Gross external debt data does not include central bank liabilities under repo agreements.

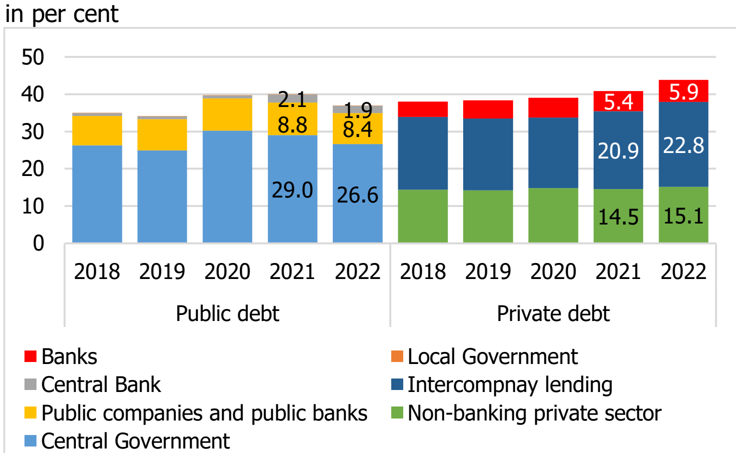
Chart 19
Structure of the gross foreign debt
By debtor
in per cent of GDP



By institutional sector
in per cent of GDP



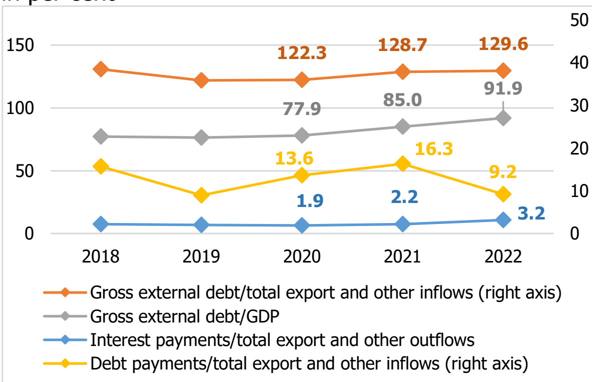
Public and private debt structure
in per cent



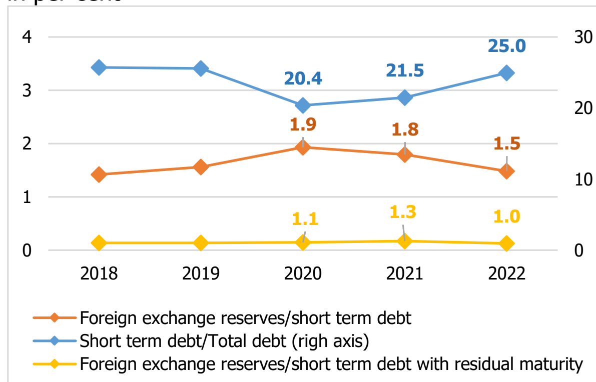
Source: National Bank.
Note: Gross external debt does not include central bank liabilities under repo agreements.

The external indebtedness of the Macedonian economy is still moderate. Solvency ratios point to low indebtedness, with the exception of gross external debt to GDP ratio which is the only ratio that classifies the domestic economy in the group of high indebted countries. Liquidity ratios registered an increase in the share of short-term in total debt, which contributed to a slight decrease in foreign reserves to short-term debt ratio, but such movements are within the historic values registered in the previous few years.

Chart 20
Solvency as an external debt indicator
in per cent



Liquidity as an external debt indicator
in per cent



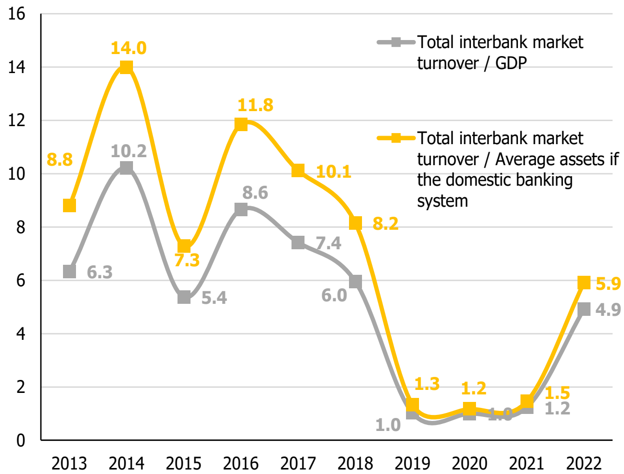
Source: National Bank.
* Moderate debt criterion is taken from the World Bank's debt indicator compilation methodology, which implies using three-year moving averages of GDP and export and other inflows as denominators in the indicator compilation.
Moderate debt criterion:

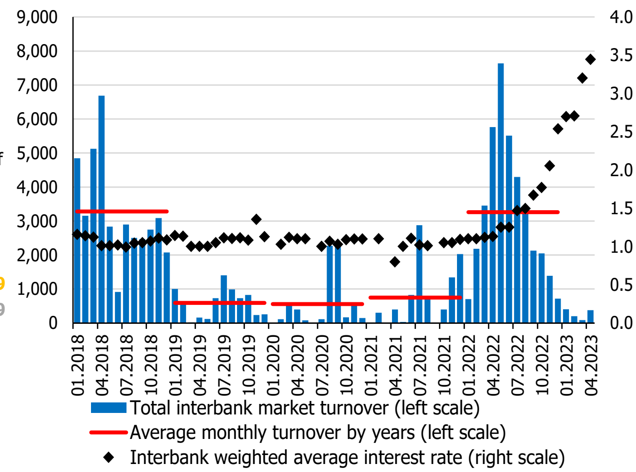
- Interest payments/export and other inflows: 12 – 20%;
- Debt payments/export and other inflows: 18 – 30%;
- Gross external debt/GDP: 30 – 50%;
- Gross external debt/export and other inflows: 165 – 275%;
- Foreign reserves/short-term debt with residual maturity 1; and
- The country needs to maintain full coverage of short-term debt (residual maturity) with foreign reserves.

1.2.1. Financial markets

During 2022, in conditions of a complex environment caused by the Russian-Ukrainian conflict, the importance of financial markets for the liquidity management of domestic banks increased. The turnover on the interbank market for non-collateralized deposits in 2022 registered high growth (of 337.7% on an annual basis) and amounted to Denar 39.1 billion. The high growth of the turnover was mainly due to the performances in the first half of the year, when the uncertainty was the highest, and reflected on domestic banks through reduced excess liquidity. Banks applied active liquidity management to successfully overcome challenges and maintain stable and solid liquidity position, which is one of the pillars of the overall banking system stability. The activity of the financial markets is still of modest importance for the financial system with a share of turnover in the gross domestic product of 4.9% and in the total assets of banks of 5.9%.

Chart 21
Indicators of the relative importance of the interbank market (left) and total turnover and interest rate on the interbank market (right)
in % and in millions of denars



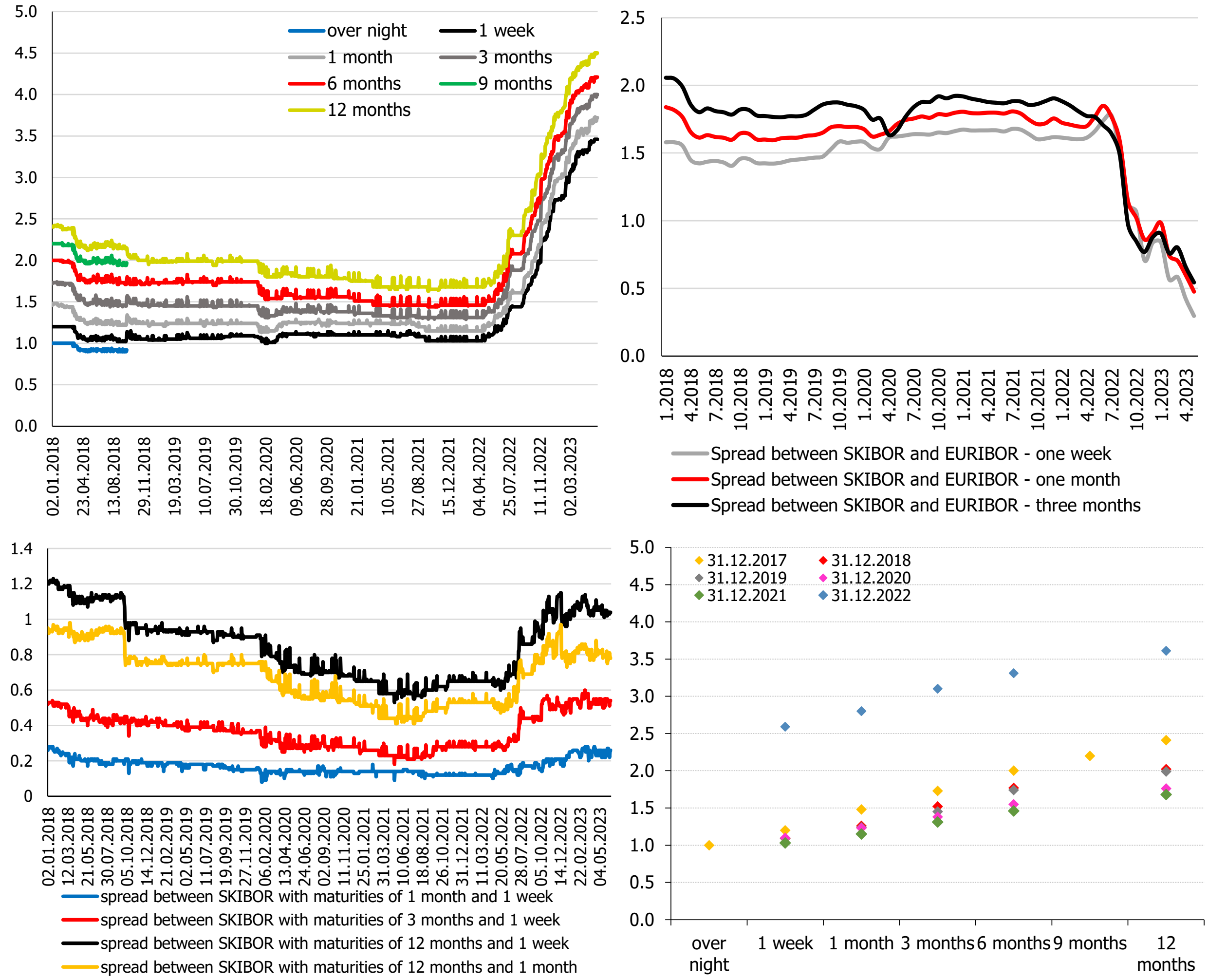


Source: National Bank.

During the year, banks used the interbank market for non-collateralized deposits mainly for compensating the short-term liquidity needs, whereby most of the transactions were concluded with maturity up to one week. After a period of three years, movements were registered in the market segment of repo-transactions, amid growth of the number and value of transactions[18]. Since the beginning of 2023, in conditions of a stable liquidity of domestic banks, the total turnover on the two market segments decreased compared to last year and reached Denar 1,445 million for the first five months.

[18] On the market segment of repo-transactions in 2022 there was conclusion of nine transactions in the maturity bucket of up to 1 week in a total amount of Denar 5,637 million and ten transactions in the maturity bucket of up to 1 month in a total amount of Denar 4,562 million. Thus, the turnover on the market segment of repo-transactions in 2022 reached Denar 10,199 million at a weighted interest rate of 1.7%.

Chart 22
Dynamics of SKIBOR (top, left), dynamics of spreads between SKIBOR and EURIBOR for selected maturities (top, right), derived term premiums from SKIBOR (bottom, left) and SKIBOR yield curves (bottom, right)
in %



Source: National Bank and European Central Bank.

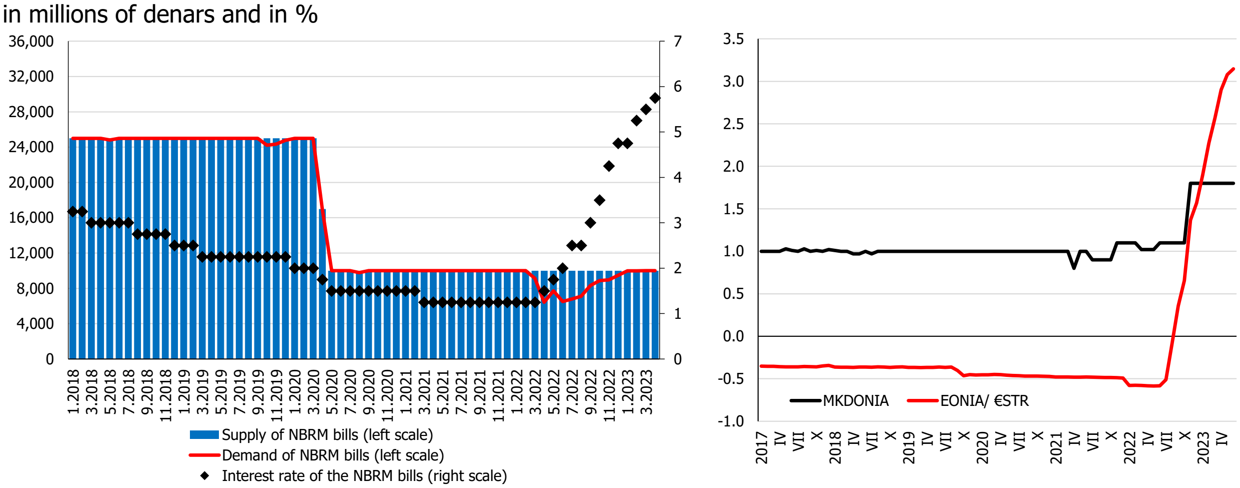
During 2022, interbank interest rates on the deposit market increased, amid tightening of the monetary policy[19] in order to stabilize inflation. Changes in the indicative interest rates for trading with interbank deposits SKIBOR resulted in growth from 1.4 percentage points for transactions of up to one week to 1.6 percentage points for transactions of up to 3 months. The interest rate on executed interbank transactions in 2022 also increased and on a monthly basis ranged from 1.5% to 2.54% (0.8% to 1.11% in 2021). In 2022, these interest rates included the average credit risk premium expressed through the spread of interest rates on the National Bank overnight and seven-day deposit facilities of 0.7 and 0.6 percentage points which is a decrease compared to last year. The growth of interest rates on the interbank market in the euro area (EURIBOR) during 2022 was stronger relative to the domestic market, which

[19] During 2022, starting from April, until the end of the year, the National Bank, on eight occasions increased its policy rate (the interest rate on CB bills) by a total of 3.5 percentage points.

narrowed the spread between the indicative quotations of denar interbank interest rates (SKIBOR) and interbank interest rates in the euro area (EURIBOR) during the year.

During 2022, the National Bank kept the supply of CB bills at the level of Denar 10 billion. Since early 2022, having increased challenges from the surrounding, especially after the outbreak of the Russia-Ukraine war, banks managed liquidity also through adaptation of the demand for CB bills, whereby at some of the auctions of CB bills held in the first half of the year, the demand was lower than the supply. From the second half of the year, with the stabilization of the situation, the demand for CB bills started to increase, and from the beginning of 2023 it is maintained at a level of the amount offered.

Chart 23
Characteristics of the primary market of CB bills issued by the National Bank (left) and overnight interest rates on domestic and interbank markets in the EU (right)
in millions of denars and in %

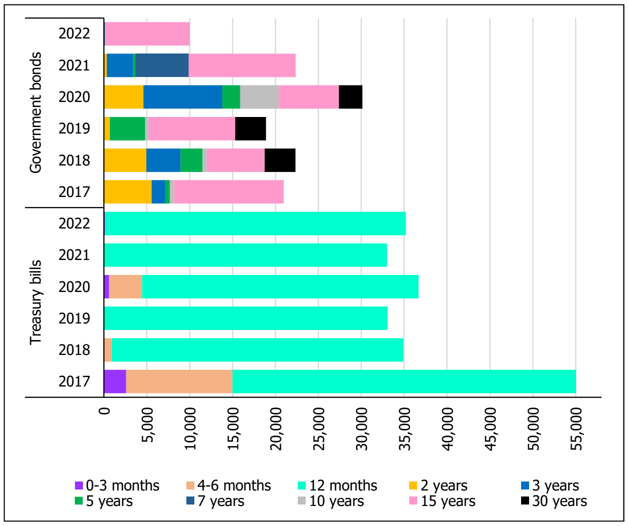


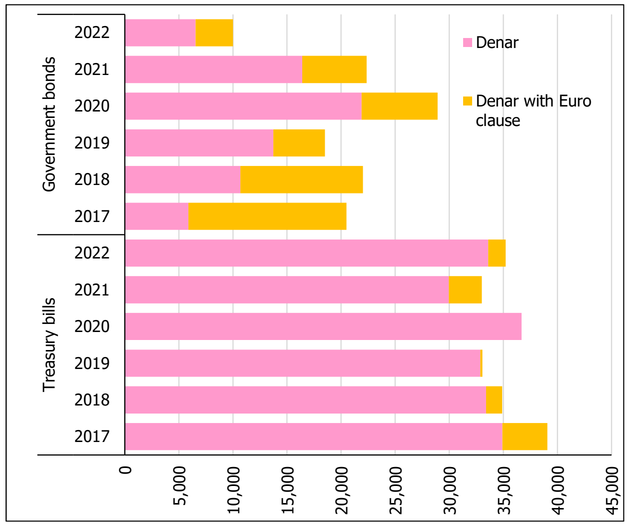
Source: National Bank and European Central Bank.
Note: On 3 January 2022, the €STR officially replaced EONIA. This new interest rate measures the costs of banks' unsecured lending on the wholesale markets in the euro area, determined on the basis of overnight transactions. ECB is the administrator of €STR and this rate was published for the first time on 2.10.2019. In the period from 2.10.2019 to 3.1.2022, €STR and EONIA were published together, where EONIA was shown as €STR+8.5 basis points.

During 2022, the Ministry of Finance reduced the volume of issued domestic government securities. The total amount of government securities[20] issued in 2022 amounted to Denar 45,589 million, which is 5.7% of GDP (7.8% in 2021) and recorded an annual decrease of 19.4%. Considering that in 2022 government securities in the amount of Denar 38,823 million fell due, the net issued amount of government securities on the domestic market in 2022 was Denar 6,766 million. New issues of government securities were mostly concentratedin treasury bills, which were almost entirely issued with maturity of 12 month and accounted for more than two thirds of the newly issued government securities (77.2%). However, the fifteen-year government bonds continue to have the highest share in the maturity structure of the stock of government securities (of 44.7%).

[20] The analysis refers to total government securities (continuous and structural). In 2022, there was one issue of structural bonds in the amount of Euro 6 million. The eleventh issue of denationalization bonds in a total amount of Euro 10 million fell due during this year.

Chart 24
Structure of newly issued government securities on the primary market by effective contractual maturity (left) and by currency denomination of the securities (right)
in millions of denars



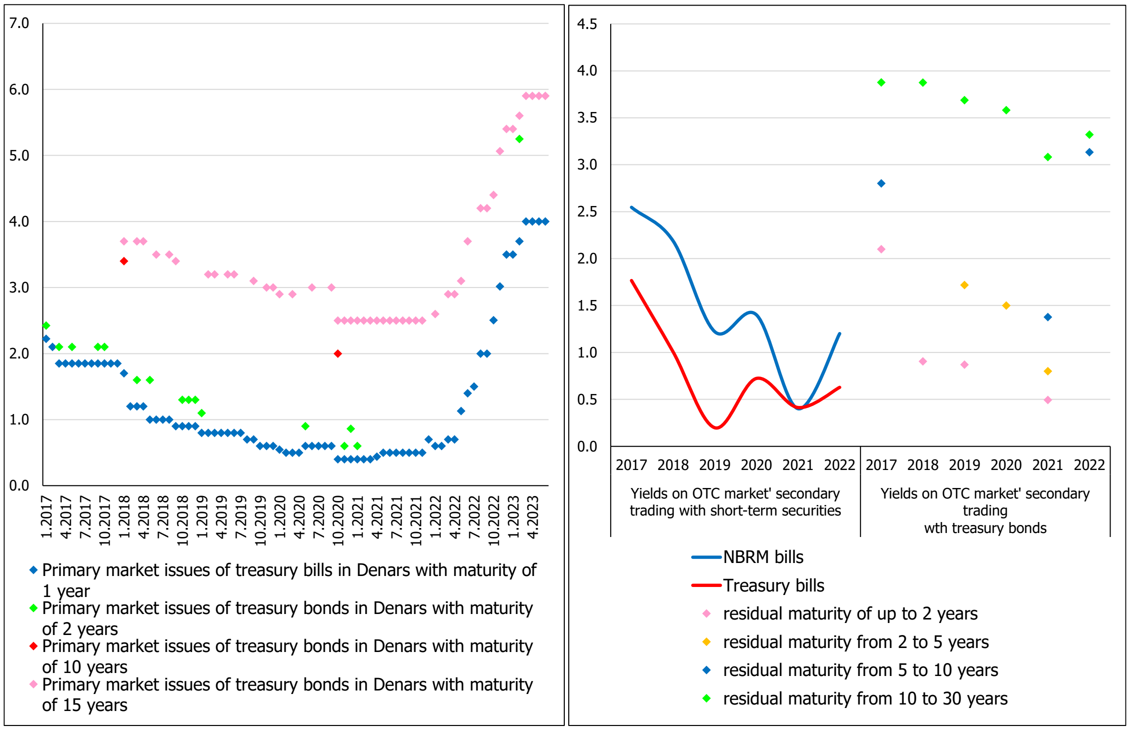


Source: National Bank.

In 2022, there was a pronounced reduction of the amount of newly issued government securities with a currency clause (annual decrease of 43.6%), which amounted to approximately 11% of the total amount of newly issued government securities. Analyzing the currency structure, government securities without currency clause still have the largest share, accounting for 63.4% of total securities. At the last auctions on the primary market held in 2022, the yield to maturity on twelve-month denar treasury bills was 3.5% (0.7% at the end of 2021), while for government bonds it ranged to 5.15% for a fifteen-year government bond (2.5% at the end of 2021).[21] At the beginning of 2023, amid upward movements of the interest rates on the international and the domestic markets, the yields to maturity on newly issued domestic government securities kept on increasing. Twelve-month treasury bills reached a yield of 4.0%, while fifteen-year government bonds reached a yield of 5.9%.

[21] The returns relate to government securities without FX clauses.

Chart 25
Yields to maturity on the primary market of government securities (left) and weighted yields to maturity in securities traded on the OTC market (right)
in millions of denars and in %



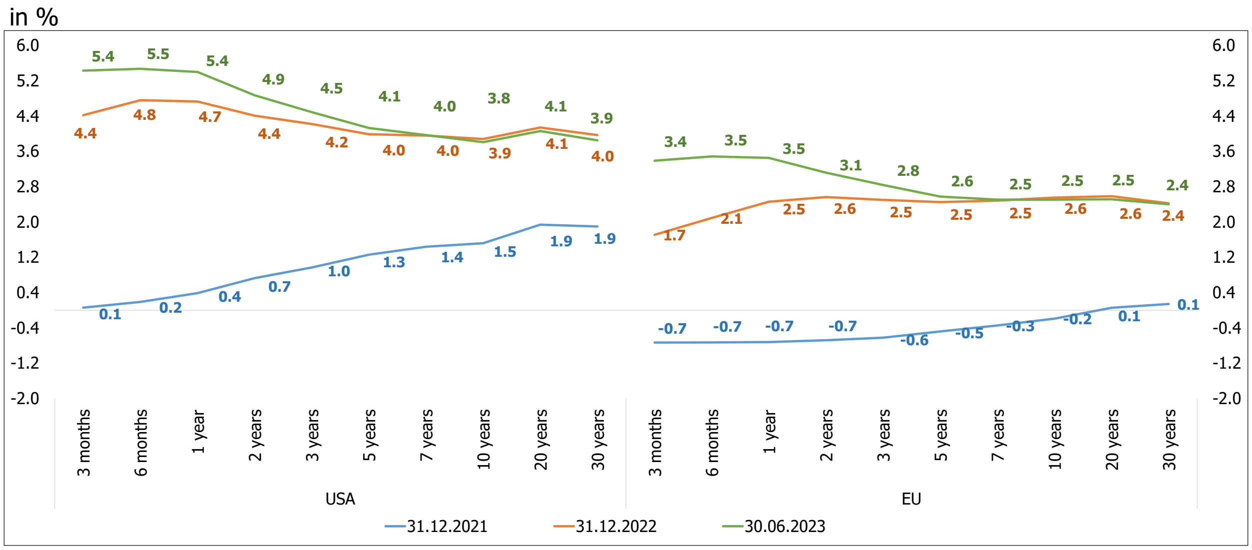
Source: National Bank.
Note: Over-the-counter market returns are a weighted average of all transactions on this market throughout the year for the corresponding maturity bucket, with the amount of individual transactions used as a weight.

Secondary trading in government securities decreased in 2022, further reducing its share in GDP which is low, which points to poor liquidity of these instruments. The trade in government securities in 2022 compared to last year decreased by 68% and amounted to Denar 2,026 million, which is very low i.e. 0.25% of GDP (0.88% in 2021). Over 70% of trading in the OTC market[22] in 2022 was focused on treasury bill transactions, unlike the previous year when government bond transactions prevailed. The liquidity of the domestic OTC market with treasury bills in 2022 was mainly concentrated in the segment with a residual maturity of up to 1 month and of 1 to 3 months. Trading in government bonds was registered only in the long-term segment with a residual maturity of over 5 years[23].
The tightening of the monetary policy globally reflected on the yield curves, which took reverse form in the developed countries (the EU and the United States). The reverse yield curve occurs when the yields on securities in the short maturities grow faster than the yields on bonds of the

[22] Pursuant to Article 72 of the Law on Securities, secondary trading in all securities is carried out through a stock exchange authorized by the Securities and Exchange Commission, with the exception of the purchase and sale of short-term securities and government bonds (except denationalization bonds), as well as the implementation of repo agreements, can be carried out on the OTC market. However, most of the trade (about 78%) in government securities in 2022 was concentrated in the OTC market, partly reflecting the difference in costs of individual market segments.
[23] In 2022 the total trade in government bonds on the OTC market was entirely concentrated in segments with remaining maturity of 5 to 30 years, in contrast to the previous year when the trade on this long-term segment accounted for 67%. Moreover, the highest share was registered in the turnover in the segment of the residual maturity of 5 to 10 years with 39.1%, while the segments of the residual maturity of 10 to 15 years and of 15 to 30 years accounted for 29.7% and 31.2% in the total turnover on the OTC market with government bonds, respectively.

long-term segment of the yield curve, i.e. the demand for long-term securities with higher interest rates is higher. This may partially reflect the investors' expectations that central banks in the future will reduce the interest rates in order to support the economies that may be under pressure of the higher financing costs.

Chart 26
Yield curve in the United States and the EU

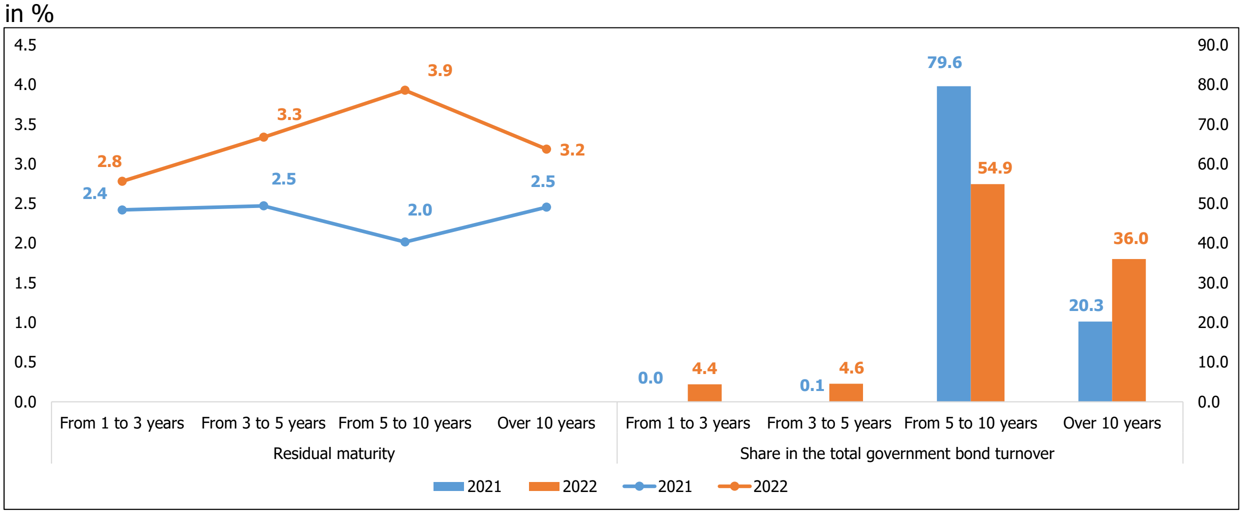


Source: The ECB and the United States Department of the Treasury.

In the domestic economy, these trends were only partially mirrored in the yield curve[24] derived from trading in government bonds on the Macedonian Stock Exchange, which is reversely skewed between the mid-term and the ultimate long-term segment. However, amid less liquid domestic government securities market, whose changes may be influenced by a small volume of individual transactions, the yield curve in the domestic economy may not be the most adequate indicator of investors' expectations. Certain movements were also registered in the yield curve derived from trading of Macedonian Eurobonds on the Frankfurt Stock Exchange after the issuance of the ninth Eurobond[25]. Sharper price decline (accordingly yield growth) in 2022 was registered in Eurobonds at lower coupon rates, and the issuance of the new Eurobond in 2023 and the pressure from the higher demand for it conditioned the fall in the yield in the maturity bucket of up to 4 years.

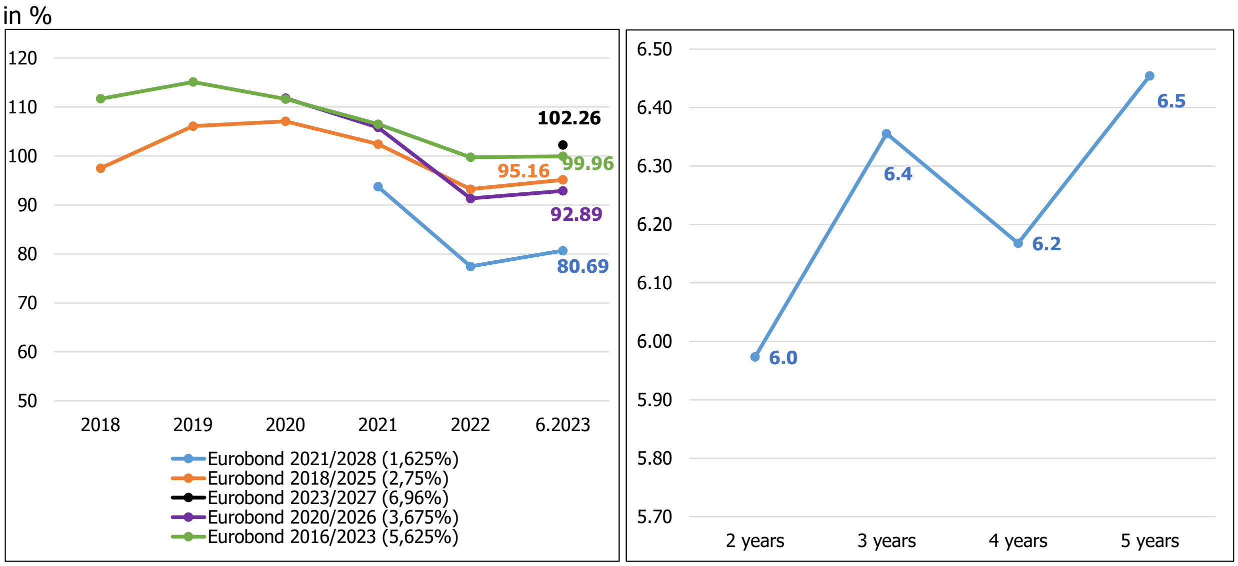
[24] On the Macedonian Stock Exchange in 2022, there was trading in government bonds with a different residual maturity. Moreover, about 64% of the turnover accounted for trading in structural bonds i.e. denationalization bonds. The rest of the turnover consists of trading in continuous government bonds. The yield curves are derived by using a weighted yield to maturity on traded government bonds at the end of 2021 and 2022 for each maturity bucket. The share of the realized turnover for each bond in the total realized turnover for the specific maturity bucket was used as a weight for obtaining the rate for a certain maturity bucket.
[25] On 8 February 2023, the Republic of North Macedonia issued the ninth Eurobond worth Euro 600 million, which will be used solely for financing the liabilities on the basis of old debts that fall due during the year. The maturity of the new Eurobond is four years, and the coupon interest rate is 6.25% on an annual basis.

Chart 27
Yield curves of government bonds derived from trading on the Macedonian Stock Exchange (left) and percentage share in the total turnover of government bonds (right)



Source: National Bank calculations, based on data published on the stock exchange.

Chart 28
Price movement of Macedonian Eurobonds (left) and the yield curve of Eurobonds (right)



Source: Eurobond trading data published on the website of the Frankfurt stock exchange.
Note: the yield curve is derived on the basis of the trading on 14 July 2023. The description for each Eurobond provides the date of issue, the maturity date and the coupon interest rate.

The developments in 2022 were yet another confirmation that private sector businesses rarely use the domestic financial market as a mechanism for providing financing. In 2022, the number of newly approved issues of securities compared to last year increased by one (from fourteen to fifteen), while the value of total newly approved issues of securities registered a slight increase (from Denar 5,181 million in 2021 to Denar 5,633 million in 2022). Of the total number of issues, thirteen were private offers (intended for a buyer known in advance), and two public offers, one of which was for own shares and one for bonds[26]. Hence, the growth of new issues was almost entirely conditioned by issues for recapitalization of joint stock companies, and less for performing the main function of the capital market, that is to mediate between private entities in need of financing and attracting potential investors. For further capital market development, it is important to improve the regulatory and institutional framework relevant to the financial markets functioning and its alignment with the relevant EU regulation, as well as to increase investment alternatives and strengthen financial education for this market segment that will provide greater visibility and competitiveness in the process of attracting potential investors.

The secondary trading in securities on the domestic institutionalized capital market recorded a decline in 2022, which comes after the high growth in the previous year, when the trading was the highest in the last ten years. **Equity securities issued by domestic joint-stock companies again play the leading role in trading on the secondary market, and trading is concentrated among domestic investors**. Its relative size against GDP is modest (0.9%). A decrease was registered in all segments of the total turnover, but it is primarily due to the reduced turnover from block transactions which reduced by 61.1% on an annual basis. Within standard trading, the largest decline results from trading in bonds which decreased by 65.7% on an annual basis. After the slight decrease in the previous year, the fall in the turnover with shares continued also in 2022, but at a slightly faster pace, in conditions of downward movements of share prices. As in other countries, the uncertain environment reflected on investors' expectations. Also, their interest to invest in shares may be influenced by the changed environment with higher interest rates, which can increase the competitiveness of the yields on bonds and bank deposits, as less risky instruments, relative to the expected return on investment in equity securities. An additional possible factor are the announced changes in the tax treatment of capital gains[27].

[26] During 2022, the Securities and Exchange Commission for the first time issued an approval for issuing long-term securities - municipal bonds by way of public offer and thus the domestic capital market of the RNM enriched with yet another financial instrument. However, during the year, there was no realization of the first issue of municipal bonds.

[27] The Law on Personal Income provided for taxation of capital gains from 1 January 2023, which was previously delayed for a period of three years. In December 2022, amendments were adopted to the Law on Personal Income, which introduced an obligation for payment of a personal income tax at a rate of 10% by the tax payer of the capital gains realized from all acquisitions of securities after 1.1.2023 and full tax exemption for the capital gains from securities that the holder realized after the expiration of two years of the acquisition, as well as for the capital gains from preliminary public offers and government securities.

Table 2.
Statistical indicators of secondary trading on the domestic institutionalized capital market

Податоци и показатели	2018	2019	2020	2021	2022
Total turnover - conventional trading and block transactions (in millions of denars)	10,409	7,701	8,196	12,854	6,997
Total turnover - conventional trading (in milions of denars)	4,889	4,178	5,965	6,737	4,633
Total turnover of conventional trading / GDP (in %)	0.7	0.6	0.9	0.9	0.6
Annual change of total turnover (in %)	119.6	-26.0	6.4	56.8	-42.1
Turnover of conventional stock' trading (in millions of denars)	2,729	3,819	5,681	5,395	4,151
Turnover of conventional bond' trading (in millions of denars)	531	359	284	1,342	460
Turnover of conventional stock' trading / Total turnover (in %)	26.2	49.6	69.3	42.0	59.3
Turnover of conventional bond' trading / Total turnover (in %)	5.1	4.7	3.5	10.4	6.6
Average monthly turnover (in milions of denars)	867	642	683	1,071	620
Average monthly number of transactions	1,994	1,573	1,891	1,721	1,440
MBI - 10 as of last trading day in the year	3,469	4,649	4,705	6,153	5,652
Annual change of MBI 10, in %	36.6	34.0	1.2	30.8	-8.1
Market capitalization of qouted stocks, as of year end (in millions of denars)	158,773	181,279	179,009	218,251	207,586
Market capitalization of quoted stocks / GDP (in %)	24.0	26.3	27.0	30.2	26.1
Market capitalization of all stocks (quoted and stocks of compnaies with special reporting obligation) / GDP (in %)	24.5	26.9	27.6	31.0	27.0

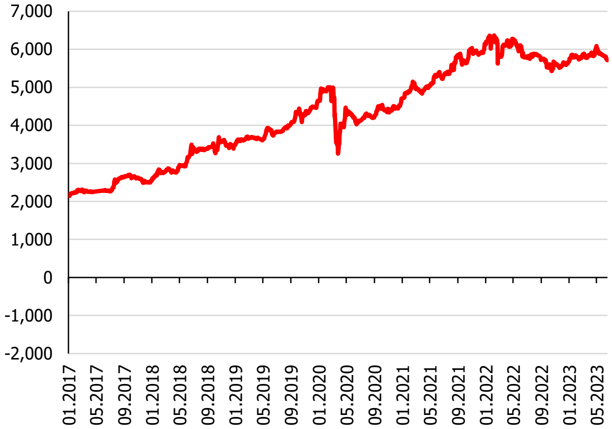
Source: Macedonian Stock Exchange AD Skopje.

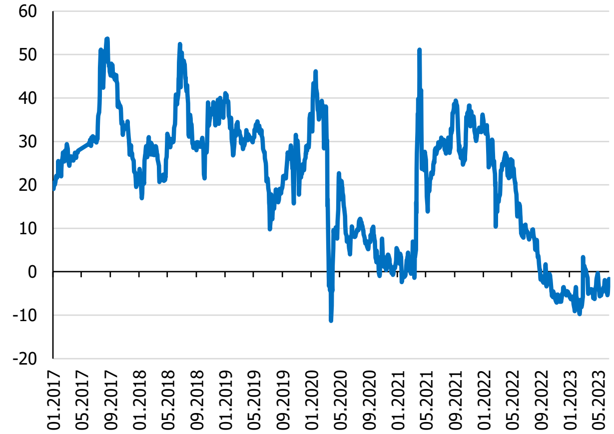
Domestic capital market turnover mainly results from **one-way trade transactions with conventional financial instruments**. Modern trading that includes the so-called uncovered short sales and derivative instruments is not currently present. Such situation requires improving the range of financial products and services. In conditions of growing importance of climate risks, the **actualization of financial instruments with an environmental, social and governance component (ESG factors), may increase the interest of domestic and foreign investors and contribute to capital market development**. For that purpose, the Guide on reporting on issues related to the environment, social issues and management of listed companies[28] was published at the beginning of 2022. The Guide on ESG reporting represents a practical tool for disclosures related to the ESG issues in accordance with the new Corporate Governance Code and the latest international ESG standards, through which listed companies would come closer to investors (especially foreign ones) that include these factors in their investment strategies and expect from companies to report thereon.

After the high growth last year, the index of the domestic institutionalized capital market (MBI-10) recorded an annual decline of 8.1% in 2022. The lowest value of the index in 2022 was registered in the fourth quarter, and the highest at the beginning of the year. Structurally observed, all stocks that make up the index registered an annual fall. On the other hand, the composition of the index shows a fairly high level of sector concentration, given that five of its ten components are banks, which in a certain way confirms the limited volume of liquid shares that can arouse significant interest among the general investment public.

[28] For more details, please visit the following link: GUIDE ON ESG REPORTING FOR LISTED COMPANIES ON THE MSE

Chart 29
Movement of the domestic capital market index (left) and its annual growth (right)
in millions of denars and in %

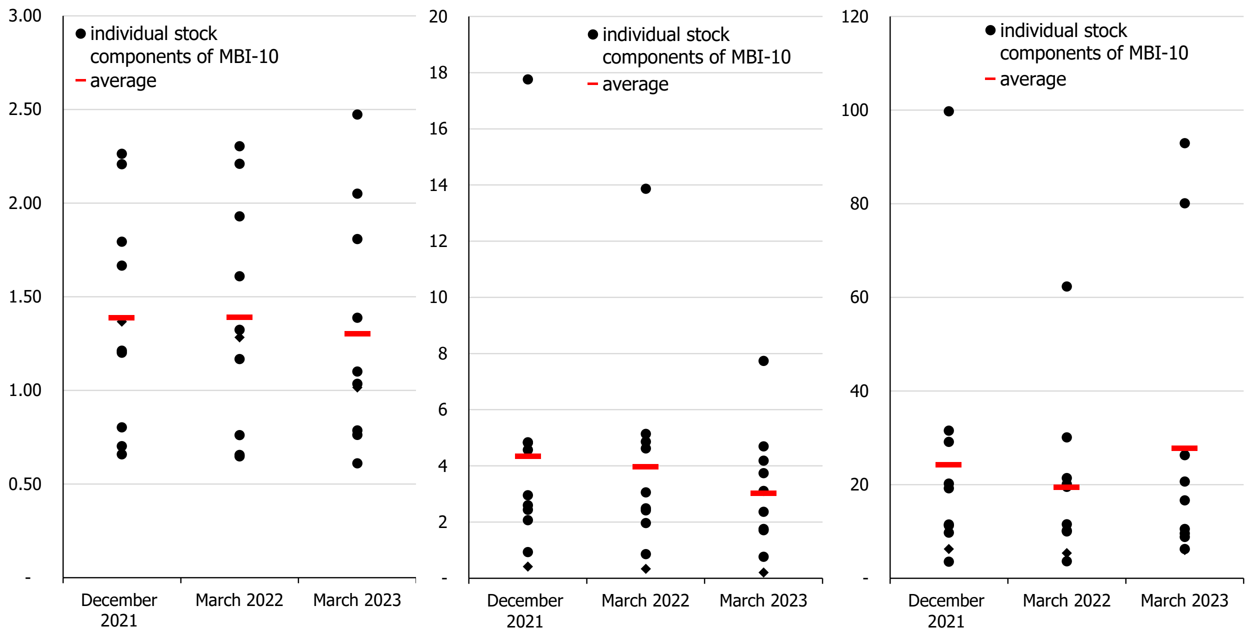




Source: Macedonian Stock Exchange AD Skopje.

After the continuous growth in the last few years, the market capitalization of listed shares on the official capital market declined and has been reduced to 26.1% of GDP in 2022. Namely, after the trend of optimism and increased valuations of the shares that was registered in the previous years, 2022 is marked by their downward revaluation, which is evident from the level of financial indicators of listed companies that make up the index of the domestic capital market, which are mainly lower compared to the end of the previous year. The continuation of the war in Ukraine and the uncertainty about the implications on the domestic economy are factors that increase the unpredictability for investors that can affect their willingness to take risks, as well as investments in the domestic capital market. Also, rising interest rates increase the competitiveness of alternative investment opportunities with lower risk, which can also affect investment decision-making.

Chart 30
Selected indicators for valuation of components that make up the domestic capital market index – price -to- book value of a share (left), price -to- sale income per share (middle) and price -to- profit per share (right)
in times



Source: National Bank calculations based on prices published by the Macedonian Stock Exchange AD Skopje, quotations of listed companies and the audited annual and unaudited quarterly financial statements of listed companies.
Note: for the shares issued by banks, total income is considered a sale income. Moreover, with the regular revision of the MBI-10 as of 15.12.2022, Stopanska Bank AD Bitola was excluded from the calculation, and UNI Bank AD Skopje was included in the calculation of the index.

The domestic institutional capital market is marked by low international visibility as seen through the modest presence of foreign portfolio investors, both individuals and institutional investors. Typical for the foreign investors present in the market for a long time was the greater interest in selling than purchasing securities, acting as a net seller on the capital market. This trend changed in 2022[29] when they became a net buyer, and their share was modest and equaled about 5.79% and 2.72% in the total purchase and sale in the institutionalized capital market, respectively (3.48% and 5.20%, respectively in 2021). The larger share of the purchasing side almost entirely results from foreign legal entities.

[29] Net sales of foreign investors in 2022 amounted to Denar 227 million, while in 2021 they amounted to Denar 208 million.

1.3. Real estate market (residential and commercial buildings)

The real estate market during 2022 was characterized by further growth of real estate prices, which during the year accelerated and reached the highest level from the period of the global economic and financial crisis. The growth of apartment prices still partly results from the factors on the supply side, amid further growth of the costs of materials and the labor cost in construction. This is also due to the demand, amid further solid growth of housing loans, which is slower compared to the previous year in conditions of gradual tightening of credit conditions. Despite the high price growth, the growth of the total value of traded real estate properties slowed down significantly compared to the previous year. The offer of new apartments continued to increase, as a result of the higher number of apartments under construction, reflecting the large number of planned new apartments according to the permits issued in the previous year. From the end of 2022, the growth of apartment prices started to slow down, which continued also in the first half of 2023, although it is still at a higher level.

It is expected that the changes in apartment prices in the next period will be determined by the relationship between supply and demand, which currently do not point to major imbalances on this market segment. The real estate market developments currently do not point to a risk of possibly sharper turning of the cycle and a fast and strong downward price adjustment, which can affect the liquidity of the market and consequently the liquidity of the pledged real estate at the banks. However, there is a need for vigilance, especially if one takes into account the environment which is still uncertain and the growth of financing costs, which can limit the access to bank loans, and accordingly the financed demand for apartments. Amid growth of interest rates, the vulnerability of existing borrowers to default risk also increased, which if materialized, can lead to materialization of credit risk in banks' balance sheets. These risks are limited for the time being, and it is especially important that banks are properly capitalized and able to mitigate risks, and the adoption of macro-prudential measures in the area of countercyclical capital buffer and the quality of credit demand further strengthen banks' resilience to shocks. In the upcoming period, the National Bank will continue to monitor closely the real estate market movements and risks, and stands ready to take appropriate macroprudential and other measures if deemed necessary to preserve financial stability.

1.3.1. Residential real estate market

The prices of residential buildings[30] on the Macedonian real estate market during 2022 registered a high double-digit growth, which is historically the highest increase from the period of the global financial and economic crisis. According to the index of apartment prices[31], the nominal price growth rate was 17.8% on an annual basis, which is more

[30] According to the Nomenclature of Constructions and Construction Works, 2015 of the State Statistics Office, residential constructions are designated as residential buildings and this group includes: one-apartment buildings; apartment buildings; and community buildings.

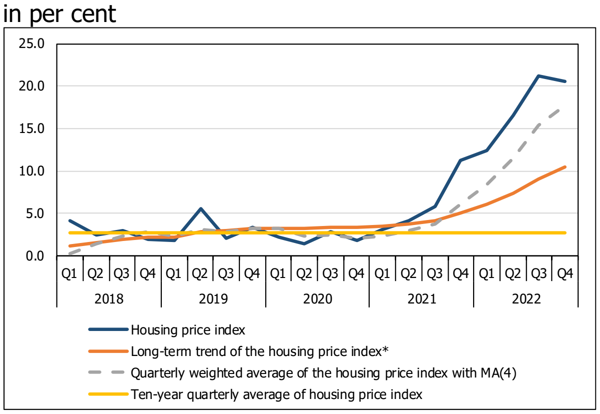
[31] Housing price index is calculated on a quarterly basis by the National Bank using the hedonic method (for more information see Davidovska-Stojanova B., Jovanović B., Kadievska-Vojnović M., Ramadani G., and Petrovska M., (2008). "Real Estate Prices in the

by 11.7 percentage points compared to 2021. The analysis of the dynamics indicates growth acceleration during the year so that the average annual rate increased from 14.4% in the first to 20.9% in the second half of the year. From the end of 2022, the growth of apartment prices started to slow down, which continued also in the first half of 2023, although it is still at a higher level (12.9% in the second quarter of 2023). The real price growth rate was 6.1%, which is a slowdown in the real growth compared to the previous year (8.1%)[32].

The growth of real estate prices is an almost globally present phenomenon in the last few years, including in the European Union member states. In 2022, there was an average growth of apartment prices of 7.7% in the European Union and 7.0% in the euro area, which is a more moderate movement compared to the domestic economy. The growth of domestic prices is closer to the average of 14.9% in the European Union member states from Central and Southeastern Europe (EU-CSEE). The change in the prices on the Macedonian real estate market is in line with the changes in the EU-CSEE countries also if the price growth is adjusted for the inflation rate.

Chart 31
Annual housing prices growth rate

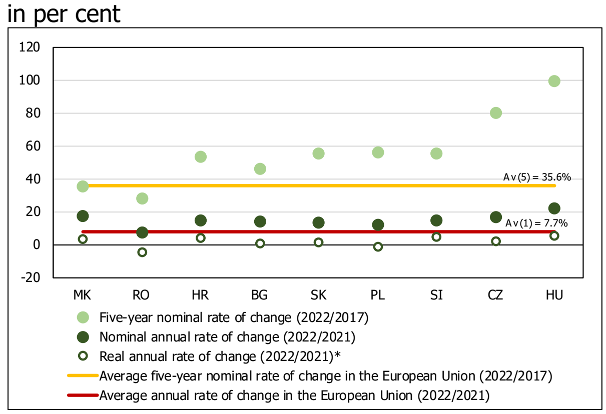
in per cent



Source: National Bank calculations.
* Calculated using a one-sided Hodrick-Prescott filter and λ = 400,000 for the period Q1 2013 – Q4 2022.

Chart 32
Housing price growth rate in selected European countries

in per cent



Source: National Bank and National Bank calculations based on Eurostat data.
* Calculated with the inflation rate for comparability.
Notes: Abbreviations: North Macedonia (MK), Romania (RO), Croatia (HR), Bulgaria (BG), Slovakia (SK), Poland (PL), Slovenia (SI), Czech Republic (CZ) and Hungary (HU).

Amid historically high price growth and net tightening of credit conditions, the growth of the volume of transactions with apartments significantly slowed down on an annual basis. The total value of traded apartments in the first three quarters of 2022 increased by 2.3% compared to the same period last year, versus 33.6% as was the growth in the previous year. There are similar movements in the total value of traded houses, which in the same period rose by 10.8% on an annual basis (growth of 37.5% in the previous year[33]). The average price

Republic of Macedonia, Working Papers, NBRM.) The index calculation uses the prices advertised by real estate agencies and includes only apartments on the territory of the City of Skopje.

[32] The real growth rate of apartment prices is adjusted for the private consumption deflator as an inflation measure.

[33] It should be borne in mind that the high annual growth rates during the previous year are a result of the significantly lower base in 2020 due to the reduced apartment trade during the pandemic.

of traded apartments[34] in the first three quarters of 2022 was Denar 46,064 per m^2, while the average price of traded houses was Denar 7,977 per m^2.

An important factor that continues to affect the price growth is the increase in construction costs as a factor on the supply side. Total costs for the construction of new residential buildings in 2022 increased by 22.0% on an annual basis. Similar to the previous year, the growth results from the increase in material costs in construction, but there is also an increase in the contribution of labor costs. The increase in labor costs of 22.1% on an annual basis corresponds to the higher net wages of employees in construction involved in the construction of buildings by 21.3%. The higher costs are also due to the strong growth of the average price of traded construction land[35], which in the first three quarters of 2022 increased by 32.3% compared to the same period in 2021. Hence, the cost price[36] of newly built apartments per square meter in 2022 increased by 21.3% after the minimal increase in the previous year.

Chart 33
Construction costs

annual growth rate in per cent

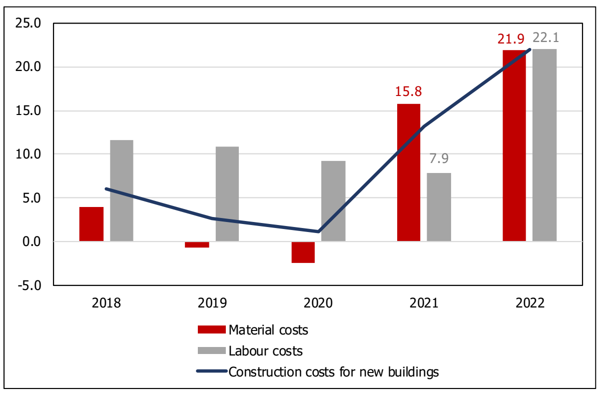
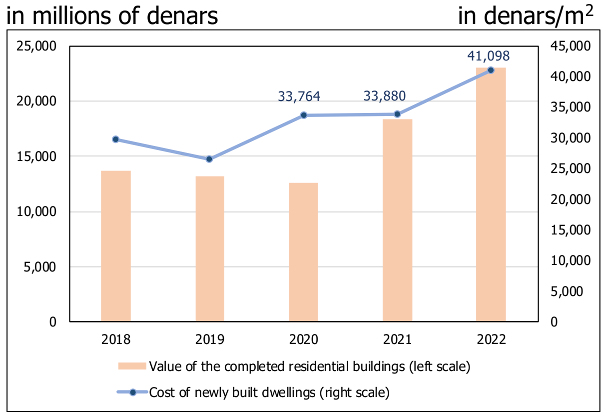


Chart 34
Value of completed residential buildings and cost price

in millions of denars in denars/m^2



Source: Calculations based on data from the State Statistical Office.

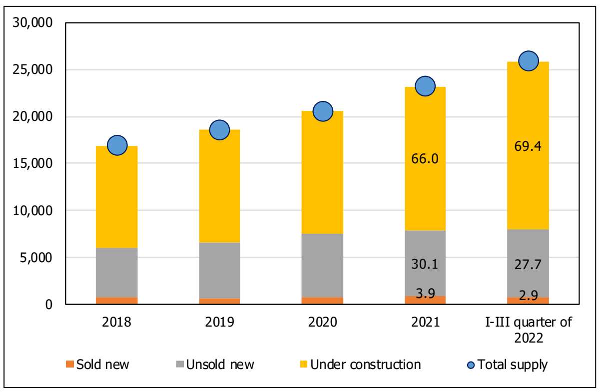
The offer of new apartments continued to increase, almost entirely due to the increased number of residential buildings under construction. In the first three quarters of 2022, the average offer of apartments[37] reached 25,901 units, which is an increase of 13.9% compared to the same period last year. Such increase was registered in conditions of an increased number of apartments under construction, due to the high number of apartments for which construction permits were issued in 2021, while the number of apartments sold decreased on an annual basis. Thus, the share of apartments under construction increased to 69.4%, mainly at the expense of the reduced share of the number of apartments unsold. The number of apartments

[34] The average price of traded apartments is the ratio between the total trade based on the purchase and sale of apartments and the total area (in m^2).
[35] The average price of traded building land is the ratio between the total trade based on the purchase and sale of building land and the total area (in m^2).
[36] The cost price of newly built apartments per square meter is a derived indicator, which is calculated as a ratio between the value of completed residential buildings and the area of completed apartments (in m^2) during the year.
[37] The total offer of new apartments consists of the number of new constructions sold, the number of new constructions unsold and the number of buildings under construction. According to Real Estate Cadastre Agency's methodology, new constructions sold are apartments with a title deed sold by an investor; unsold new constructions are apartments with a title deed that have not yet been sold by an investor; and buildings under construction are apartments that have been pre-marked according to the investor's building permit, but the construction has not yet been completed and the title deed has not been issued.

for which construction permits were issued in 2022 decreased and stabilized around the historical levels after the strong growth in 2021. The average absorption rate[38] in the first three quarters of 2022 amounts to 9.5% and is lower in the same period of the previous year as a result of the reduced sale of apartments in the first half of the year. Consequently, the average period of sale of built and offered apartments is slightly higher compared to 2021 and equals 2.7 years.

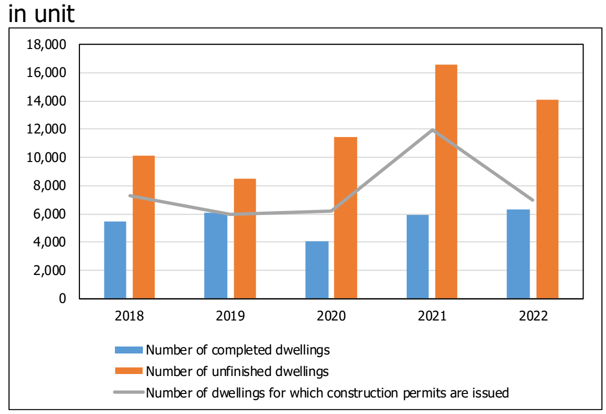
Chart 35
Offer of new apartments

number of apartments and shares in per cent



Source: National Bank calculations based on data from the State Statistical Office and the Real Estate Cadastre Agency.

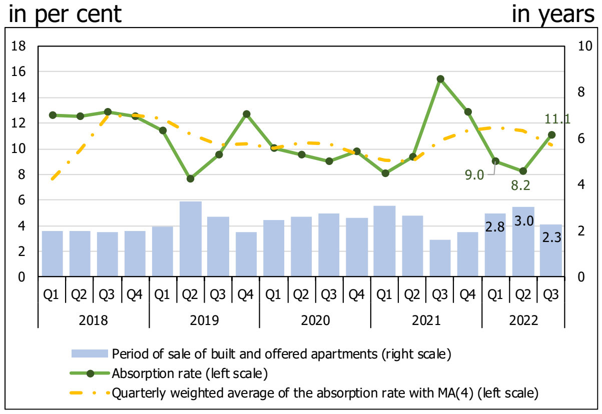
Chart 36
Housing construction status and building permits
in unit



Source: State Statistical Office and National Bank calculations, based on data from the State Statistical Office.

Chart 37
Absorption rate

in per cent
in years



Source: National Bank calculations based on data from the Real Estate and Cadastre Agency.

Housing loans as an important factor on the side of the demand for apartments continue to grow, but at a slightly slower pace compared to the previous year amid tightening of credit conditions in the second half of the year. Household loans for the purchase of residential property in 2022 on average increased by 13.4%, which is less by 1.0

[38] The absorption rate is the ratio between the number of new buildings sold and apartments under construction and the total number of offered apartments. Since there is no data on the number of sold apartments under construction, i.e. pre-marked apartments, an assessment was made that buildings under construction are sold at the same rate as completed new buildings.

percentage points than the average growth rate in the previous year. The slight growth deceleration was registered in conditions of an unchanged average interest rate on new housing loans and expectations for tightening of banks' credit conditions (in accordance with the Bank Lending Survey for the last two quarters in the year[39]). However, the slower housing lending is more significant if one analyzes the amount of new housing loans, which in 2022 decreased by 5.4%, which follows after the double-digit growth in the previous four years. Housing loans are the highest-quality segment of the banks' loan portfolio comprised of households, whose rate of non-performing housing loans recorded a minor improvement and equaled 0.6%.

The structure of housing loans is predominated by loans for the purchase of a dwelling apartment with an average share of 71.6% in 2022, which registered an increase compared to the previous year, contrary to the smaller portion which is for the purchase of an apartment for other purpose[40]. The rate of non-performing housing loans in both types of housing loans – for the purchase of a dwelling apartment and for other purpose – is equal to and also stands at 0.6%.

Chart 38
Newly approved housing loans and interest rates

in millions of denars | in per cent

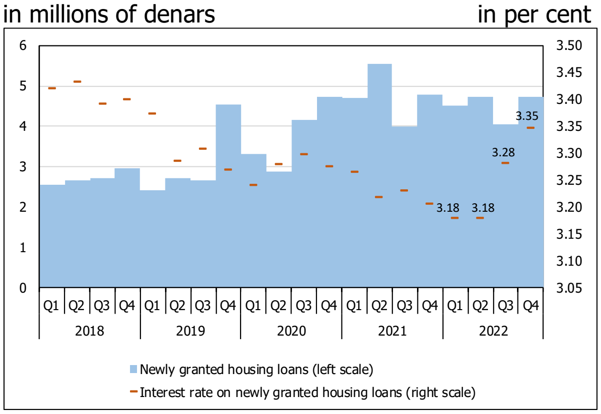
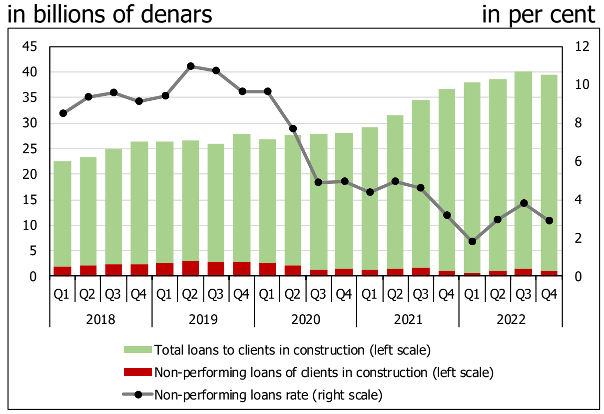


Chart 39
Loans to the construction sector and related activities

in billions of denars | in per cent



Source: National Bank.

Lending to the construction sector as a factor on the side of the supply of apartments followed the tendency of housing lending. The average growth rate of loans to construction in 2022 was 19.0% and remained at the level of the previous year. The main difference is notied in the dynamics of changes by quarters, which during 2021 grew in a period of recovery from the pandemic, and during 2022 it decreased as a result of the expectations for tightening of credit conditions. The rate of non-performing loans continued to decline and in the first quarter of 2022 fell to the historically lowest level of 1.8%, after which it registered a slight increase in the second half of the year.

The availability of apartments in the Macedonian economy remains lower compared to the European Union member states. The availability of apartments is monitored through

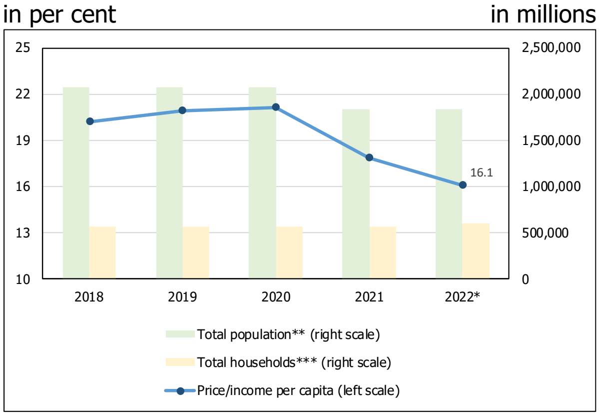
[39] According to the Bank Lending Survey, the net percentage for changing the conditions for approval of housing loans by banks was 33.4 in the third and 23.9 in the fourth quarter of 2022. The net percentage is the difference between the sum of the percentages of "significantly tighter" and "partially tighter" and the sum of the percentages of "partly relaxed" and "significantly relaxed". The negative net percentage denotes easing, while the positive net percentage denotes tightening of credit conditions.

[40] The calculations for the structure of housing loans by purpose and accordingly the rates of non-performing loans by purpose are made on the basis of data submitted by 11 banks.

the ratio of the price of apartments per 1 m^2 and the disposable income of households[41] (price-to-income ratio), which equals 13.9% in the first three quarters of 2022. The ratio is above the average for the countries of the EU-CSEE, the European Union and the euro area. Compared to the countries of the EU-CSEE, the availability of apartments on the Macedonian real estate market is the smallest and is at the level of Croatia. Price-to-income per capita[42] ratio in the first three quarters of 2022 was 16.1%.

Chart 40
Housing availability indicator

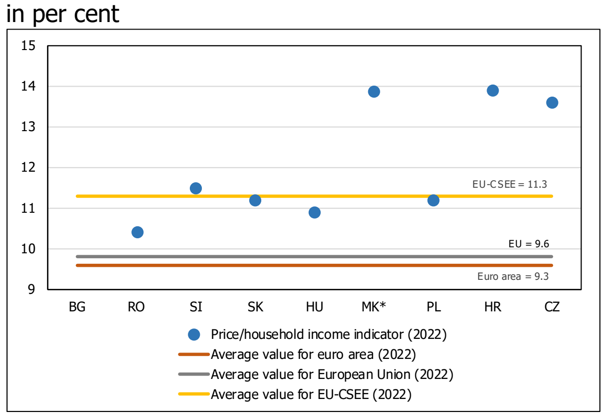
in per cent / in millions



Source: National Bank calculations based on data from the SSO.
* 2022 data are as of the third quarter.
** National Bank forecasts.
*** Data from the census in 2002 for the period 2018 – 2021 and from the census in 2021 for 2022.

Chart 41
Comparison of the housing availability indicator (price/income) with selected countries

in per cent



Source: Numbeo and National Bank calculations.
* National Bank calculation for the first three quarters in 2022.

It is expected that the changes in apartment prices in the next period will be determined by the relationship between supply and demand, which currently does not point to major imbalances on this market segment. However, there is a need for vigilance, especially if one takes into account the still uncertain environment and the growth of financing costs, which in circumstances when the inflation is still high, can limit the access to bank loans for certain categories of households. This could have a certain influence on the demand for real estate proerties financed through this channel, with effects on the liquidity of the market and the value of the real estate pledged at domestic banks. Amid growth of interest rates, the vulnerability of the existing borrowers increased, who could face debt repayment problems due to the higher costs. In this context, it is important that most of housing loans are with combined interest rate (fixed for a certain number of years, after which it passes in variable), whereby in about a quarter of them the change from fixed to variable will occur until 2024. All

[41] The smaller the level of this indicator, the greater the availability, i.e. the share of the price per m² in the disposable income per household.
The disposable income per household is the product of the disposable income and the average number of employed persons per household, and the average number of employed persons per household is the quotient of the total number of employed persons and the total number of households. The average number of employees calculated in this way per year is as follows: 1.35 for 2018, 1.41 for 2019, 2020 and 2021 and 1.16 for 2022. Moreover, it should be noted that in 2021 there is a structural interruption due to the publication of data from the census in the same year, and these data are used for revision of the number of employees during 2022, therefore the calculated values of the derived indicators are not fully comparable to those in the previous years.
[42] The price-to-income per capita is a ratio between apartment price per square meter and the disposable income per capita.

these are factors that can increase the credit risk for banks which arises from their exposure to the real estate market. These risks are limited for the time being, and the fact that banks are profitable and properly capitalized as well as able to mitigate risks is an important advantage, and the adoption of macro-prudential measures in the area of countercyclical capital buffer and the quality of credit demand further strengthen the resilience to shocks. In the upcoming period, the National Bank will continue to monitor closely the real estate market movements and risks, and stands ready to take appropriate macroprudential measures if deemed necessary to preserve financial stability.

1.3.2. Commercial real estate market

The prices of commercial buildings[43] continued to grow rapidly during 2022 amid increased demand, which was evident from the strong growth of total traded value and area. In the first three quarters of 2022, the traded commercial buildings reached an average price of Denar 19,769 per m^2, which is higher by 12.7% compared to the same period last year. Such growth is a result of the higher increase in the value than the area of traded buildings, although both categories increased at double-digit annual growth rates. In the absence of data for the purpose of corporate loans, the loans for the purchase of commercial property are not analyzed as a possible factor on the demand side for the positive movements in the total amount of traded commercial properties[44].

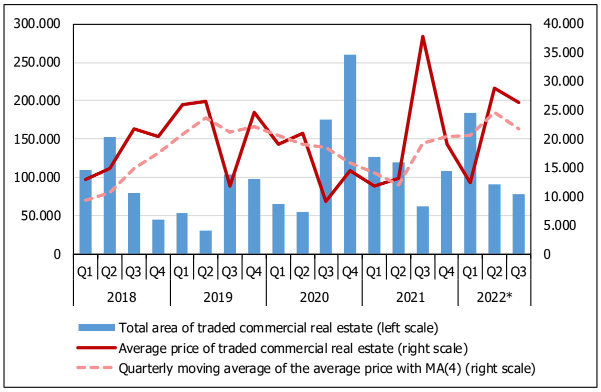
The supply of commercial buildings registered growth of the total value of constructed buildings after the fall in the previous three years, but such movements largely reflect the higher construction costs. The total value of completed commercial buildings in 2022 increased by 10.8%. Regarding the newly issued permits for the construction of non-residential buildings, their total number registered a decline, amid reduction in all types of buildings, except commercial buildings. However, the total planned area of buildings for which the permits were issued is higher, and this is especially pronounced in buildings for wholesale and retail trade where the increase is more than twofold and is at the highest level in the last ten-year period.

[43] According to the 2015 Nomenclature of Constructions and Construction Works of the State Statistics Office, commercial constructions are designated as commercial buildings and this group includes: hotels and similar buildings; office buildings; buildings in wholesale and retail trade; buildings for traffic and other communications; industrial buildings and warehouses; public entertainment, educational, hospital or institutional care buildings; and other non-residential buildings.

[44] The available data on household lending for purchase of commercial offices reveals that its share in total household loans as of 31.12.2022 is insignificant (about 0.4%) and historically stable, so the movements of this market segment are not a representative indicator to draw conclusions.

Chart 42
Total number of traded commercial constructions and average prices

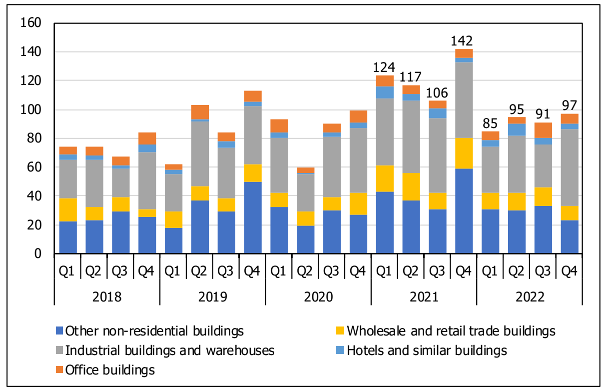
in m² in denars



Source: Real Estate Cadastre Agency and National Bank calculations based on data from the Real Estate Cadastre Agency.

Chart 43
Issued non-residential building permits

in unit



Source: State Statistical Office.

According to the availability of data, the risks for the financial stability due to the developments on the commercial construction market for the time being can be monitored through the share of loans collateralized by commercial property in total loans. At the end of 2022, about 38.7% of the total credit exposure accounted for loans collateralized by commercial property. In the credit portfolio comprised of companies, the share of loans collateralized by commercial property was significant 74.3%, while in household loans it was significantly lower and equaled 7.7%. Also, the underdeveloped commercial construction market creates a risk of reduced liquidity of commercial properties taken as collateral due to the uncertainty in case of their execution.

Analysis of the exposure of the pledged real estate at banks to risks of climate changes and earthquakes

This analysis makes a preliminary assessment of the possible effects of climate risks on the banking sector by analyzing the exposure of the pledged real estate to risks of climate changes and risk of earthquakes.

The inclusion of the risks of climate changes and the risk of earthquakes in the financial stability and macro-prudential policy of central banks especially intensified from the end of 2017 when the Network for Greening the Financial System was formed, which has set four climate scenarios about how climate changes and technological trends could develop in the future.[45] In 2021, the Basel Committee on Banking Supervision has published a report indicating the drivers of climate changes and methodological approaches for their measurement that banks have at their disposal or are in the process of development.[46] In 2022, the European Central Bank has published a document with methodological explanations and findings of implementation of climate stress-test in the euro area.[47]

The climate risks that banks are exposed to can be divided into two groups as follows: 1) physical risks and 2) transitional risks. Physical risks can be acute, which are the result of extreme weather conditions and natural disasters (e.g. floods, forest fires and droughts) and chronic, which have a long-term character and encompass predictable climate changes (e.g. increase in the average temperature, changes in the rainfall and increase in the sea-water level). Transitional risks arise from changes in policies, in legislation, in regulations and in technology for the purpose of transitioning to an economy with low carbon emissions. The risks of earthquakes represent the probability of occurrence of material damage as a result of future earthquakes.

Regarding the real estate market, the materialization of the risks of climate changes and the risk of earthquakes can cause damage and devaluation of the real estate of borrowers. This represents a source of risks for the financial stability because the reduced value of real estate can adversely affect the solvency of borrowers, and also limits the banks' access to liquid assets in recompense for the losses from default through sale of the devalued pledged real state.

The methodology for analysis of the exposure of the pledged real estate properties to risks of climate changes and risk of earthquakes in the Macedonian financial system consists of the following few steps: 1) determination of natural disasters and mapping of risk areas, 2) determination of price shocks amid materialization of risks, 3) setting of the value of the pledged real estate by areas and the amounts of the loans to which it refers and 4) calculation of the possible losses from materialization of risks.

1) The natural disasters that are analyzed are the following: river floods, floods in urban areas, forest fires and earthquakes. The risk level reflects the expected material damage that may occur and is divided in four categories as follows: very low, low, medium and high. Maps with mapped risk areas for each natural disaster are downloaded from the ThinkHazard platform[48], which was developed by the Global Facility for Disaster Reduction and Recovery. Geographical areas are the cadastre divisions in the country[49].

2) Price shocks are determined on the basis of the methodology for the climate stress-test of the European Central Bank (ECB), so for each risk level a different rate of reduction of the value of the real estate properties is given, that is: 4% for very low, 10% for low, 19% for medium and 45% for high risk.[50]

3) The values of the pledged real estate properties by areas are calculated by aggregating the values by communities, cadastre municipalities and municipalities on the basis of data submitted by banks.[51] The values of the loans to which the real estate refers by area have been calculated in a similar way.

4) The expected loss from the materialization of the risks in the entire country is calculated by using the formula:

$$L_t = \sum_{d}^{4} p_{t,d} \sum_{i=1}^{30} \varepsilon_{t,i} C_{t,i},$$

where L_t represents the expected loss value of the real estate properties; $C_{t,i}$ is the estimated value of the pledged real estate properties; $\varepsilon_{t,i}$ is the price shock due to materialization of the risk of disasters that corresponds to the risk level in the area; $p_{t,d}$ is the probability of occurrence of a disaster[52]; and t, i and d are symbols for the time period, the geographical area and the type of disaster, respectively. The expected rate

[45] Climate scenarios are constructed depending on the strength of the implemented policies to achieve the climate goals by reducing the physical and transitional risks of climate changes, and can be divided in the following groups: 1) orderly transition (low physical and low transitional risks), 2) disorderly transition (low physical and high transitional risks), 3) hot house world (high physical and low transitional risks) and 4) too little, too late (high physical and high transitional risks). Orderly transition includes scenarios for moderate reduction of carbon emissions immediately in order to meet the climate goals. The disorderly transition consists of scenarios that assume a sudden response that is sufficient to meet the goals. The hot house world includes scenarios for reduction of the emissions, but insufficient implementation of measures for reduction of physical risks. The too little, too late scenarios suggest that there are not enough activities for fulfillment of the climate goals.

[46] More in Basel Committee on Banking Supervision (2021). *Climate-related risk drivers and their transmission channels*. Bank for International Settlements.

[47] More in European Central Bank (2022). *2022 climate risk stress test*, July 2022.

[48] The platform is available on the link https://thinkhazard.org/en/.

[49] In accordance with the cadastre division, the RNM consists of 29 cadastre divisions and 1 real estate cadastre center. The scope of mapped risk areas of the ThinkHazard platform mainly corresponds to the scope of the areas in accordance with the cadastre division, and difference is only noticed in the scope of the cadastre divisions Kočani and Delčevo. Namely, the territory of Makedonska Kamenica Municipality is part of the cadastre division Delčevo, but the mapping of ThinkHazard includes it in the cadastre division Kočani. In order to reconcile with the mapping, the analysis makes a deviation from the cadastre division and the scope of the cadastre division Kočani is increased with Makedonska Kamenica Municipality at the expense of the scope of the cadastre division Delčevo.

[50] The ECB methodology uses different values for the price shocks of residential buildings (4% for very low, 10% for low, 19% for medium and 45% for very high risk) and commercial properties (3% for very low, 8% for low, 16% for medium and 43% for high risk). Given that the subject to analysis is pledged real estate (residential and commercial buildings), for the purpose of precaution, the higher values for the price shocks are taken into account, i.e. those of residential buildings.

[51] The aggregate data by cadastre divisions and the cadastre real estate center are calculated on the basis of the data submitted by a total of 10 banks (two banks failed to submit data, the Development Bank of North Macedonia AD Skopje is not included in the analysis).

[52] Disaster occurrence probabilities are calculated based on data on the frequency of disasters that caused material damage in the last 20-year moving period, available in the International Disaster Database of the Center for Disaster Epidemiology Research, by using the formula

$$p_{t,d} = \frac{N_d}{TN},$$

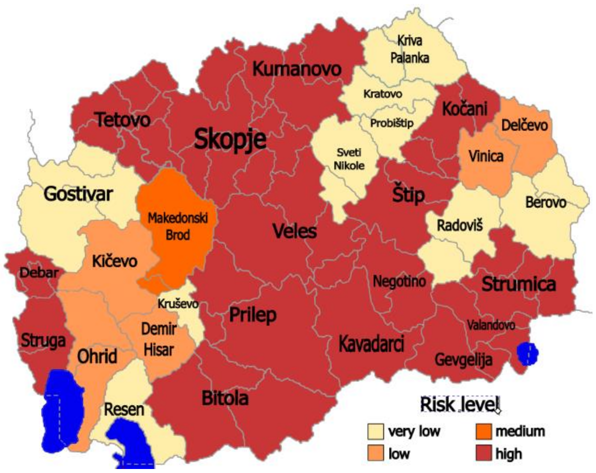
where N_d is the number of natural disasters of type d in the last 20-year period, N is the total number of disasters in the same period, and $T = 20$ is the time period in which the natural disasters are observed.

of loss value of the pledged real estate properties in the entire country λ_t can be calculated as

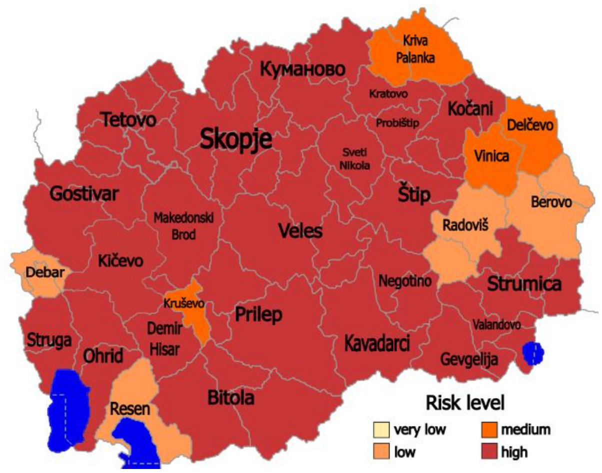
$$\lambda_t = \frac{L_t}{\sum_{i=1}^{30} C_{t,i}}.$$

Figure 1

Map of areas according to the risk level of river floods



Map of areas according to the risk level of floods in urban areas



Map of areas according to the risk level of forest fires

Map of areas according to the risk level of earthquakes

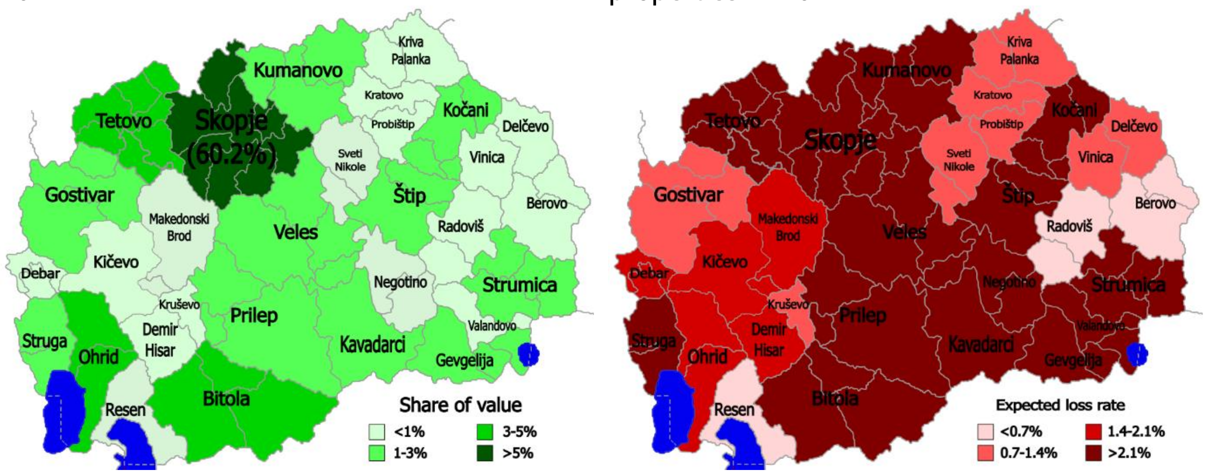
Source: National Bank based on ThinkHazard maps.

The maps of the areas according to the risk level suggest that the entire territory of the country is at high risk of forest fires and medium risk of earthquakes. Regarding the river floods, the areas along the valleys of the rivers Vardar, Bregalnica, Crna River, Black Drim and Strumica are at high risk, the area along the course of the River Treska is at medium risk, while the remaining areas are at low or very low risk. The risk level of floods in urban areas is significantly higher and almost the entire territory of the country is under high risk, with the exception of the extreme eastern and northeastern parts, as well as some areas in the western and southwestern parts of the country.

Figure 2

Map of areas according to the share of the value of the pledged real estate properties in 2022

Map of areas according to the expected rate of loss value of the pledged real estate properties in 2022



Source: National Bank.

The expected rate of loss value of the pledged real estate properties as a result of the materialization of climate risks for the entire country in 2022 equals 2.1% and is at the same level compared to the previous five-year period. Given that the pledged real estate properties in Skopje and its surrounding area have a predominant share that grows (60.2% in 2022) in the total value of the pledged real estate properties in the country, the expected rate of the entire territory mainly results from the total risk level and the expected rate in Skopje, which is 2.2% for 2022.

According to the climate scenarios set by the Network for Greening the Financial System, the natural disasters can vary by intensity and frequency. In addition, the material damage caused by each natural disaster is different as a result of the changes in the intensity of the natural disasters, but also of the improvement of the infrastructure to neutralize the adverse effects of the disasters. Hence, there is a need for analysis of different scenarios for the development of climate changes and their impact on the value of the pledged real estate properties. For that purpose, in addition to the baseline scenario that was previously elaborated, two additional scenarios have been set, depending on the risk level and the frequency of occurrence of natural disasters, as follows: optimistic (reduction of the risk level in each area by one level and reduction of the expected frequency of natural disasters) and pessimistic (increase in the risk level in each area by one level and increase in the expected frequency of natural disasters). The change in frequency was made by changing the time period in which the natural disasters were observed. The shortened time period assumes occurrence of the same number of natural disasters as in the baseline scenario in a shorter period (increased frequency), and the prolonged time period assumes occurrence of the same number of natural disasters as in the baseline scenario in a longer period (reduced frequency).

Table 1

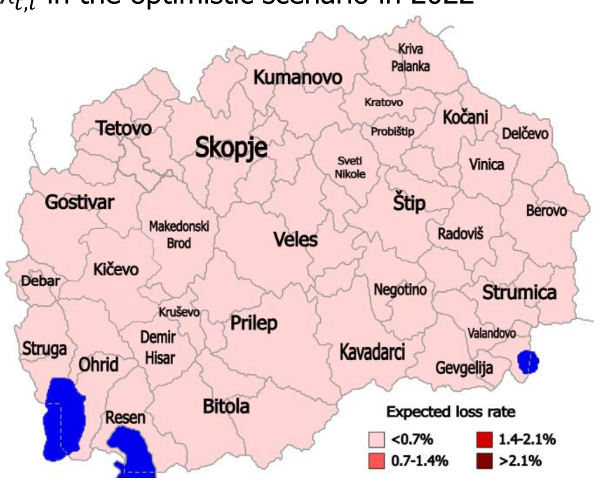
Scenario	Time period (T)	Risk level (r)
Baseline	$T = 20$	r
Optimistic	$T = 30$	$r - 1$
Pessimistic	$T = 10$	$r + 1$

Notes: in the optimistic scenario, the reduced risk level refers to all areas, except to those whose risk level was very low in the baseline scenario. In a similar way, in the pessimistic scenario, the increased risk level refers to all areas, except to those whose risk level was higher in the baseline scenario.

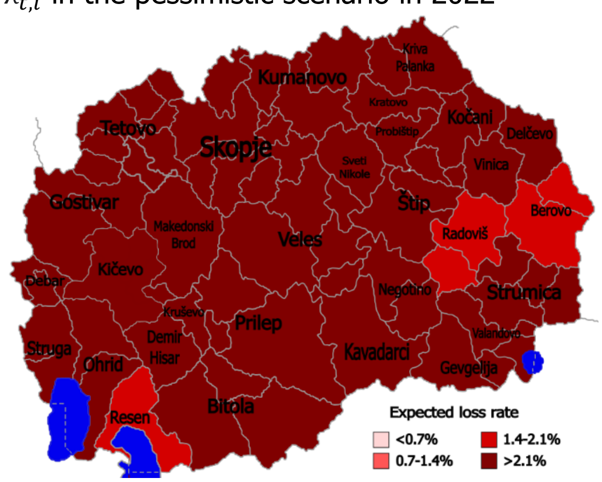
The expected rate of loss value of the pledged real estate properties for the entire country in 2022 is 0.6% in the optimistic and 4.3% in the pessimistic scenario. In the optimistic scenario, the expected rate by city ranges from 0.2% to 0.6%, and is lower than the expected rate for the entire country in the baseline scenario. On the other hand, in the pessimistic scenario, the expected rate by city ranges from 2.0% to 4.5%, and only three cities have a lower expected rate than that in the baseline scenario for the entire country. These findings suggest that the organized and timely implementation of green transition measures and other reforms can contribute to reduction of the expected loss value of the real estate, and thus reduction of the risks for banks' solvency.

Figure 3

Map of areas according to the expected rate $\lambda_{t,i}$ in the optimistic scenario in 2022



Map of areas according to the expected rate $\lambda_{t,i}$ in the pessimistic scenario in 2022



Source: National Bank.

1.4. Household sector

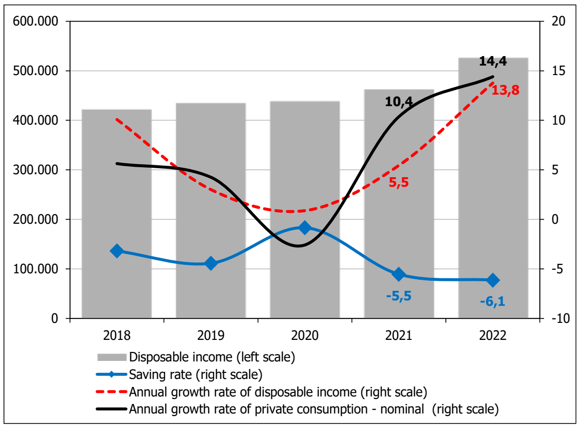
During 2022, despite the uncertain macroeconomic environment, with shocks that may affect the balance sheets of households, risks to this sector remain moderate. Solvency and liquidity ratios registered minimal improvements in 2022, still indicating limited sensitivity of the households sector to shocks, with a relatively limited systemic vulnerability of this sector, which can be seen from the level of the aggregate indicator for the systemic risk.

The nominal disposable income, which is the basis for the sustainability of the households sector's debt as a whole, as well as for the formation of savings, taking financial risks through investments and subsequent increase in financial assets, continued to grow in 2022 as well, at a significantly faster pace. In 2022 there was a nominal increase in accumulated financial assets, amid retained propensity of households for less risky investments, primarily in deposits with banks and in private pension funds. Households' savings continued to grow, although the war in Ukraine and the uncertainty it reflects, as well as the crisis of the consumer price crisis changed the currency and maturity preferences of households to save. In the first half of the year, when the effects of the generated shocks were most pronounced, there was a short-term and moderate decrease in savings (in March), which quickly stabilized and the savings continued to grow, yet with a larger contribution of foreign currency savings compared to domestic currency and increase in short-term component of savings. This is a common behavior in periods of uncertainty, and towards the middle of the year the expectations improved, while by the end of the year the growth of denar deposits reinforced in the long term, and continued in 2023. In 2022, the degree of euroization, measured as a ratio between foreign currency deposits and total household deposits, increased to 52.2% (50.5% in the previous year), which is a moderate increase in the households' propensity to save in foreign currency, compared to the more evident upward shift in the period of the global financial crisis.

The household debt further increased, yet at a slower growth rate, which was lower than the growth of the nominal GDP. This allowed the household debt ratio to remain at a moderate and relatively stable level of around 30% of GDP. The debt repayment indicators point to moderate risks to household creditors as well. In conditions of relatively strong price pressures and accelerated inflation rates, followed by stricter monetary policies from almost all central banks including the domestic, the credit risk from the household sector had no significant effect on the quality of the Macedonian banks' portfolios. In fact, the rate of non-performing loans in the household credit portfolio recorded a modest annual improvement and as of 31.12.2022 equaled 1.9%. Household loans further grew, but in 2022 at a slightly slower pace compared to the last year. The new household borrowing is mainly in the form of long-term housing and consumer loans, where clients' creditworthiness is less certain. Coupled with currently increased inflation and expected further growth of interest rate, it may have an adverse effect on the creditworthiness of households, which if remains for a longer period, could lead to possible increase in the non-performing loans rate and credit losses of banks. Highly indebted households, which have a more limited space to mitigate the effects of the price and the interest rate shock, are particularly

vulnerable compared to their disposable income. In order to prevent the accumulation of systemic risks in households, as well as in the real estate market, at the end of 2022 the National Bank introduced macro-prudential instruments for borrower-based ratios and determined the methodology for calculating indicators related to the natural persons' leverage level and ability to repay monthly liabilities, and at the same time defined the loan-to-value of the real estate pledge ratio. In April 2023, the National Bank continued to strengthen the macro-prudential framework by setting maximum values for these indicators on a systemic basis, the value of which does not deviate significantly from the most frequent level of these indicators applied by banks.

Chart 44
Disposable income, private consumption and savings rate of households
in millions of denars and in %



Source: National Bank calculations based on data from SSO, MF and CSD.

In 2022, in conditions of high global uncertainty caused by the war in Ukraine, raising inflation and energy crisis, **the nominal disposable income[53] of households accelerated annually,** at a more than double growth rate, compared to the previous year (13.8% in 2022, compared to 5.5% in 2021). Observing individual components that create the household disposable income, the largest contribution (over 50%) to the growth of total household inflows in 2022 was made by employees assets, followed by income of individual producers and social transfers (with a contribution of 13% each in the growth of total household inflows). On the other hand, government expenditures occupy the largest part (almost 90%) of the total outflows that form the disposable income of the households sector. Thus, the growth of disposable income outflows mainly stems from the higher amount of wage contributions, which in conditions of almost unchanged number of employees in 2022[54], is entirely due to the nominal growth of the average wage paid, amid increased minimum wage, as well as

[53] Due to lack of data on disposable income in the official statistics, since 2007, the National Bank has been preparing an approximate data on the disposable income of households in the country, which is updated annually. For some of the components of disposable income for which there is no official data, estimates are made. Disposable income is the difference between the nominal amount of the estimated inflows and the outflows of cash to and from the household sector. Inflow components include: gross amount of compensations of employees, income of individual producers, social transfers (pensions paid by the Pension and Disability Insurance Fund of North Macedonia, social welfare, unemployment benefits, sick pay compensations, etc.), second pillar pensions, private transfers from abroad, income from interests and from dividends, estimates for taxed income from other grounds (income from royalties and patent rights, income from property and property rights, realized capital gains, revenue from gains from games of chance and other prizes), income from regular repayments of denationalization bonds, interest payments from government securities and compensations of employees residents abroad. Outflows include: interest expenses, wage contributions for the Pension and Disability Insurance Fund of North Macedonia, for the second pension pillar, for the government health insurance, for unemployment insurance, private transfers to abroad and payments for personal income tax.

[54] In 2022, the employment rate kept the last years' level of 47.3%. The slower economic growth, amid high uncertainty of the war in Ukraine and deteriorated energy market, affected the demand on the labor market as well. Thus, the number of employees in 2022 decreased by 0.2%. In 2022, as well, the Ministry of Labor and Social Policy and the Employment Agency continued to implement active measures and programs aimed to increase employment. The operating plan for active employment programs and measures and labor market services in 2022 included around 13,000 unemployed, through nine different programmes that include certain measures (more information on https://av.gov.mk/operativen-plan.nspx and https://vlada.mk/node/27001).

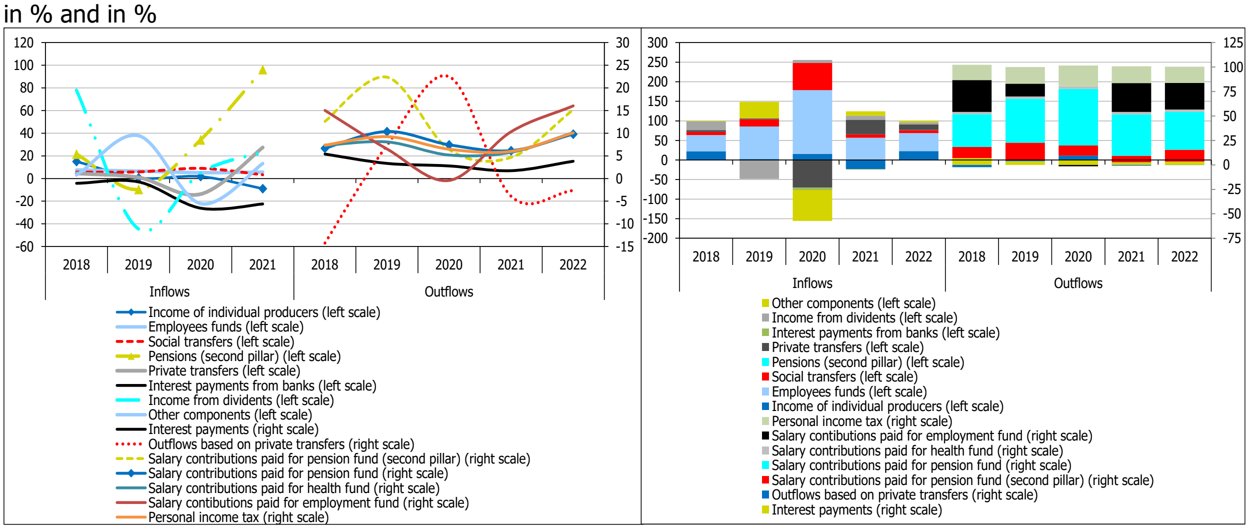
increase in the part of public sector wages[55]. Additional contribution to the increase in the average wage was made by certain structural factors, such as lack of labor force in some labor market segments. However, amid price growth during the year, **the real growth rate**[56] of disposable income slowed down and in 2022 equaled 2.5% (3.5% in the previous year).

The unspent part of the household disposable income, following the private consumption expenses, makes the household savings, which are the basis for calculating the rate of household savings[57]. In 2022, amid nominal growth of average wage paid and further solid credit support, the private consumption registered an accelerated annual growth of 14.4% (10.4% in 2021). Moreover, the faster growth of private consumption compared to the growth of disposable income hindered the full coverage of private consumption with disposable income, which in turn reduced the rate of household savings. However, it should be born in mind that the disposable income is based on the National Bank assessment and its distribution of private consumption and savings should be interpreted with caution, especially if it is known that in our country the gray economy usually participates in the formation of the disposable income[58]. Thus, certain years, such as 2022, show a negative marginal propensity of households to save, which can still be considered as an extremely unusual data in circumstances of growth in deposits of this sector with banks.

Chart 45

Annual rate of growth of components of inflows and outflows (left) and contribution of inflow and outflow components to the growth (right), of disposable income

in % and in %



Source: National Bank calculations based on data from SSO, MF and CSD.

[55] The growth is partly due to the increase in the minimum wage of 18.5% in March 2022, as well as to the increase in part of the public sector wages in September 2022 (In accordance with the Budget revision, the September wage increased by 15% for the employees in justice department, secondary and primary education and child care, 7% for the employees in higher education, while the wages of the employees in the MOI and health department grew by 5%). The minimum gross wage, from March 2022 to February 2023, is Denar 26,422 (previously Denar 22,146), i.e. the minimum net wage is Denar 18,000 (previously Denar 15,194).

[56] The real rate of change of the disposable income is adjusted by the private consumption deflator as an inflation measure.

[57] The rate of household saving is the ratio of the savings and the disposable income of households.

[58] Given that there is no officially published data on certain components of disposable income, the National Bank makes an assessment, which creates a possibility that the determined disposable income will not be comprehensive, which consequently affects the calculated savings rate.

In the forthcoming period, environmental risks are mainly related to inflation, which if sustains high, may reduce the real household disposable income, especially in low income ones, which may affect both consumer and investment decisions of households, as well as the ability to regularly repay debts.

1.4.1. Financial assets of the household sector

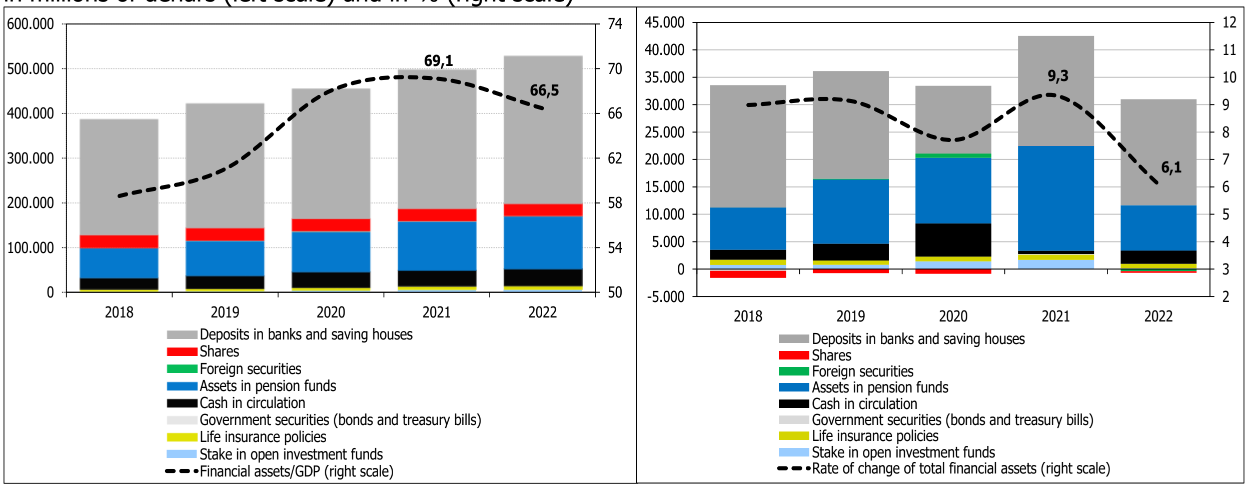
In 2022, financial assets of the household sector[59] further grew, yet at a slower pace (increase of 6.1% as opposed to 9.3% in 2021) Amid faster growth of the nominal GDP, the share of financial assets of the household sector in gross domestic product moderately decreased and equaled 66.5% (69.1% in 2021). Most of the growth of financial assets resulted from household deposits in domestic banks and savings houses (a contribution of 63.8%), as well as investments in private pension funds (a contribution of 27.3%). Households are traditionally the most significant depositor in the Macedonian banking system since they account for over 65% of the total bank deposits. During 2022, their deposits in banks grew (by Denar 19,385 million, or 6.3%), which in conditions of pronounced risks to domestic economy due to global factors, is slower compared to the growth in 2021 (6.9%). The outbreak of the war in Ukraine, the shock in primary commodity prices, especially in energy and the overall rising uncertainty had certain effects on the household savings, yet they were short-lived and limited. Thus, in the first half of the year, when the effects of the accumulated shocks were most pronounced, a moderate monthly decrease in savings was registered (in March), followed by an increase in household deposits. The current uncertainty urged depositors to hold their assets in foreign currency increased, but in the middle of the year the expectations stabilized, while by the end of the year the growth of denar deposits reinforced. In addition, the National Bank measures to differentiate the reserve requirement rate by currency of deposits[60] encouraged the growth in denar savings. At the same time, depositors' propensity to hold shorter term deposits in banks increased, thus demand deposits determined the annual growth of household deposit potential. This was overcome with the upturn in trends in the second half of the year, when long-term deposits

[59] Clarification of some more specific components of financial assets: 1) cash in circulation - on the basis of the assessment that 80% of cash in circulation (outside of banks) is in households and is included in their financial assets; 2) domestic shares - the investments of resident natural persons in domestic shares are the sum of listed and non-listed shares from domestic joint stock companies, at nominal value; 3) life insurance policies - the amount of the assets that cover the mathematical reserve on the appropriate cut-off date is taken as approximation for the claims of households on the basis of life insurance policies; 4) foreign securities - the stock of the investments of natural persons in foreign financial instruments is approximated through the difference between the inflows and outflows of the realized transactions, obtained through the notifications from the banks for the international payment operations.

[60] Through the reduction of the reserve requirement rate from denar liabilities (first, from 8% to 6.5%, and then to the level of 5%) and the simultaneous increase in the reserve requirement rate on foreign currency liabilities (first, from 15% to 16.5%, and then to the level of 18%), which apply from June, i.e. from August 2022 (additionally, from January 2023 even higher reserve requirement rate of 19% has been applied on foreign currency liabilities), one seeks to affect the interest rates on bank deposits and consequently the currency structure of deposits in the banking system.

registered positive monthly shifts, which indicates a reaction to the growth of yields, as well as positive expectations and depositors' confidence.

Chart 46
Financial assets of households (left) and annual growth of components (right)
in millions of denars (left scale) and in % (right scale)



Source: National Bank assessments and calculations based on data submitted by banks and savings houses, MF, CSD, MAPAS, SEC, ISA and SSO.

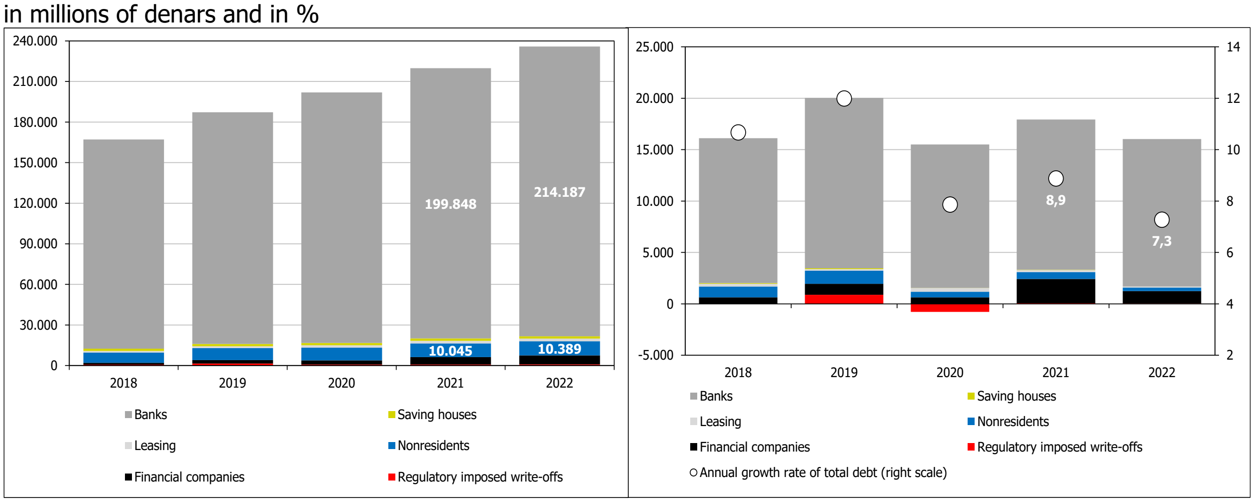
Households are net creditor of the domestic banking system, while their positive net financial position[61] further strengthened during the year. This is due to the faster absolute deposit growth[62] compared to the growth of household debt[63] to banking sector. Household show a slight propensity to take market risks. Although, in the past years, amid low interest rates, there was a certain redirection of assets towards alternative financial instruments (such as voluntary pension funds, life insurance policies, stakes in open-end funds or foreign financial markets[64]), the share of these investments remained modest compared to banking deposits.

[61] Financial position of households to domestic banks is the difference between claims on domestic banks (deposits) and debt to domestic banks (loans). If the sector has excess financial assets, the net financial position is positive, i.e. the sector is a net creditor. If the sector has lack of financial assets, the net financial position is negative, i.e. the sector is a net debtor. According to this analysis, the household debt includes the loans that were subject to mandatory write-off as acquired by regulations.
[62] In 2022, amid pronounced risks to domestic economy caused by global factors, household deposits registered an increase of 6.3%, which was moderately slower compared to the increase in 2021 of 6.9%.
[63] The total household debt to domestic banks in 2022 increased by 7.2% compared to 7.9% in 2021.
[64] Investments of residents in financial instruments on foreign financial markets were enabled since early 2019 with the beginning of the second stage of the Stabilization and Association Agreement between our country and the EU.

1.4.2. Household debt

In 2022, household debt further grew, yet at a slower pace of 7.3% (8.9% in the previous year). The household debt ratio measured by the share of the total household debt in gross domestic product, decreased (by 0.8 percentage points relative to the end of the previous year) and equaled 29.7%. In 2022, the household debt to almost all creditors[65] increased, yet it remained driven by the debt to domestic banks[66], which dominates the total household debt (with a share of 90.8%). In 2022, there was a significant growth of the debt to financial corporations (22.2% on an annual basis). Their share in the total household debt remains low (around 3%), but can be a significant risk to some household categories with higher debt to income ratio.

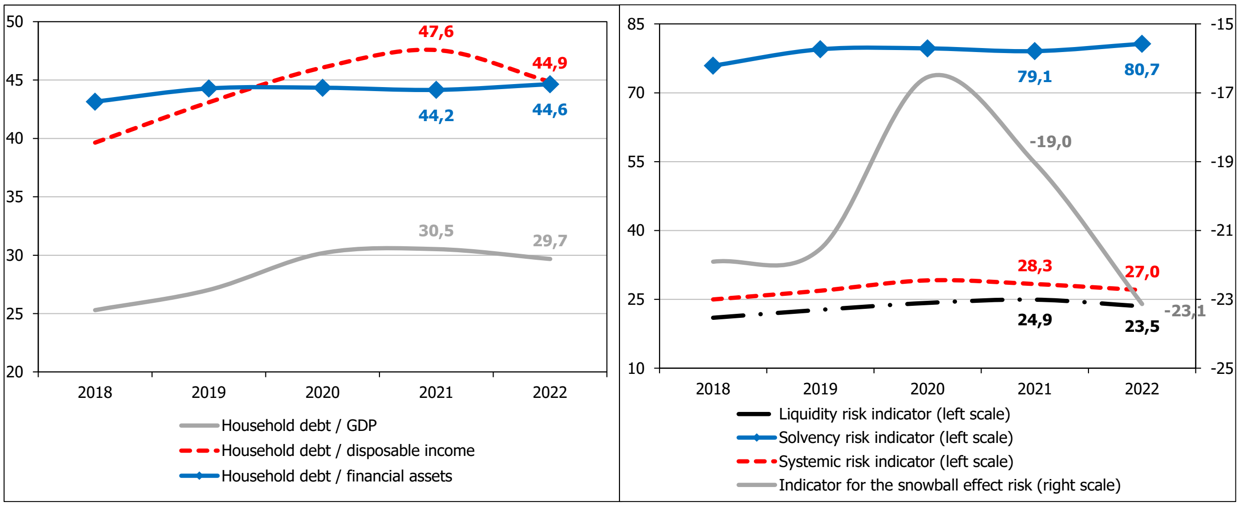
Chart 47
Structure of household debt (left) and of the annual change in household debt (right)
in millions of denars and in %



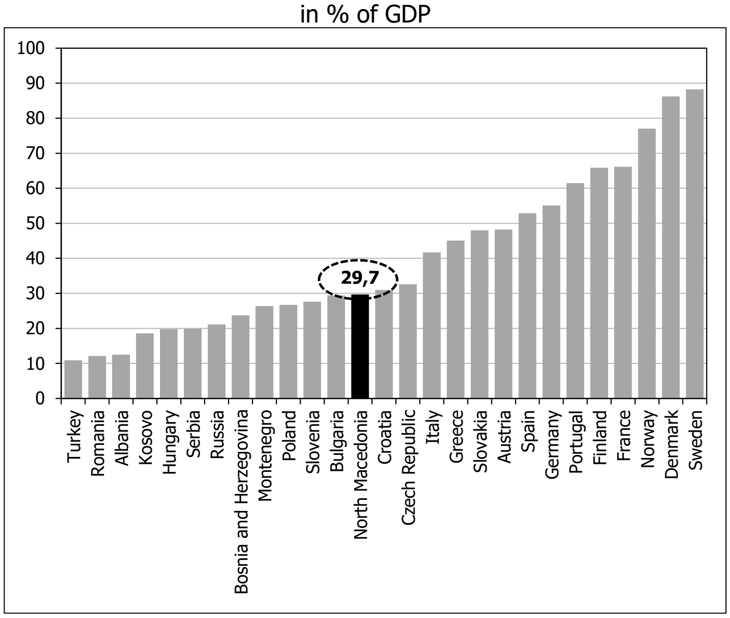
Source: National Bank's Credit Registry, based on data submitted by banks, savings houses, the MF, the CSD, the MAPAS, the SEC and the ISA, as well as the State Statistical Office for the GDP data from the press release published on 5 June 2023.

[65] The household debt increased to domestic financial corporations (by 22.2%), to leasing companies (by 4.9%) and to non-residents (by 3.4%). Debt to savings houses decreased (by 2%).
[66] Debt to banks also includes mandatory write-offs, as required by regulations.

Chart 48
Indicators of the relative size of household debt (up left), indicators of risks and vulnerability of household debt (up right) and comparative analysis of the household debt in 2022, by country (down middle)
in millions of denars and in %



in % of GDP

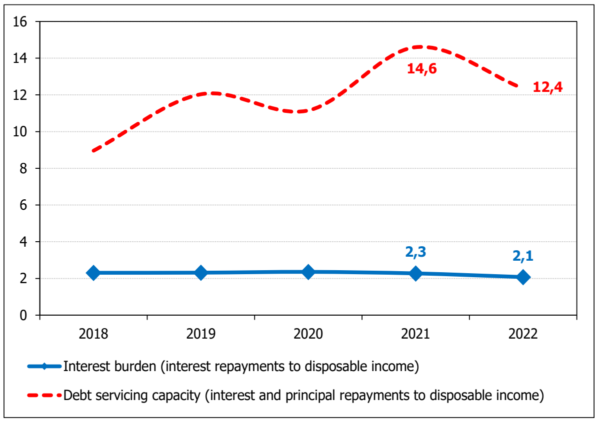


Source: National Bank's Credit Registry, based on data submitted by banks, savings houses, the MF, the CSD, the MAPAS, the SEC and the ISA, as well as the State Statistical Office for the GDP data from the press release published on 5 June 2023. Data for the household debt by country are taken from the IMF' global debt database.

Note: $\text{Liquidity risk indicator}_t = \mathbf{0,5}\frac{\boldsymbol{Debt_t}}{\text{Disposable income}_t} + \mathbf{0,5}\frac{\boldsymbol{Interest\ payment_t}}{\text{Disposable income}_t}$. A higher value of this indicator denotes a higher ratio of debt to household disposable income.

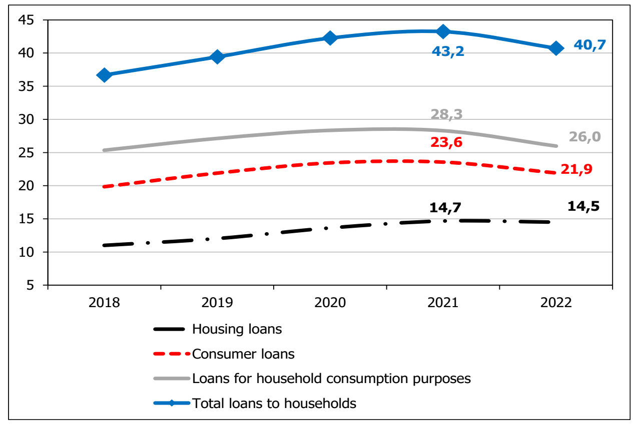
Snowball effect risk ratio = $\frac{\text{Interest payment}_t}{\frac{Debt_t + Debt_{t-1} + Debt_{t-2} + Debt_{t-3}}{4}} - \left(\frac{\text{Disposable income}_t}{\text{Disposable income}_{t-4}} - 1\right)$. The snowball effect indicator has a negative value given the fact that the share of the cost of funds received as debt (interest payments) in the average debt for the last four years is lower than the average growth of disposable income for the same period. The insolvency risk indicator is the correlation between the household debt and the net financial assets (the net financial assets represent difference between the financial assets and the household debt). The systemic risk ratio is the average of the analyzed liquidity risk, insolvency risk and snowball effect risk ratios.

Chart 49
Household creditworthiness indicators
in %



Source: National Bank, based on the data submitted by banks.

Chart 50
Household debt to disposable income ratio, on various bases
in %



Source: National Bank's Credit Registry, based on data submitted by banks.

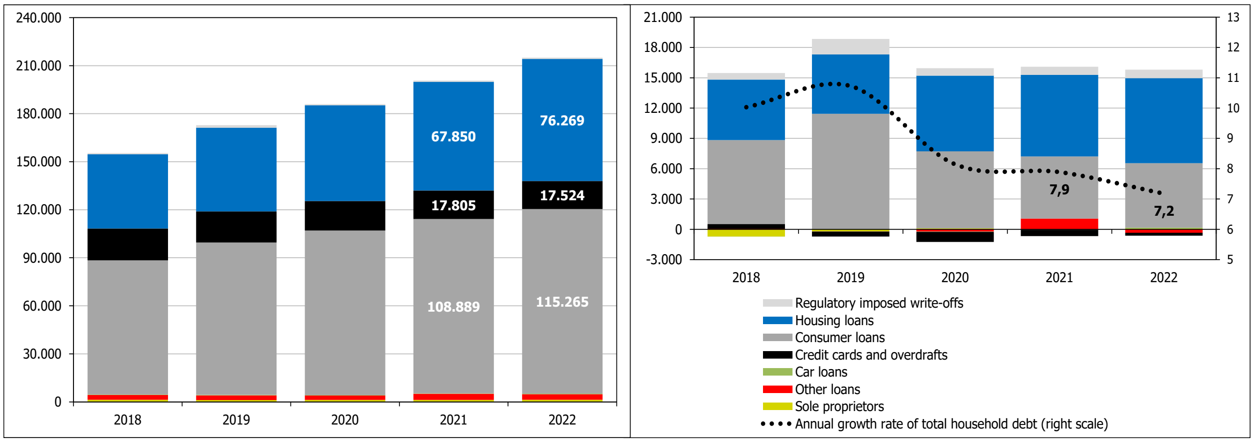
In 2022, despite the uncertain macroeconomic environment, solid credit support to household by domestic banks remained[67], yet at a slightly slower pace compared to the previous year and at a slower pace compared to the increase in the nominal disposable income. As a result, the liquidity position of households slightly improved, as well as the indicator of household ability for repayment of the debt based on principal and interest[68]. Furthermore, the significant increase in net financial assets contributed to moderate improvement of the household solvency position. As a result of the slower growth of the debt, the household debt monitoring indicators moderately increased, yet remained within the level characteristic for the past couple of years. At the end of 2022, the household debt to GDP was 29.7% (30.5% in 2021) typical for countries with similar development levels, but lower than the developed countries and the derived vulnerability threshold[69]. This ratio is neither sufficient nor the only indicator to assess indebtedness. The debt should also be seen in the context of the

[67] In 2022, lending to households made a contribution of 39% to the annual growth of lending to non-financial corporations by domestic banks. The slower household credit growth may be related to the slower demand for loans (it significantly decreased in the last quarter of the year), as well as from tighter household credit standards in the second half of 2022, after a longer period of net easing of the conditions in this sector (source: National Bank's Lending Surveys).

[68] For the purposes of this indicator we use the amount of newly granted household loans during the analyzed year. The newly granted loans in 2022 were lower by 3.5% compared to the previous year.

[69] Vulnerability threshold for household debt is derived from the MIP Scoreboard used by the European Commission to assess potential risks and macroeconomic imbalances in the EU countries. The MIP scoreboard sets a vulnerability threshold for total private sector debt at 133% of GDP. Vulnerability threshold of household debt of 34% of GDP is derived according to the ECB (ECB Financial Stability Report, November 2018), which decomposes the 133% threshold for total private debt into household debt and corporate debt threshold, based on the average share of household and corporate debt in total private sector debt. For the decomposition of vulnerability threshold for the Republic of North Macedonia, we used the average share of household and corporate debt for the period 2006– 2022.

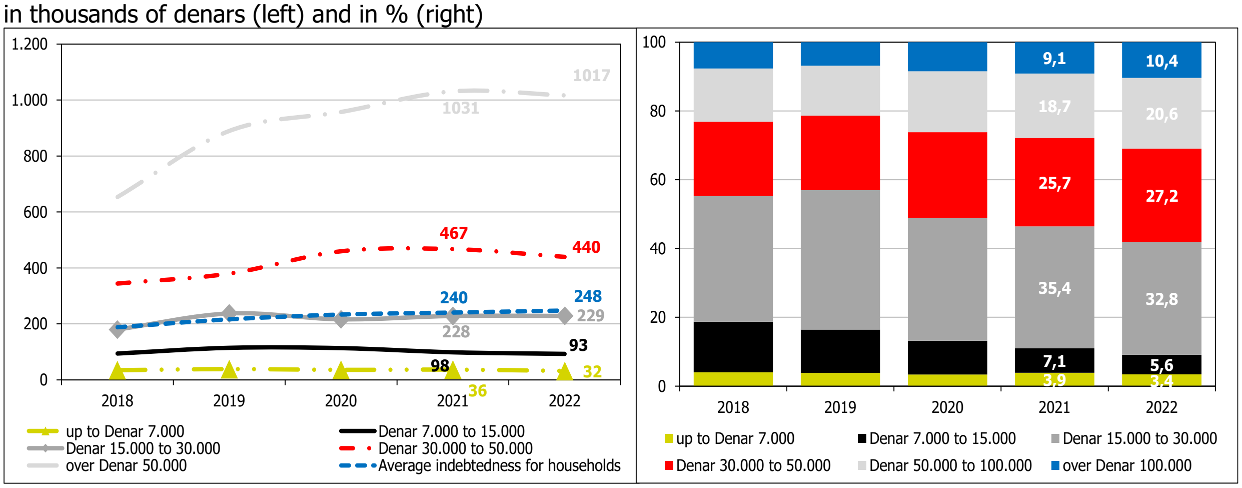
Chart 51
Household debt to domestic banks by type of loan product (left) and annual growth (right)
in millions of denars and in %



Source: National Bank, based on the data submitted by banks.

volume of financial assets and the disposable income of the sector, which for now has been providing solid creditworthiness of the sector as a whole. Solid household solvency and the possibility for further borrowing was also confirmed by the relatively low systemic vulnerability of the household sector, reflected through the aggregate systemic risk indicator, which in 2022 slightly moved down. However, the prolonged uncertainty of the war in Ukraine, the endurance of the high inflation and tightening of financial conditions created rising risks to the future household creditworthiness, to which the lower income segments are particularly sensitive.

Chart 52
Average debt by household (left) and structure of household debt (right), by monthly income
in thousands of denars (left) and in % (right)



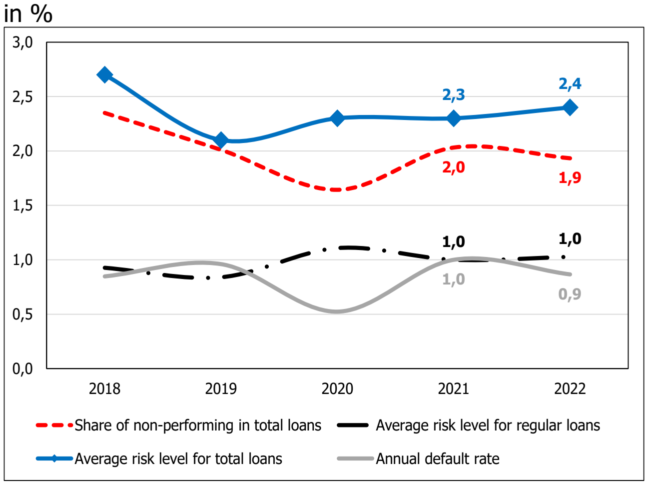
Source: National Bank, based on the data submitted by banks.

According to the type of the credit product that the households sector uses from domestic banks[70], 2022 also registered the largest annual increase in housing loans (by 12.4%), with a contribution

[70] The total household debt also includes the amount of mandatory write-offs made by banks due to the requirements in the regulations that refer to credit risk, because the written-off debt remains an obligation of households. The National Bank holds data on mandatory

of 55.4% to the growth of the total household debt to banking sector. They are followed by consumer loans with an increase of 5.9% and contribution of 42% to the growth of the total household debt to banks. Despite the accelerated growth of housing loans in the last couple of years, the structure of household debt to banks is still dominated (65%) by the debt which finances household consumption[71]. On the other hand, in the countries with a higher level of development, especially in the countries that have an extremely high household debt to gross domestic product ratio, as a rule, the largest part of household debt refers to financing the purchase of real estate. Hence, the structural changes of the debt in the following period will depend on the disposable income dynamics which directly determines the creditworthiness of households, i.e. determines the maximum volume of debt that they can settle, at the level of a borrower. The growth of interest rates and the changes on the real estate market may also affect household decisions to borrow larger loans and in a long run.

Chart 53
Household loan quality indicators
in %



Source: National Bank's Credit Registry, based on data submitted by banks.

The household sector capacity for regular repayment of liabilities is significant for the credit risk arising from this sector, as one of the more significant risks to domestic financial institutions. In domestic banks, as the most important creditor of the households, the quality of the overall credit portfolio composed of households is solid, which is evident from the dynamics of the rate of non-performing loans, which was relatively low for a longer period, while in 2022 it moderately decreased by 0.1 percentage points (from 2.0% on 31.12.2021 to 1.9% on 31.12.2022). If we exclude the effect of mandatory net write-offs[72] the rate of non-performing loans to households would amount to 5.4% which is almost equal to its ten-year average. This indicator decreased in most credit products, and as usually, the lowest rate of non-performing loans was registered in loans for purchase of real estate. In 2022, for the first time since the introduction of mandatory write-offs, banks have written-off more non-performing loans to households compared to non-financial corporations (54% of total mandatory write-offs of non-performing loans refer to households) and these write-offs are mainly due to the corona crisis. However, their share in total household debt is insignificant (0.4%) and indicates no risk to household sector stability.

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write-offs only by sectors (households and non-financial corporations), but not on their currency and maturity structure, nor on structure by type of credit product. Because of this, the effect of write-offs is included only in the total household debt, but not in the analyses according to its individual structural features.

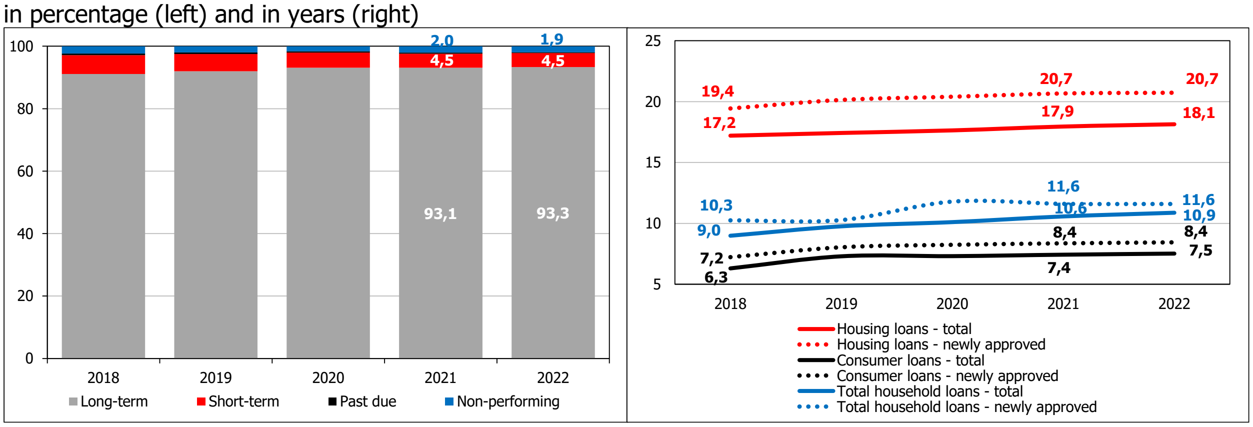
[71] It refers to consumer loans, car loans, overdrafts, credit cards and other loans.

[72] In accordance with the regulation as of mid-2019, each bank has been required to write-off credit exposures where twelve months have passed from the date when the bank was obliged to make full impairment, or allocate special reserve. In the period from 2016 to 1 July 2019, banks were required to write-off credit exposures where twenty four months have passed from the date when there was an obligation for full impairment, or allocation of special reserve. The term mandatory write-offs refers to the amount of write-offs reduced by the collection of previous write-offs.

A certain increase in the non-performing loan portfolio of households was recorded in 2022 (of around Denar 100 million or 2.5%), which stems from non-performing loans to natural entities for consumption financing[73]. The new non-performing loans to households can mostly be associated with the effects of the pandemic. On the other hand, non-performing loans to natural person for financing the purchase of residential and commercial properties reduced by around 3% (or denar 12 million) in 2022, with a decrease in non-performing loans to retailers (by around denar 3 million) as well. However, regardless of the relatively modest annual changes in non-performing loans in 2022, the overall economic and financial environment in which the domestic economic agents operate, became more complex in 2022, with the increase in macroeconomic risks and tightening of the global financial market conditions. Therefore, the continuous and careful monitoring of customers' creditworthiness, especially those that currently have higher level of indebtedness and are more sensitive to environmental changes, becomes one of the most important activities that domestic banks should pay attention to.

Amid continuous growth of lending to households, the quality of this loan portfolio of banks, as well as the possibilities for its further growth, are directly related to the creditworthiness of households. This primarily applies to the ability of the individual households to service liabilities, measured by the ratio of the monthly obligations for repayments to banks and their monthly income. Moreover, the amount of income is an extremely important factor for the assessment of the creditworthiness, since the risks of high indebtedness and occurrence of excessive indebtedness, are usually far more pronounced in natural persons who have a lower amount of monthly income. Around 40% of the household debt is concentrated in the income group up to Denar 30,000, which includes the largest number of borrowers (around 75% of the total number of household borrowers from banks).

Chart 54
Maturity structure of household debt (left) and average weighted maturity of new household loans, and by credit product (right)
in percentage (left) and in years (right)



Source: National Bank's Credit Registry, based on data submitted by banks.

The faster growth of household debt mostly on longer terms[74] in which the creditworthiness of the clients is more uncertain, is a risk factor for the quality of this

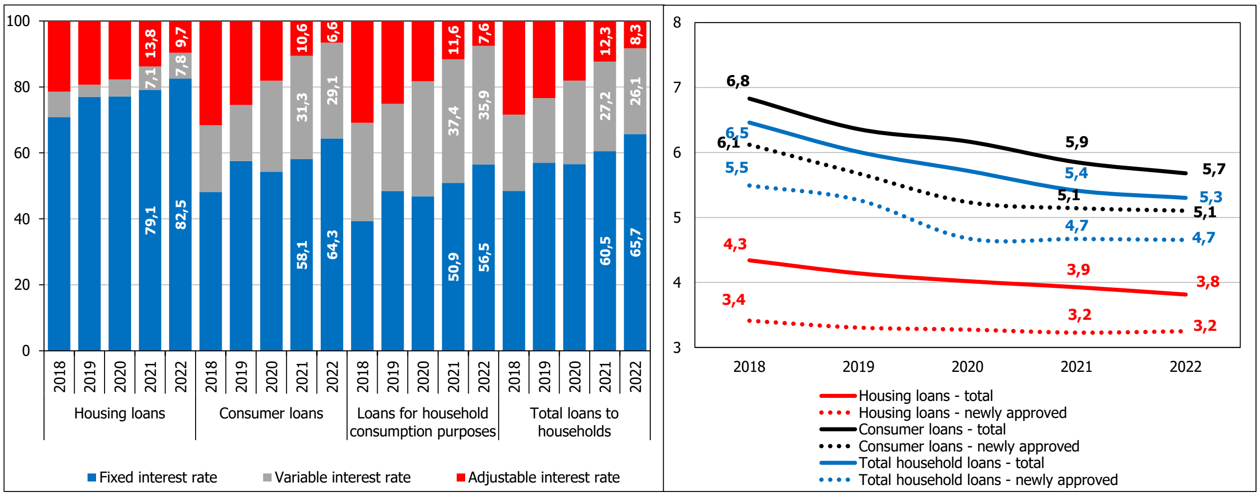
[73] Non-performing consumer financing loans increase mainly due to the increase in non-performing consumer loans by Denar 200 million, while non-performing loans with other credit products (overdrafts of payment accounts, credit cards, car loans and other loans) reduced by around Denar 90 million.
[74] As of the end of 2022, long-term household loans accounted for 93.3% of total household loans.

segment of the banks' loan portfolio, especially in conditions of increased inflation and rising interest rates. The average weighted maturity of newly approved household loans is around eleven years, which is an increase compared to the period of ten years ago (for instance, in 2012 it was about eight years). The average maturity of both housing and consumer loans grew.

Chart 55

Structure of household debt by certain credit products, by type of interest rate (left) and average interest rate on total and newly approved loans to households, by type of credit product (right)

in %

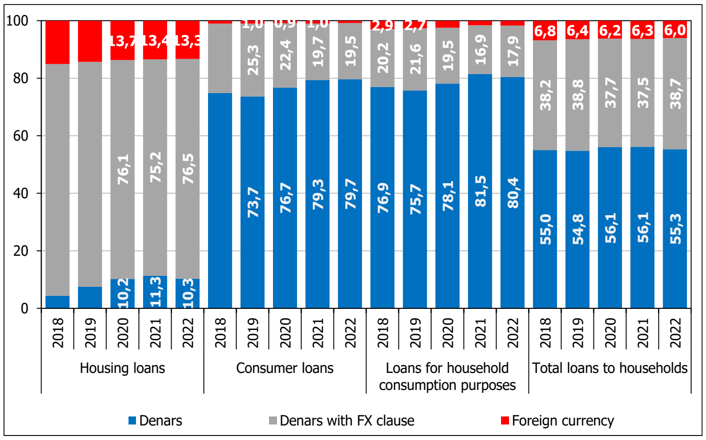


Source: National Bank's Credit Registry, based on data submitted by banks.

The high share of the longer maturity in the household debt to domestic banks increases the significance of the household exposure to interest risk, and accordingly, to banks' indirect credit risk , due to possible excessive debt burden for borrowers amid growth of interest rates. This results from the significant share of interest rates that could be changed (adjustable and variable interest rates) in credit agreements with households (34.3% in total loans to households, with a larger share, 43.5%, in loans for consumption financing). The interest rate risk is more pronounced amid current interest rate growth, which has intensified in household loans since the beginning of 2023. This poses risks to the volume of liabilities, not only the current ones, but also the future household liabilities that expose banks to indirect credit risk associated with the interest rate risk. Therefore, as before, banks need to continue with greater prudence in the management of these risks. Further details on the exposure and sensitivity of the household sector to interest rate risk can be found in the ad hoc analysis of the interest rate risk in the banking book, which is an integral part of this report.

The currency component is still quite present in household debt, which highlights the household exposure to currency risk. In 2022, there are no significant changes in the currency structure of household loans (around 44% of household loans are with a currency component, predominantly in denars with a currency clause). The interest difference between denar loans and loans with a currency component underlines the importance of the cost factor (interest rate) when choosing the currency of financing by households, which maintains the demand for loans with a currency component, especially in housing loans. Other credit products, mainly intended for consumption, are dominated by denar lending, with denar loans dominating total household loans. Unlike loans, deposits registered greater propensity for foreign currency deposits due to uncertainty, with a higher annual growth compared to denar deposits (increase of 10% in foreign currency household deposits, against the increase of 2.5% in denar deposits). Thus, more than 50% of household deposits are in foreign currency. Although the households sector as a whole is close to a matched currency position, it is very likely that most of the depositors are not borrowers with banks at the same time. Hence, the different household categories may have individually high short currency positions, i.e. higher exposure to currency risk. In circumstances when the sources for repayment of this debt, i.e. most of the households' income is generated in denars, the stability of the denar exchange rate, which has been successfully maintained, is important for maintaining the level of the households' debt and their ability for repayment of the debt to the financial sector.

Chart 56
Currency structure of household debt to banks, by credit product
in %



Source: National Bank's Credit Registry, based on data submitted by banks.

1.5. Corporate sector[75]

In 2022, amid new environmental challenges, almost all corporate activities increased their operating income and improved profitability. Catering, as the most affected activity by the pandemic, registered the highest growth of sales and consequently the best profitability indicators. The increase in the corporate net profit is solid on an annual basis, yet slower compared to 2021, due to the loss in micro entities. This loss is twice as big compared to the loss of micro entities in the previous year, which together with the tightened financial conditions, may additionally limit this entities' access to bank financing[76] and increase risks arising from them. To ensure sustainable profitability of the corporate sector in the following period, it is important to continue improving productivity and financial discipline, which would maintain this sector's liquidity stable.

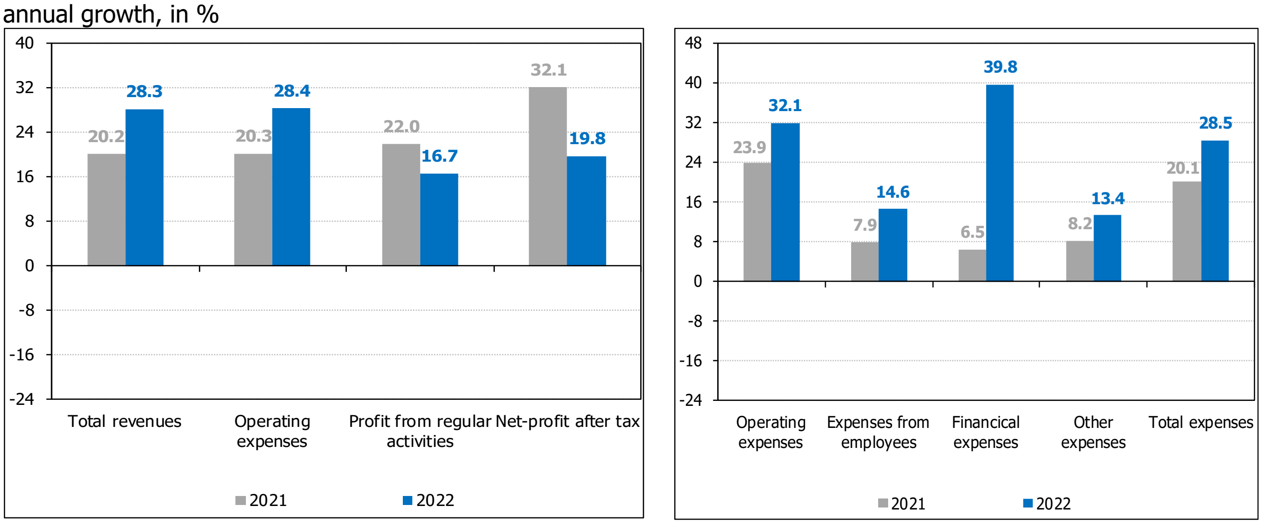
The total debt of the domestic corporate sector increased in 2022 as well, thus the debt ratio measured through its share in GDP increased, yet remained below the derived vulnerability threshold. Non-resident sector remains the main creditor of the domestic corporate sector, and the debt to domestic banks has also increased in conditions of increased liquidity needs of companies amid higher energy prices and in general, increased operating costs. A significant part of the debt (47%) has variable interest rates indicating an exposure to interest risk, which becomes particularly important in the current environment of increased interest rates. The corporate sector is exposed to currency risk, in conditions of increased debt with currency component, which is limited due to the exchange rate targeting strategy.

Risks to the corporate sector operations remain pronounced in the upcoming period, in conditions of increased financing costs which could raise the companies' vulnerability, especially for the entities that are highly indebted or have insufficient volume of operating cash flow. The protracted environmental uncertainty which creates risks to economic activity is an additional risk factor for the corporate debt sustainability.

[75] Corporate sector includes companies and sole proprietors whose main activity, in accordance with the National Classification of Activities (NCA), is industry (which includes entities with main activities of mining and quarrying, supply of electricity, gas, steam and air conditioning and water supply, sewerage, waste management and environmental recovery activities), wholesale and retail trade, and repair of motor vehicles and motorcycles, construction, agriculture, forestry and fishing, transport and storage, information and communications, accommodation and food services, real estate activities, professional, scientific and technical activities and administrative and ancillary services. The corporate sector does not cover legal entities that have registered prevailing activity in: financial and insurance activities; public administration and defense, compulsory social security; education; health and social care activities; arts, entertainment and recreation; other services; activities of households as employers; activities of households that produce different goods and perform various services for their own needs; and extraterritorial organizations and bodies.

[76] In 2022, banks had credit exposure to only 25.1% of a total of 36.198 micro entities that submitted annual account. Bank lending to small and medium-sized enterprises is more than twice, even three times bigger, i.e. it equals around 55% and 83%, respectively, while in large enterprises it is around 80%.

Chart 57
Revenues, expenditures and profit of the corporate sector
annual growth, in %



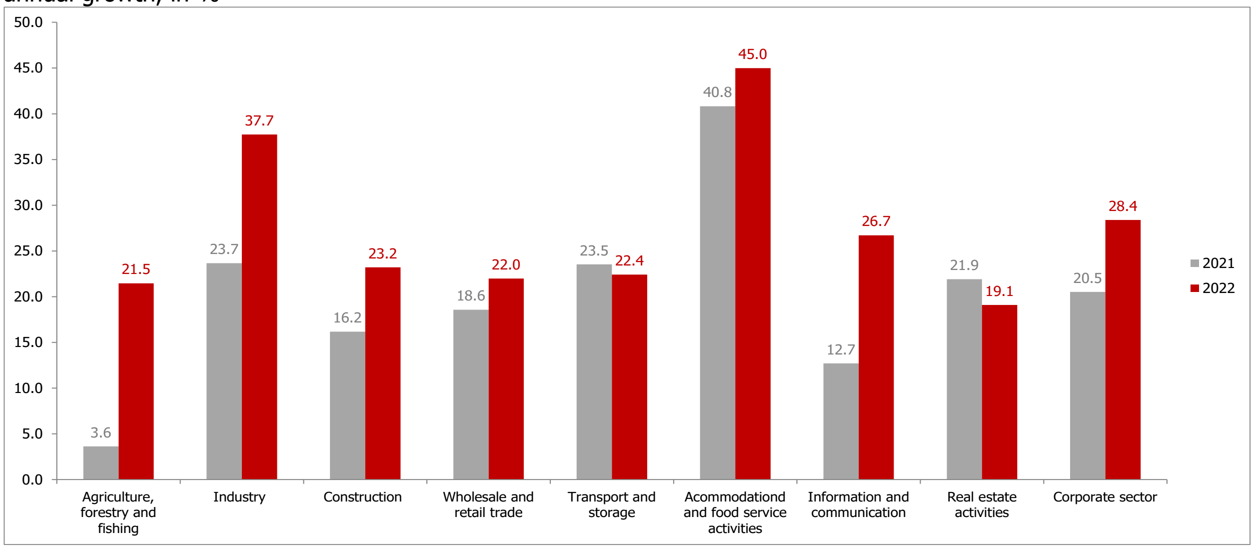
Source: Central Registry of the Republic of North Macedonia.

For the second year in a row, the corporate sector recorded a high growth of total revenues of 28.3%, which, this year as well, entirely results from the growth of sale income. The expenditures increased as well, primarily due to the costs for raw materials and purchase of goods, with a doubled growth of employees costs (amid doubling of the average gross wage[77] despite the reduced number of employees[78]). The most significant increase is registered in financial expenditures, which grew rapidly, mostly due to increased expenditures based on exchange rate differences. Interest expenses also increased, yet moderately, in conditions of further debt growth, and higher interest rates. This year, all of the corporate sector activities returned to the profitability track, with the most significant growth of the profitability in catering, which is above the pre-pandemic level, with the largest growth in sale income as well. It is followed by the industry which showed significant results in sales as well, which puts it among the three most profitable activities, despite the challenges posed by the energy crisis.

[77]The average gross wage in the corporate sector in 2022 increased by 15% annually. The growth of average monthly wages is registered in all of the corporate sector activities, with the highest growth rate in activities related to real estate, professional, scholar, technical, administrative and auxiliary services (15.6%) and wholesale and retail trade, transport, storage and catering (14.6%). The growth in wages is partly due to the increase in minimum wage of 18.5% in March 2022. Pursuant to the latest amendments to the growth of the minimum wage (Official Gazette of the Republic of North Macedonia No. 41/22) from March 2022, the minimum net wage was extraordinarily increased by Denar 2,806, in accordance with the three-party agreement reached between the Government, the unions and the employers, where the government will subsidize the contributions (from March 2022 to December 2022 in the amount of Denar 1,197 each month). The minimum gross wage, from March 2022 to February 2023, is Denar 26,422 (previously Denar 22,146), while the minimum net wage is Denar 18,000 (previously Denar 15,194). Moreover, the latest amendments provide a new methodology which will adjust the minimum wage in the next period, i.e. from March 2023, with the increase of the average wage paid in the RNM for the previous year and the consumer price index - 50% of the increase of each indicator, respectively. Also, it is also defined that the minimum wage cannot be lower than 57% of the average net wage paid in the RNM for the previous year. The increase in the minimum wage was partly due to certain structural factors, such as lack of labor force in some labor market segments.

[78]The number of employees in the corporate sector decreased by 14.3% on annual basis, after the minor increase of 0.9% in the preceding year. Reduction in employment is registered in almost all activities, mostly in manufacturing industry, agriculture, forestry and fishing and wholesale and retail trade.

Chart 58
Income from sales by activity
annual growth, in %

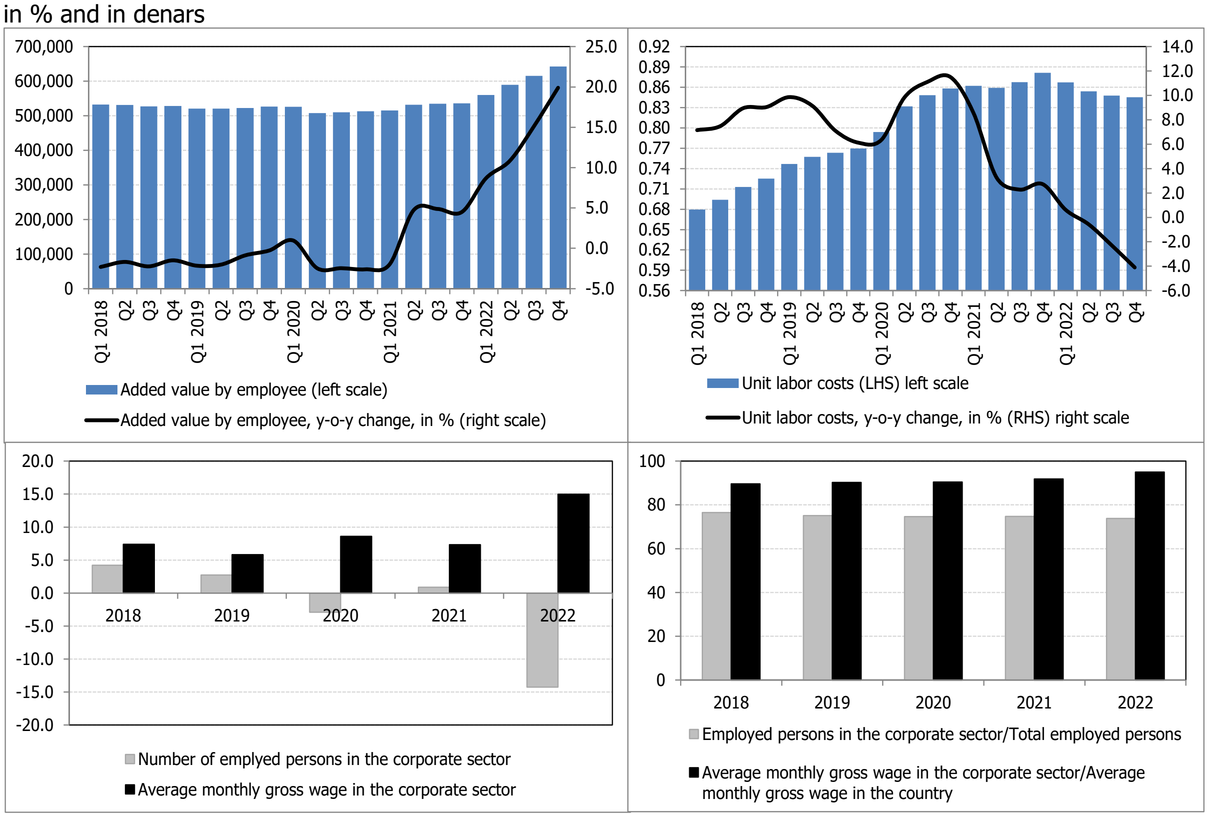


Source: Central Registry of the Republic of North Macedonia.

Observing the competitiveness indicators, the corporate sector productivity[79] is growing, at an accelerated pace for two years in a row (by significant 13.6% in average, as opposed to 3% in the previous year amid stagnation, as well as amid negative movements in employment), given the decrease in unit labor costs (by 1.6%, as opposed to the increase in the previous year of 4.2%). Analyzing sectors, the productivity growth mainly results from the service sector and less from agriculture (primarily due to the decline in the number of employees), amid decline in the information and communication sector. Developments on the labor market in 2022 were affected by the reduced economic activity, amid sustained uncertainty of the war in Ukraine, and ongoing energy crisis. Thus, the number of corporate sector employees decreased annually, while the analysis by activity shows significant reduction of employment in manufacturing industry, agriculture and wholesale and retail trade.

[79] The productivity of the corporate sector is calculated as the ratio between the value added and the number of employees in the sector. Unit labor costs are calculated as the ratio of the average monthly gross wage and the value added per employee in the sector.

Chart 59
Corporate sector competitiveness indicators: added value by employee (up, left), unit labor costs (up, right), annual growth of the number of employees and wages (down, left) and indicators for the importance of the corporate sector for the domestic labor market (down, right)
in % and in denars

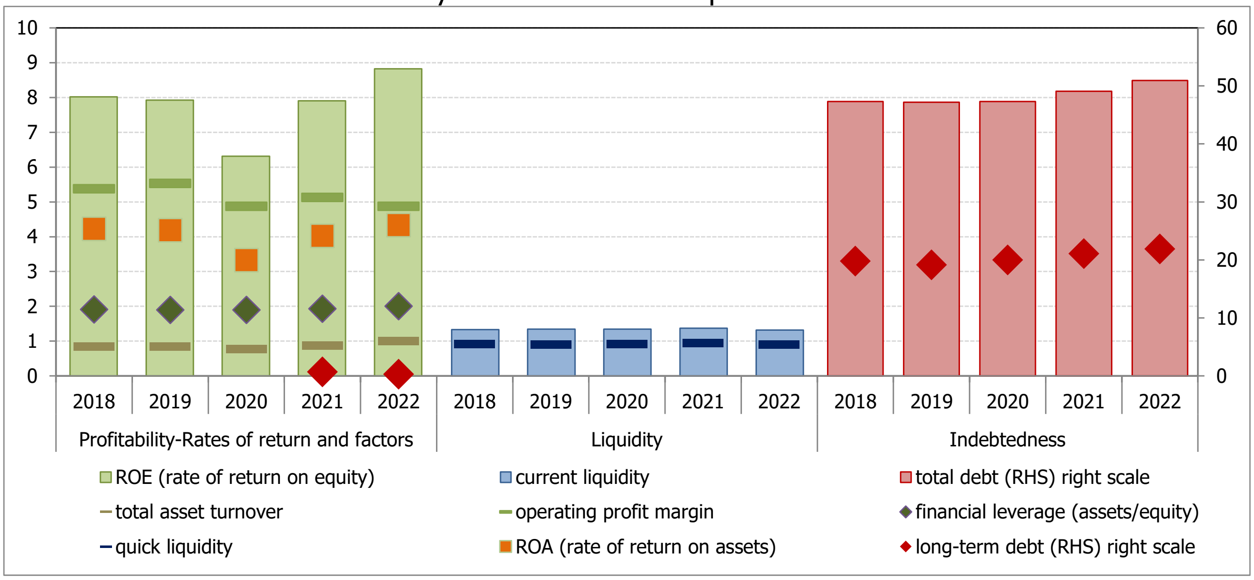


Source: State Statistical Office of the Republic of North Macedonia and National Bank calculations.

After the fast annual growth of net profit in the previous year (32.1%), the growth in 2022 was slightly slower (19.8%) but still high, which reflected in improved profitability indicators of the sector. Thus, the return on assets (ROA) in 2022 equaled 4.3%, while the return on equity and reserves (ROE) amounted to 8.8%, which is an increase of 0.3 and 0.9 percentage points respectively on an annual basis. The analysis by activity shows that information and communication remains the most profitable activity, while agriculture is the least profitable. Large enterprises are the main drivers of net profit of the domestic corporate sector, with a contribution of 72.7%, which is the largest share in the total net profit of the corporate sector (55.2%). On the other hand, micro entities[80] still generate operating loss, which in 2022 deepened more than double compared to the previous year, exceeding the level in the pandemic year, which pronounces their vulnerability to financial operational risks. The share of corporate entities that reported loss additionally decreased in 2022 and accounted for 26.8% of the total number of corporate entities as opposed to 30.1% in the previous year.

[80] Micro entities in 2022 account for 61.8% of the total number of corporate entities, followed by small entities with a share of 35.4%, medium-size entities (1.8%) and large entities (1%).

Chart 60
Indicators of the financial stability of the domestic corporate sector

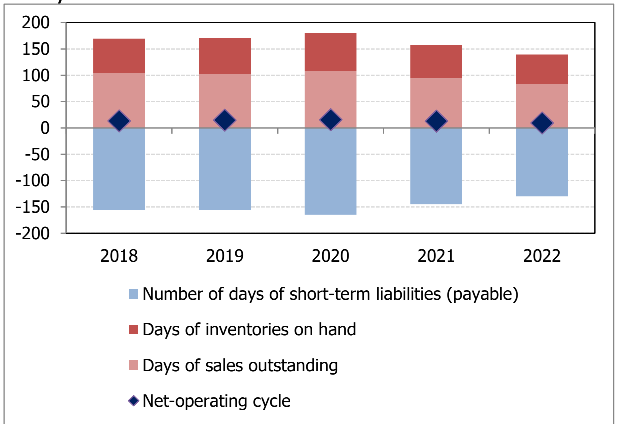


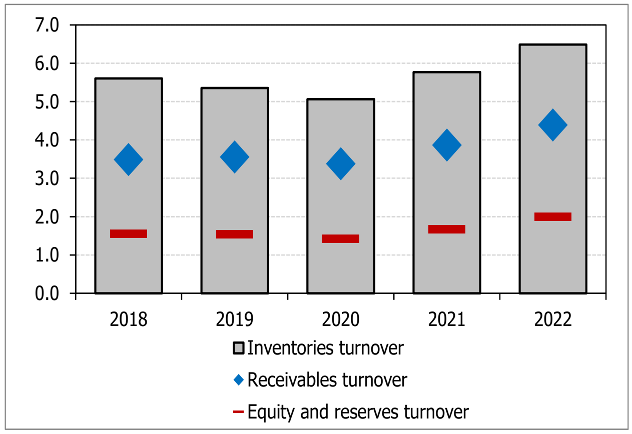
Source: Central Registry of the Republic of North Macedonia.

The liquidity risk remains the key vulnerability source for the domestic corporate sector, despite the improvement in operating efficiency in 2022. Thus, during the year, liquidity indicators remained at their ten-year average, but below the level that is theoretically considered satisfactory[81]. Micro entities and entities from the agriculture sector show greater vulnerability to liquidity shocks, which is perceived through the lower level of the current liquidity compared to other entities and to the sector average. In 2022, a specific for the domestic corporate sector was the improved financial discipline, which is perceived through the shortened net operating cycle[82] to around nine days, in conditions of accelerated payment of liabilities and faster collection of claims. Thus, during the year, the domestic corporate sector needed around 2.5 months on the average for collection of claims, while 4 months for payment of short-term liabilities. The greater regularity in payments, if sustained in the period ahead, could make positive contribution to maintenance of the corporate sector liquidity position stable, as well as to positive spillover effects on the debt sustainability.

[81] For a level that is usually considered satisfactory, 1 is used for moment liquidity, i.e. 2 for current liquidity. The indicator for the moment liquidity of the domestic corporate sector in 2022 was 0.9, while the current liquidity indicator was 1.3.
[82]Net operating cycle is the average time from the payment to suppliers to the collection of claims on customers, including the time needed for transforming raw materials into finished products through a production process.

Chart 61
Selected indicators of operational efficiency of the corporate sector
in days and in times



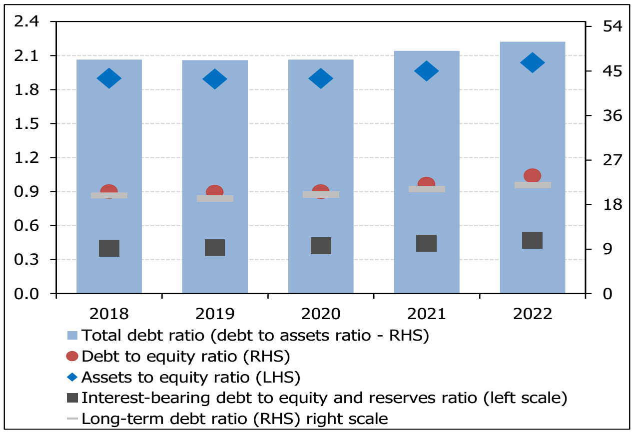


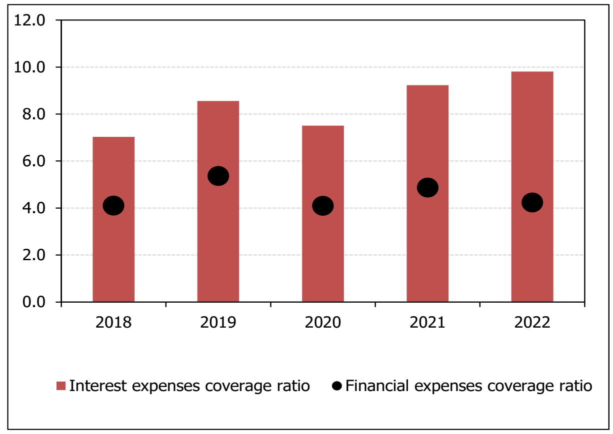
Source: Central Registry of the Republic of North Macedonia.

The overall corporate debt ratios, currently, do not indicate high risks to the solvency of this sector. Total debt of the corporate sector[83] further increased, at the same pace as in the previous year and amounted to 50.9% (49.1% in 2021), amid moderate increase in the interest-bearing debt (23.2% of the total assets), with a similar dynamics in long-term debt, which in 2022 equaled 21.9%. Financial deleveraging indicator (debt to equity and reserves ratio) remains at the stable level 1, amid accelerated growth in domestic corporate sector capital. Moreover, there is further improvement in the coverage of the interest expenditures, with a slightly decreased coverage of financial expenses with the profit of regular operations, which is due to the previously mentioned significant growth of other financial expenses, amid increased corporate sector profitability. Debt management is an upcoming challenge, primarily due to the decelerated growth as a result of the energy crisis, the hindered supply and increased consumer prices which posed tightening of the financial conditions worldwide. Such risks are mostly relevant to micro entities with a negative working capital and operating loss above the pre-pandemic level, amid increased debt and reduced liquid position which is low anyway.

[83]The method of calculation of indicators is shown in the Annexes to this report. Total debt is determined as corporate debt (or total assets reduced by principal and reserves) to total assets ratio.

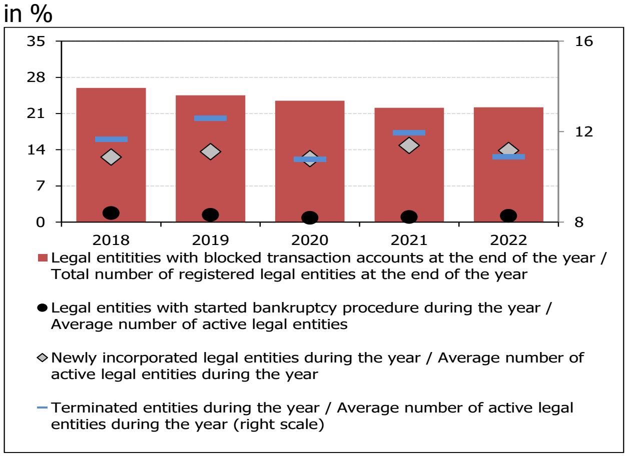
Chart 62
Selected corporate debt indicators
in times and in %

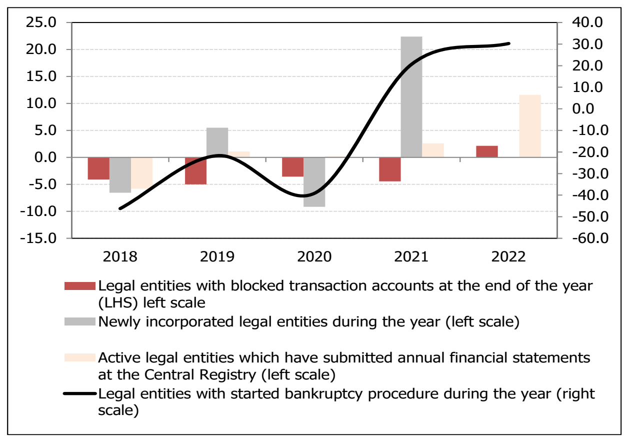




Source: Central Registry of the Republic of North Macedonia.

Chart 63
Relative importance (left) and annual growth (right) of newly incorporated, bankrupted, ceased legal entities and legal entities with blocked accounts
in %





Source: Central Registry of the Republic of North Macedonia and National Bank of the Republic of North Macedonia for the number of blocked accounts.

In conditions of complex macroeconomic environment with numerous environmental challenges, the number of legal entities that entered into bankruptcy during 2022 increased, thus increasing the rate of bankrupted legal entities[84] to 1.2% (1% in the previous year), which is still below the pre-pandemic levels. A slight increase was also recorded in the number of entities with blocked transaction account to the level of 22.2% of the total number of registered entities at the end of the year (22.1% in the previous year). The share of ceased legal

[84] The bankruptcy rate is the ratio between the number of legal entities that entered into bankruptcy during the year (which is data from the Central Registry of the Republic of North Macedonia) and the average annual number of active legal entities, which is the average of the number of active legal entities (registered entities that submitted an annual account to the Central Registry of the Republic of North Macedonia) at the end and the beginning of the respective calendar year.

entities[85] in total number of active legal entities in 2022 amounted to 10.9%, which is a decrease compared to the previous year (11.9%). The rate of ceased entities remains lower than the rate of newly established legal entities[86], which, after the increase in the previous year, reduced to 13.8%.

1.5.1. Indebtedness of the corporate sector

The total domestic corporate debt[87] in 2022 continued to grow rapidly at an annual rate of 13.7% (10.3% in 2021), thus the corporate debt[88] ratio increased to the level of 71.1% (as opposed to 69% in the previous year). The debt[89] of the corporate sector (as measured by the share in GDP) remains below the derived vulnerability threshold[90], but exceeds the average of the indebtedness in the past ten years. Without short-term trade credits[91], as an instrument for financing foreign trade, which is usually interest-free, the total domestic corporate debt to GDP ratio is almost unchanged compared to the previous year and amounts to 55.1% (decrease of 0.1 percentage points).

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[85] The number of ceased legal entities is a derived data on the basis of the data on the total number of registered legal entities from the end of the previous and the number of newly established legal entities in the current year. Moreover, the reason for the closure of the legal entity is not taken into account, having in mind that the Law on Trade Companies prescribes the procedure for determining the status of an inactive entity and the possibility of deregistration of such entities from the records of the Central Registry of the Republic of North Macedonia, including in case of failure to submit annual accounts.

[86]The rate of newly established companies is calculated as the ratio of the number of newly established legal entities during the year and the average number of active legal entities in the year. Active legal entities in the year are considered those who submitted annual accounts to the Central Registry of the Republic of North Macedonia. The Law on Trade Companies prescribes the procedure for determining the status of an inactive entity and the possibility of deregistration of such entities from the records of the Central Registry, including in case of failure to submit annual accounts.

[87] For the needs of this analysis, the total corporate debt includes: liabilities to banks based on loans, interest and other claims, including the cumulative amount of written-off debt, in accordance with the banks' regulatory obligation for write-off of the exposures that have been fully provisioned for more than two years (for more than one year from July 2019), external liabilities (non-residents), value of active lease contracts and liabilities based on active contracts with financial companies.

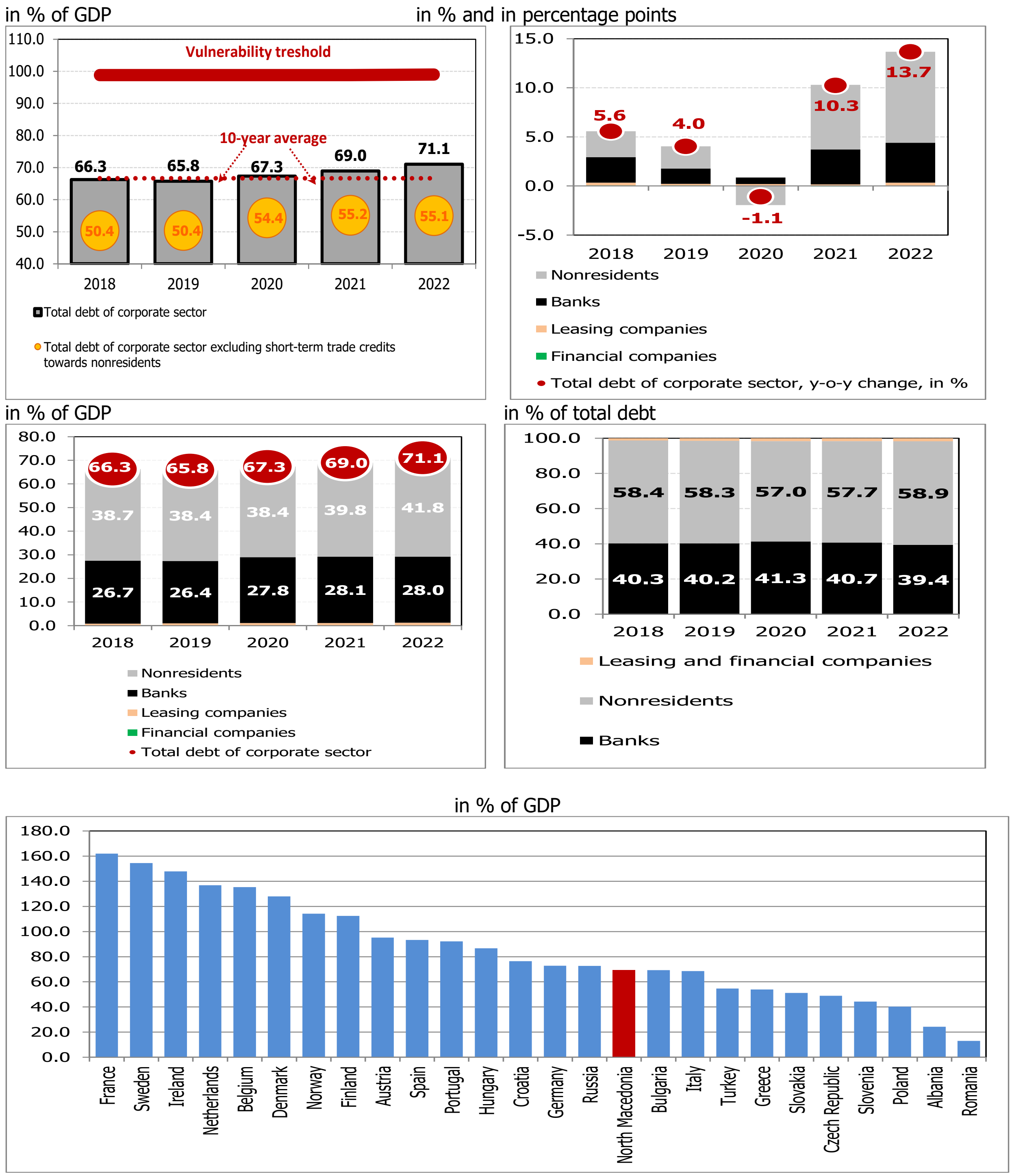
[88]The debt ratio is shown through its share in GDP.

[89] At the end of 2022, the total debt of the corporate sector was Denar 565,019 million, compared to Denar 496,915 million, as it was at the end of the previous year.

[90] Vulnerability threshold for corporate debt is derived from the MIP Scoreboard used by the European Commission to assess potential risks and macroeconomic imbalances in the EU countries. The MIP scoreboard sets a vulnerability threshold for total private sector debt at 133% of GDP. Vulnerability threshold for corporate debt of 99% of GDP is derived according to the ECB (ECB Financial Stability Report, November 2018), which decomposes the 133% threshold for total private debt into household debt and corporate debt threshold, based on the average share of household and corporate debt in total private sector debt. For the decomposition of vulnerability threshold for the RN Macedonia, we used the average share of household and corporate debt for the period 2006 - 2022.

[91] At the end of 2022, short-term trade credits represent 22.5% of the total debt of the corporate sector and 38.3% of the debt of the corporate sector to non-residents.

Chart 64
Debt of the corporate sector (up left), contribution to the annual growth of the total corporate debt, by type of creditor (up right), structure of corporate debt, by type of creditor (middle, left and right) and comparative analysis of the corporate debt in 2022, by country (down, middle)



Source: National Bank, Ministry of Finance and State Statistical Office. Data for the corporate debt by country are taken from the IMF' global debt database.

During 2022, the annual growth of the corporate sector indebtedness was driven by the higher debt financing from abroad, i.e. the external debt, which accounted for almost 70% of the annual growth of the overall debt. Thus, the external debt to GDP ratio increased and amounted to 41.8% (39.8% of GDP in the previous year). The domestic debt[92] also increased rapidly in 2022, almost entirely due to the increased credit activity of the banking sector as the main domestic corporate creditor. The share of the non-banking financial institutions in domestic corporate sector financing remains modest (1.8% of the total debt). There is also a lack of financing through the issue of debt securities on the domestic or foreign financial markets, which was the case with the domestic corporate sector in the past period of relatively favorable movements of the corporate debt interest rates on international financial markets. Thus, domestic companies haven't asked for or received a credit rating from an internationally active credit rating agencies unlike foreign companies.

Table 3.
Structure and changes to components of the domestic corporate sector

Type of debt		Structure (in %)			Absolute change (in Denar millions)			Relative change (in %)		
		2020	2021	2022	2020	2021	2022	2020	2021	2022
Currency	Denar debt	22.1	22.5	21.1	-542	12,153	7,363	-0.5	12.2	6.6
	FX debt	65.8	66.6	69.0	-8,241	34,069	58,767	-2.7	11.5	17.8
	Denar debt with FX clause	7.5	6.6	6.0	2,740	-694	992	8.9	-2.1	3.0
	Cummulative of regulatory imposed write-offs to domestic banks	4.6	4.3	3.8	1092.1	688.9	194	5.6	3.3	0.9
Maturity	Short-term debt	31.2	32.6	34.6	-22,417	21,348	33,300	-13.8	15.2	20.6
	Long-term debt	62.1	61.2	60.0	20,868	24,281	34,409	8.1	8.7	11.3
	Other debt (past due and nonperforming)	2.1	1.9	1.6	-4,494	-100	-322	-32.5	-1.1	-3.5
	Cummulative of regulatory imposed write-offs to domestic banks	4.6	4.3	3.8	1092.1	688.9	194	5.6	3.3	0.9
Type of interest rate	Debt with fixed interest rate	41.9	41.2	41.8	6,463	9,608	18,840	4.6	6.5	11.9
	Debt with variable interest rate	43.9	46.1	45.9	18,615	21,420	17,549	13.6	13.8	9.9
	Debt with administratively adjustable interest rate	3.6	1.7	1.1	-13,621	-6,304	-1,921	-51.5	-49.1	-29.4
	Other - interest free debt towards nonresidents	5.0	5.7	6.4	1,239	4,272	4,953	7.6	24.2	22.6
	Cummulative of regulatory imposed write-offs to domestic banks	5.6	5.3	4.9	1039.8	631.0	163	5.6	3.2	0.8

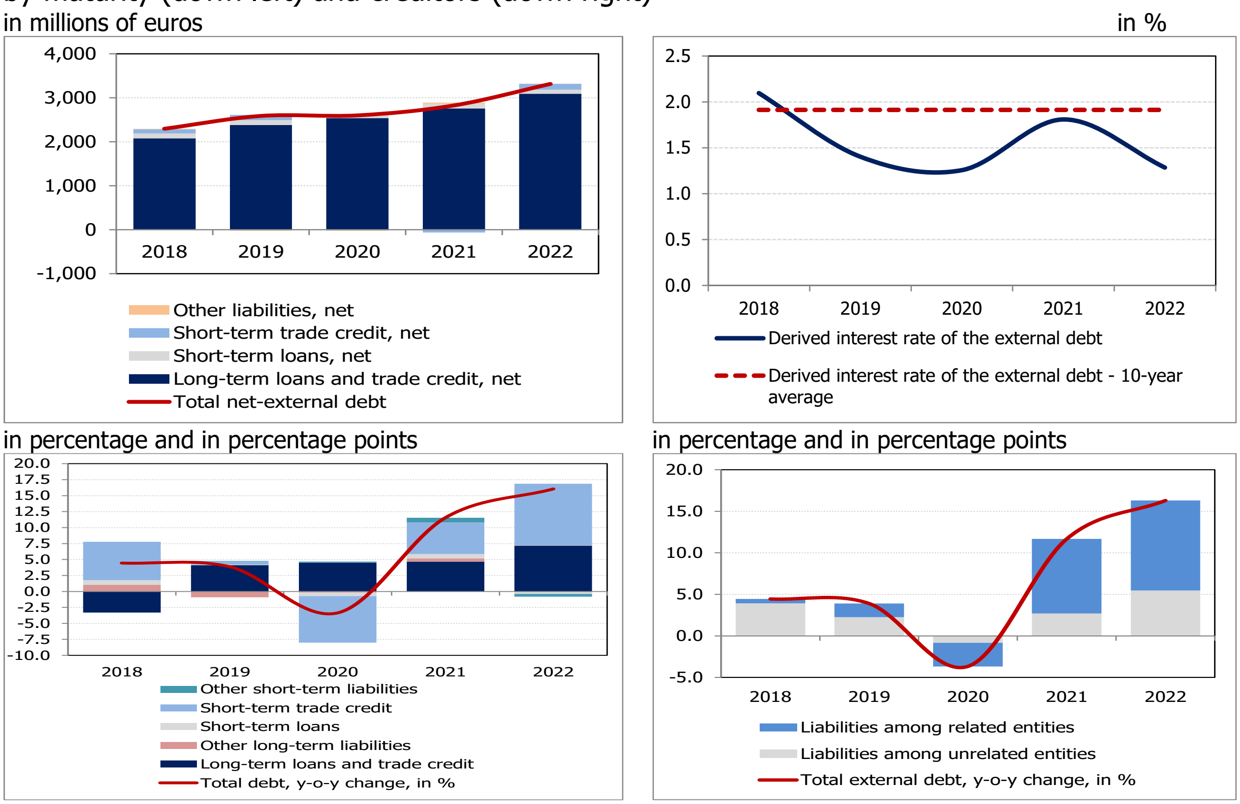
Source: The National Bank on the corporate debt to banks and nonresidents, the Ministry of Finance on the corporate debt to leasing companies and financial entities.
Note: in the maturity structure of the debt, the share of other (past due and non-performing) debt is obtained based on the data for the indebtedness of the corporate sector to banks, due to unavailability of data on the non-performing debt to other creditors. The structure of the debt by type of interest rate is obtained according to the debt to the banking system and debt on the basis of the principal of loans to non-residents. The item for the written off indebtedness by the domestic banks presents that part of the indebtedness of the domestic corporate sector which was written off by banks in the period 2016 - 2022, in accordance with the regulatory obligation for write-off of exposure that has been fully covered by impairment for more than two years (more than one year as of July 2019).

Within the external debt, the growth is driven by the short-term trade loans[93], as an instrument for deferred interest-free financing of foreign trade, which in 2022 increased by 18.2%. Short-term loans still dominate in total short-term liabilities of the corporate sector abroad

[92] Domestic corporate debt amounts to Denar 232,408 million at the end of 2022, as opposed to Denar 210,293 million at the end of the previous year, which is an increase of 10.5% (8.5% increase in 2021).
[93] Trade (commercial) credits denote relations between residents and non-residents (claims or liabilities) arising from direct loan approval from the supplier (supplier) to the buyer (receiver) on the basis of trade in goods and services, advance payments for trade in goods and services or for performing works.

with a share of 93.5%. **Growth was also registered in long-term loans which are mainly in a form of intercompany loans from foreign parent companies.** The structure of the external debt remains dominated by the long-term borrowing (share of 59.1%), which contributes to relatively favorable debt repayment with longer maturity, which reduces the risk of debt re-financing at less favorable terms, especially in the current environment of increased financing costs. **The analysis of creditors shows that slightly more than half (51.9%) of the total external debt refers to the intercompany indebtedness between related entities,** which additionally reduces the risk of refinancing the external debt of the domestic corporate sector, under the assumption that these related entities will continue with regular activities. Within the intercompany indebtedness, around 60% account for long-term liabilities, while short-term liabilities almost entirely refer to trade loans (a share of 90%, while the rest are short-term loans).

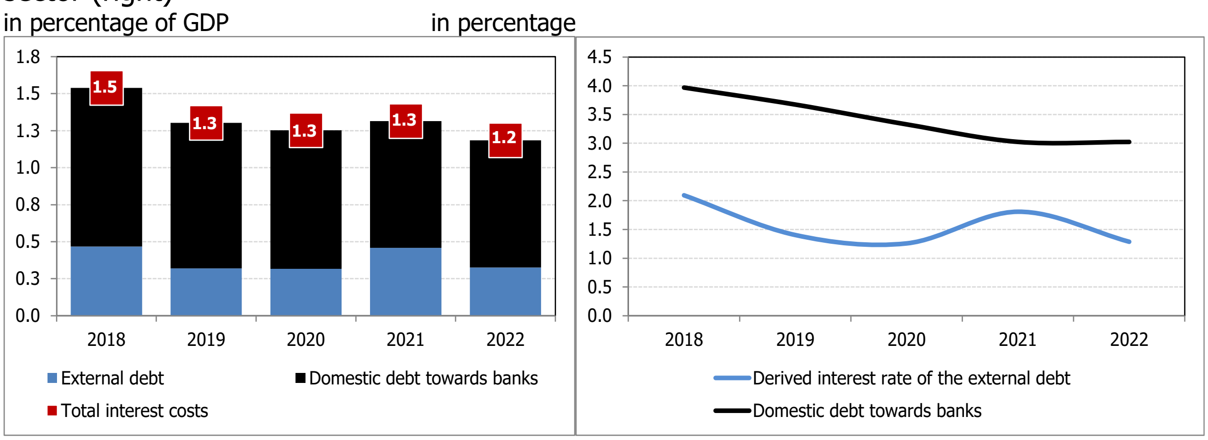
Chart 65
Net external debt of the corporate sector (up left), derived interest rate of the external debt (up right) and contribution to the annual growth of the debt of the corporate sector to non-residents, by maturity (down left) and creditors (down right)



Source: National Bank.
Note: net external debt is calculated as the difference between the gross external debt and gross external claims of the corporate sector.
The derived interest rate of the external debt is calculated as the ratio of paid interest based on used loans from non-residents by the corporate sector and total liabilities based on used loans from non-residents by the corporate sector. The red dashed line represents the ten-year average of the derived interest rate of the external debt.

The corporate debt to domestic banking sector was growing rapidly for two years in a row, but the share of GDP remained stable at 28% in 2022. Long-term loans still make greater contribution to the debt to banks, although in 2022, the short-term lending increased as well. Such developments were registered in conditions of high price growth of energy and general increase of operating costs, which affected the liquidity needs of the domestic corporate sector. Amid higher import prices, the growth of foreign currency loans further increased, and its share reached 25.6% (21.9% at the end of 2021). The uncertain economic environment may affect the supply of loans to the corporate sector in the following period. The Lending Survey of the National Bank[94] shows tightening of the credit standards, more pronounced in small and medium-sized enterprises. Such developments were most affected by the banks' worsened expectations for the total economic activity and perspective of individual economic activities. The banks have tightened the standards mostly through the increase in interest rate, but in the second half of 2022, there is an evident increase in commission and fee costs for loans, as well as tightening of collateral requirements. The tightening of credit standards occurs amid further increased demand for loans (more pronounced in large enterprises with shorter maturity), primarily due to increased needs for investments in inventories and working capital, and fixed assets.

Chart 66
Interest costs of the corporate sector (left) and derived interest rate of the debt of the corporate sector (right)

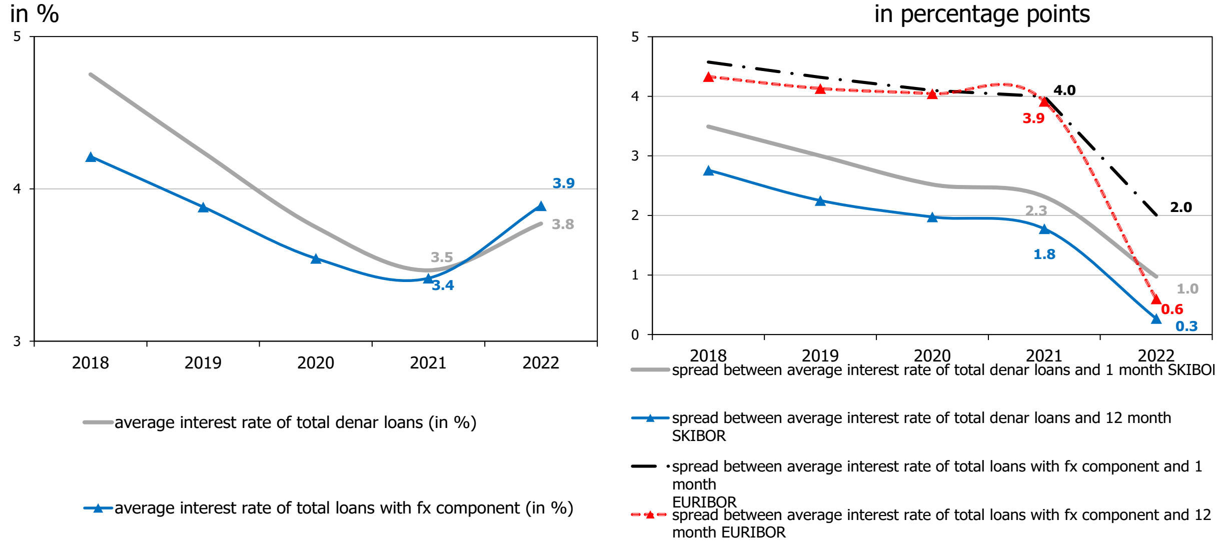


Source: National Bank, based on data submitted by banks and external debt data.
Note: Interest costs are based on the data submitted by banks and external debt data. Interest costs for the external debt include the paid interest on the basis of loans used by the corporate sector during the year, while for the domestic debt, the banks' income from non-financial corporations during the year is taken into account.
The derived interest rate of the domestic debt is calculated as the ratio of the banks' interest income from non-financial companies and the total bank loans to the corporate sector. The derived interest rate of the external debt is calculated as the ratio of paid interest based on used loans from non-residents by the corporate sector and total liabilities based on used loans from non-residents by the corporate sector as of 31.12.2022 (excluding possible borrowings repaid in 2022).

Observing maturity features of the overall corporate debt, in 2022, both maturity features made almost the same contribution to the growth, in conditions when the growth rate of short-term loans accelerated, mainly due to the growth of short-term trade loans. However, long-term indebtedness still dominates the total corporate debt with 60% at the end of 2022. Around two-thirds of the annual growth of the long-term corporate debt are conditioned by non-resident creditors.

[94]The Lending Survey of the National Bank is conducted on a regular quarterly basis. For the purposes of this section of the Financial Stability Report, the Survey results are analyzed as average results of the four quarterly surveys for each calendar year. For more information about the results from the lending surveys, visit the National Bank website.

Chart 67
Average interest rates on total corporate loans by domestic banks (left) and spread of average interest rates over the basic interbank interest rates (right)



Source: NBRM's Credit Registry, based on data submitted by banks and NBRM calculations.

The analysis of the interest structure of the total corporate debt shows its sensitivity to interest rate risk, which is further pronounced in the current conditions of financing costs growth. Almost half (47%) of the total corporate debt is with variable interest rate (including the debt with adjustable[95] interest rate). The interest rate risk is less pronounced in the external debt, which is dominated by the debt with fixed interest rate (56.9%), while additional 13.3% refer to interest-free debt. As for domestic banks, most of the debt is with variable or adjustable interest rate (joint share of 67.2%), which implies corporate sector exposure to higher interest rates on loans and to increased debt servicing burden in the following period.

Amid monetary policy tightening, the average interest rates that banks charge on domestic corporate loans increased in 2022, after a longer period of reduced cost of loans. Growth was registered in both denar loans and loans with currency component, yet more moderate compared to the growth in interbank interest rates, which narrowed the spread between them.

In 2022, interest costs for servicing the corporate debt to domestic banks increased, yet their share remained stable as a percentage of GDP[96]. On the other hand, the external debt interest payments decreased, thus slightly reducing the total interest costs to the level of 1.2% of GDP. The derived interest rate of the domestic debt[97] in 2022 equaled 3% and remained unchanged

[95]The debt with adjustable interest rate further decreased and at the end of 2022 its share was negligible and amounted to 1.1% of the total corporate debt.
[96] Refers to derived interest costs which for the external debt include the paid interest on the basis of loans used by the corporate sector during the year, while for the domestic debt, the banks' income from non-financial entities during the year is taken into account.
[97]The derived interest rate of the domestic debt is calculated as the ratio of the banks' interest income from non-financial entities and the total bank loans to the corporate sector.

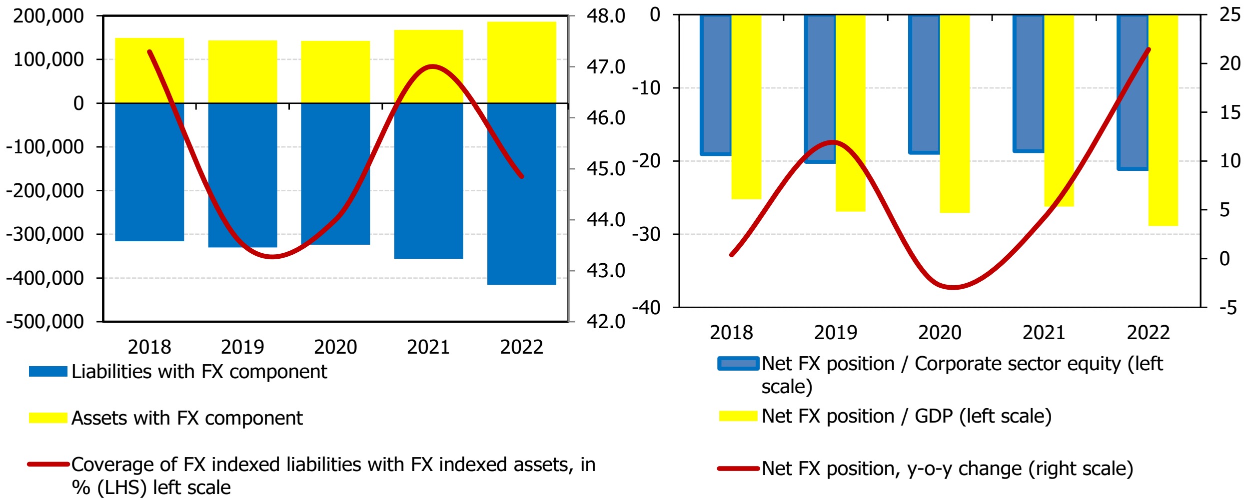
annually, as opposed to the derived interest rate of the external debt[98] which amounted to 1.3% and decreased compared to the previous year by 0.5 percentage points.

Currency risk is a significant risk to the corporate sector, given the fact that the foreign currency debt still dominates the total corporate debt. The debt with currency component accounts for 75.1%[99] at the end of 2022 as the main driver of the new debt, while the denar debt with currency clause slightly increased, in contrast to the decline in the previous year. The increased external debt accounts for 68.3% of the growth of total debt, or 78.3% of the growth of foreign debt. Thus, the share of the external debt to total corporate debt with currency component at the end of 2022 remained stable at the level of 78.5%. Credit support by domestic banks, which mostly resulted from foreign currency loans, also contributed to the increase in the exposure to currency risk, amid reduced placements in denar loans with foreign exchange clause. Given that euro is the leading currency in the structure of external debt with a share of 80.6%, the strategy of maintaining a stable denar exchange rate against the euro is of great importance for limiting the economic entities' vulnerability to currency risk materialization. The share of euro within the credit exposure of domestic banks to corporate sector is also important and amounts to 39.4%, which accounts for 98.3% of the credit exposure with currency component. The second most important currency is the US dollar, which as of 2022 accounted for 18.7% of the total external debt and modest 0.7% of the exposure of domestic banks to corporate sector, while the share of other currencies is insignificant. The US dollar strengthened during 2022, amid more aggressive increase in interest rates by the FED, in dealing with inflation, while its exchange rate against the euro and consequently against the denar, is freely established on the foreign exchange market and the debt in US dollar, in fact, represents the essential exposure of domestic corporations to currency risk.

Data on 2022 indicate moderate worsening of the coverage of liabilities with currency component with corporate assets with currency component to the level of 44.8% (47% in the previous year), following the three-year period of improvement of this indicator. Consequently, there was a **moderate deepening of the short (negative) net currency position**[100] which in 2022 amounted to 28.9% of GDP, with a growth of 2.6 percentage points annually. Such movements resulted from the increased liabilities with currency component of the corporate sector, compared to the increase in their assets with currency component, which highlights the importance of maintaining a stable foreign exchange rate of the denar against the euro, as well as prudent currency risk management in order to ensure long-term sustainability of the corporate debt.

[98]The derived interest rate of the external debt is calculated as the ratio of paid interest based on used loans from non-residents by the corporate sector and total liabilities based on used loans from non-residents by the corporate sector.
[99]It refers to the joint share of foreign currency debt and denar debt with foreign exchange clause.
[100] Net currency position is calculated as the difference between assets and liabilities with currency component (in foreign currency and in denars with FX clause) of the corporate sector, which is positive, i.e. long, when the assets are greater than liabilities, and negative, i.e. short, when the liabilities with currency component exceed assets. Assets with currency component include deposits with currency component, total claims on non-residents including cash on accounts abroad and investments abroad. Liabilities with currency component include: credits with a currency component from domestic banks and total liabilities to nonresidents. The stock of investments abroad as of 31.12.2022 is based on data as of 31.12.2021, since the data for 2019 becomes available in the second half of 2023.

Chart 68
Net currency position of the corporate sector
in millions of denars and in %



Source: National Bank, State Statistical Office and the Central Registry.

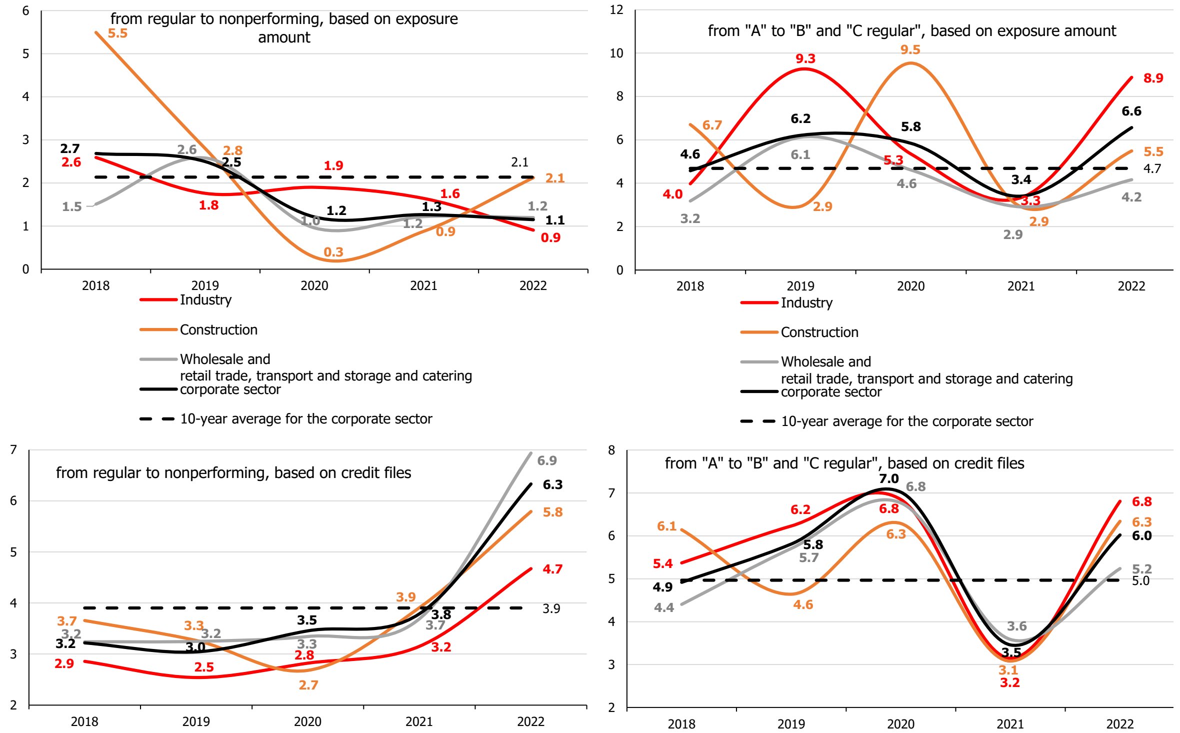
The quality of the credit exposure and the features of credit requirements of the corporate sector in the current volatile environment

In the past period, domestic and international environment abounded with events which posed new challenges to the companies from the domestic and corporate sector. Although it seemed that the greatest problems for the domestic companies resulted from the pandemic in 2020, however, they were coupled with the high inflation, already disrupted supply chains, new geopolitical conflicts and upheavals in monetary policy and the tightening of the credit standards. Even in such uncertain conditions, non-performing corporate loans in 2022 decreased due to the post-pandemic normalization of business activities and the economic recovery in 2022. However, the vulnerability of the corporate sector to gradual interest rate growth, which can limit the opportunities for refinancing and less certain future economic developments, remain pronounced in the upcoming period, thus imposing the need for constant monitoring of the quality of credit exposure to this sector and prudent assessment of its ability to regularly service debt.

For better understanding of the loan portfolio and the effect of the shocks of the environment upon it, an analysis of the quality and the regular credit exposure is inevitable, in addition to monitoring the trend of non-performing exposure. **In this context, the annual migration rates from exposure with better to exposure with poorer quality are being analyzed, within the regular credit exposure to corporate sector, which increased in 2022.** Thus, the migration rates within the regular credit exposure (transition from risk category A to categories B and C-regular), increased in 2022 and exceeded the ten-year average of the corporate sector. This shows that within the regular corporate loan portfolio and by activity, banks have registered increasing credit risk, i.e. they have estimated that there is a certain deterioration in the quality of credit agreements that form the preforming credit exposure after the approval, not having evident objective signs to classify it as non-performing. Despite this deterioration within the regular corporate loan portfolio, the annual migration rates from regular to non-performing exposure were mainly below the ten-year average for the corporate sector with minimal changes. The construction sector is an exception, which in 2022 reached the long-term average, in line with the slowdown of the economic activity in domestic economy, unfavorable effects of the energy crisis and the increased prices, which resulted with decline in construction. However, observing the overall corporate sector, the migration rate by the amount of exposure, from regular to non-performing, dropped to the level of 1.1% in the end of 2022 (1.3% in the previous year). On the other hand, in 2022, the rates of migration from regular to non-performing exposure calculated by the number of corporate credit agreements increased.

This indicates that in 2022, the default in the loan portfolio of the corporate sector was more focused on credit agreements with exposure amounts below average, which in turn may point to a relatively weaker quality of lower exposures to enterprises, especially in the service sector (wholesale and retail trade, transport, storage and catering). In contrast, the group of activities trade, transport and catering, which were most affected by the COVID-19 crisis, registered favorable performances and growth of turnover during 2022, with the highest positive contribution to the growth of domestic economy as well.

Chart 1.
Annual migration rates for the three largest exposures by activity and in the corporate sector
in %

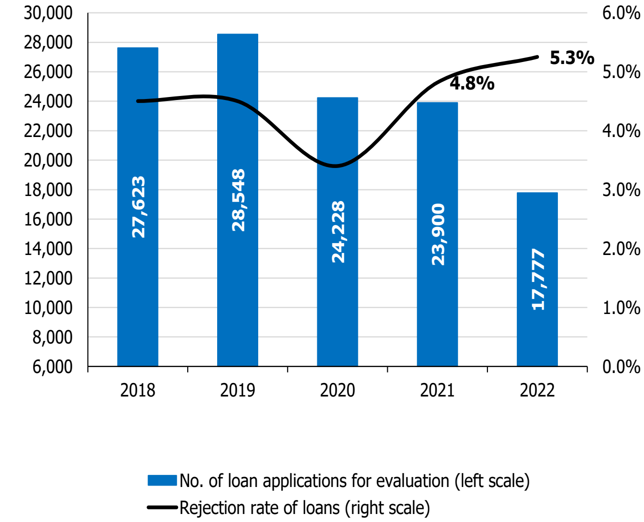


Source: National Bank's Credit Registry, based on data submitted by banks. Note: The dashed line represents ten-year average of the corporate sector migration rate, calculated on the basis of the annual frequency of the relevant migration rates.

The banking sector has a key role of a domestic creditor of the corporate sector, thus the need for an objective assessment of the creditworthiness of companies at the time of establishing of credit exposure is equally important to banks. During 2022, banks received a total of 233,351 loan applications for evaluation, within which 7.6% (or 17,777) were submitted by the non-financial corporations. This year, a significant decrease of loan applications submitted by non-financial corporations is evident, which is in line with the tightened terms of financing.

The total number of loan applications from this sector considered by banks decreased by 25.6% compared to the previous year. Moreover, 16.4% of the total loan applications received were rejected by banks, with a slight increase compared to the previous year (by 1.9 percentage points.). The percentage of rejected applications of non-financial corporations equals 5.3% and is slightly increased on an annual basis (by 0.4 percentage points). The rate of rejected loan applications was the lowest in the pandemic 2020, when the companies received stronger credit support, to deal with the operating difficulties, due to the COVID-19.

Chart 2
Number of evaluated loan applications and rate of rejected loan application of non-financial corporations in %



Source: Calculations based on data submitted by banks.

II. DOMESTIC FINANCIAL SYSTEM AND MARKETS

2.1. Structural features and concentration of the financial system

Financial system assets and its individual segments registered a growth in 2022, which amid uncertain global environment, increase in inflation and interest rates, decelerated compared to the previous year. The banking system, the mandatory private pension funds and the insurance companies remain with the highest share in the assets of the financial system and almost constantly contribute the most to its absolute growth. The other segments of the financial system, individually and together, still occupy a very small portion of the total assets of the financial sector, although some of them almost constantly register a relatively rapid growth. Despite the continuous growth of the financial system, the comparative analysis of the levels of financial intermediation with other countries of Central and Southeastern Europe indicates a modest size of the domestic financial sector. The largest and most important segments of the financial system are predominantly owned by foreign shareholders. The ownership structure and the concentration in the individual segments of the financial system registered no significant changes in 2022.

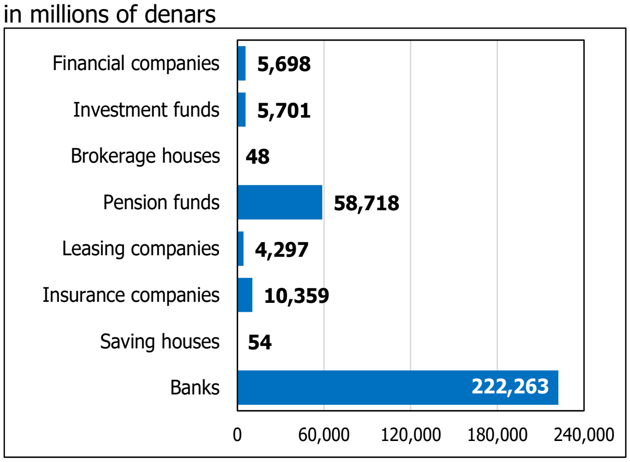
Table 4.
Structure of total assets of the financial sector in the Republic of North Macedonia

Type of financial institutions	Total assets (in millions of Denars)		Structure (in %)		Change 31.12.2022 / 31.12.2021		Number of institutions		Share in GDP (in %)	
	2021	2022	2021	2022	in millions of Denars	in %	2021	2022	2021	2022
Deposit takers	**640,771**	**686,286**	**79.4**	**79.2**	**45,515**	**7.1**	**15**	**15**	**88.9**	**86.3**
Banks*	638,666	684,255	79.1	79.0	45,589	7.1	13	13	88.7	86.1
Saving houses	2,105	2,031	0.3	0.2	-74	-3.5	2	2	0.3	0.3
Non-deposit takers	**166,239**	**179,783**	**20.6**	**20.8**	**13,544**	**8.1**	**143**	**150**	**23.1**	**22.6**
Insurance companies	28,513	30,389	3.5	3.5	1,877	6.6	16	16	4.0	3.8
- Non-life insurance companies	18,076	18,834	2.2	2.2	758	4.2	11	11	2.5	2.4
- Life insurance companies	10,436	11,555	1.3	1.3	1,119	10.7	5	5	1.4	1.5
Insurance brokers	2,281	2,791	0.3	0.3	510	22.3	39	41	0.3	0.4
Insurance agents	189	165	0.02	0.02	-24	-12.7	12	10	0.03	0.02
Leasing companies	6,766	8,238	0.8	1.0	1,472	21.8	6	8	0.9	1.0
Pension funds	108,675	116,957	13.5	13.5	8,282	7.6	6	7	15.1	14.7
- Mandatory pension funds	105,801	113,882	13.1	13.1	8,081	7.6	3	3	14.7	14.3
- Voluntary pension funds	2,874	3,075	0.4	0.4	201	7.0	3	4	0.4	0.4
Pension funds management companies	1,600	1,754	0.2	0.2	154	9.6	3	4	0.2	0.2
Brokerage houses	145	169	0.02	0.02	24	16.4	5	5	0.02	0.02
Investment funds	11,516	11,103	1.4	1.3	-413	-3.6	19	20	1.6	1.4
Investment funds management companies	327	451	0.0	0.1	123	37.7	5	5	0.05	0.06
Private funds management companies	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Financial companies	6,226	7,766	0.8	0.9	1,540	24.7	32	34	0.9	1.0
Total	**807,010**	**866,069**	**100.0**	**100.0**	**59,059**	**7.3**	**158**	**165**	**112.0**	**109.0**

Source: for each institutional segment, the competent supervisory authority (the NBRNM, the SEC, the MAPAS, the ISA and the Ministry of Finance) and the SSO (GDP data).
*Development Bank of North Macedonia AD Skopje operates on the basis of a license issued by the Governor of the National Bank, but performs specific activities as a bank and does not collect deposits from the public.

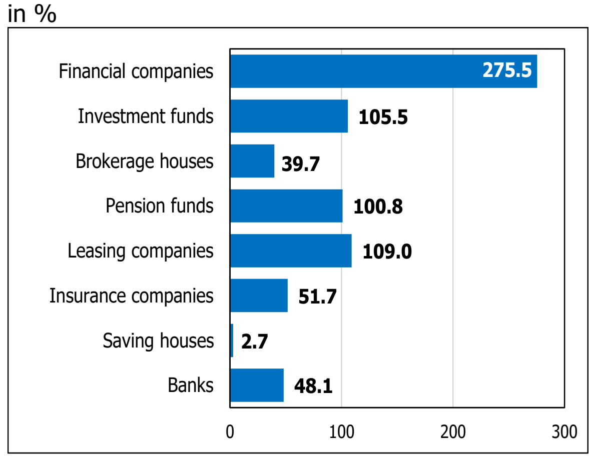
In 2022, the financial system assets continued to grow. The financial system assets increased by Denar 59,059 million or by 7.3%, which is a slowdown compared to the growth registered in 2021 (growth of 11% or by Denar 79,996 million). The annual changes in the assets of the banking system and the mandatory private pension funds, made the greatest contribution to the total growth of the financial system assets, of 77.2% and 14%, respectively. They are followed by the insurance companies and financial corporations, which made a moderate contribution to the absolute change in the financial system assets of 3.2% and 2.6%, respectively. Moreover, all segments of the financial system, with the exception of investment funds and savings houses, increased the volume of activities in 2022, which was slower compared to the previous year. Financial companies, which multiplied the volume of their activities in the last five years, registered an intensive growth[101]. Analyzed by the annual growth rate, the assets of the open-end investment funds management companies and the assets of the financial companies registered the highest annual growth rates, of 37.7% and 24.7%, respectively, but also other segments registered high growth (the annual growth exceeds 20% in the insurance brokerage companies and leasing companies).

Chart 69.
Cumulative absolute growth of the assets of the individual financial system segments, for the last five years
in millions of denars



Source: National Bank calculations based on data submitted by banks, savings houses, SEC, MAPAS, ISA and the Ministry of Finance.

Chart 70.
Cumulative percentage growth of the assets of the individual financial system segments, for the last five years
in %



Source: National Bank calculations based on data submitted by banks, savings houses, SEC, MAPAS, ISA and the Ministry of Finance.

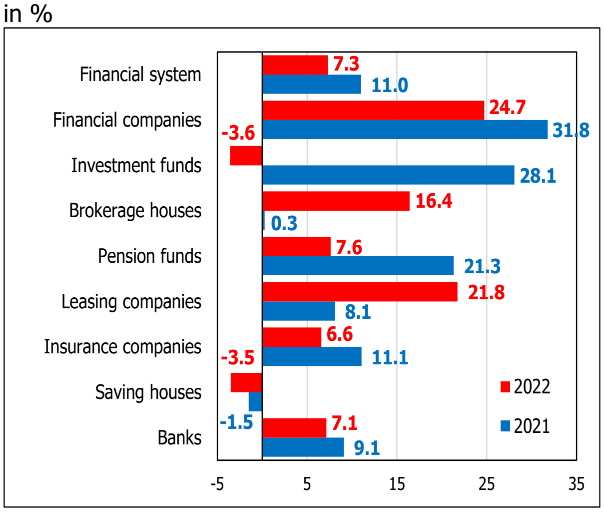
The share of the financial system assets in GDP dropped by 3 percentage points and reached 109%, for 2022. The level of financial intermediation in our country is still modest, which particularly comes to the fore in the comparative analysis with the countries of Central and Southeastern Europe. The lower levels of financial intermediation, coupled with the simple structure of the financial system, show that **there is room for greater support from the financial sector for the economic growth and development of the country**. In contrast, the simple structure of the financial sector, the small interdependence of its segments and the small integration with the international flows make it more resistant to external shocks, and its modest size additionally limits the potential returning negative effects from the financial system to the economy.

[101] In the last five years, the total assets of the financial system increased by Denar 309,458 million, or by 55.6%.

The concentration in the individual financial segments registers no significant annual changes[102]. The Herfindahl index mainly shows an acceptable level of concentration in the financial segments.

The number of financial system institutions increased by seven, compared to the previous year, thus the number of insurance companies reduced by two, while the number of companies in other financial system segments increased by nine (two financial corporations, two brokerage companies, two leasing companies, one investment fund, one voluntary pension fund and one pension fund management company).

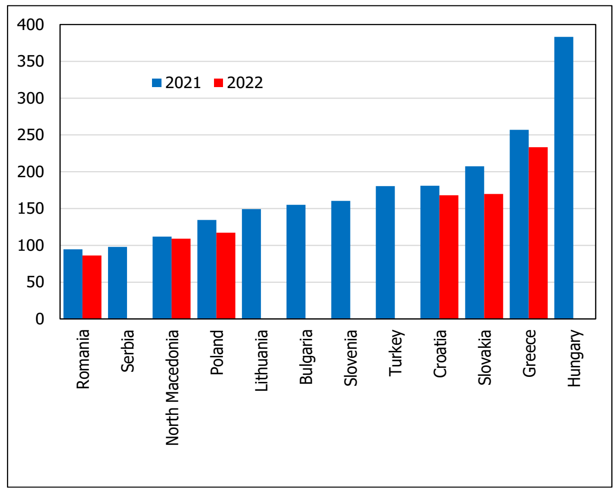
Chart 71.
Comparison between the growth rates of the assets of the financial system in 2021 and 2022
in %



Source: National Bank calculations based on data submitted by banks, savings houses, SEC, MAPAS, ISA and the Ministry of Finance.

Chart 72.
Financial system assets to GDP ratio, by country

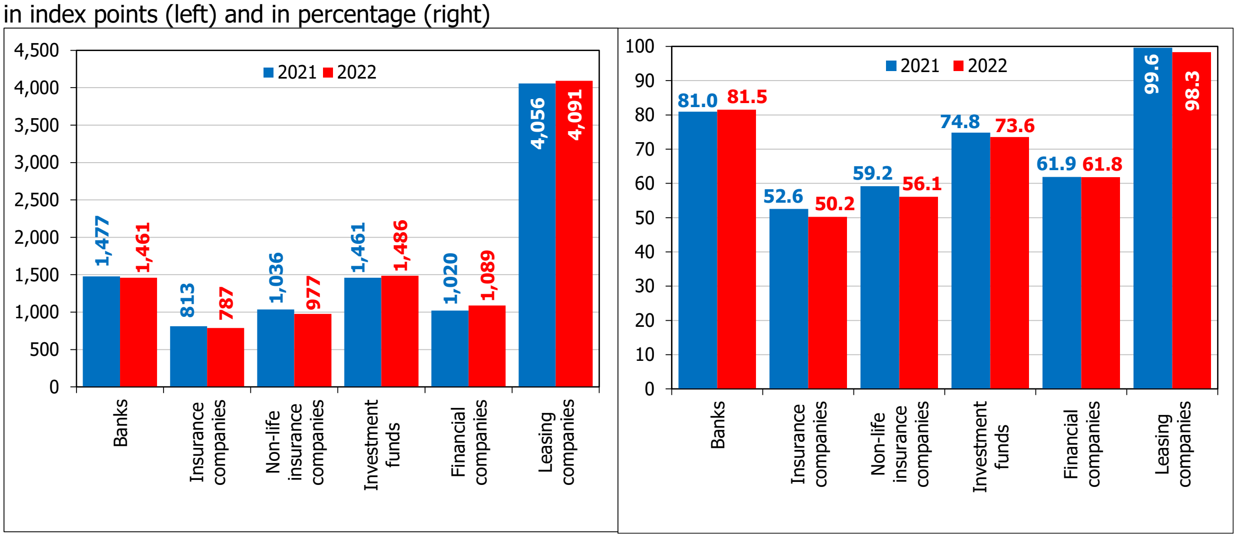
in %



Source: for North Macedonia, National Bank calculations based on data submitted by banks, savings houses, SEC, MAPAS, ISA, SSO, Ministry of Finance and the SSO. For the other countries, the websites of Eurostat (https://ec.europa.eu/eurostat) and the central banks from the individual countries. Given that the data for 2022 is not available for all countries, for the purpose of better comparability between the countries, the data for 2021 is also presented.

102 The analysis takes into account those segments of the financial system where at least six institutions actively operate and where data on the amount of assets by individual institution are available.

Chart 73.
Herfindahl index (left) and CR5 index (right) for the total assets, by segment of the financial system
in index points (left) and in percentage (right)



Source: National Bank calculations, based on data from banks, the ISA, the SEC and the CR.

In 2022, there are no major changes in the ownership structure of individual financial segments. **The largest and most important segments of the financial system are predominantly owned by foreign financial institutions** (the banking system, the pension funds management companies and the insurance companies). Hence, these segments of the domestic financial system, through their foreign owners, are more exposed to risks arising from the developments in the international environment, although in a small and open economy, the transmission and materialization of the negative effects of the external shocks mainly occur relatively quickly and easily and by different channels (and not only through the owners of legal entities).

Table 5.
Ownership structure of financial institutions
in %

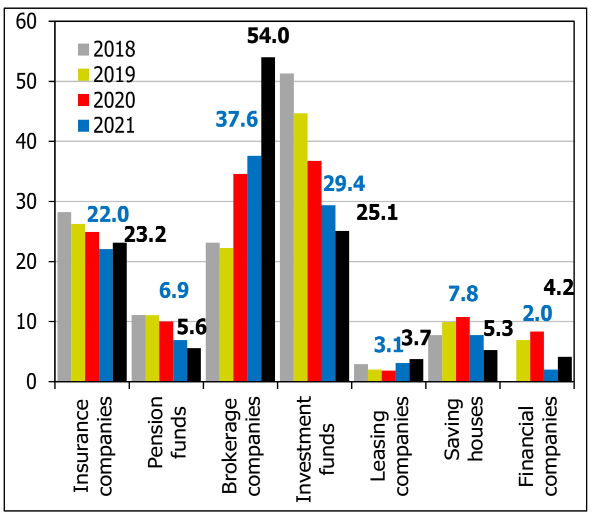
Owners	Banks	Saving houses	Insurance companies	Brokerage houses	Leasing companies	Pension funds management companies	Investment funds management companies	Financial companies
Domestic owners	***21.8***	***100.0***	***22.9***	***88.8***	***83.8***	***14.1***	***37.0***	***57.2***
Non-financial legal entities (including civic associations)	7.5	100.0	0.5	46.7	1.3	0.0	21.7	30.1
Banks	0.1	0.0	16.9	0.0	6.8	9.0	0.0	0.0
Other financial institutions	0.4	0.0	1.3	0.0	0.0	5.1	0.0	0.0
Natural persons	7.3	0.0	4.1	42.1	75.7	0.0	15.3	27.0
Public sector	6.5	0.0	0.03	0.0	0.0	0.0	0.0	0.0
Foreign owners	***77.9***	***0.0***	***77.1***	***11.2***	***16.2***	***85.9***	***63.0***	***42.8***
Natural persons	1.5	0.0	0.5	8.2	0.0	0.0	0.0	12.8
Non-financial legal entities	6.8	0.0	3.1	3.0	5.0	0.0	16.2	0.0
Banks	67.8	0.0	0.0	0.0	9.3	0.0	25.5	0.0
Other financial institutions	1.9	0.0	73.5	0.0	1.9	85.9	21.2	30.0
Undefined status	**0.3**	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***
Total	***100.00***	***100.0***	***100.0***	***100.0***	***100.0***	***100.0***	***100.0***	***100.0***

Source: National Bank calculations based on data submitted by banks, savings houses, SEC, websites of pension funds management companies, ISA, CSD and the Ministry of Finance.
Note: The share by type of owner in the ownership structure refers to shareholder capital / core capital of the financial institutions.

2.2. Cross-sector relation, "contagion" channels and their impact on financial stability

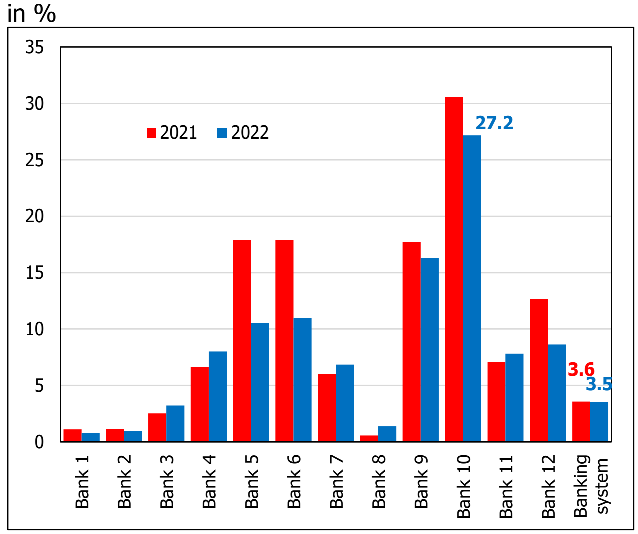
Cross-sector relation of institutional segments in the financial system of the Republic of North Macedonia and the possibilities of risk spillover are low. The reason behind is the simple financial system structure, small interdependence of the activities of the individual segments and absence of complex financial instruments and services. Stability of the financial system is mostly results from the stability of the banking sector as its dominant segment, where savings of both non-financial sector and other financial institutions are concentrated. The ownership relation between individual institutions of the financial system increased in 2022, yet remained moderate and it is not a contagion channel between individual segments.

Chart 74
Deposits of non-banking financial segments in banks to total assets
in %



Source: National Bank calculations, based on data from banks, savings houses, ISA, MAPAS and CSD.
Note: Data on deposits of financial companies before 2019 is not available.

Chart 75
Shares of the total deposits from the non-banking financial segments in the total liabilities of the banks and the banking system
in %



Source: National Bank calculations, based on data submitted by banks.
Note: The analysis does not include the Development Bank of North Macedonia", AD Skopje, because it does not accept deposits.

Amid relatively poor development of domestic financial markets and limited alternatives to invest and generate yields from investments in financial instruments, a significant portion of the assets of non-banking financial institutions are placed in bank deposits (Denar 20,674 million)[103]. Deposits placed with banks are an important part of the assets of non-bank financial institutions, especially with the brokerage companies, the investment funds and the insurance companies, where more than 20% of the assets are invested in deposits in the domestic banks. Relatively high placements in deposits with domestic banks are in line with the nature of the activities of the non-banking segments of the financial system, as

[103] Deposits also include transaction accounts of other institutional segments in the banks. As of 31.12.2021, 13.3% of the total deposits of the non-bank financial institutions are funds on a transaction account with a bank or are in the form of sight deposits.

well as with the degree of the financial market development, and regulatory opportunities and limits. Hence, the solvency and liquidity of the banking system are important factors for the stable operations of the non-bank financial institutions and a significant potential channel for spillover of risks from banks to these financial institutions. Analyzed at the aggregate level, the deposits of the domestic non-bank financial institutions do not represent a significant source of funds for the banking system (they account for 3.5% of total liabilities of the banking system), nor their assumed withdrawal would significantly affect the liquidity and stability of the banking system. However, analyzed by individual bank, with four banks in the system (with a total joint market share in total assets of 4.9%), the deposits of the non-bank financial institutions remain a relatively significant source of financing and account for more than 10% of the total liabilities of these banks, despite the decrease in these shares compared to the end of 2021. Having in mind that deposits of financial institutions are treated as less stable source, these deposits, with banks in which they have more significant share, are potential channel for liquidity consequences in case they are simultaneously withdrawn.

Bank loans approved to non-bank financial institutions are yet another potential contagion channel in the financial system but, its importance is rather small. As of 31.12.2022, bank loans approved to domestic non-bank financial institutions equaled modest Denar 760 million, or 0.2% of the total bank loans (by individual bank this share does not exceed 1.9%). Bank loans do not represent a significant source of financing of the activities of the individual non-bank financial segments, with the exception of open-end investment funds management companies[104] and insurance-brokerage companies[105], where bank loans account for 14.8% and 14.4% of the total sources of funds, respectively. They are followed by leasing companies and financial companies, where bank loans account for 4.1% and 4% of the funding sources, respectively. In other non-banking financial institutions, the share of non-banking loans is below 2% of total sources of funds.

Interbank claims and liabilities have a relatively small importance as a channel of contagion in the banking system. In 2022, in conditions of increased uncertainty and complicated environment in which banks operated, there was a certain movement in the interbank trading in deposits. Thus, the total turnover on the unsecured interbank deposit market in 2022 reached Denar 39,108 million (or 6.1% of banks' assets at the end of 2021), which is a trade volume higher by more than four times compared to the turnover in 2021. At the same time, significant movement was recorded in repo-transactions in interbank borrowing, where Denar 10,199 million were traded (or 1.6% of the banking system assets as of 31.12.2021), which is a more significant annual growth compared to 2021, when the trade of this segment amounted to only Denar 140 million. In early 2023, the turnover on the secured and unsecured interbank deposit market decreased compared to the same period in 2022 and is within the usual volume for this time of the year, similar to the one in 2021. Despite the significant growth of interbank trade, the stock of interbank claims and liabilities on banks' balance sheets is relatively stable and confirms relatively low exposure of banks to the risk of spillover of possible problems from one bank to another. Total claims based on interbank loans and deposits (including interbank transaction accounts) amount to Denar 16,340 million, or 2.4% of the total assets of the banking system (2.2% as of 31.12.2021). Moreover, most, or 88.5% of the total amount of interbank claims accounts for one bank (the Development Bank of North Macedonia AD Skopje), whose

[104]This involves the borrowing in 2022, in one open-end investment funds management company, where the share of bank loan is 28.9% in total sources of funds. One large bank is a creditor.
[105]Most of the liabilities based on bank loans are concentrated in one insurance-brokerage company, with three banks as creditors.

core activity is to place the loans obtained from the international financial institutions and from the government to end users through domestic banks (due to which most of its assets consists of claims on other banks). The contagion risk in this bank would materialize only in case of an extreme scenario of default by most banks through which this bank places the loans. As for the other banks, the interbank claims do not exceed 2.7% of the total assets of the individual banks. On the liabilities side, analyzed by individual bank, the highest share of the interbank liabilities in the total liabilities amounts to 6.9%.

Banking insurance, i.e. cooperation between banks and insurance companies based on an agreement for representation in insurance, was applied by seven banks in 2022 (same as in the previous year). The amount of these transactions is growing, but has small to moderate importance for both segments. The gross written premiums charged through banks in 2022 equaled 5.9% of total insurance companies premiums (4.1% in 2021), while the share of commission income that bank obtained from insurance policies sale is 2.2% in total commission income for 2022 (1.8% for 2021)[106]. Banks' exposure secured by a life insurance policy reached 18.6% of the total credit exposure to natural persons[107] or 21.8% of the exposure to natural persons excluding credit cards and overdrafts on current accounts which is a slight upward change compared to the previous year (in 2021, these shares amounted to 16% and 19.2%, respectively). Significant growth is registered in bank loans insured against default with some insurance company, which reached almost Denar 20 billion (Denar 12 billion as of 31.12.2021)[108], or 4.7% of total loans to non-financial entities (3.1% as of 31.12.2021). The possible materialization of the credit risk in these loans would be treated as risk event, and the damages resulting thereof will be covered by the insurance companies, in accordance with the amount insured[109]. Moreover, the potential damage to loan collateral, protected by property insurance policy (as of 31.12.2022, in 69.6% of the banks' total credit exposure to non-financial entities secured with property, the collateral is secured with property insurance policy[110]) is yet another potential channel for connection between the insurance and banking sectors. In this context, the risk that a single event can cause great damages that could not be paid by the insurance companies, thereby jeopardizing the collection of claims of some bank, can be materialized in case of possible natural disasters.

There is an inherent connection between the leasing and the insurance sectors due to the regulatory obligation of the leasing user to insure the subject of leasing in an insurance company. Also, the **offer of products which are a combination of life insurance with collective investment (so called unit-link),** i.e. life insurance in which the investment risk is on the burden of the insuree, point to a connection of this type of insurance with the movements on the financial markets, i.e. the performances of the investment funds (gross written premiums on the basis of unit-link products account for 21.7% of the total gross written premiums of life insurance companies in 2022[111]). In other words, the investment component of returns from these insurance products strictly results from the return from instruments in which the investment

[106]Banks' services for selling insurance policies are relatively expensive to insurance companies since the commission income that banks charge for this service is almost 30% of total gross written premium charged through them. This could be a limiting factor for greater cooperation between insurance companies and banks in selling insurance policies.

[107] In 2022, risk event covered with life insurance policy occurred in 0.1% of loans secured with life insurance (and banks collected damages from insurance companies, according to the insured amount).

[108]The annual growth of these loans is almost entirely concentrated in one bank. Source: data submitted by banks.

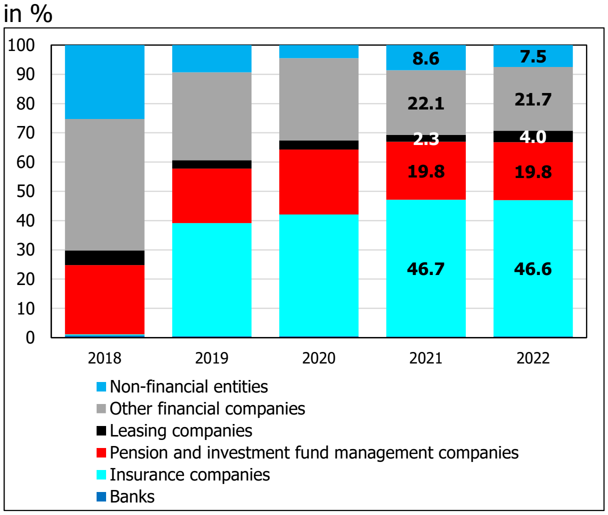
[109] In 2022, banks collected damages from insurance companies on the basis of materialization of the credit risk of 0.01% of the total loans insured against default.

[110] Source: data submitted by banks.

[111] This share was 19.1% for 2021.

funds invest. The attractiveness of this product is constantly growing (growth of gross written premiums based on unit-link products of 28.9% in 2022). In this context, the insurees need to be appropriately informed on the features and possible risks of these non-traditional insurance products, and all the costs related thereto. Thus, the Insurance Supervision Agency took specific measures for greater transparency when investing in such products. Thus, from the beginning of October 2022, a new regulation on life insurance in relation to stakes in investment funds when the insuree takes the investment risk, will come into effect. [112]

Chart 76
Structure of banks' investments in equity instruments, in subsidiaries and associates, by the type of domestic legal entity
in %



Source: National Bank calculations, based on data submitted by banks.

Ownership relations between individual financial institutions are yet another potential channel of interdependence and possible spillover of risks from one segment of the financial system to another. The equity investments of the banks in domestic financial and non-financial legal entities equal modest Denar 2.012 million, or 0.3% of the total assets of the banking system (by individual bank, this share does not exceed 1.2%). Analyzing the other financial institutions, banks are predominant or significant owner in one insurance company in the country, one open-end investment funds management company, one pension funds management company and three leasing companies (two of these companies[113] were founded during 2022 and it is still hard to assess whether banks and leasing companies will establish other significant relations, through the credit or deposit channel, besides the already established capital relations)[114]. A new voluntary pension funds management company was established in 2022[115] and is entirely owned by open-end investment funds management company, which increases the

[112] More details about this regulation are given in the section concerning the insurance sector within this report, in the Official Gazette of the Republic of North Macedonia No. 109/22 or on the website of the ISA.
[113] These are Stopanska Leasing DOOEL Skopje and NLB Lease and Go DOO Skopje (with capital investments of Stopanska Bank AD Skopje and NLB Bank AD Skopje, respectively). Sparkasse Leasing DOO Skopje operates from previously on the market (with a capital investment of Sparkasse Bank AD, Skopje).
[114] Banks have (joint) investments also in other domestic financial institutions, such as the Macedonian Stock Exchange, the CSD, KIBS, CaSys.
[115] The voluntary pension funds management company WFP Pension Company AD Skopje (owned by the open-end and closed investment funds management company WFP Fund Management AD Skopje).

cross-sector relation of this financial system segments, especially considering that both companies are part of a group that operates on the domestic market through a brokerage company as well.

2.3. Deposit-taking institutions

2.3.1 Banks[116]

Still not recovered from risks related to COVID-19 pandemic, the environment in which the domestic banking system operates became even more complex in 2022, with the onset of the war between Russia and Ukraine. The new challenges imposed by the war conflict, coupled with the problems derived by the post-pandemic opening of the economies and the energy crisis, are the main source of risk in the environment, especially on the energy and food product markets, enhancing the inflationary pressures that emerged last year. In such an environment the banks remained resilient to the external shocks, preserved the stability on their balance sheets and provided additional credit support to the economy. The National Bank acted accordingly as well and as of the end of 2021 it started with the process of gradual normalization of the monetary policy in order to maintain the medium-term price stability. In addition, it made changes also to the reserve requirement instrument intended for reduction of eurization, as well as for underpinning lending projects for renewable sources of energy. The National Bank adopted systemic and macro prudential measures to strengthen the banking system's resilience and maintain financial stability.

The banking system solvency is stable and kept improving. The banking system's own funds are of high quality and exceed the amount of the necessary regulatory and supervisory minimum. At smaller annual deposit growth, and at the same time a moderately intensified credit support, the liquid assets of the banking system registered small annual decrease, with the indicators for liquidity monitoring and assessment are at a satisfactory level. The conducted stress testing of the banking system resilience to simulated shocks indicates satisfactory level of resilience of its solvency and liquidity positions.

In 2022, the banks became more vigilant due to the uncertain environment in which their clients operate, thereby increasing the provisioning of regular credit exposure, without objective signs of classifying it as non-performing. Therefore, it needs to be more cautious when monitoring the credit portfolio quality, given the fact that the credit risk is usually materialized gradually and with a certain delay after the increase in interest rates, which continued at the beginning of 2023.

The banking system is profitable, the financial result has been registering further growth in 2022, although significantly slower compared to last year. Higher interest rates usually mean increased net interest income of the banks, but they also increase the borrowers' debt burden, which in the coming period can lead to credit risk materialization and increased expenses on that basis.

[116] For more details on the developments in the banking system in 2022 see the Report on the risks in the banking system in 2022 (NATIONAL BANK OF THE REPUBLIC OF MACEDONIA (nbrm.mk)).

At the beginning of 2023 there was a temporary turbulence in global financial markets, fueled by developments in the US and Swiss banking systems. These events were followed by quick reactions by policy makers, so the global financial system remained stable. These developments had limited direct effects on the Macedonian banking system, having in mind the implemented traditional business model,[117] the low exposures and liabilities to non-residents[118], as well as the comparatively low levels of placements in securities[119]. However, the uncertain environment creates risks for domestic banks, which imposes the need for careful risk management and planning of capital positions. In the long term, banks are exposed to risks related to climate change and digital security.

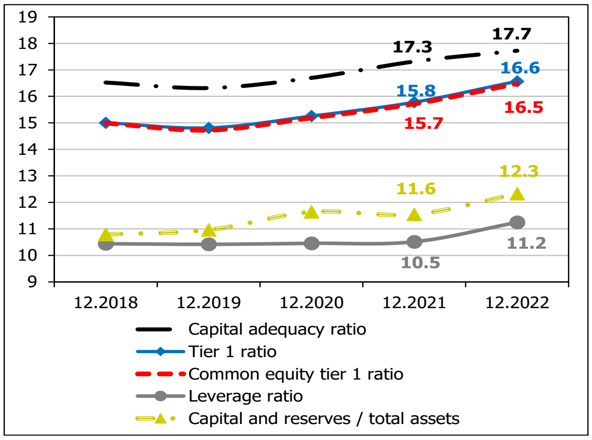
At the end of 2022, the banking system registered higher solvency and capitalization indicators compared to the previous year. The improvement in solvency indicators results from higher capital positions, which is mostly due to retained earnings and new issues of capital instruments at several banks. At the end of 2022, the capital adequacy ratio of the banking system was higher than the total regulatory and supervisory requirements by 1.9 percentage points, determined for this ratio. Thus, after covering all capital requirements (regulatory requirements, supervisory requirements and currently activated capital buffers, for capital conservation and for domestic systemically important banks), excess own funds of 10.9% of the total own funds remains. Over 90% of the own funds account for the Common Equity Tier I capital, which represents the highest-quality segment of the banks' regulatory capital. However, the general environment is still uncertain and changeable, which requires banks to continue to be cautious in maintaining their capital position, as well as in taking and managing risks. Hence, in the second half of 2022, the National Bank introduced a countercyclical capital buffer of 0.5% for the period from August to December 2023 and of 0.75%, starting from 1.1.2024. At the end of June 2023, the countercyclical capital buffer rate increased by additional 0.25 percentage points, to the level of 1%, effective as of 1.07.2024. The increased capital requirements from banks would retain the trend of improvement of the banking system solvency in the following period.

[117] On the liability side, deposits from non-financial entities account for 72.2%, while in assets, loans to non-financial entities occupy 59.1%.

[118] As of 31.12.2022, the claims on non-residents account for 5.4% of total assets. At the same time, liabilities to non-residents occupy 8.8% of total liabilities.

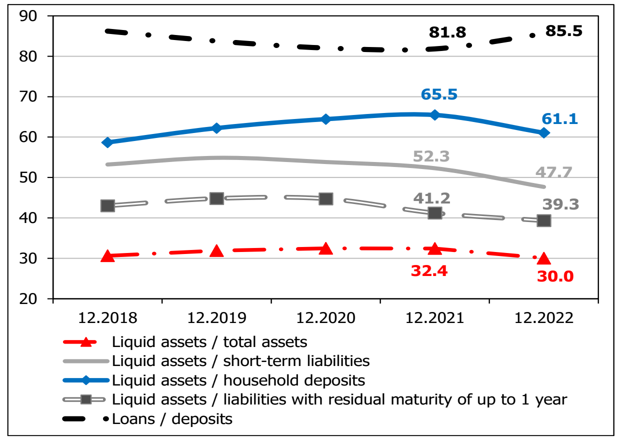
[119] As of 31.12.2022, the banks' total placements in securities account for 12.5% of the total assets. In their structure, the highest share accounts for the investments in government securities issued by North Macedonia (83.3%) and placements in CB bills (11%).

Chart 77
Indicators of solvency and capitalization of the banking system
in %



Source: National Bank, based on the data submitted by banks.

Chart 78
Indicators of liquidity of the banking system
in %

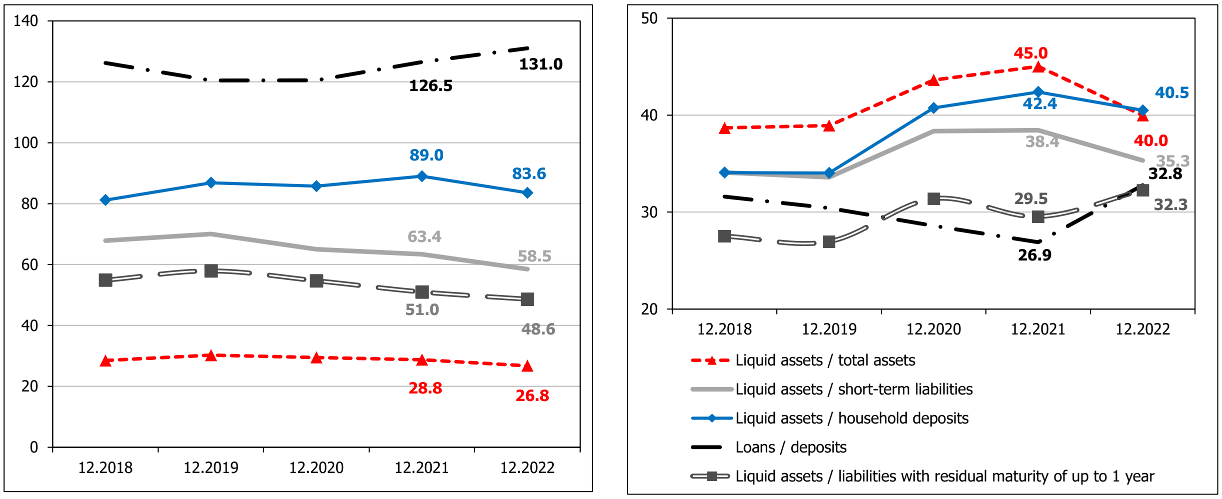


Source: National Bank, based on the data submitted by banks.

At slower annual deposit growth and simultaneously moderate intensification of the credit support, the banking system's liquid assets registered slight annual decline of 0.9%. However, **the banks have a satisfactory volume of liquid assets.** The indicators for liquidity monitoring and assessment decreased on an annual basis, but are still at a satisfactory level, which is within their usual level. Analyzed by currency structure, the denar liquidity indicators and the foreign exchange liquidity indicators also recorded a decrease. Hence the foreign currency liquidity are lower compared to the denar liquidity, which emphasizes the importance of the adequate volume of the foreign reserves and the presence of the National Bank in the foreign exchange market (in order to maintain a stable exchange rate) for covering the possibly increased demand for foreign currency cash[120]. As of 31.12.2022, the liquidity coverage ratio of the banking system was 273.8% (the regulatory minimum is 100%), whereby the so-called high-quality liquid assets of the banking system are higher by 2.7 times compared to the amount of net cash outflows, which would be realized in conditions of stress with a duration of 30 days.

[120] In this context it should be borne in mind that the European Central Bank (ECB) granted the National Bank access to foreign currency liquidity in euros, with appropriate collateral. This access has been granted in the form of repo line, since August 2020, totaling Denar 400 million. The deadline for application of the repo line was extended several times and currently is until January 2024. So far, the National Bank had no need for using the funds from this repo line.

Chart 79
Liquidity ratios by currency– Denars (left) and FX (right)
in %



Source: National Bank, based on the data submitted by banks.

An important requirement for smooth management of banks' liquidity is to ensure adequate maturity matching of the agreed inflows and outflows according to their residual maturity. There is a relatively high negative gap between the agreed inflows and outflows up to one year, and the risk arising thereof did not materialize thanks to the high percentage of stable deposits. Having in mind the fact that 66% of the bank deposits are demand deposits, and almost 67% of the total deposits are deposits of the households (which are usually more sensitive to negative news, information and speculation), the public confidence in banks is crucial for the liquidity and stability of the system.

Since the beginning of 2022, the Russian-Ukrainian crisis has created uncertainty and stirred reactions among part of the population, which has caused short-term pressures on the banks' deposit base. Also, groundless speculations about the denar stability intensified, which encouraged the conversion of denar deposits into foreign currency or foreign currency cash, which is not odd behavior in crisis conditions. The National Bank reacts appropriately to reduce the pressures, primarily by providing foreign currency liquidity in the foreign exchange market, increasing the policy rate[121] and changes in the reserve requirement instrument, in order to encourage savings in domestic currency[122]. Thus, after the deposit outflow registered in the first half of the year, the deposits of non-financial entities registered a solid increase in the second half, thus registering a growth of 5.4% at the end of the year (8.8% in 2021), primarily owning to the household deposits (77.2%). The trend of currency transformation, which began with the health crisis outbreak, and influenced by the uncertainty, continued in 2022, when foreign currency deposits recorded a higher annual growth compared to denar deposits, and the share of deposits with a currency component in total deposits increased to the level of 46.4% (45%, as

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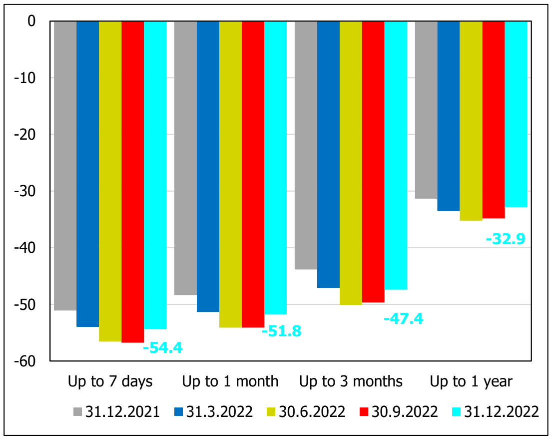
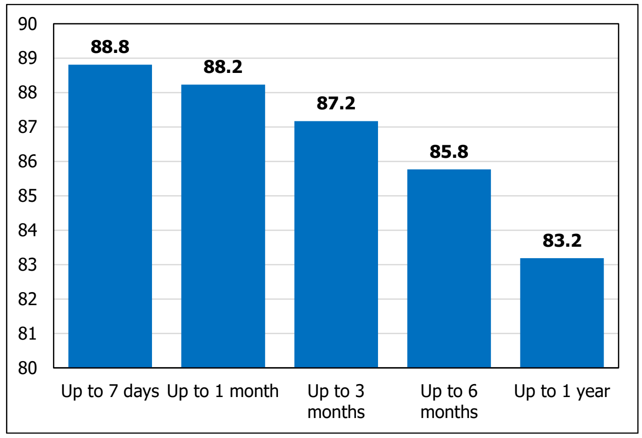
[121] The policy rate increased from 1.25% in December 2021, to 4.75% in December 2022. Over the same period, the interest rate on deposit facilities increased from 0.15% to 2.65%, while the interest rate on seven-day deposits moved from 0.30% to 2.70%. The National Bank continues to increase interest rates in 2023 as well, whereby the interest rate on CB bills is 6.15% as of August 2023.
[122] The changes in the reserve requirement ratios referred to their greater separation in the calculation of the reserve requirement in denars, as opposed to liabilities in foreign currency. Thus, the reserve requirement rate on denar liabilities decreased from 8% to 5%, while the reserve requirement rate on foreign currency liabilities increased from 15% to 19%. Moreover, the part of the foreign currency reserve requirement that banks meet in euros has also been increased, to the level of 77%, which strengthens the effect of the change in this instrument.

of 31.12.2021). The maturity transformation of deposits also continued, so that the share of demand deposits in total deposits reached 66.4% (64.5% as of 31.12.2022). However, at the end of the year, the expectations stabilized significantly, which led to favorable changes in the currency savings structure, with the positive monthly changes also being observed in long-term deposits, which indicates a reaction to the yields growth, but as well as positive expectations and confidence of the depositors[123].

Chart 80
Share of the cumulative gap between the agreed inflows and outflows (including the cumulative amount of unencumbered assets)- left and expected deposit stability, according to the remaining period to maturity, as of 31.12.2022 (right)
in %





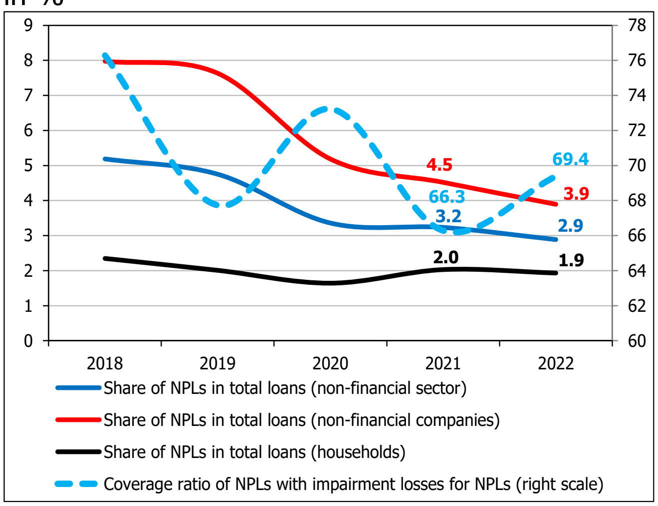
Source: National Bank, based on the data submitted by banks.

In 2022, the developments in the banking system environment have no large impact on the credit risk materialization, as measured by the movements of non-performing loans and their share in total loans. Non-performing loans registered an annual decrease (1.7%), mainly under the influence of mandatory write-offs, primarily with loans of the non-financial corporations. In conditions of solid credit growth and a decline in non-performing loans, the share of non-performing loans in total loans decreased to the historically lowest level of 2.9%. Observed by sector, in the non-financial corporations' credit portfolio, the non-performing loans reduced to 3.7%, with a decline being registered in almost all important predominant activities of non-financial corporations. In the household's credit portfolio, non-performing loans increased moderately by 2.5%, but the rate of non-performing loans minimally improved on an annual basis. The coverage of total non-performing loans with impairment increased above 69%. Hence, the negative effects of the assumed complete default on non-performing loans on the capital positions are small and at worst they would "spend" 4.3% of total own funds of the banks. Also, **the quality of regular loans is important for the bank solvency**, especially in instances of an assumed situation of a substantial deterioration in the quality of these loans, particularly when they are increasingly transformed into non-performing loans. However, the analyses show that it takes rather extreme migration of 17.4% from regular to non-performing credit exposure to the

[123] As of May 2023, the share of deposits with a currency component in total deposits is slightly lower and amounts to 46.1% (46.4% as of 31.12.2022), while the share of demand deposits in total deposits has dropped to the level of 65.7% (66.4% as of 31.12.2022), due to the growth of the share of denar and term deposits. As of 31.5.2023, the annual growth rate of denar deposits was 14.6% (-5.6% as of 31.5.2022), and that of long-term deposits was 17.1% (-8.5% as of 31.5.2022).

non-financial sector, for the capital adequacy ratio of the banking system to reduce to 8%[124]. For illustration, the percentage of migration of the regular to a non-performing credit exposure (for a period of one year) was 1.0% for 2022, while the ten-year average of this percentage is 1.8% (the maximum realized amount for this percentage is 4.4% and was registered for the period from 30.6.2008 to 30.6.2009[125]). However, within the regular credit portfolio, there is a certain shift from regular exposures with lower to regular exposures with higher risk. Thus, the transition rate of the regular credit exposure, from the best (A) to the next two risk categories (B and C-regular) was 4.9%, for 2022, which is a higher level, as compared to the registered rate of transition from 2021 (2.9%), as well as in relation to the ten-year average of this rate (3.5%). This shows that, within the regular loan portfolio, banks have registered increasing credit risk, i.e. they have estimated that there is a certain deterioration in the creditworthiness of credit agreements that create the regular credit exposure after the exposure being approved, without having objective signs to classify it as non-performing. At growth in the transition rates within the regular portfolio, banks increased the coverage of regular loans with impairment, although minimally (by 0.1 percentage point), to the level of 2.4%.

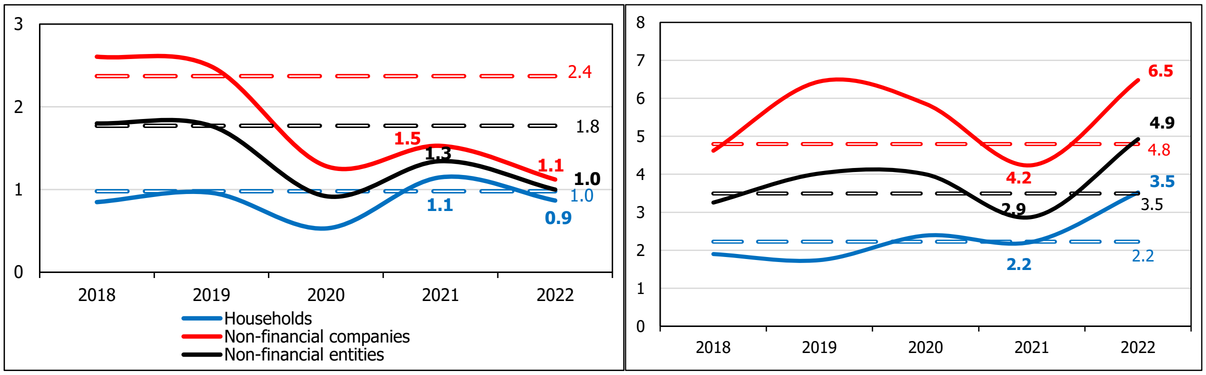
Chart 81
Share of non-performing loans in total loans and coverage of non-performing loans with impairment
in %



Source: National Bank, based on the data submitted by banks.

[124] The source of the data is the regular quarterly stress testing of the National Bank. The conduct of this simulation assumes that the new impairments would be treated as unrecognized impairments, which is a rather conservative assumption, the application of which contributes even more to reducing the capital adequacy ratio.
[125] Data on the percentage of transition from regular to non-performing credit exposure are available for a period of 14 years.

Chart 82
Annual rates of transition of regular to non-performing credit exposure (left) and of exposures classified in "A" to risk categories "B" and "C regular" (right)
in %

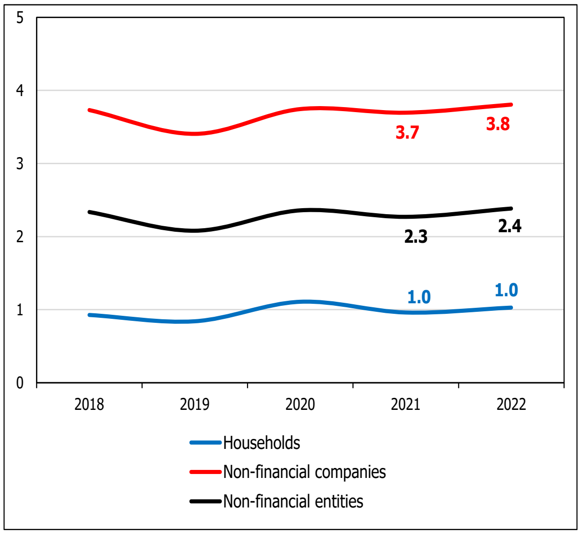


Note: the ten-year average of the transition rates is calculated based on the quarterly frequency of the corresponding annual transition rates and is shown by the dashed line.
Source: National Bank, based on the data submitted by banks.

The risk management arising from possible larger deterioration of the creditworthiness of the banks' clients is facilitated considering the relatively high share of the loans secured by some type of security, the estimated value of which, on an aggregated level, significantly exceeds the amount of the collateralized loans. Thus, in case of default on loans, the collateral could be used as a secondary source of repayment. In addition, household loans are mostly approved to clients with a regular monthly income, who receive their wage through the payment accounts opened in the banks that extended the loans. Thus, borrower's wage can be considered a relatively high-quality "collateral" for the bank. For loans to natural persons approved in 2022, the indicator of the ratio between the amount of credit exposure and the estimated value of the collateral (or LTV) was 69.1%, on average for the four quarter of the year (66.6%, for newly approved loans in 2021 year). At the same time, the indicator of the ratio between the amount of the total liabilities of the individual client based on the credit exposures of banks and savings houses on a monthly basis and his total monthly income (or DSTI) was 33.8%, on average for the four quarters of the year (34,8%, for newly approved loans in 2021)[126].

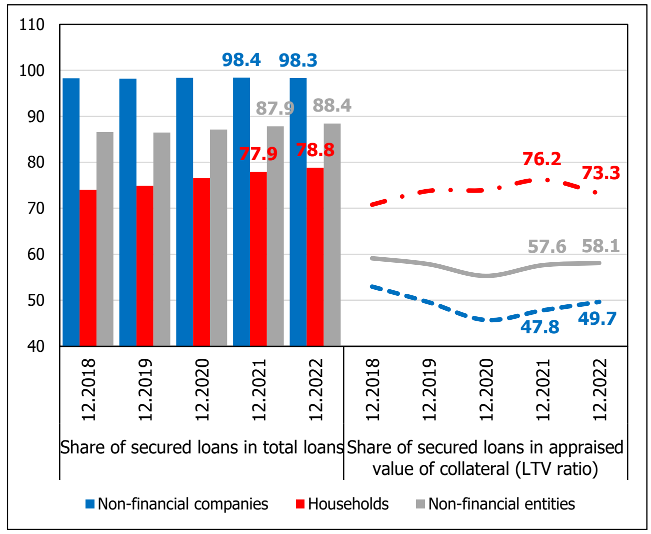
[126] The amount of the two indicators (LTV and DSTI), for individual quarters of 2021 and 2022, has been calculated based on the data provided by the banks determined in accordance with their internal methodology for the calculation of these indicators, which may be different for individual banks.

Chart 83
Coverage of the regular (performing) loans with regular loans impairment
in %



Source: National Bank, based on the data submitted by banks.

Chart 84
Shares of collateralized loans in total loans and LTV ratio
in %

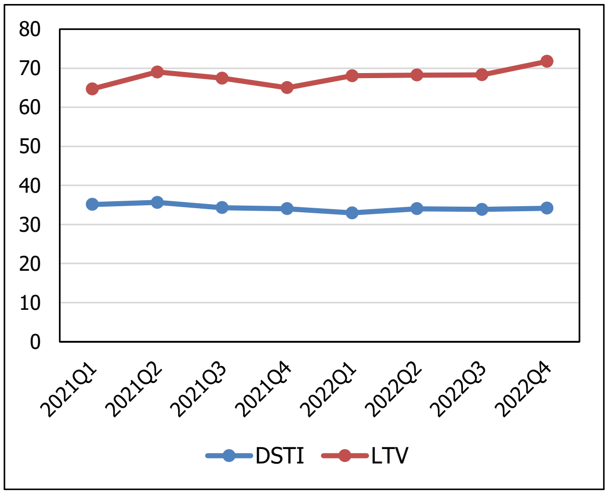


Source: National Bank, based on the data submitted by banks.

Taking into account the importance of these indicators for the sustainability of the natural persons indebtedness, at the end of 2022 the National Bank introduced macro prudential instruments for the quality of the natural persons' credit demand, which imposed an obligation on banks to calculate and report to the National Bank on these indicators according to unified methodology, when a new loan is approved or the current debt is increasing on the basis of used loans. In April 2023, macro prudential measures were taken, i.e. the maximal values of the DSTI ratio (55% when approving new or increasing the existing credit exposure in denars and 50% when approving new or increasing the existing credit exposure with currency component) and LTV ratio (85%, when approving new or increasing the existing exposure secured with real estate) were restricted. Also, a limit was introduced on the maximum maturity of new housing loans (30 years) and on new mortgage loans that are not intended for the purchase/construction of a residential building (20 years). These macro prudential measures, applicable as of 1.7.2023, enable to prevent accumulation of systemic risks in the household segment and real estate market.

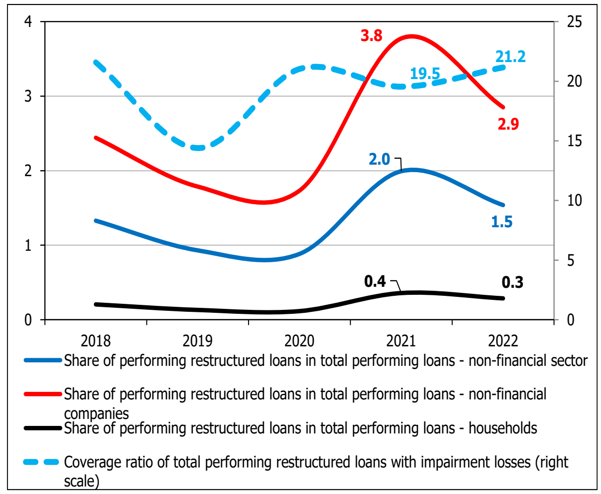
Chart 85
Movements of DSTI and LTV indicators of newly approved loans to natural persons, by quarter

in %



Source: National Bank, based on the data submitted by banks.

Chart 86
Shares of regular restructured loans in total regular loans and their coverage with impairment
in %



Source: National Bank, based on the data submitted by banks.

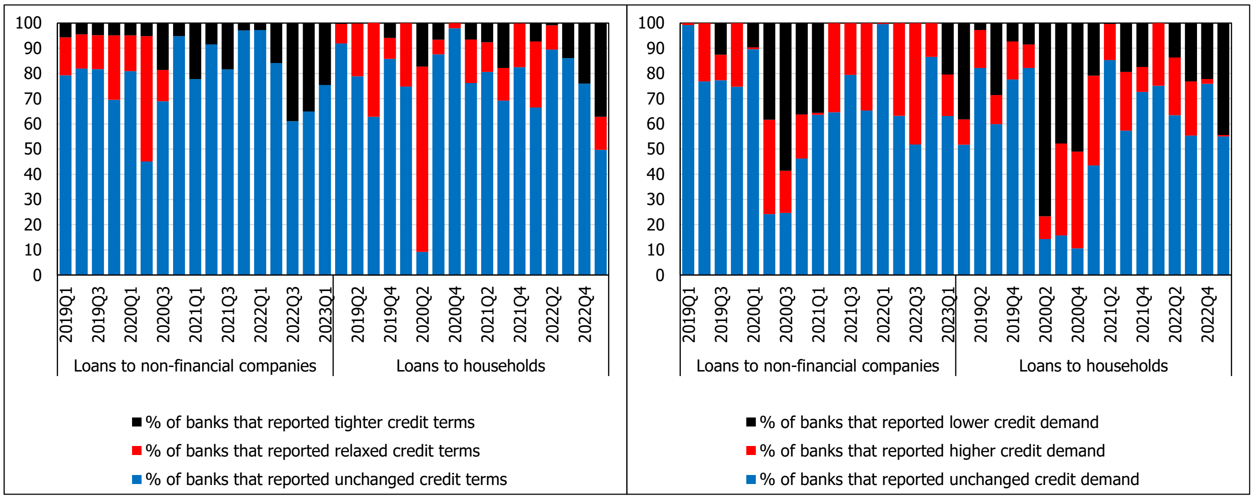
Banks usually make efforts to ease the credit conditions and to prevent or to reduce the migration of the regular to non-performing loans by restructuring the loans for those borrowers where a deteriorating financial position is noticed (or there are signals for deterioration of their financial position). After the relatively high increase in 2021, which was mainly due to the pandemic effects[127], in 2022 regular restructured loans recorded a decrease of 15.3%. Their participation in total regular loans is 1.5% and for now they do not represent a significant risk factor since their amount is minor (from a sectoral point of view, almost 91% of regular restructured loans are approved to non-financial corporations). Yet, the banks should remain precautious in both, restructuring customer claims, and expectations for credit losses based on these loans, which is particularly important if the restructuring does not give the expected results.

In conditions of increased uncertainty and a complicated economic environment, followed by monetary policy tightening both globally and domestically, the banks began to tighten credit standards at the end of 2022 and in the beginning of 2023, when they also reported a reduced credit demand.[128] Such movements will in turn have an impact on the dynamics of credit growth in the coming period, and depending on the intensity of that impact and on future developments primarily in the international economic environment, adverse effects on the indicators of credit risk materialization are possible. Banks managed to

[127] In 2021, the possibilities for approving new regulatory reliefs in order to more easily overcome the consequences of the pandemic have been exhausted and in the majority of cases where a grace period of repayments was previously approved, it has completely expired, with which the banks started to restructure the liabilities of certain clients (mainly non-financial corporations) who were facing a worsening financial situation. This was the main reason for the high growth of restructured loans in 2021.
[128] According to the banks' lending surveys published on the website of the National Bank.

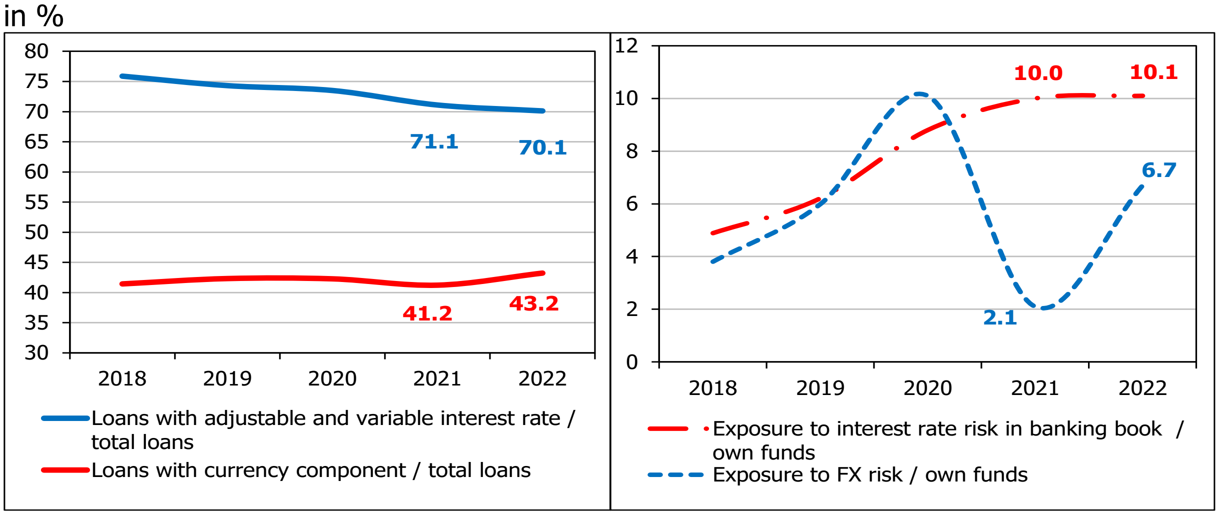
accelerate the annual rate of credit growth in 2022, to the level of 10.1%[129] (8.5% in 2021), but as of the first quarter of 2023, it slowed down to 6.4%[130], while no significant changes were registered in the non-performing loans.

Chart 87
Results of the banks' lending surveys regarding lending terms (left) and credit demand (right)
in %



Source: National Bank, based on lending surveys.

Chart 88
Banking system exposure to indirect credit risk, from loans with currency component and loans with variable and adjustable interest rates*** (left) and banking system exposure to currency risk* and interest rate risk** (right)
in %



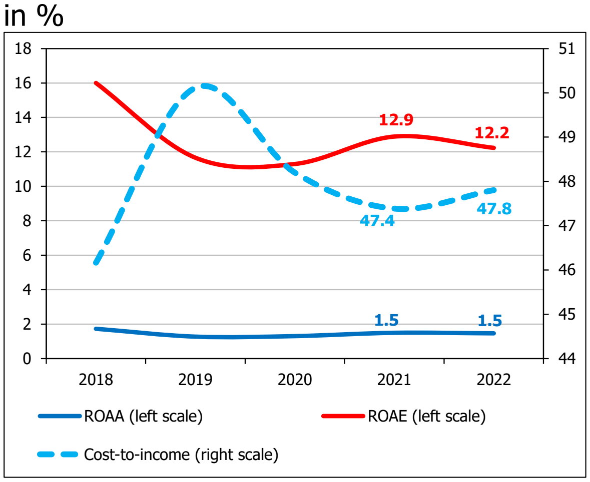
[129] The National Bank also took measures to encourage the loan growth intended to finance projects related to the domestic electricity production from renewable sources, by reducing the basis of the reserve requirement for the amount of newly approved loans to legal entities for this purpose. In this way, in conditions of energy crisis and strong growth of the global electricity prices, the National Bank contributes to mitigate the pressures and the structural problems in the economy, while the measure also supports "green finance" and sustainable financing as a strategic goal in the latest strategic plan of the National Bank. Despite the strong growth of "green lending", from 45.9% in 2022, the share of these loans in the total loan portfolio is still small and equals 3.6% as of 31.12.2022.
[130] As of May 2023 it equaled 6.3% (last available data in the period of writing the Report).

Source: National Bank, based on the data submitted by banks.
*The currency risk exposure is measured through open foreign exchange position, which is a gap between on-balance and off-balance sheet assets and liabilities with currency component.
**Exposure to interest rate risk in banking book is measured through weighted value of banking book, which denotes potential loss of economic value of this portfolio, amid assumed unfavorable interest shock of ±2 percentage points.
*** It should be taken into account that as of 31.12.2022, about 15% of total loans that are presented as loans with variable interest rate are currently in the period of application of a fixed interest rate, which after a certain period (of at least six months) will be replaced with variable and adjustable interest rate.

The banks' indirect exposure to credit risk, arising from the presence of loans with currency component and loans with adjustable and variable interest rate, is significant. Banks' exposure to credit risk which arises from the exposure of their clients to interest rate risk becomes important with the increase in interest rates, in conditions of monetary policy tightening both globally and domestically. Namely, the growth of interest rates on loans increases the burden for servicing of borrowers' debt which can affect adversely their creditworthiness. Banks' exposure to credit risk, which in turn arises from the exposure of their clients to currency risk, is limited due to the implementation of the strategy of a stable exchange rate.

The banking system's exposure to currency risk and to interest rate risk in the banking book equal 6.7% and 10.1% of own funds, respectively, which remains acceptable and far below the prescribed limits.

Chart 89
Selected profitability indicators
in %



Source: National Bank, based on the data submitted by banks.

Profitability indicators of the banking system remained at a similar level as in 2021. In 2022, the domestic banking system registered increase in the profit (by 5.7%), but it is significantly lower compared to the previous year (26.2%). The increased profit mostly results from the growth of net interest income and net commission income. During such movements, the rate of return on average assets remained the same, the rate of return on average capital and reserves recorded a slight decline, while the net interest margin increased minimally, to the level of 3.1%. A more significant negative contribution to the change in profit was made by operating costs, which registered a faster growth compared to total revenues, which slightly worsened the indicator of the operational efficiency of the banking system. The profitability of the banking system in the coming period largely depends on the success of the banks in adapting their operations to the environment of higher interest rates. Namely, in the environment of ever higher interest rates, the costs of financing the banks[131] are also growing and their transfer to credit users, through an increase in interest rates on loans, could affect both the volume of credit activity and the creditworthiness of clients. In the first quarter of 2023, during which no larger materialization of credit risk was registered, the banks made a relatively high profit, mostly under the influence of higher net interest income. However, it should be taken into account that the credit risk is usually materialized gradually and with a certain time delay after the raising of the interest rates and increasing of the clients' debt burden.

[131] In this context, the development bond for citizens, the first issue of which the state made in July 2023, can have influence to certain extent on the attractiveness of bank deposits, on relatively favorable terms that are competitive with those offered by banks to natural persons to place deposits with them. With the first issue of the development bond for citizens, about Denar 1.5 billion were collected from natural persons, which is only about 0.4% and 1% of the total and term deposits of natural persons, respectively.

Stress testing of the banking system of the Republic of North Macedonia using scenario analysis

In June 2023, stress testing of the banking system was carried out by using scenario analysis, where extreme but theoretically feasible shocks in the macroeconomic environment are simulated, in order to assess the coping capacity and resilience of the banking system to shocks. For the purposes of this stress test, two scenario analyses were made, with a different level of extremity, which are hypothetical and assume significant negative deviations of the economic activity of the country from the regular forecasts, i.e. they assume extreme, slightly plausible, but theoretically feasible events. For comparison, below, there are main assumptions and results of the stress-scenarios, but also of the baseline and stress macroeconomic scenario[132], which cover the forecasts for the future, more or less, expected developments in the economy. All scenarios cover a period of two years, 2023 and 2024.

Table 1
Baseline and stress macroeconomic scenario for the conduct of the stress test
in %

Macroeconomic variables	Realized levels		Baseline macroeconomic scenario		Stress scenario 1 - stagflation with weak recovery		Stress scenario 2 - deviation from baseline scenario in the amount of 1/2 to 2 standard deviations	
	2021	2022	2023	2024	2023	2024	2023	2024
GDP growth (annual, in real terms)	3.9	2.1	2.1	3.6	-0.8	0.3	-2.3	-3.8
Unemployment rate	15.7	14.4	13.3	11.7	14.6	16.9	20.5	24.1
CPI (annual, cummulative)	3.2	14.2	8.7	2.4	10.6	3.0	11.4	5.0
Credit growth- private sector (annual)	8.3	9.4	5.7	6.4	3.4	3.0	3.0	1.0

Source: National Bank calculations.

The first stress scenario assumes stagflation in 2023, with a slow recovery of the economy in the next, 2024. Namely, in the first year, the GDP has registered a real decrease of 0.8%, while the inflation rate would reach 10.6%. The labor market conditions deteriorated, which is shown through the growth of the unemployment rate, compared to the baseline macroeconomic scenario (to 14.6%). In 2024, it is assumed that the economy is going to recover to certain extent, although slowly, evident through an increase in GDP of only 0.3%, while the inflation rate in 2024 is lower compared to the previous year and goes down to the level of 3%. Conditions on the labor market are deteriorating even more and the unemployment rate reaches a level of 16.9%. The annual growth rate of credit support slows down significantly and equals 3.4% and 3%, for 2023 and 2024, respectively.

With the second, more extreme scenario, a severe recession is assumed for two consecutive years, while maintaining the inflation rate at a higher level compared to the baseline or the first stress scenario. This scenario can be considered historical (as opposed to the first one, which is hypothetical) and is constructed as an unfavorable deviation of individual macroeconomic variables from their forecasted values in the baseline macroeconomic scenario, in the amount of 1 to 2 standard deviations (more precisely 1; 1.5 or 2 standard deviations). The number of standard deviations for which this correction is made depends on the ratio of the projection of the variable with its historical average, in the first year, and in the second year with the realization in the first forecast year, except for the inflation rate where the comparison is made with its projected path in the baseline macroeconomic scenario.

The results of the conducted stress test indicate a generally satisfactory resilience of the banking system to macroeconomic shocks. Thus, in the first stress scenario (assumed stagflation with slow recovery), the share of non-performing loans in total loans would reach a level of 4.2%, while in 2024 this share would rise to 4.6%[133], while the average level of riskiness of total loans from the initial 4.3% would equal 5.3% in 2023 and 5.8% in 2024 (average level of riskiness = impairment losses / total loans). The cumulative growth of non-performing loans at the level of the banking system in the two forecast years would be about 50% (growth of about 30% in 2023 and an additional 14% in 2024). Moreover, in the first forecast year, the banking system would operate at a loss, mainly caused by the credit risk materialization, but also partly due to the decline in the banks' operational result, the share of which in the average assets for 2023 is 0.5%. According to this scenario, in 2024 the banking system would record a profit of 0.2% of average assets for 2024. The capital adequacy ratio in 2023 would register a slight decrease for both forecast years to the level of 17%. Finally, the indicator of the coverage of short-term liabilities of the banking system with liquid assets would drop to the level of 45%, while the coverage of household deposits with liquid assets would decrease to 43.2%.

In the second stress scenario, which assumes a recession in two consecutive years, a more significant increase in unemployment and a decrease in the inflation rate, but slightly slower than its path from the first stress scenario, the indicator for the share of non-performing loans in total loans would reach a level of 7.9% at the end of 2023 and 5.8% at the end of 2024[134]. The average level of riskiness of total loans from the initial 4.3% would rise to 5.4% and 6.9%, in both forecast years, respectively, while the aggregate growth of non-performing loans for both years under this scenario would be slightly over 87%. The capital adequacy ratio of the banking system is decreasing, with the effect being greater in the second forecast year when it reaches 15.3%. Unlike the first stress scenario, in the second less favorable scenario, the banking system operates with a loss in the two forecast years, which would equal -0.9% of average assets in 2023 and -1.1% of average assets in 2024. In this scenario, the decrease in liquidity indicators is faster, so the coverage of short-term liabilities with liquid assets at the level of the banking system from the initial 47.7% would reach 42.2% at the end of 2024.

[132] The main assumptions and forecasts in the baseline macroeconomic scenario are presented and described, in more details, in the Quarterly Report of the National Bank, from May 2023 (Istrazuvanje_Kvartalen_izvestaj_maj_2022.pdf (nbrm.mk)).

[133] If take into account the cumulative write-off of non-performing loans that the banks were obliged to perform in accordance with the National Bank regulations on credit risk management, the share of non-performing loans from the initial 9.7% would amount to 10.7% in 2023, i.e. 11.4% in 2024. If the amount of write-offs that banks would perform in accordance with the existing regulatory framework in 2023 and 2024 is approximately determined, the share of non-performing loans in total loans would equal 3.7% and 4.1% in both forecast years, respectively.

[134] In this stress scenario, if we take into account the cumulative write-off of non-performing loans that the banks were obliged to perform in accordance with the National Bank regulations on credit risk management, the share of non-performing loans from the initial 9.7% would equal 10.9 % in 2023, i.e. 12.7% in 2024. If the amount of write-offs that banks would make in accordance with the current regulatory framework in 2023 and 2024 is approximately determined, the share of non-performing loans in total loans would equal 3.8% and 5.3% in both forecast years, respectively.

Chart 1
Realized and forecasted levels of the share of non-performing loans in total loans to non-financial entities (left) and rate of return on average assets (right)
in %

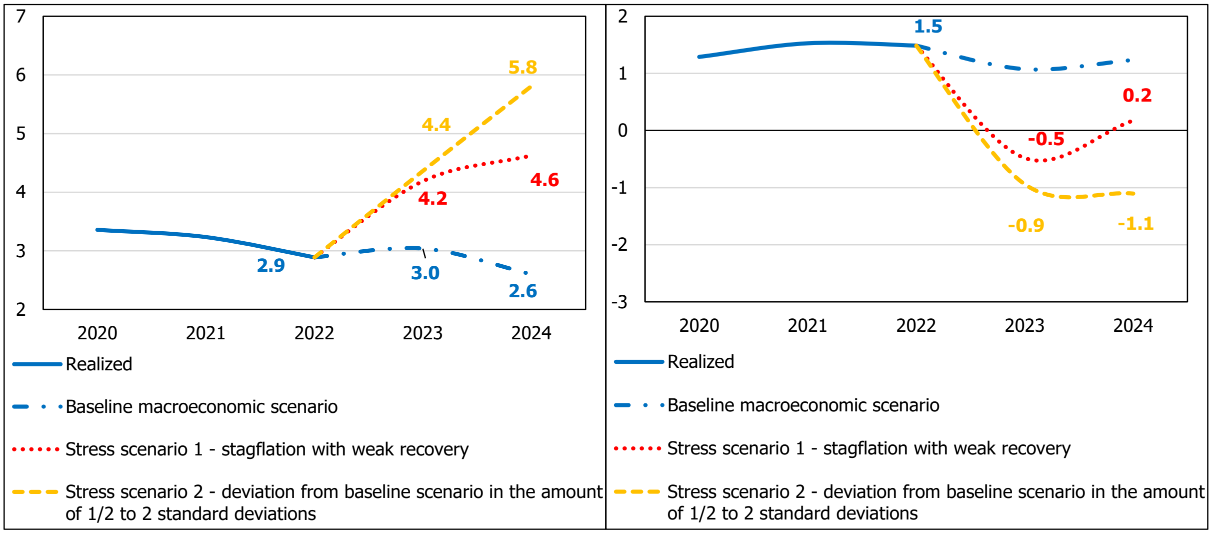
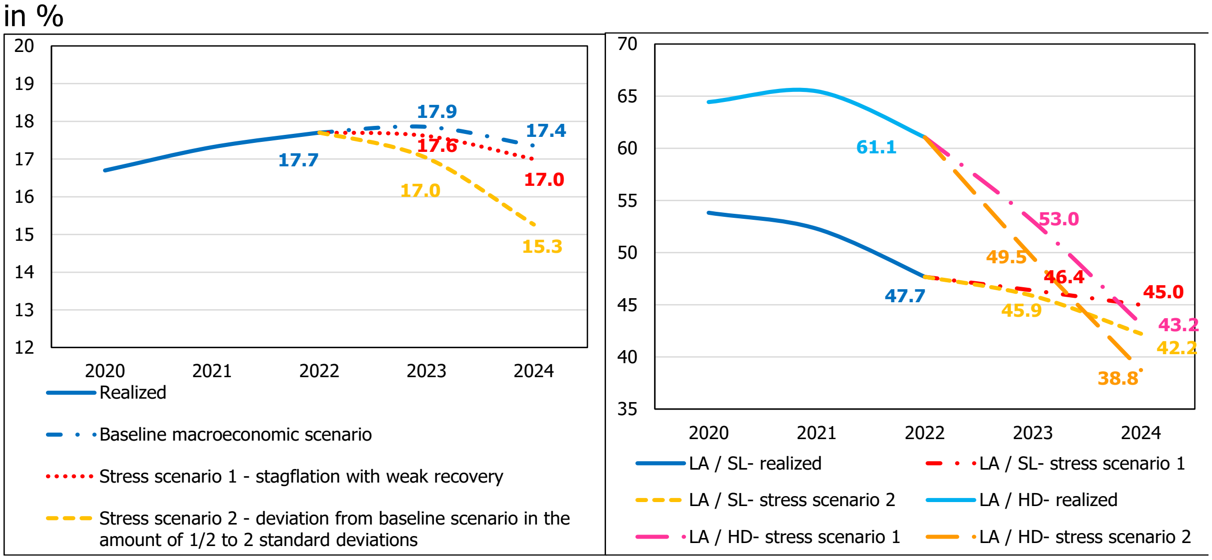


Chart 2
Realized and forecasted levels of the capital adequacy ratio (left) and realized and forecasted levels of selected liquidity ratios (right)
in %



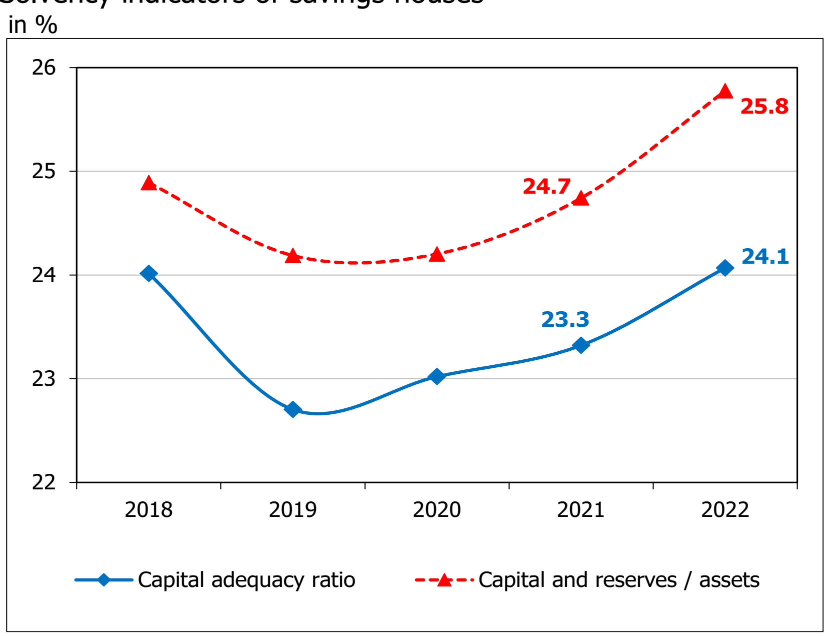
Source: National Bank calculations.
*LA / SL - liquid assets / short-term liabilities; LA / HD - liquid assets/household deposits.
Note: The capital adequacy ratio and ROAA is obtained by applying the assumption that the new expected losses due to credit risk are recognized by the banks in their income statement and consequently have the effect of a reduction of total assets and risk weighted assets.

2.3.2. Savings houses

The importance of the savings houses for the Macedonian financial system is low primarily due to the small volume of their activities[135]. Savings houses are important for financial inclusion as they cover a certain segment of the credit market which has tougher access to sources of funding than from banks. In addition, the savings houses are deposit-taking institutions which collect deposits from natural persons, which is why their performance, and above all their reputation, is important for the overall financial stability. The danger of risk materialization and risk spillover of risks is low, primarily due to the small volume of their activity and deposit insurance, as well as due to their satisfactory solvency and liquidity. The quality of the savings houses' credit portfolio is good and almost in the same proportion as in the preceding year. However, in conditions of further uncertainty coming from the environment, there is a risk of possible growth of non-performing loans in the coming period. Towards the end of 2022, savings houses were allowed to participate in the auctions of the National Bank's CB bills, which enhanced their opportunities to invest free funds in income-bearing liquid financial instruments.

In 2022, the solvency of both savings houses remained high. The capital adequacy ratio slightly improved (0.7 percentage points) compared to the previous year, mainly due to the growth of own funds of 0.7% (primarily due to reinvestment of profits from 2021 in both of them and increase in subordinated instruments in one savings house), amid almost unchanged amount of risk weighted assets by 2.4%. The capital adequacy ratio of both savings houses is above the regulatory requirement of at least 20%[136].

Chart 90
Solvency indicators of savings houses



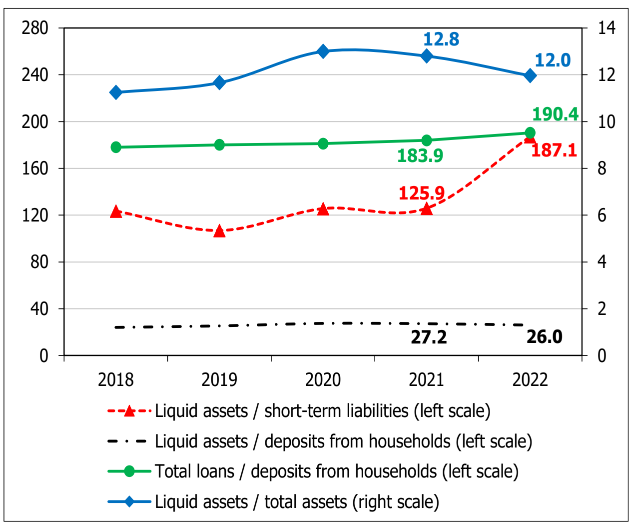
Source: National Bank, based on data submitted by the savings houses.

135 More details in the section concerning the Financial System Structure of this Report.
136 The minimum regulatory capital requirement for savings houses (20%) is significantly higher than that for banks (8%).

The savings houses register lower liquidity indicators compared to banks, as main deposit-taking institutions, which results from the specificities in savings houses' operations (for example, collecting deposit from natural persons, limited selection of liquid financial instruments investments, etc.). The liquid assets of savings houses registered a fall in 2022 (by Denar 26.5 million or by 9.8%), which is why some of the liquidity indicators decreased. However, since the beginning of 2023, liquid assets have been growing and for the first eight months, they are higher compared to the end of the previous year. Savings houses maintain a satisfactory liquidity position, which enables them to smoothly perform their daily operations. The decrease in liquid assets in 2022 is the result of changes on the side of sources of funds (decrease in deposits by Denar 56 million or by 5.7% as a result of the uncertain environment that caused short-term pressures on the deposit base at the beginning of the year and on liabilities based on loans by Denar 23 million or by 5.2% due to the repayment of loans to the banking sector), and accordingly the savings banks showed a reduced volume of activities in 2022 (the assets of the savings banks decreased by 74 million denars, or by 3.5%). The share of the liquid assets in total assets is at a significantly lower level compared to banks, but they enable full coverage of short-term liabilities, which results from the preference of the savings houses' depositors to save on a longer run[137]. Having in mind that 83.4% of the savings houses' assets are comprised by the lending claims mainly on natural persons, there is constantly a very high loan to deposit ratio, whereby except by deposits, the credit activity is also financed by the capital of savings houses, as well as loans. In addition, the loans quality and the regular provision of cash inflows based on their collection is a particularly significant prerequisite for maintaining adequate liquidity at savings houses.

Chart 91
Liquidity ratios of savings houses

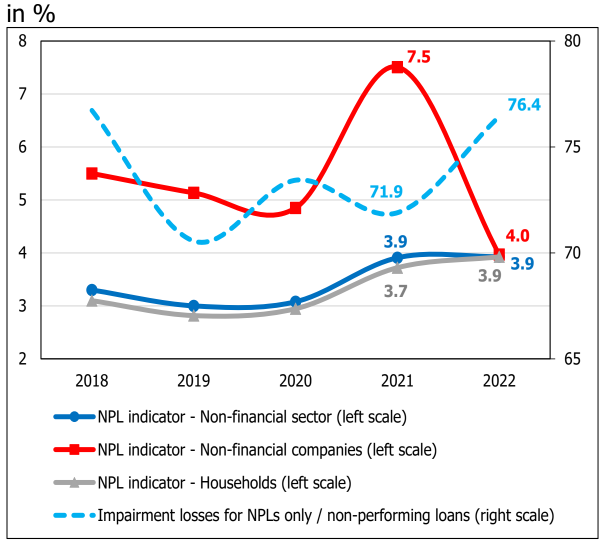
in %



Source: National Bank, based on data submitted by the savings houses.

Chart 92
Rate of non-performing loans in total loans and coverage of non-performing loans with impairment for them

in %



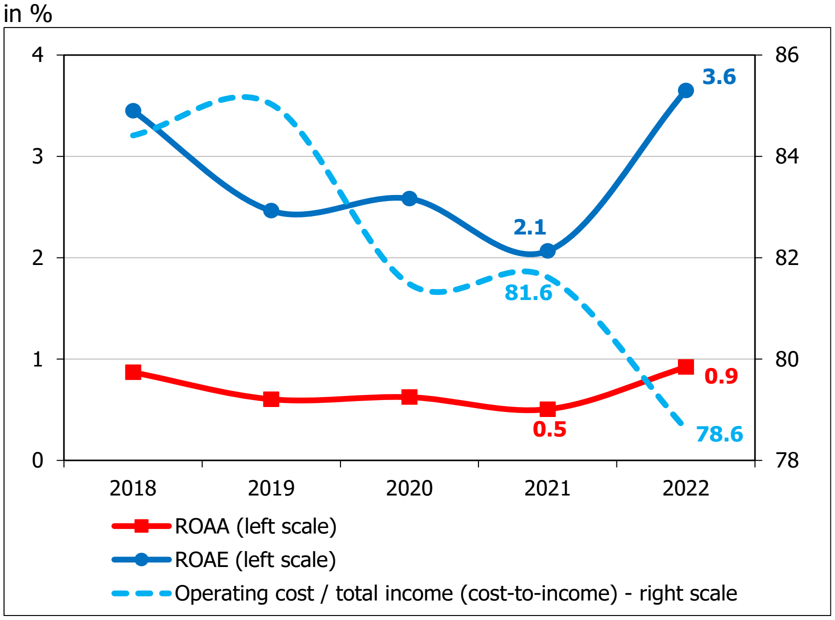
Source: National Bank, based on data submitted by the savings houses.

[137] Almost 90% of deposits invested in savings houses are long-term deposits.

Credit risk is the most significant risk the savings houses are exposed to. Given the fact that the lending to savings houses is mostly aimed at natural persons[138] (95.5% of loans to savings houses), consequently the credit risk due to default on claims is dispersed among many users and at smaller amounts. The level of credit risk materialization, as measured by the share of non-performing loans in total loans to non-financial entities is moderate and almost the same compared to 2021 (there is minimal improvement due to the decrease in non-performing household and corporate loans by Denar 1 million, or by 1.9%).

The high coverage of the non-performing loans with impairment, enables to minimize the effects on the solvency of the savings houses, given an assumption of a complete default on these loans (in case of such an simulation, only 3% of the own funds of savings houses, which would marginally reduce the capital adequacy (by 0.7 percentage points).

Chart 93
Selected profitability indicators
in %



Source: National Bank, based on data submitted by the savings houses.

Profitability indicators of savings houses improved compared to 2021. In 2022, savings houses generated higher profit compared to the previous year, which largely stems from the increased other regular income (by 8.1%), and net profit from commissions and fees (by 13.1%, as well as due to the fall in impairment charges (7.3%). The ratio between net interest income and average assets of the savings houses (8% for 2022) is by three times higher than the banking system, which is important in the process of generating profit. But the wider net interest spreads are also a signal for significantly lower competitiveness of the savings houses compared to banks, which also restricts the opportunity for stronger growth of their activities, coupled with the stricter regulatory requirements for savings houses. Savings houses have relatively low operational efficiency, reflected by the relatively high level of the indicator for the ratio between operating costs and total income (78.6% as of 31.12.2022). The new Law on Payment Services and Payment Systems (effective from 1.1.2023) provides for an opportunity, in addition to banks, for

[138] In 2022, total household loans decreased by 1.9% (increase of 1.4% in 2021).

other institutions to offer payment services that will meet the required conditions, prescribed by this Law. Thus, after the adequate harmonization with the Banking Law[139], the savings houses can expand the scope of activities, in the segment of payment services, which in turn would represent an additional source of (non-interest) income.

2.4. Fully funded pension insurance

In 2022, domestic private pension funds operated in unfavorable conditions of increased global inflation rates and their transmission to the inflation in the domestic economy, tightening of monetary policies of global central banks and simultaneous corrections in the price levels of capital market instruments. Under such conditions, as in most other countries, domestic pension funds experienced tough, with negative annual nominal and real rates of return, as well as a decrease in rates of return measured for several years. Also, the growth rate of the assets of the fully funded pension insurance was historically the lowest, which slightly reduced their relative volume in relation to the gross domestic product on an annual basis. However, it should be taken into account that the pension funds are long-term investors, which in the domestic economy still acts as funds collectors, which opens up space to compensate for the adverse effects of these market shocks by achieving better investment results in the next period. The strategic allocation by asset classes did not change in 2022, although a certain improvement of the portfolio structure of debt financial instruments is observed, with the reemergence of investments in foreign government bonds. Investments in domestic government bonds remain dominant within the portfolio of debt financial instruments, while the foreign funds traded on the stock market prevail in the structure of the portfolio of the pension funds' equity financial instruments. The portfolio of debt securities of the pension funds is exposed to the interest rates risk which may lead to economic losses on the balance sheets in case of early sales. These risks are even more pronounced if we take into account the relatively large average maturity of domestic government securities and the further tightening of monetary policies in the first half of 2023, thus the management of interest rate risk remains extremely important for the further realization of the private pension funds. In the structural profile of the exposure to other financial risks of the pension funds, no significant changes were registered in 2022.

2.4.1. Assets of the fully funded pension insurance

The total assets in the system of the private fully funded pension insurance at the end of 2022 equal Denar 117 billion, registering an annual growth of Denar 8.3 billion, i.e. 7.6%[140]**.** This is the lowest annual growth rate of the assets in the fully funded pension insurance system since its establishment in 2005. In addition, **for the first time, an annual decrease in the share of the total assets of the pension funds in the gross domestic product has**

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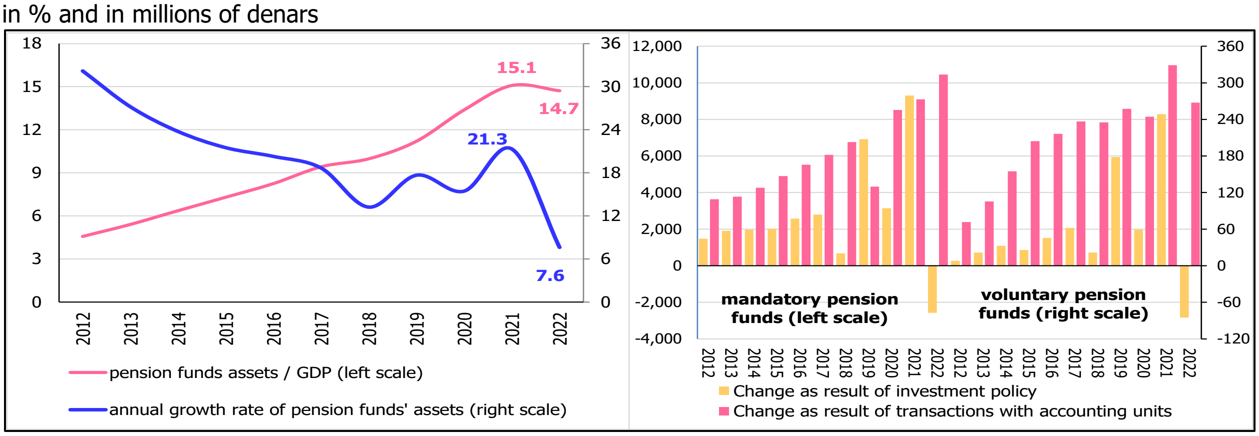
[139] The operating of the savings houses is regulated by the Banking Law, according to which the savings houses can perform payment transactions, which imposes a need of harmonization of the Banking Law in this segment with the new Law on Payment Services and Payment Systems.

[140] In 2022, the assets of mandatory pension funds grew by 7.6% (21.2% in 2021) while the assets of voluntary pension funds increased by 7.0% (25.2% in 2021). The total contributions paid to private pension funds in 2022 equal Denar 11,553 million (Denar 10,090 million in 2021), i.e. 1.45% of the estimated GDP. Of these contributions, 96.5% were paid into the mandatory pension funds (with an annual growth of 15.2%), and 3.5% were paid into the voluntary pension funds (with an annual decrease of 1.8%).

been registered. At the end of 2022, the pension funds' total assets are at the level of 14.7% of GDP, which compared to the end of 2021 is lower by 0.4 percentage points. Unlike the fully funded pension insurance, which at the end of 2022 covers a solid part of the number of employed persons (82.7%) and of the active population (39.1%), the coverage of the population with the voluntary pension insurance is symbolic and as of the end of 2022, these indicators equal 4.3% of the number of employed persons[141] and 2.0% of the active population. At the same time, no major changes were observed in the structure of the total assets of the pension funds, regardless of the fact that in 2022 a new voluntary pension fund was established and began operating[142]. The largest portion (over 97%) of the total assets in fully funded private pension insurance belong to mandatory private pension funds, which is due to the mandatory membership for the majority of newly employed persons, but also due to the low interest of domestic economic agents[143] (households and legal entities) for the voluntary fully funded pension insurance. Having in mind that the private pension funds have relatively small volume of liabilities, their net assets are almost equal to the total assets[144]. The growth of the net assets of the private pension funds in the last year was entirely due to the net inflows based on the paid contributions, while the assets management and investment had a negative effect, that is, it caused a decrease in the net assets of the pension funds.

Chart 94
Annual growth rate of assets of private pension funds (left) and structure of absolute growth of net assets of private pension funds (right)
in % and in millions of denars

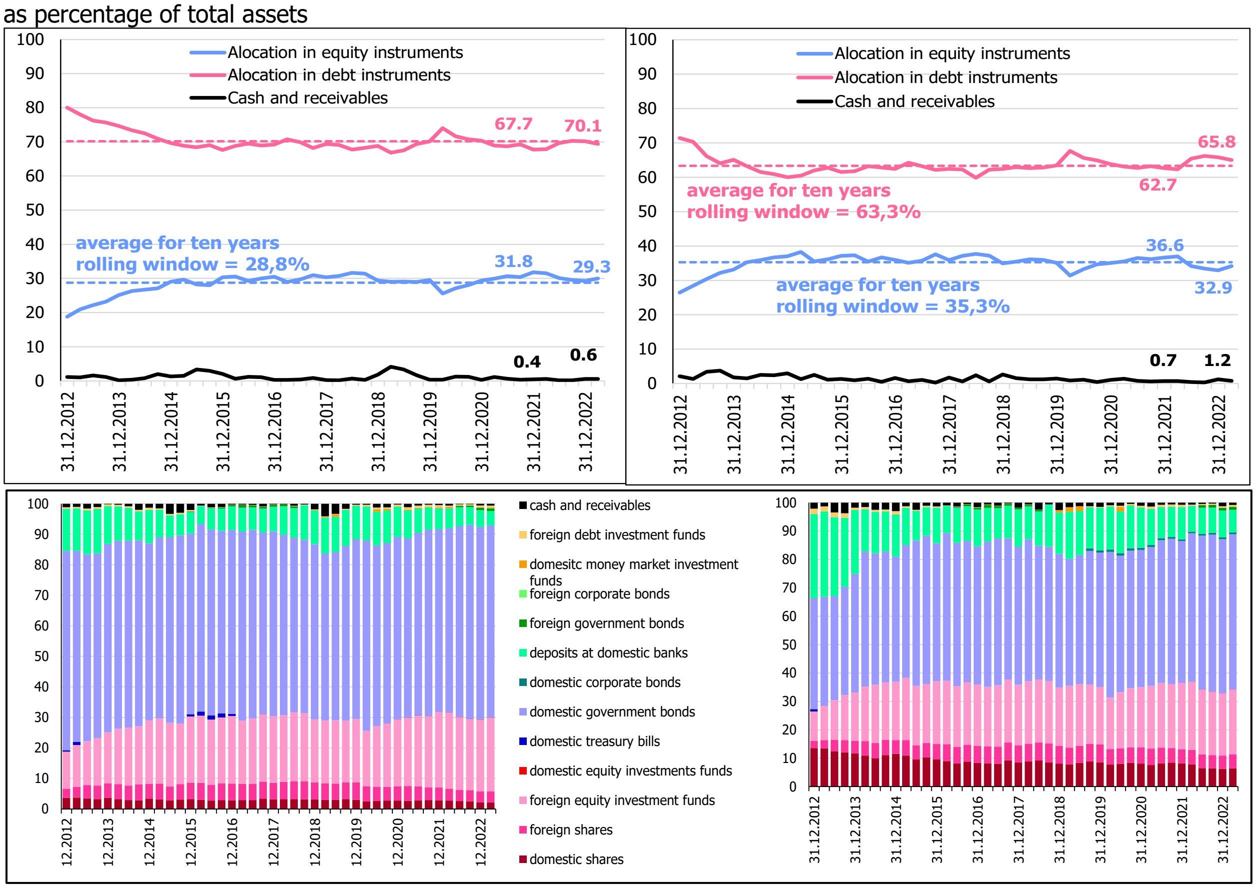


Source: internal National Bank calculations based on MAPAS data.

[141] The indicators for the coverage of the households with fully funded pension insurance for 2022 have been calculated by using the data for the assessment of the different categories of the households in accordance with the results of the last census conducted in 2021, which reduces the comparability with previous years where the assessment of the different categories is using the results of the 2001 census. For more detailed information on the structural features of pension funds in terms of households see Indicators of the Membership in Private Pension Funds, below.
[142] In October 2022, a new voluntary private fully funded pension fund (VFP open voluntary pension fund) began operating, so now the total number of private pension funds in the Republic of Macedonia equals seven (three mandatory and four voluntary).
[143] The households can participate in the system of voluntary pension insurance through individual membership by concluding a membership agreement with the pension company and opening a voluntary individual account or through professional pension schemes which, in accordance with the law, can be established and financed by an employer (at the expense of its employees) or from associations of citizens (for the account of their members) and opening a professional account. As of 31.12.2022, about 46% out of the total number of members in voluntary pension funds (29,502 people), are members with a voluntary individual account, and about 54% are members through professional pension schemes.
[144] At the end of 2022, the net assets of the private pension funds equal Denar 116.6 billion, which is 99.7% of their total assets.

In 2022, the assets[145] of the pension funds were mainly within the established strategic distribution between the equity and the debt financial instruments in proportion 30% equity : 70% debt financial instruments with the mandatory, i.e. 35% : 65% with the voluntary pension funds[146].

Chart 95
Assets structure by assets classes of the mandatory (top, left) and the voluntary (up, right) pension funds and assets structure by financial instruments of the mandatory (bottom, left) and the voluntary (bottom, right) pension funds
as percentage of total assets



Source: National Bank internal calculations based on MAPAS data.

Investments in domestic government bonds are individually the most common instrument with the largest participation within the portfolio of debt financial instruments. The share of these instruments in the structure of the pension funds' total assets at the end of 2022 reached 63.1% in the mandatory pension funds (at a growth of 3.2 percentage points compared to of 2021) and 54.2% in the voluntary pension funds (at a growth of 4.3

[145] More detailed data on the pension funds' assets structure by assets classes and by individual types of financial instruments can be seen in the annexes enclosed to this report.
[146] In addition to equity and debt financial instruments, the claims of the pension funds and the funds in the bank that performs the function property custodian, form a special "residual" category, which has a symbolic share in the total assets and does not change the general levels set for the strategic allocation of funds.

percentage points compared to 2021)[147]. The growth of the structural share of government bonds in 2022 was due to the reduced share of deposits in domestic banks from 6.8% to 5.5% in mandatory, i.e. from 11.4% to 9.4% in voluntary pension funds[148]. After an almost five-year absence, investments in foreign government bonds reappeared in the portfolio structure of the pension funds' debt financial instruments, with a relatively small share in the total assets at the end of 2022 of 0.82% and 0.91% in the case of mandatory and at voluntary pension funds, respectively[149]. In addition, in the first quarter of 2023, investments in foreign corporate bonds are for the first time present in the structure of pension funds' assets. With the changes in the monetary policies setup of the central banks and the increase in their policy rates, the attractiveness of the risk-return ratio for certain foreign bonds increases[150], especially on the shorter and medium-term blocks of the yield curve, which means that there are preconditions for the participation of these instruments to increase further. **In the portfolio of pension funds' equity financial instruments, the main place is for the investments in foreign investment funds that invest in shares, which are in the form of so-called ETF – exchange traded funds)[151].** At the end of 2022, their share in the total assets equals 23.5% and 22.0%, respectively with the mandatory and voluntary pension funds[152], recording an annual decrease of 1.8 and 1.4 percentage points, respectively. Such instruments allow for a greater degree of diversification of idiosyncratic risk than investment in instruments of individual issuers, so the yield from the portfolio of equity instruments is largely influenced by the systemic risk arising from general market movements. The share of direct investments in foreign or domestic shares also recorded a drop from 7.0% to 5.8% in total assets among mandatory and from 13.2% to 10.9% among voluntary pension funds.[153]

2.4.2. Performance of the private pension funds

In 2022, the rates of return[154] of the investments of the domestic pension funds were influenced by the complex macroeconomic environment, which led to the materialization of certain risks to which they are exposed when invest.

[147] The share of domestic government bonds in the portfolio of debt financial instruments at the end of 2022 is 90.0% for mandatory pension funds and 82.4% for voluntary pension funds, and compared to the end of 2021, it has grown by 1.6 and 2 .8 percentage points, respectively.

[148] The share of deposits in domestic banks in the portfolio of debt financial instruments at the end of 2022 is 7.8% for mandatory pension funds and 14.4% for voluntary pension funds, and compared to the end of 2021, it is lower by 2.3 and 3.7 percentage points, respectively.

[149] The participation of foreign government bonds in the portfolio of debt financial instruments at the end of 2022 is 1.2% for mandatory pension funds and 1.4% for voluntary pension funds, and the remaining types of debt instruments (domestic government bonds, domestic corporate bonds, foreign investment funds that invest in bonds and domestic investment funds that invest in money market instruments) jointly participate with 1.1% and 1.9% in the structure of the portfolio of debt financial instruments for mandatory and voluntary pension funds, respectively.

[150] To illustrate, yields to maturity of one-year and ten-year German bonds, as approximate value of the yield on low-risk assets in the euro area, rose from -0.6100% and -0.1790% as of 31.12.2021 to 2.6330% and 2, 5645% as of 31.12.2022, respectively. Also, yields to maturity on one-year and ten-year US bonds rose from 0.3840% and 1.5120% as of 31.12.2021 to 4.7330% and 3.8790% as of 31.12.2022, respectively.

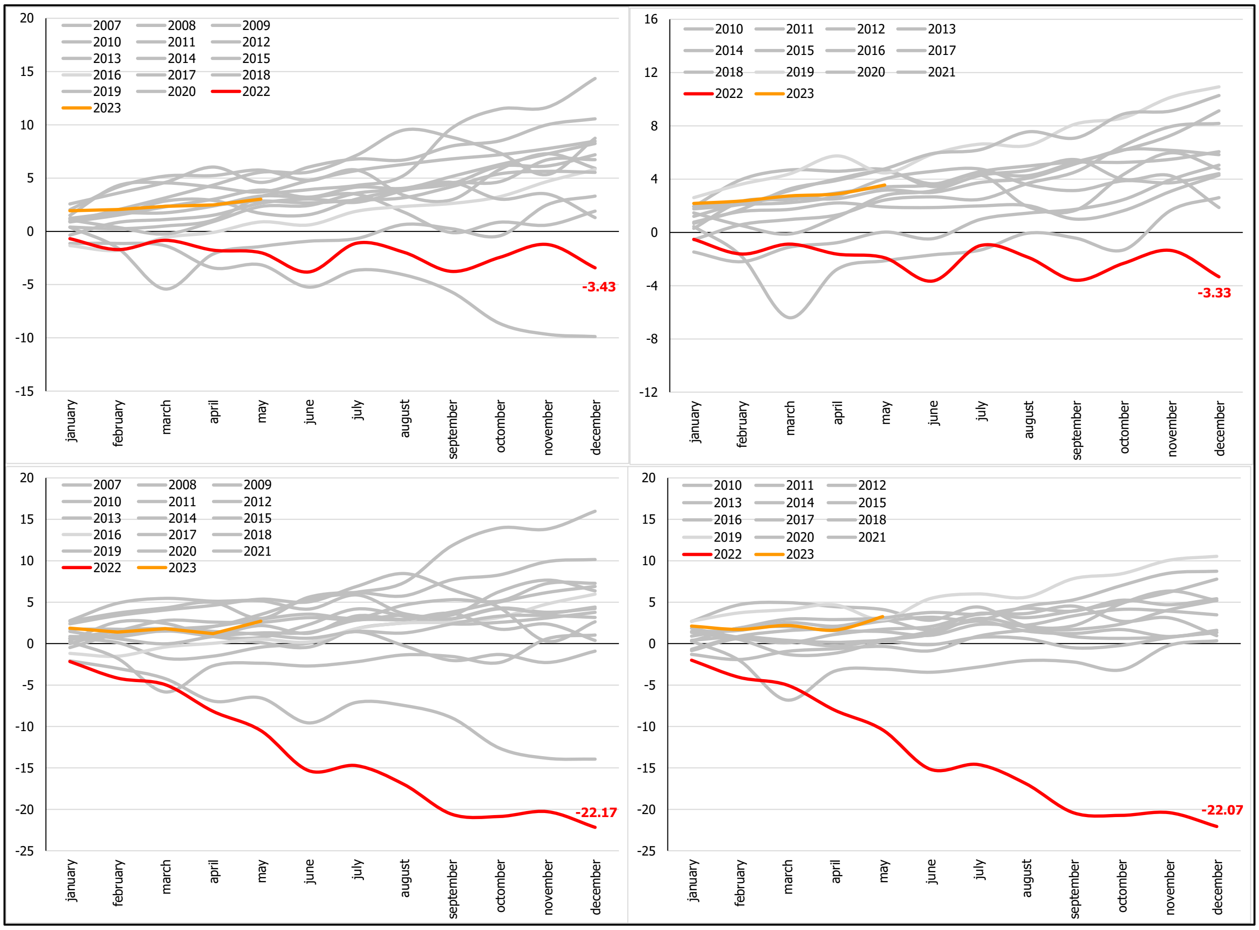
[151] A significant part of investments in exchange-traded investment funds that invest in stocks is actually a replication of the return resulting from a specific stock market index, because the very investment mandate of these exchange-traded funds involves a follow-up of adequately selected stock market index.

[152] The share of investments in foreign investment funds that invest in shares in the total portfolio of equity financial instruments at the end of 2022 is 80.1% for mandatory and 66.8% for voluntary pension funds. Compared to the end of 2021, their participation increased by 2.2 and 2.9 percentage points in the mandatory and voluntary pension funds, respectively.

[153] The share of direct investments in shares in the total portfolio of equity financial instruments at the end of 2022 equaled 19.7% in mandatory and 33.2% in voluntary pension funds, and compared to the end of 2021, it is a decrease of 2.4 and 2.8 percentage points, respectively.

[154] More details on the rates of return of the mandatory and voluntary pension funds can be seen in the annexes enclosed to this report.

Chart 96
Periodic dynamics for the period from the beginning of the year to the end of each month, of the nominal (top) and real (bottom) weighted rates of return of mandatory (left) and voluntary pension funds (right), by years
in %



Source: Internal National Bank calculations based on MAPAS data and data from audited financial statements on mandatory and voluntary pension funds. The rates are calculated by weighting the share of each pension fund in the total net assets of the pension funds. Real rates of return are calculated using the periodic inflation rate in each year from the beginning of the year to the end of each month.

In the conditions of rising inflation in global and domestic frameworks, tightening of monetary policies and volatility in global financial markets with downward revaluation of equity financial instruments, in 2022, as in most other countries, the realized annual weighted nominal rates of return were negative and equaled -3.4% for mandatory and -3.3% for voluntary pension funds. With such movements in nominal returns and simultaneously high inflation growth, the annual weighted real rates of return of pension funds at the end of 2022 equaled about -22%. However, it should be taken into account that these are short-term effects, while pension funds are long-term investors. Their achievements are evaluated in the long run in which they could compensate the losses under the assumption of more favorable financial and macro economic conditions and realization of better investment results. Movements from the beginning of 2023 show a certain slowdown in global inflation, but also persistence of inflationary pressures, which is seen through the maintenance of core inflation at a relatively higher level. In order to stabilize inflation expectations on a more permanent basis, most central banks worldwide continued to tighten monetary policy in the first half of 2023, which is reflected in financial markets and investors' expectations. The environment is still uncertain and accompanied by risks, which imposes the need for careful risk management by pension funds that will ensure an adequate return adjusted for the degree of investment risk.

The poorer performance in 2022 also reflected on the movement of the pension funds' rates of return realized over longer periods. The nominal rates of return for a period of five, seven, and ten years (annualized) decreased during 2022, ranging from 0.92 to 1.81 percentage points. The decline was more pronounced in real rates of return measured over longer periods. Given that, as a rule, the period of seven years is considered as a rule of thumb over a market cycle, this particular period can be considered as the most representative for the analysis of the long-term achievements of private pension funds. **The real rate of return** for a period of seven years (on an annual basis), at the end of 2022 equaled to 0.89% and 0.70% for the mandatory and voluntary pension funds, respectively, registering on an annual decrease of 3.82 and 3.72 percentage points, respectively. For the entire period from the establishment of the pension funds[155] until the end of 2022, the nominal rates of return, annually, equal 5.18% and 5.32% for bot mandatory and voluntary pension funds, respectively, which is less by 0.57 and 0.86 percentage points compared to the end of the preceding year. The real rates of return for the entire period from the establishment of the pension funds until the end of 2022 are 2.22% and 2.37% respectively, which is a decrease of 1.48 and 2.06 percentage points compared to the end of 2021.

Chart 97
Dynamics of rates of return of mandatory (top) and voluntary (bottom) pension funds, achieved over a period of five years (left), seven years (middle) and ten years (right), annually
in %

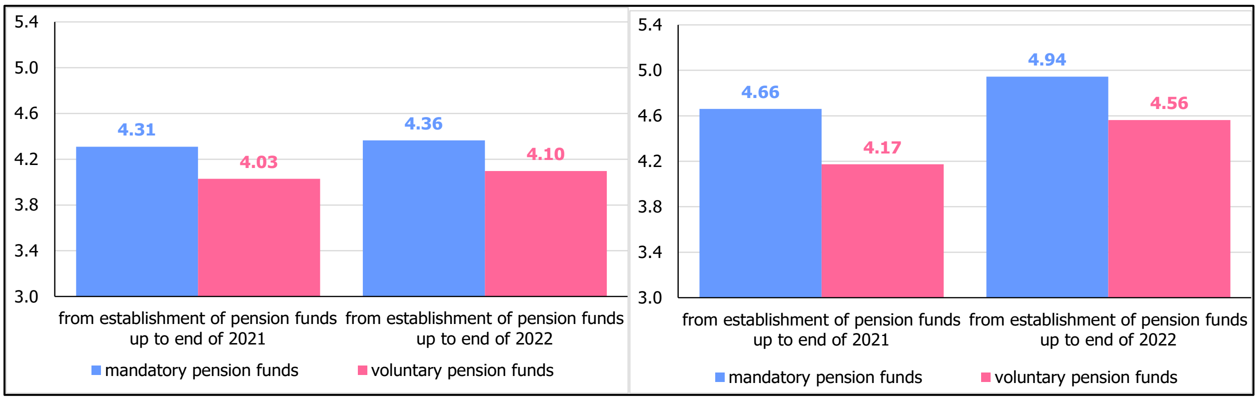
Source: Internal National Bank calculations based on MAPAS data and data from audited financial statements on mandatory and voluntary pension funds. When calculating the rates of return, the data is used only for the pension

[155] The nominal rate of return for the entire period since the establishment of private pension funds has been calculated by weighting the share of each pension fund in the total net assets of the pension funds, while the real rates of return have been calculated using aggregate inflation for the entire period since the establishment of pension funds, reduced to an annual level. The first mandatory private pension funds have been effectively operating since 31.1.2006, and the first voluntary private pension fund has been operating since 30.6.2009.

funds that had been operating during the entire period for which the rates are calculated and weighted on the basis of the participation of each pension fund in the total net assets of the pension funds. Real rates of return are calculated by using the inflation rate for the corresponding period for which the nominal rate of return is calculated.

In 2022, the domestic pension funds also registered higher historical volatility of their rates of return. The increase in the historical volatility was more pronounced relative to the real rates of return, which is true for both mandatory and voluntary pension funds.

Chart 98
Average weighted historical volatility of the nominal (left) and real (right) return of the domestic private pension funds, annually, since the establishment of the pension funds until the end of the relevant calendar year
in %

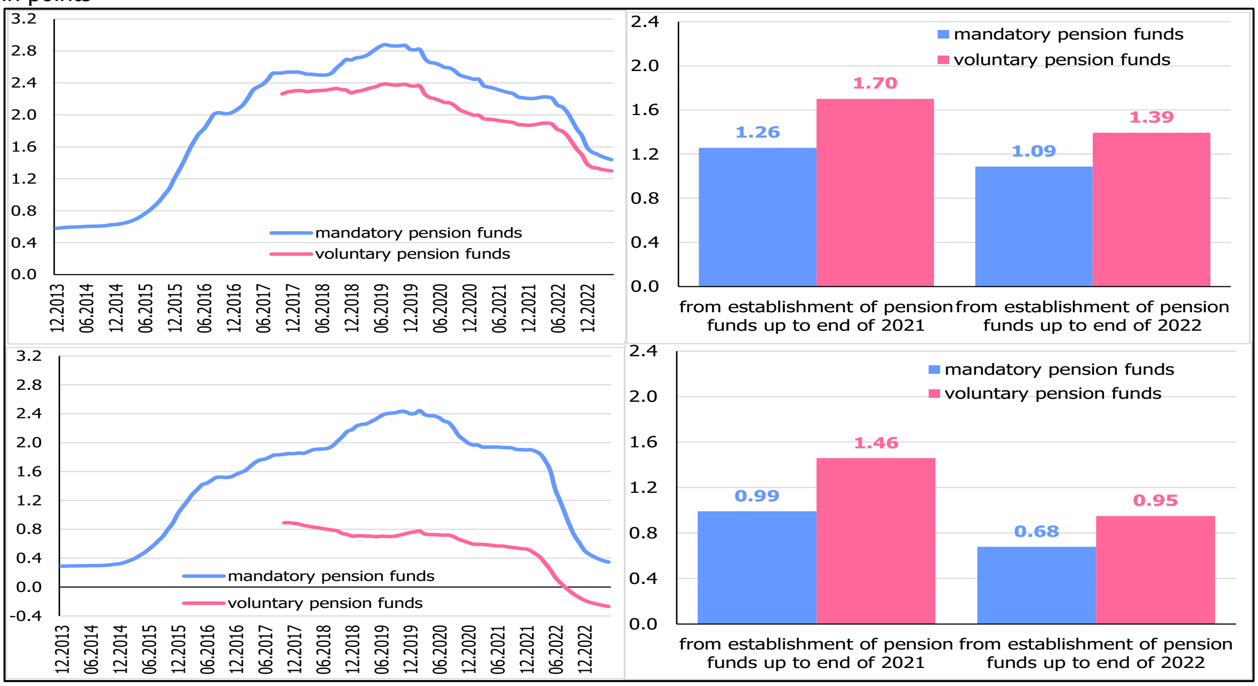


Source: internal National Bank calculations based on MAPAS data. The calculation is based on weighting the historical volatility of the individual pension funds by their participation in the total net assets of the pension funds, using a simple average of the monthly rates of return presented in logarithmic format.

The pension funds performance in 2022 is also analyzed through the dynamics of the risk-adjusted performance measures. The dynamics of these indicators practically shows how skillful asset management is, in terms of the amount of return that the funds bring per unit of risk taken. The ex post Sharpe ratio[156], as an absolute measure for the risk-to-yield ratio, calculated for the period since the establishment of the funds, registered a decrease in 2022, which was slightly more evident with the real rates of return.

[156] It is called a Sharpe ratio after the Nobel laureate William Sharpe, one of the founders of the CAPM (CAPM – Capital Asset Pricing Model), which is a theoretical basis of this ratio. The Sharpe ratio is a measure of the average return based on the asset management of the pension fund over the average low-risk rate of return, per unit risk taken when investing the assets. The calculation formula is as follows: $S_a = \frac{\overline{R_p} - \overline{R_f}}{\sigma_{\widetilde{Rp-Rf}}}$; where $\overline{R_p}$ is the average return of pension funds presented in logarithmic format for the selected calculation period, $\overline{R_f}$ is the average risk-free interest rate presented in logarithmic format for the same selected calculation period and $\sigma_{\widetilde{Rp-Rf}}$ is volatility of the realized return of the fund over the low-risk-bearing rate of return for the same selected calculation period. "Low-risk-bearing" rate of return, in the calculation of the Sharpe indicator, is the return on the one-year German government security.

Chart 99
Dynamics of the Sharpe ratio for a trailing 84-month period, calculated on the basis of annual nominal (left, top) and real (left, bottom) rates of return and average weighted Sharpe ratio for the period since the establishment of the pension funds until the end of the relevant calendar year, calculated on the basis of monthly nominal (right, top) and real (right, bottom) rates of return, annually
in points



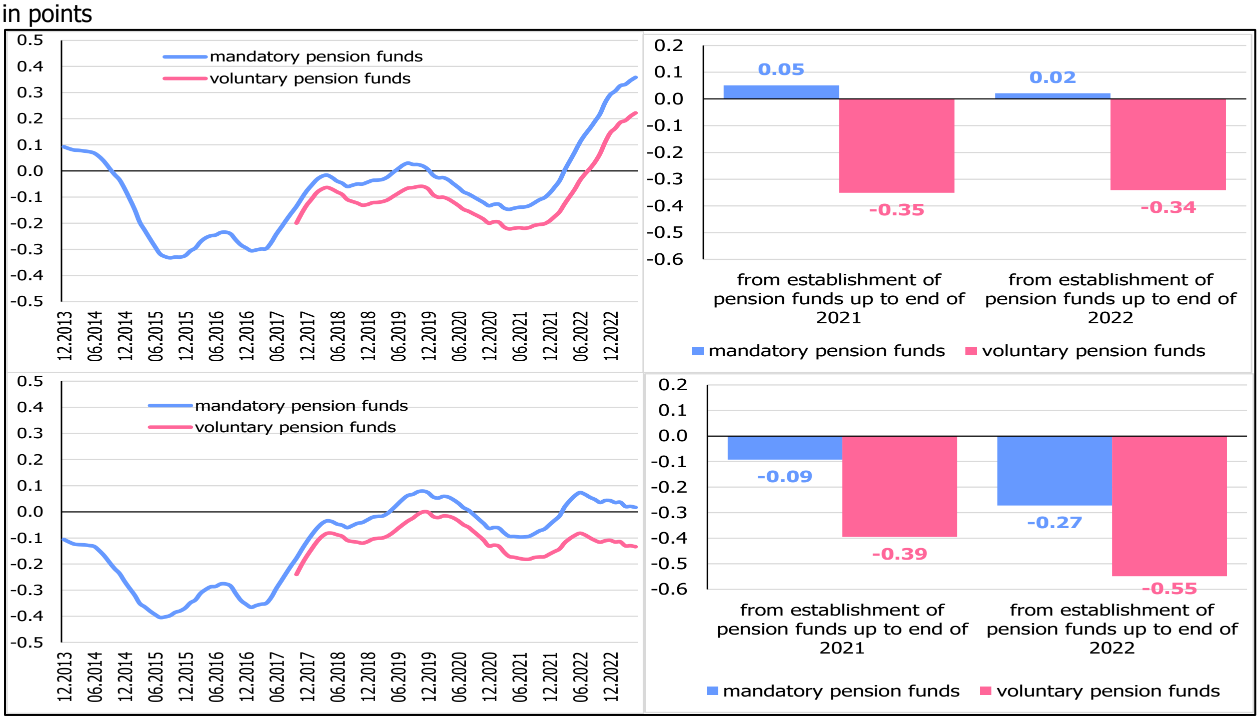
Source: internal National Bank calculations based on MAPAS data. Rates of return used for calculation purposes are expressed in logarithmic format. The calculation is based on weighting the Sharpe ratio of the individual pension funds by their share in the total net assets of the pension funds.

The ex post information indicator[157], as a relative measure of the ratio between risk and return calculated for domestic pension funds based on nominal annual rates of return for the period of the past seven years, shows an improvement in 2022, but is at a relatively low level, indicating a modest contribution of management in obtaining an active return per active risk unit. The improved dynamics of the information indicator for the nominal yield of pension funds in 2022 is due, on the one hand, to the relatively high participation of debt financial instruments in the structure of pension funds' assets and, on the other hand, to the fact that a large part of debt financial instruments are measured at amortized value and consequently, changes in financial market conditions (i.e. market interest rates) are not directly reflected on their accounting value, and therefore not on the dynamics of nominal rates of return. The acceleration of the inflation rate was seen through the deterioration of the information indicator on the real annual rates of return of pension funds. However, the negative effect on pension fund asset management as a result of the market correction in 2022 is smaller compared to the pension companies show slightly better success in managing mandatory pension funds, which is

[157] The ex-post information indicator is a measure of how much the pension funds management brings an average return above the appropriate selected average benchmark per unit of active risk taken when investing the funds. The formula for its calculation is: $IR = \frac{\overline{R_p}-\overline{R_b}}{\widetilde{TE}}$; where $\overline{R_p}$ is the average return on the pension fund, $\overline{R}_b$ is the average return on the adequate benchmark and $\widetilde{TE}$ is the active risk, that is, the tracking error, which is defined as the average standard deviation of the difference between the pension fund's return and the chosen benchmark that the fund's return is expected to track.

reflected in the higher information indicator for them compared to the information indicator for voluntary pension funds.

Chart 100
Dynamics of the information indicator for a trailing 84-month period, calculated on the basis of annual nominal (left, top) and real (left, bottom) rates of return and average weighted information indicator for the period since the establishment of the pension funds until the end of the relevant calendar year, calculated on the basis of monthly nominal (right, top) and real (right, bottom) rates of return, annually
in points



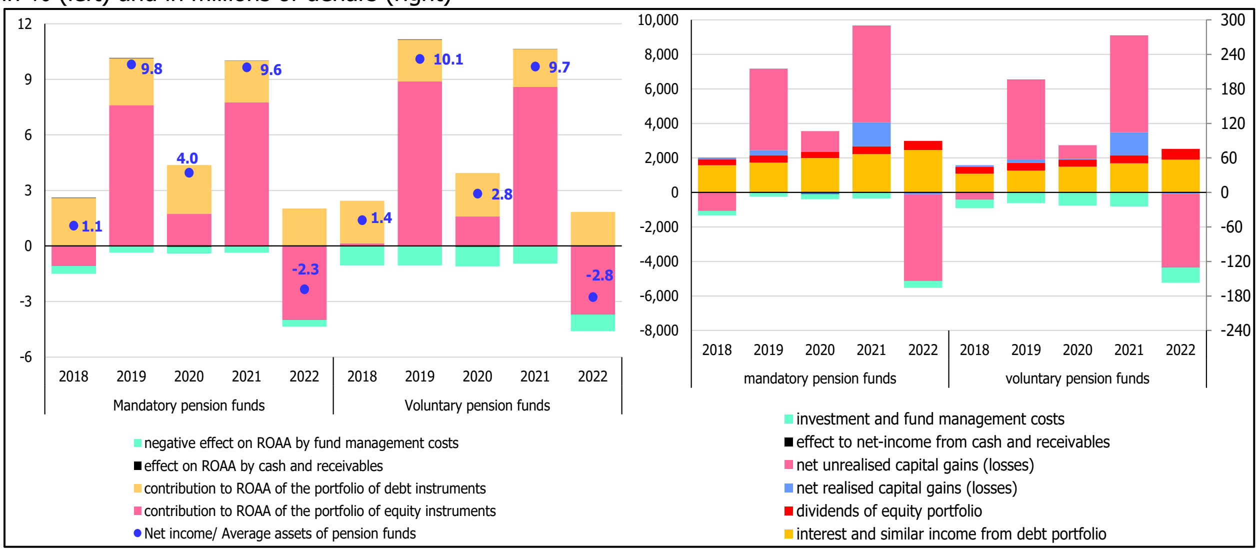
Source: internal National Bank calculations based on MAPAS data. Rates of return used for calculation purposes are presented in logarithmic format. The calculation is based on weighting the information indicator of the individual pension funds with their share in the total net assets of the pension funds. For the purposes of calculating the information indicator of individual funds, a constructed nominal benchmark is used as a combination of 70% of the nominal return of the Bloomberg Global Aggregate total return index value unhedged EUR) and 30% of the nominal yield of the MSCI WORLD EUR index for mandatory pension, i.e. combination of 65% of the nominal yield of the Bloomberg Global Aggregate total return index value unhedged EUR) and 35% of the nominal yield of the MSCI WORLD EUR for voluntary pension funds, whereby the share of the individual indices are an approximate reflection of the achieved strategic allocation of the assets of the pension funds by individual asset classes (currently, but also in the context of historical dynamics).

As a result of the risk materialization on the financial markets in 2022, namely the price corrections on the global markets of equity financial instruments, the domestic pension funds showed a loss in their financial statements for 2022 in the amount of Denar 2,626 million[158] which is happening for the second time since the introduction of the fully funded pension insurance (after 2008). The loss shown practically meant realized negative annual rates of return on average assets of -2.34% and -2.76% for mandatory and voluntary pension funds, respectively. According to individual asset classes, the reason for

[158] The share of the mandatory pension funds in the total amount of the loss in 2022 is 96.9% (or Denar 2,545 million). More details on the structure of the pension funds' financial result are provided in the annexes attached to this Report.

the negative financial result in 2022 accounted for the equity financial instruments, which also have a significantly higher volatility (variability) of the realized rates of return[159]. By financial result components, most of the loss is due to the non-realized capital losses. The indicator of the ratio of the management costs born by the funds[160] with their average assets in 2022 with the mandatory pension funds is at the level of 0.37% and registered no changes compared to the previous year, which practically shows that at a growth of the total assets, the worsened performance of the funds was not followed by improvement in the relative operational efficiency in asset management. On the other hand, with regard to the voluntary pension funds, although this indicator slightly improved in 2022 (from 0.95% in 2021 to 0.91% in 2022), is however significantly higher compared to the mandatory pension funds.

Chart 101
Distribution of the return rate by individual asset classes (left) and components that form the net profit of private pension funds (right)
in % (left) and in millions of denars (right)



Source: Internal calculations of the National Bank, based on data published by MAPAS and data from audited financial statements of mandatory and voluntary pension funds.
Note: the contribution to the formation of the return on assets is calculated in relation to the average assets of the pension funds, which are calculated as an average for a subsequent twelve-month period (so-called TTM trailing twelve months), by using a series of quarterly The effect of the revaluation of financial instruments, recognized by fair value through the other comprehensive income, is not included in the calculation of the return rate. Interest income also includes the effect of depreciation of the discount or premium from debt securities.

The rates of return on the portfolio of equity financial instruments in 2022 equaled -13.08% in the mandatory (25.4% in 2021) and -10.59% in the voluntary pension funds (23.84% in 2021), while in the portfolio of debt instruments they were positive: 3.28% in the mandatory (3.28% in 2020) and 3.25% in the voluntary pension funds (3.6% in 2020). The negative rates of return for

[159] The low volatility of the return on debt financial instruments results from the fact that a large part of them are measured at amortized cost.
[160] The Law on Mandatory Fully Funded Pension Insurance, as well as the Law on Voluntary Fully Funded Pension Insurance, regulate the distribution of costs for investing and managing funds between pension funds and the companies that manage them, that is, they determine which costs are borne by the pension fund. According to the data published in the audited financial statements of pension companies and pension funds, in 2022, of the total costs borne by private pension funds, 88.5% relate to direct management costs for pension companies (89% in 2021), followed by the expenses for property custodians with a share of 8.8% (9.4% in 2021), and the remaining 2.8% are expenses for brokerage commissions, interest and similar other expenses that are on fund burden (1.6% in 2021).

equity financial instruments result from net unrealized capital losses, which mostly result from investments in foreign investment funds, and partly from direct investments in shares[161]. In the portfolio of debt financial instruments, the return mainly derives from interest income, primarily from government securities. Moreover, the rates of return for individual types of financial instruments in 2022 do not show significant differences between mandatory and voluntary pension funds.

Table 6.
Rates of return on more important types of financial instruments in which the private pension funds invest
in %

Rate of return	Mandatory pension funds						Voluntary pension funds					
	2017	2018	2019	2020	2021	2022	2017	2018	2019	2020	2021	2022
domestic treasury securities	4.12	3.95	3.84	3.88	3.43	3.27	3.84	3.97	3.74	3.87	3.27	3.09
deposits at domestic banks	3.04	3.00	2.81	2.78	2.61	2.54	3.06	3.11	3.34	3.14	2.87	2.59
domestic shares	27.36	18.34	27.04	7.17	26.67	-1.66	22.61	21.49	21.87	0.36	18.83	3.91
foreign equty instruments	7.95	-6.03	25.92	6.13	25.28	-14.15	8.14	-6.15	25.98	6.07	25.30	-14.30

Source: internal calculations of the National Bank, based on data published by MAPAS and data from audited financial statements

2.4.3. Exposure of the pension funds to financial risks

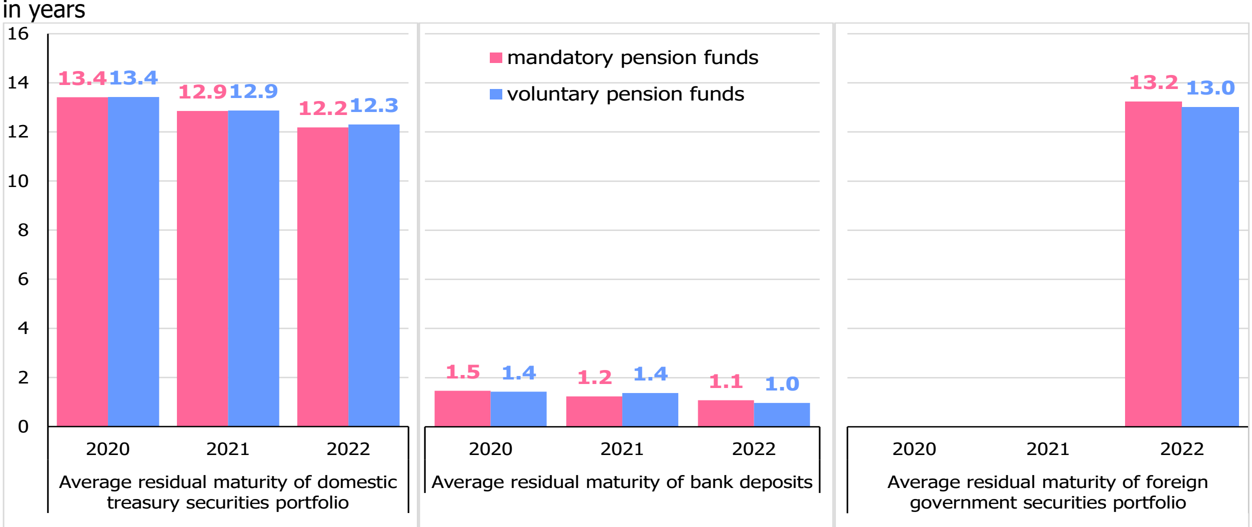
The risk exposure of the pension funds emphasizes the importance of both credit and currency risk, which is still limited due to the implementation of the strategy of fixed exchange rate of the denar in relation to the euro. In conditions of growth of interest rates, the significance of the interest rate risk also increases due to possible losses of the economic value of the portfolio of debt securities resulting from government securities measured at amortized cost[162]. Liquidity risk is currently not a major concern for pension funds given the relatively young membership and the funds collection phase that mandatory pension funds are still in, leading to very small need for liquidity in order to pay pensions[163]. The voluntary pension funds have slightly larger liquidity need[164], which is relatively easily satisfied having in mind that the inflows themselves based on paid contributions from the membership on an annual basis are almost three times higher than the outflows due to the payment of pension fees.

The small need of sources of funds to deal with the liquidity outflows to the membership directly encourages the pension companies to have a relatively high interest risk tolerance, measured through the weighted average maturity of the most important financial instruments that are included in the debt financial instruments portfolio as the closest value to their duration. The weighted average residual maturity of domestic government securities as the single most important component in the portfolio of debt financial instruments at the end of 2022 decreased by approximately seven months for both mandatory and voluntary pension funds. Investments in

[161] More details on the structure of net realized capital gain and net unrealized capital gain by financial instrument can be seen in the annexes attached to this report.
[162] For more details on the sensitivity of the portfolio of debt securities of pension funds to the risk of changes in interest rates, see the attachment at the end of this section.
[163] According to the data of the audited financial statements of the mandatory pension funds, the total cash outflows based on pension payments from the mandatory pension funds in 2022 amounted to Denar 168.7 million (Denar 129.8 million in 2021), which represents 0.16% of average assets in 2022 calculated as a twelve-month moving average (0.13% in 2021).
[164] According to the data from the audited financial statements of the voluntary pension funds, the total cash outflows based on the payment of pension fees in 2022 amounted to Denar 120.7 million (Denar 65.6 million in 2021), which represents 4.1% of average funds in 2022 calculated as a twelve-month moving average (2.6% in 2021).

foreign securities have an even longer residual maturity compared to domestic government securities. The lowest residual maturity and consequently the lowest exposure to the interest rate risk is observed in the pension funds' investments in deposits with domestic banks.

Chart 102
Weighted average residual maturity of the important types of financial instruments within the debt portfolio of the private pension funds
in years



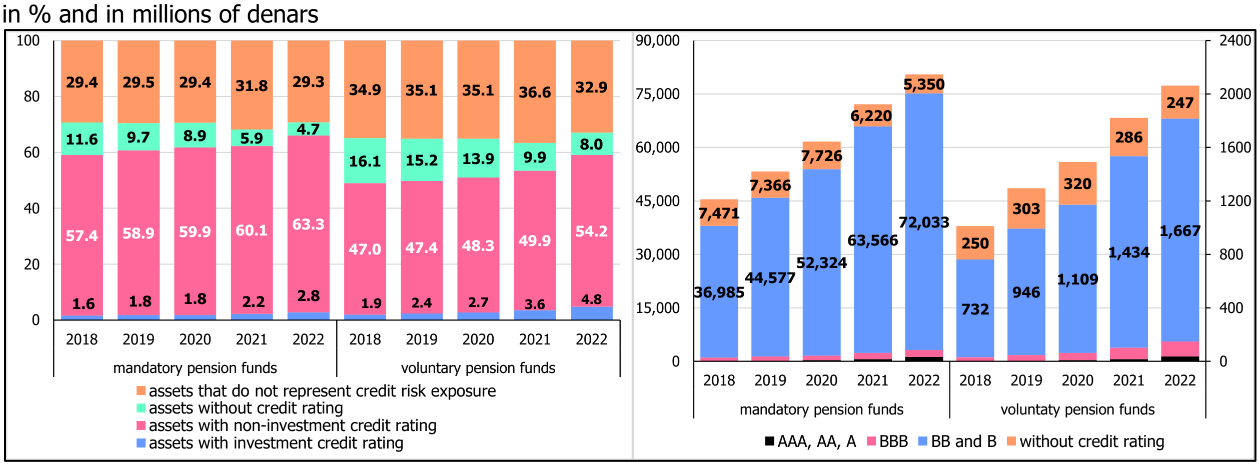
Source: Internal National Bank calculations based on MAPAS data and data from audited financial statements on mandatory and voluntary pension funds.
Note: the calculation of the average maturity is made by weighting the average maturity of the relevant financial instruments of each pension fund with its structural participation in the total investments in the same financial instruments of all pension funds. The calculation of the average maturity of the respective financial instruments for the individual pension fund is made by dividing the individual financial instruments into annual maturity blocks according to the residual contractual years until maturity, after which the value of each maturity block is obtained as an average of the marginal remaining years until the maturity block falls due, is weighted by its share in the total investment in the corresponding financial instrument of the pension fund.

The assets structure of the domestic private pension funds, with the largest share of debt financial instruments, and within their framework, of domestic government securities, highlights the importance of the credit risk the pension funds are exposed to, as well as the spread dynamics which represent the credit risk premium as an important bearer of the future expected return on their assets. **At the end of 2022, over 70% and over 67% of the total assets of the mandatory and voluntary pension funds, respectively, are invested in financial instruments that imply exposure to credit risk. Within such funds, the largest share accounts for the debt financial instruments with a non-investment credit rating, primarily due to investments in domestic government securities**[165]. The share of assets with investment credit rating in the assets structure representing exposure to credit risk increased from 3.2% and 5.6% at the end of 2021 for mandatory and voluntary pension funds, respectively, to 3.9% and 7.2% at the end of 2022. These assets in 2022 are also slightly more diversified, given that in addition to investments in deposits in a domestic bank with a BBB credit rating and

[165] RN Macedonia, as an issuer of securities, has a long-term credit rating of BB+ (with a stable outlook) from the credit rating agency "Fitch" during the last revision of the credit rating dated 14.4.2023 (the report is available at https://finance.gov.mk/wp-content/uploads/2023/04/Fitch-Republic-of-North-Macedonia-2023-04-27.pdf) and a long-term credit rating of BB- (with a stable outlook) from the credit rating agency "Standard & Poor's" at the latest revision of the credit rating from 30.1.2023 (the report is available at: RatingsDirect_NorthMacedonia_2942753_Jan-30-2023.pdf (finance.gov.mk)).

investments in foreign investment funds that invest mostly in debt instruments, a part of them is also due to direct investments of pension funds in foreign government bonds. The annual increase in the relative share of assets with an investment rating in the pension funds' assets representing credit risk exposure was at the expense of a decrease in the share of assets without a credit rating, which at the end of 2022 occupied 6.7% and 12.0% of assets carrying exposure to credit risk in mandatory and voluntary pension funds, respectively (8.6% and 15.7% at the end of 2021). Assets without credit rating mainly derive from the investments in deposits with domestic banks, which, with the exception of one, have not requested a credit rating from internationally active credit rating agencies.

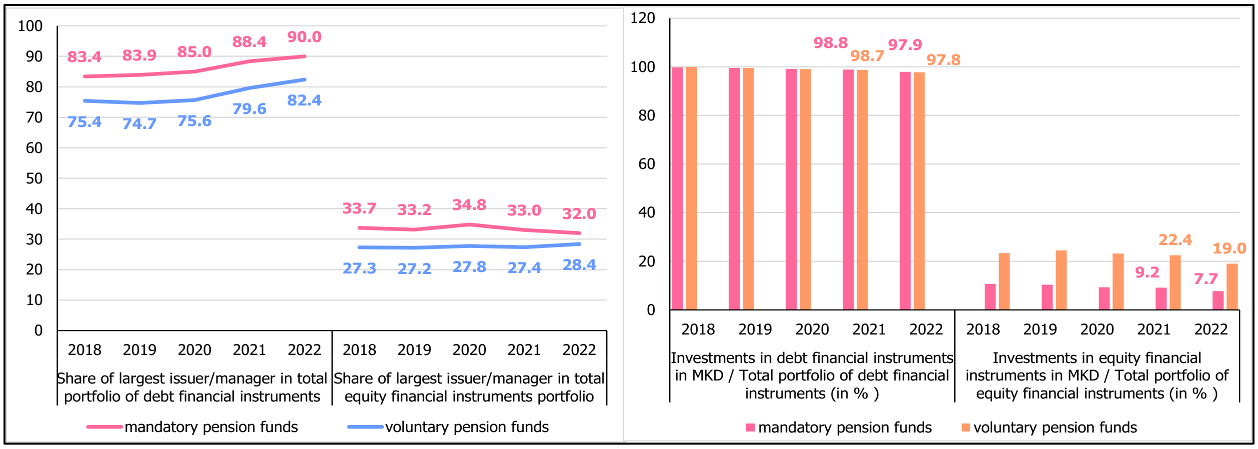
Chart 103
Structure of pension fund assets by credit risk (left) and allocation of pension fund assets that bring credit risk exposure according to the credit rating of the financial instrument issuer (right)
in % and in millions of denars



Source: National Bank calculations based on MAPAS disclosures, audited financial statements of the funds and publicly available data on the credit rating of financial assets issuers.
Note: Equities are assets that do not represent credit risk exposure. All instruments that imply credit risk exposure are classified according to the credit rating of their issuer or creditor obtained by the international credit rating agencies Fitch, Standard & Poor's, or Moody's. If the credit rating assigned by these three agencies differs, an average of the available ratings is taken, with rounding to the lower rating. The determining the credit rating of investments in domestic investment funds that invest in money market instruments and investments in foreign investment funds that invest in debt instruments is based on an approach of identifying the structure of their investments according to the credit rating and appropriate distribution of the total market value of such pension funds' investments in accordance with the structure of these investments of the investment funds according to the credit rating (the so-called look-through approach) in accordance with the latest publicly available data.

The portfolio of debt financial instruments of the domestic private pension funds shows significantly high concentration. The share of debt financial instruments of their largest individual issuer (the Government) is 90% and 82% for mandatory and voluntary pension funds, respectively. Also, the geographical concentration of the portfolio of debt financial instruments is extremely high, that is, over 97% of the investments are in instruments of domestic issuers, with a minimal decrease on an annual basis. The absence of satisfactory diversification of their portfolio of debt financial instruments, actually means that almost the entire portfolio is influenced by identical risk factors, primarily the credit risk of the country, the movement of interest rates in the domestic economy and the inflation expectations. Regardless of the fact that in 2022 the pension funds started investing in foreign government securities as well, whereby the geographic concentration recorded a minimal annual decline, there are still possibilities for further diversification of the debt portfolio and, consequently, further reduction of the concentration.

Chart 104
Concentration by issuer/portfolio managers of debt and equity financial instruments of mandatory and voluntary pension funds (left) and geographic concentration (right)
in %



Source: Internal National Bank calculations based on MAPAS data and data from audited financial statements of the pension funds.

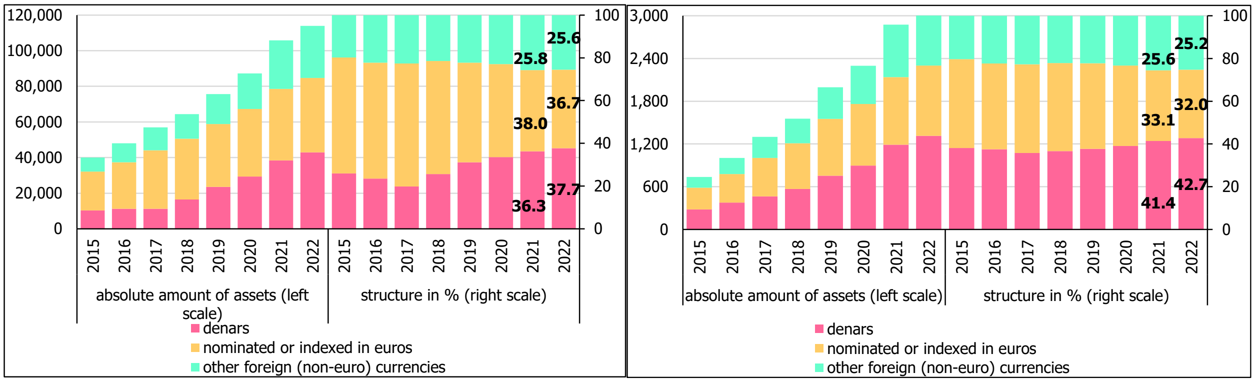
In the portfolio of equity financial instruments, the concentration by issuer/manager of the instrument is lower. Thus, the single largest manager of foreign investment funds traded on the stock exchange, at the end of 2022, participates with 32% and 28.4% of the portfolio of equity financial instruments of the mandatory and voluntary pension funds, respectively. Although compared to the portfolio of debt financial instruments, the geographical concentration is significantly lower in the portfolio of equity financial instruments, the presence of the so-called "home bias", more pronounced in voluntary pension funds[166], which is a specific risk factor that can affect the performance of the portfolio of equity financial instruments, especially if there are divergent movements on the domestic and international capital markets. In the portfolio of equity financial instruments, a higher concentration per individual instrument is observed compared to the portfolio of debt financial instruments. Thus, the participation of the ten individually largest equity instruments in the total portfolio of equity financial instruments of pension funds at the end of 2022 ranges from 50.2% to 97.0%. However, this concentration is mitigated when it is taken into account that the majority of these financial instruments are funds traded on the stock exchange, which within their portfolio have a high degree of diversification of exposure to individual instruments.

The exposure to currency risk of domestic pension funds in 2022 registered a decrease, which is seen through the decline in the share of assets denominated or indexed in foreign currencies in the total assets of pension funds. The share of assets with a currency component in total assets in 2022 decreased by 1.4 and 1.3 percentage points, for mandatory and voluntary pension funds, respectively. However, it should be noted that this reduction in exposure to currency risk results from the fact that market corrections in 2022 were more pronounced in financial markets in developed countries where most of the assets with a currency component of pension funds are invested. Exposure to currency risk is limited due to

[166] Home bias is a significantly higher participation in a certain portfolio of investments in the domestic market, compared to its relative importance within the global market of equity financial instruments. In this case, the investments of the pension funds in the Macedonian capital market are significantly higher with its insignificant participation in the capitalization of the global capital market, thus the portfolio of the pension funds shows a strong bias towards domestic investments.

the strategy of a fixed exchange rate of the denar against the euro, in conditions where more than half of the assets with a currency component are denominated or indexed in euros. Unlike the exposure in euros, in 2022 the exposure in US dollars had a positive effect on the value of the assets of the pension funds due to the strengthening of the US dollar in relation to the euro in 2022[167], and through that indirectly also in relation to the Macedonian denar.

Chart 105
Exposure of domestic mandatory (left) and voluntary (right) pension funds to currency risk.
in millions of denars and in %



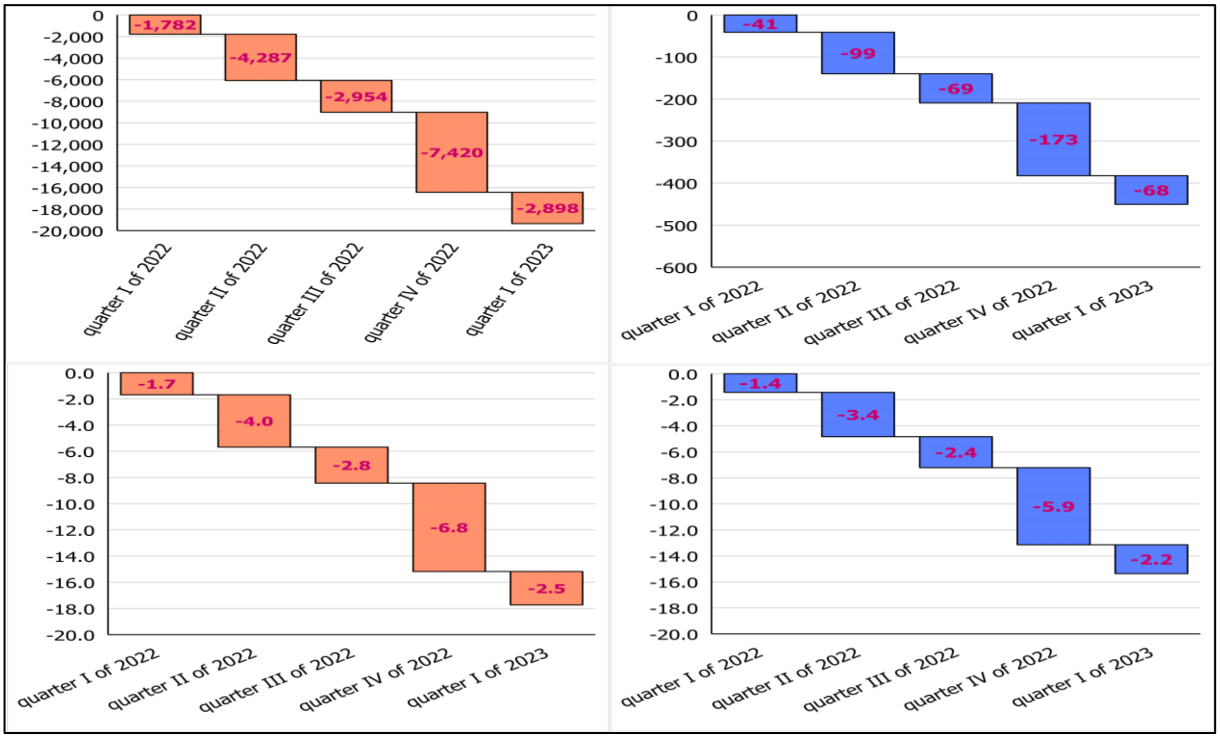
Source: Internal National Bank calculations based on regular periodic data disclosures by pension companies.

[167] The exchange rate of the US dollar against the euro, and practically due to the maintenance of a de facto fixed exchange rate in relation to the Macedonian denar, at the end of 2022 compared to the end of 2021 appreciates by about 6%.

Analysis of the sensitivity of the pension funds' debt securities portfolio to interest rate risk

In 2022, in conditions of monetary policy tightening in the global and domestic economy, there was an increase in interest rates in the financial markets and an adjustment in the yields of government securities. **The upward movement of the market yields emphasizes the exposure of the domestic pension funds to interest rate risk.** Exposure to interest rate risk is not perceived through immediate changes in the value of debt financial instruments or in the dynamics of nominal rates of return, since the majority of debt financial instruments (regardless of their accounting classification) are essentially measured at amortized cost value[168]. In order to assess the sensitivity of the portfolio of debt securities to interest rate risk, an estimate was made of the approximate change in the economic value[169] of the portfolio of debt securities[170], primarily long-term government bonds. Calculations show that the approximate aggregate annual loss of the economic value of the debt securities portfolio equals 14.4% and 12.4% of the assets of the mandatory and voluntary pension funds at the end of 2022, respectively. Practically, this would be the projected annual reduction of pension funds' assets if their debt securities portfolio were measured at fair value instead of amortized cost value. The reason for the appearance of such a loss in the economic value of the debt securities portfolio, primarily stems from the fact that the pension companies, in order to achieve better returns, and at low interest rates that prevailed at the global and domestic level, implemented an investment strategy for the pension funds' assets by investing them in bonds with relatively long contractual maturities (ten-year, fifteen-year, and even thirty-year domestic government securities), which at the time of their issuance, observed in a historical context, carried relatively low coupon rates. Such an economic loss can become an accounting loss only if the securities are sold before their contractual residual maturity date. Given that pension funds do not have significant expected liquidity outflows, it is likely that they will not realize this economic loss through sales of securities (i.e. it is unlikely to become an accounting loss), but there is a risk that the loss of economic value will remain in the portfolio of pension funds in the following years as well, if the yields of the newly issued securities in the next period remain higher than the yields of the already acquired government securities in the pension funds' portfolios.

Chart 1.
Aggregated absolute amount of the loss of the economic value of the debt securities portfolio due to an increase in interest rates (top) and its relative importance as % of assets at the end of the previous quarter (bottom), for private mandatory (left) and voluntary (right)) pension funds, by quarters
in millions of denars and in %



Source: internal National Bank calculations based on data submitted by MAPAS.

Note: the loss of the economic value of the debt securities portfolio for each quarter is calculated based on the net weighted position of individual pension funds in debt securities at

[168] In accordance with international financial reporting standards, debt financial instruments can be measured at amortized purchase value or at fair value by applying their market price as a basic input element in determining the fair value or based on an appropriately applied theoretical model for their evaluation. In accordance with the MAPAS Rules for the assessment of the assets of the mandatory and voluntary funds (Official Gazette of RN Macedonia no. 138/2008, 55/2013, 218/2018, 41/2019 and 250/2019), if the fair value of debt securities cannot be determined by using the market price as an input element due to the absence of an active market or if the instrument has not been traded in a period longer than 30 days prior to the evaluation date, then they are evaluated according to the effective interest amortization method rate or according to the straight-line depreciation method applied to the last determined fair value. Considering that the domestic government securities either do not have an active market or even when there was trading, it is not on a regular basis, practically a large part of the portfolio of debt financial instruments owned by the pension funds, regardless of the classification in the financial statements should to be measured at fair value, they are actually measured at amortized cost and consequently, changes in market interest rates are not directly reflected in their evaluation.

[169] The economic value of the portfolio of debt securities is calculated on the basis of the net position of the pension funds in debt securities, their allocation by maturity blocks according to the residual maturity and weighting of each maturity block with an appropriate weight which is obtained as a product of the attained change in interest rates and the estimated modified duration of each maturity block. The realized increase in interest rates on the primary market of government securities is an average of the quarterly increase in coupon interest rates on government securities that were subject to issuance during 2022, namely: domestic denar treasury bills with a contractual maturity of 1 year, denar government bonds with a contractual maturity of 15 years and government bonds in denars with an euro clause with a contractual maturity of 15 years. When interest rates rise, the economic value is negative, which means a loss of economic value due to the change in interest rates. The maturity blocks and their estimated modified duration are taken from table 1 of the Decision on managing interest rate risk in the portfolio of non-bank activities (Official Gazette of the Republic of Macedonia no. 163/08 and 144/09).

[170] As of 31.12.2022, the debt securities form 91.2% and 84.8% of the portfolio of debt financial instruments of the mandatory and voluntary pension funds, respectively.

the end of the previous quarter and based on the increase in interest rates on the primary market at the time of issuance of government securities in the respective quarter to which the calculation refers. The aggregated loss of the economic value for all pension funds is the sum of the losses of the economic value of the individual pension funds. The relative loss volume of the economic value as a percentage of total assets is obtained as a weighted average of this ratio for individual pension funds, with the share of each pension fund in the total assets being used as a weight.

The exposure to the interest rate risk remained relatively high even at the end of 2022. The sensitivity analysis shows that the pension funds' net position in debt securities under a simulation of a 100 basis point change in interest rates would create a change in economic value of about 5.09% and 4.43% for mandatory and voluntary pension funds, respectively. To illustrate, in the first quarter of 2023, coupon interest rates in the primary market of domestic government securities, regardless of their contractual maturity or currency characteristics, rose by 0.5 percentage points.

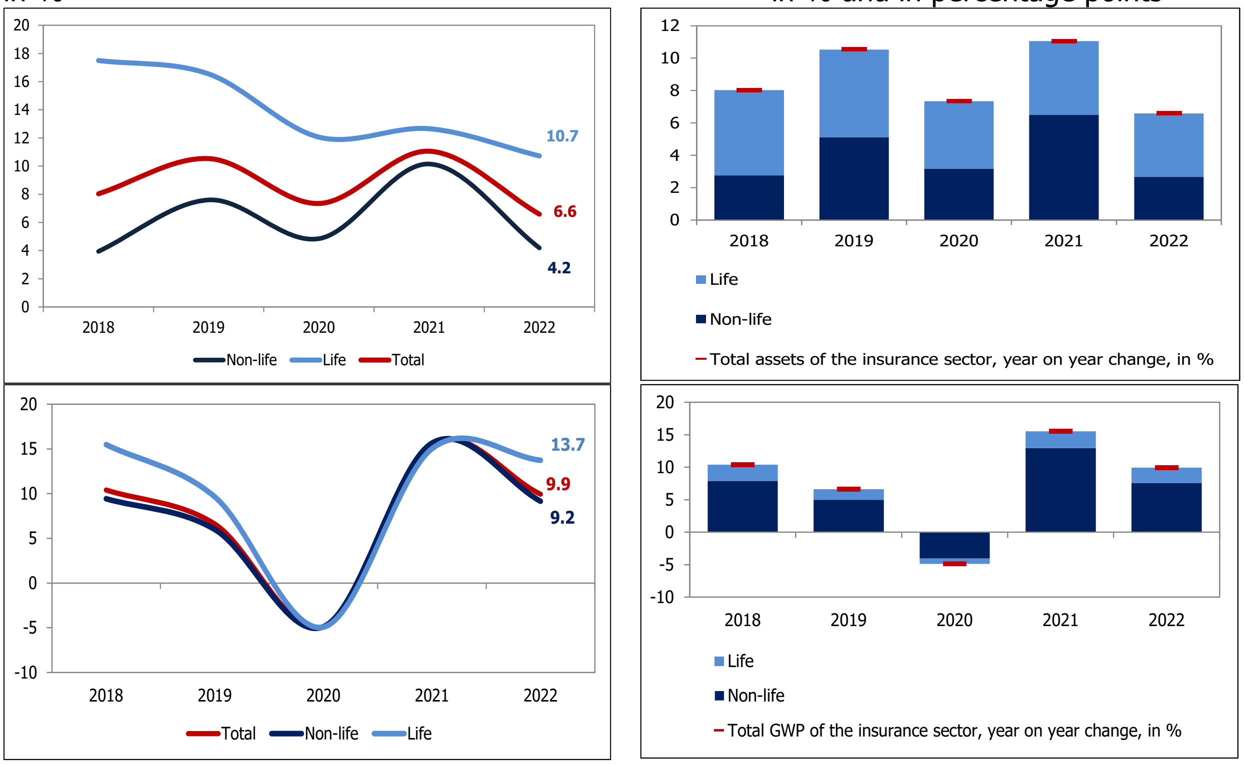
2.5. Insurance sector[171]

The insurance sector continues to grow in 2022, supported by both insurance segments. At the same time, it improved the results of the operation and maintained the solvency at an appropriate level. This was achieved in conditions of prolonged uncertainty from the environment, with higher inflation and growth in interest rates, which for the time being does not have a significant impact on the stability of the insurance sector. The insurance sector is not directly exposed to the risks that have emerged in global financial markets since the beginning of 2023, driven by developments in the US and Swiss banking systems. The activities of the insurance sector are mainly focused on the domestic market, which refers to both concluded insurance contracts and investments. Investments of insurance companies are still mainly in domestic government bonds and deposits in domestic banks, while investments in foreign financial instruments are insignificant and occupy less than 1% of the total assets of the insurance sector. This investment structure contributes to the sector stability as it protects the insurance companies against risks arising from financial market volatility. On the other hand, it emphasizes the concentration risk whereby the government sector and the domestic banking sector are crucial for the stability of the insurance sector. The government securities' portfolio is sensitive to interest rate risk, considering that the fair (market) value of government securities decreases with the rise in interest rates. However, higher interest rates are also an opportunity for insurance companies to achieve a higher return on investment through new investments, which would have a positive impact on the sector's profitability. Although the profitability of the insurance sector improved significantly in 2022, it is still under the pressure of low cost efficiency, which is a structural limitation of the sector and is an important challenge for operations in the next period as well. An additional risk factor is inflation, which, although it has been decreasing since the beginning of 2023, is still at a higher level, and it can affect the operation of the insurance sector through increased costs for claims and possibly worsened availability of insurance. In the long term, the insurance sector is exposed to risks related to climate change and digital security.

In 2022, the insurance sector grew by 9.9%, which is a continuation of the growth from the previous year when the total GWP[172] on an annual basis increased by 15.5%. Such movements are a confirmation of the sustainable recovery of the insurance sector from the pandemic, which is also resilient to new environmental challenges related to the war in Ukraine, higher inflation and the growth of interest rates. Non-life insurance still prevails in the structure of the insurance sector and in 2022 recorded an annual growth of GWP of 9.2%. In life insurance, GWP increased by 13.7% annually, continuing the trend of accelerated growth rates (which was temporarily interrupted by the pandemic) and further increasing the importance of life insurance to the domestic insurance market[173].

[171] The analysis of the insurance sector is in accordance with the data submitted by the Insurance Supervision Agency of the RNM in May 2023.
[172] Gross written premium.
[173]The domestic insurance sector consists of two segments - life and non-life insurance. The sector structure is traditionally dominated by non-life insurance with a share in total assets and total GWP of the sector of 62% and 82.2%, respectively in 2022. However, the growth of life insurance has been continuously increasing the share of this segment and in 2022 it accounts for 38% of total assets and 17.8% of total GWP, compared to 32.8% and 16.8%, as was the share in total assets and total GWP, respectively, in 2018.

Chart 106
Annual growth rates and contribution to the annual growth of assets (up) and GWP (down) of the insurance sector
in % | in % and in percentage points



Source: National Bank, based on data from the Insurance Supervision Agency

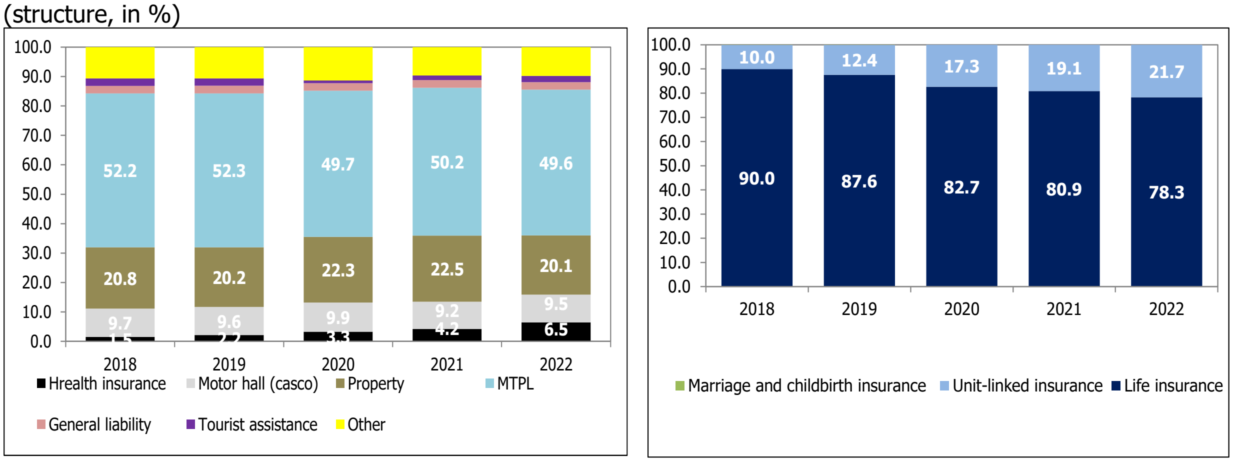
Within non-life insurance, there continues to be an upswing in health insurance sales, a trend that began at the outbreak of the pandemic. Investment in health insurance have more than tripled in the last three years, reaching 6.5% of total investment in non-life insurance in 2022, compared to 2.2% in the pre-pandemic 2019. Travel insurance further increased as well, same as the sales of credit insurance, which is still the lowest class of insurance. Property insurance continues to be the most represented class of voluntary insurance, although in 2022 it saw a slight decline in sales, after high growth in the previous year. The compulsory third-party liability car insurance (AO) has the largest share in total sale of non-life insurance policies which continued to increase in 2022. **The life insurance segment continues its rapid grow** after the record high in the previous year when there was the highest increase in the number of concluded policies since the life insurance market was established in 2005. New investments in life insurance policies continued to be largely focused on classic life insurance, which includes "riziko" insurance and insurance with a savings component. This growth is largely due to tying up the "riziko" insurance with bank loans[174], with the bancassurance registering further growth as a sales channel for life insurance policies. At the same time, the growth of unit linked[175] insurance

[174] "Riziko" is a special type of life insurance that covers risk only in the event of death for the duration of the insurance, is not saving in nature and is without profit payment. This means that in the event of death of an insured who is the beneficiary of a bank loan, the insured amount is paid to the beneficiary of the insurance. However, if the risk does not occur before the expiry of the insurance policy, all the invested funds are retained by the insurance company that assumed the risk of paying funds in the event of death of the insured.

[175] Unit linked insurance is a life insurance product with an investment component, where funds are invested in units of investment funds, and the investment risk is borne by the insured.

strengthened, which in 2022 contributed with 40.3% to the growth of the total BPP of life insurance. With the constant growth of unit linked insurance, which was not interrupted during the pandemic, the share of this insurance class in 2022 reached 21.7% of the total BPP of life insurance, which is more than doubling compared to five years ago (10% in 2018). While the unit linked insurance is a product with a high potential for fertilization of invested assets, it also contains risk of loss from financial market volatility, which affects the value of investments. For greater protection of insurers and other insurance users, at the end of 2022, the competent regulator (Insurance Supervision Agency-ISA) adopted a Life Insurance Regulation on investment fund units when an insured takes investment risk, that strengthens the provisions which apply to informing the insured users of this type of insurance product and generally, increases transparency when investing in unit linked life insurance. This helps the insured to make informed decision concerning financial investments, which is an important prerequisite for responsible investment and risk management in all circumstances, especially in the current context of high global uncertainty and financial market volatility.

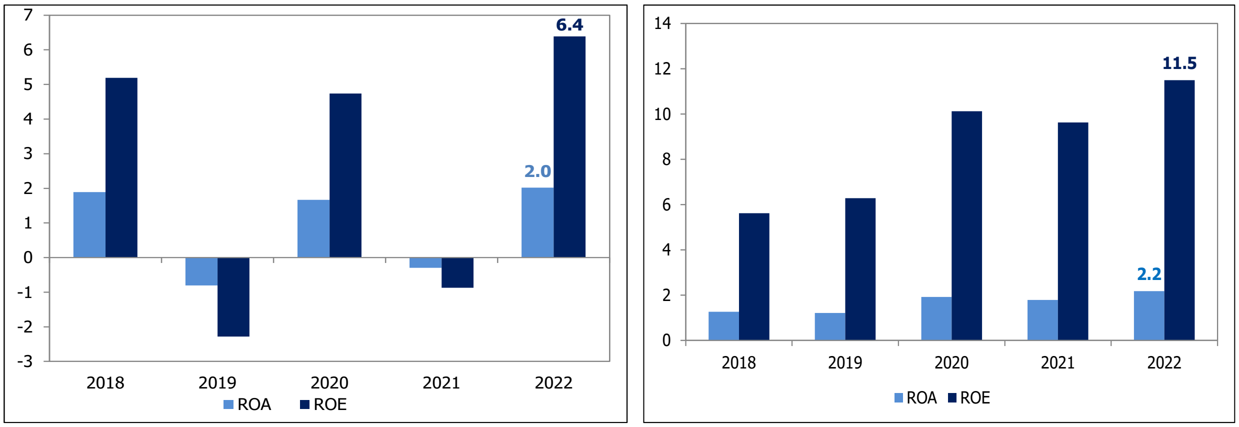
Chart 107
Gross written premiums, by non-life (left) and life (right) insurance classes
(structure, in %)



Source: National Bank, based on data from the Insurance Supervision Agency

In 2022, the insurance sector profitability improved, with both market segments registering the highest performance in the last five years. After the loss in the previous year, the non-life insurance segment in 2022 reported a positive rate of return on assets of 2% (-0.3% in the previous year), while the rate of return on equity was 6.4% (-0.9% in the previous year). **The life insurance segment continued to operate at a profit** and registered rates of return on assets and equity of 2.2% and 11.5% respectively, which is an improvement compared to the previous year (1.8% and 9.6%, respectively in 2021).

Chart 108
Profitability indicators of the domestic insurance sector
in %
Non-life
Life

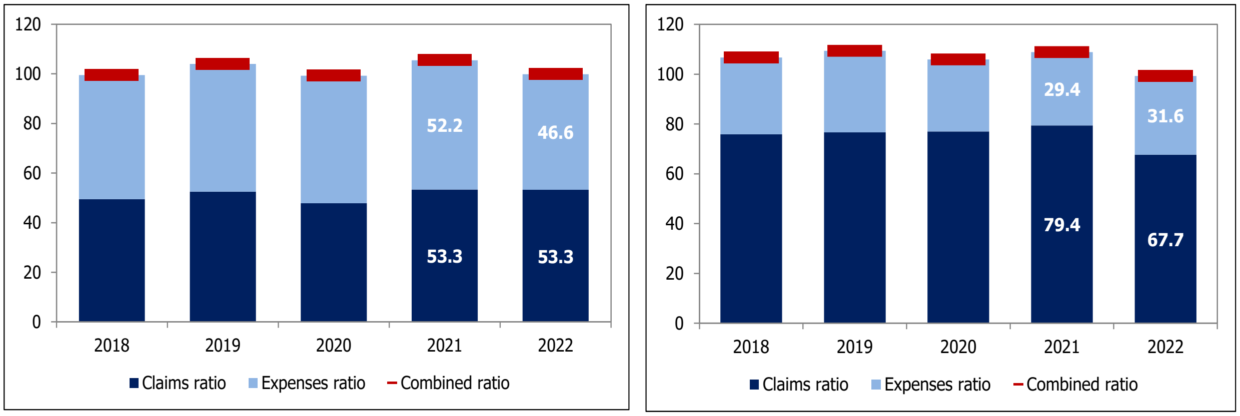


Source: National Bank, based on data from the Insurance Supervision Agency

In the non-life insurance segment, the reasons for profitability improvement are mainly on the income side of the profit and loss account, namely high growth in net premium income. **The growth of gross liquidated claims slowed down** which altogether contributed to keeping the ratio of claims[176] in non-life insurance stable at 53.3%. The slowdown in claims growth mainly stems from the largest insurance class, third-party liability car insurance, whose claims growth is more than twice as low compared to the previous year. On the other hand, the rapid growth of health insurance during the pandemic was seen in the increased costs of claims, which in 2022 have doubled on an annual basis, after having previously more than tripled in 2021. This is due to the high utilization of the product by the insured, amid increased private health care service prices, where some insurance companies do not rule out the possibility of streamlining of this type of insurance in the coming period[177]. **In the life insurance segment, claims growth also slowed down,** with the claims ratio declining from 79.4% in 2021 to 67.7% in 2022. In the structure of gross liquidated claims, the share of paid claims based on classic life insurance is still the largest, although with the growth of unit linked insurance, the share of paid compensations on this basis has been increasing in the last three years.

[176] The claims coefficient is calculated as the ratio between damages inflicted in the period and net - premium written.
[177] Source: Соопштение на АСО

Chart 109
Technical ratios of the domestic insurance sector
in %
Non-life Life

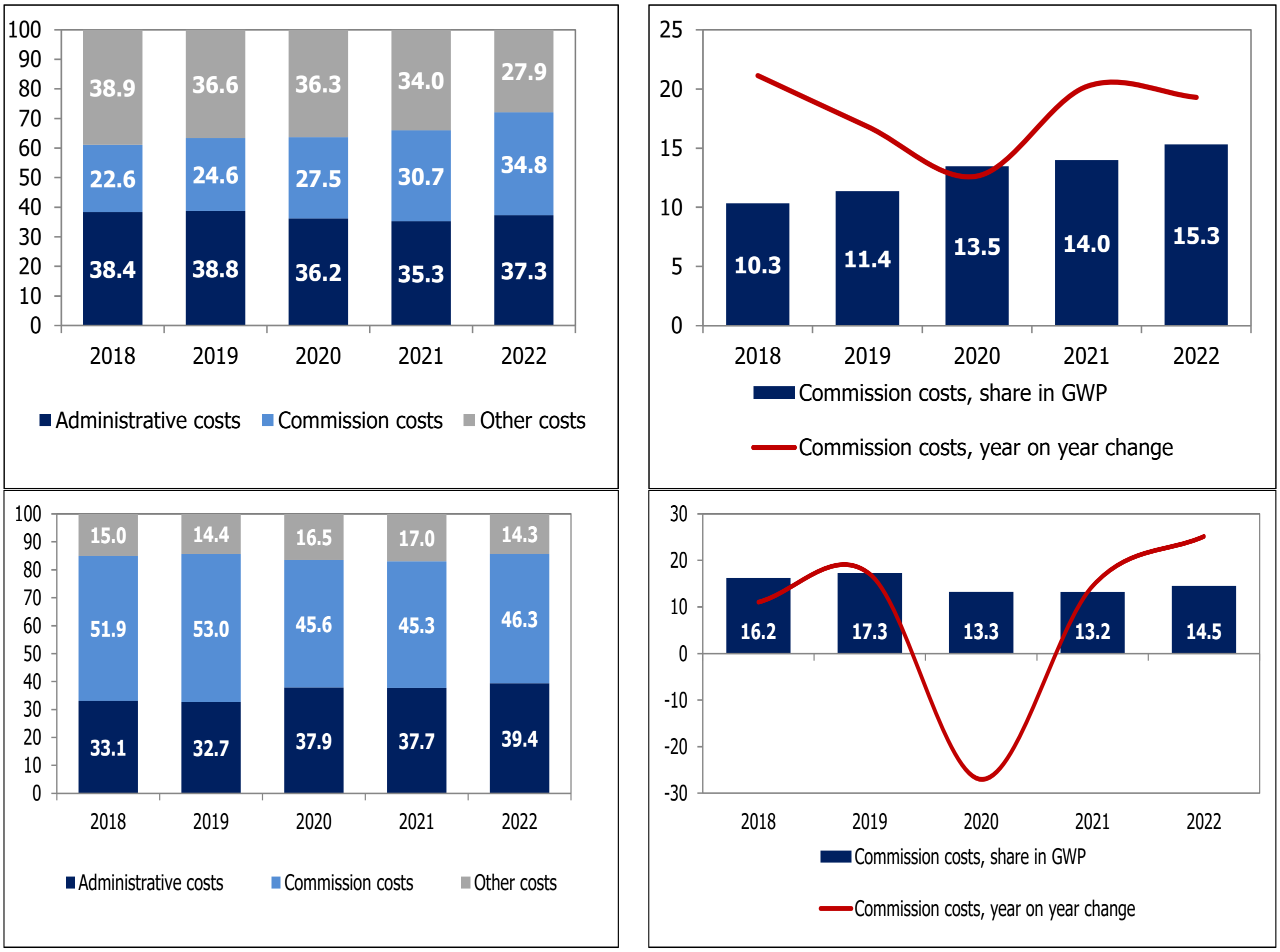


Source: National Bank, based on data from the Insurance Supervision Agency

During 2022, the non-life insurance segment improved operational efficiency, which is the first such development in the last five years. The cost ratio[178] decreased to 46.6% from 52.2% in the previous year, **which is still due to the high growth of net premium, when operating costs continue to grow.** Within their framework, the growth of commission costs is again high and in 2022, they reached 15.3% of the total BPP non-life insurance (14% in the previous year). Administrative costs also grew, thus increasing the total costs for implementing the insurance on an annual basis by 5.3% (7.5% in the previous year). **Within life insurance,** commission costs -to- total BPP reached 14.5% in 2022 (share of 13.2% in the previous year), and administrative costs also grew (by 27.9%). This contributed to an **increase in the cost ratio** of life insurance to 31.6% in 2022, against 29.4% in the previous year. In accordance with these trends, **low cost efficiency is still a structural weakness of the domestic insurance sector and it is important to improve it in the future to ensure sustainable profitability of the sector in the medium and long term.** This is even more striking with the current surrounding environmental risks, amid protracted geopolitical uncertainty and inflation that is still high yet declining, which, if continued, may affect the insurance sector capacity to generate operating profit.

[178]The cost ratio is the ratio between insurance implementation cost and net premium. The combined ratio represents the sum of the cost ratio and the claims ratio.

Chart 110
Structure of administrative costs and insurance implementation costs (left) and commission costs (right) of non-life insurance (top) and life insurance (bottom)
in % in %



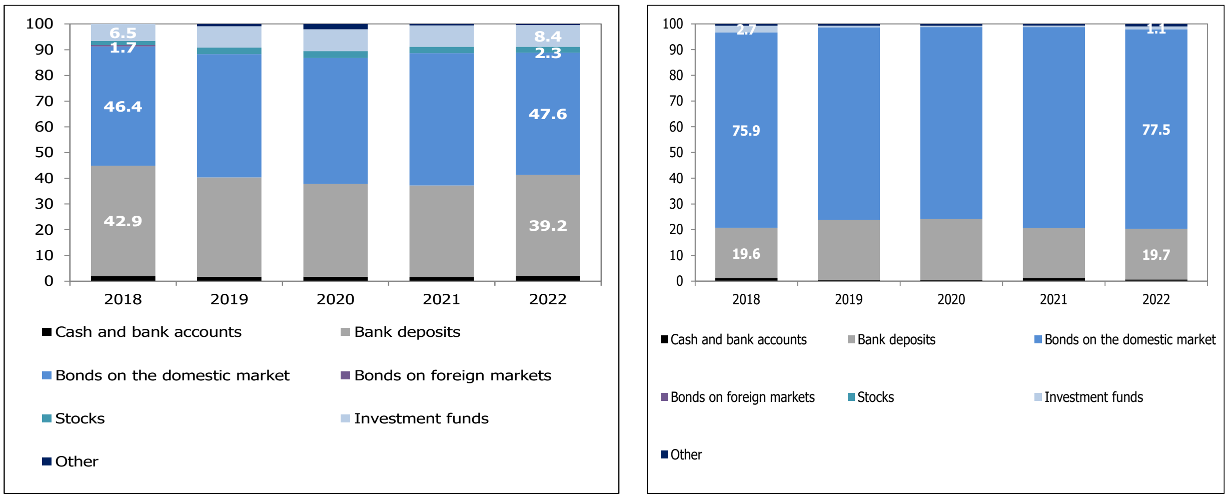
Source: National Bank, based on data from the Insurance Supervision Agency

Protracted uncertainty and higher inflation pose challenges to the profitability of both insurance segments. The non-life insurance segment is exposed to risk of growth in claims costs, which may be higher than expected, which the companies took into account when forming technical reserves. At the same time, pressures on the income side are possible with the reduction in demand and rise in the number of terminated insurance policies, provided that the higher inflation limits disposable income and worsens insurance affordability. These risks are perhaps more pronounced in the life insurance segment, given its savings and investment nature. An additional factor is the growth of interest rates, which may encourage some of the insured to terminate or redeem their life insurance policies and to reinvest funds in new policies or higher yield instruments. Financial market uncertainty and potential volatility may affect interest in unit linked products. The 2022 data show a doubling of the number of terminated and redeemed life insurance policies, so that the rate of terminated and redeemed life insurance policies climbed to 26.8% of the total number of concluded insurance policies[179] (13.7% in the previous year). In

[179] The higher rate of terminated and redeemed insurance policies is partly due to the possibility for an early redemption of life insurance policies, where the purchase value of the policy is paid to the insured person.

the non-life insurance segment, the growth of terminated policies was more moderate (11.3%), so the rate of terminated policies still ranged around the level of previous years and equaled 0.5% of the total number of concluded insurance policies. **In the long term, and globally, the domestic insurance sector is also exposed to structural vulnerabilities arising from climate change and digital security as additional challenges to the profitability of this sector.**

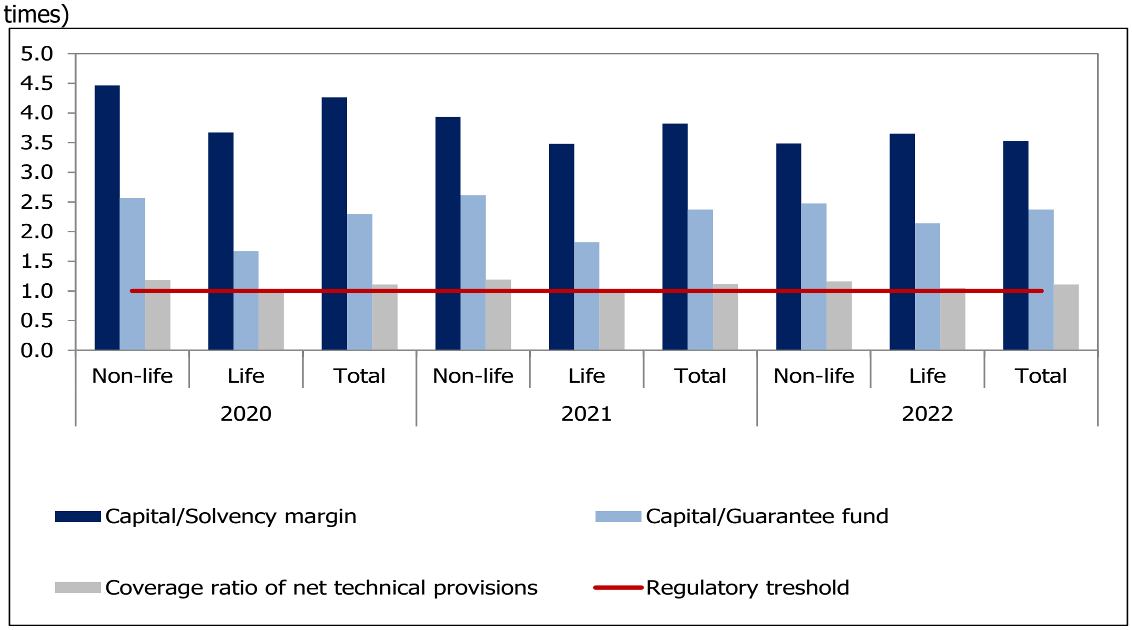
Chart 111
Investment of technical and mathematical provisions
(structure in %)
Non-life
Life



Source: National Bank, based on data from the Insurance Supervision Agency

The growth of interest rates is basically a positive risk factor for the resilience of insurance companies in the medium term. This results from the possibility for higher return on investment through new investment, compared to the previous period, which can contribute positively to the profitability and ultimately to the insurance sector solvency. **However, due to the current investment structure, insurance companies are sensitive to interest rate risk.** Insurance companies mostly invest in domestic government securities and bank deposits, which together make up 86.8% of total non-life insurance investment, i.e. 97.2% of life insurance investment. The portfolio is particularly concentrated in life insurance companies, where domestic government securities account for 77.5% of total investments. In the non-life insurance companies, this share is 47.6%. This conservative approach of investing by insurance companies in less risky instruments contributes to the sector stability, as it provides protection against the risks associated with the financial markets volatility. On the other hand, the high concentration of investments in government securities exposes insurance companies to interest rate risk, considering that the fair (market) value of government securities decreases with the rise in interest rates. This would entail capital losses for insurance companies in case of sale of government securities. The exposure to international financial markets is very low, with the share of investment in foreign financial instruments of 2.2% among non-life insurance companies, while life insurance companies have almost no investment in foreign financial instruments.

Chart 112
Coverage ratios of insurance companies solvency margin and technical provisions requirements
(in times)



Source: National Bank, based on data from the Insurance Supervision Agency

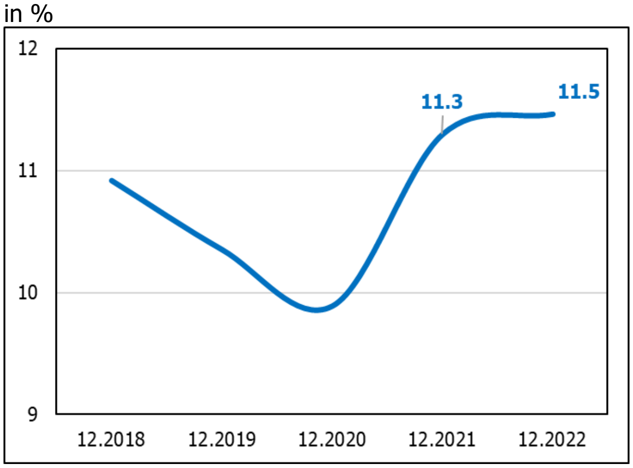
The insurance sector solvency remains at an appropriate level, exceeding by multiple times the minimum requirement. As of the end of 2022, the insurance sector capital exceeded the solvency margin by 3.5 times in non-life insurance and by 3.7 times in life insurance. Insurance companies also maintain adequate coverage of the guarantee fund[180] with capital and net technical provisions by investing in permitted asset categories. The insurance sector capitalization and solvency levels underlie its stability and shock resistance, emphasizing the importance of maintaining a sound solvent position in the period ahead. Hence, it is especially important to harmonize the domestic legislation with the European Solvency Directive 2 as soon as possible, which will contribute to improving risk management and further strengthening of solvency of the domestic insurance sector.

[180] Pursuant to Article 77 of the Law on Insurance Supervision, the guarantee fund consists of items included in the calculation of the insurance company capital, which consists of Tier I and Tier II capital, calculated in accordance with the Law. The guarantee fund must not be lower than one third of the solvency margin requirement, calculated in accordance with the Law. In addition to this provision, the insurance company guarantee fund minimum requirement is set between Euro 2 and Euro 4.5 million, depending on the class of insurance and the scope of activities performed by the company.

2.6. Financial leasing

Leasing sector plays a minor role, and has little significance for the domestic financial system[181]. It does not represent an important channel for risk spillover to other financial system segments, both for its small volume and weak connection with other financial system segments. In 2022, the assets of leasing companies continued to increase at a faster pace compared to the previous year. The credit risk is the most significant risk to these companies, while most credit risk indicators improved in 2022. The liquidity risk exposure ratios and the capitalization ratio (equity and reserves to total assets ratio) have also improved. Leasing companies have a short currency position, whose level against equity and reserves is significant and almost all lease agreements are in denars with a foreign exchange clause, which underlines the importance of the policy of *de facto* peg of the denar against the euro for the stability of these institutions (both for maintaining the stock of companies' liabilities and for the exposure of lease companies' clients to currency risk). The leasing companies' profitability ratios improved in 2022.

Chart 113
Equity and reserves to total assets ratio
in %



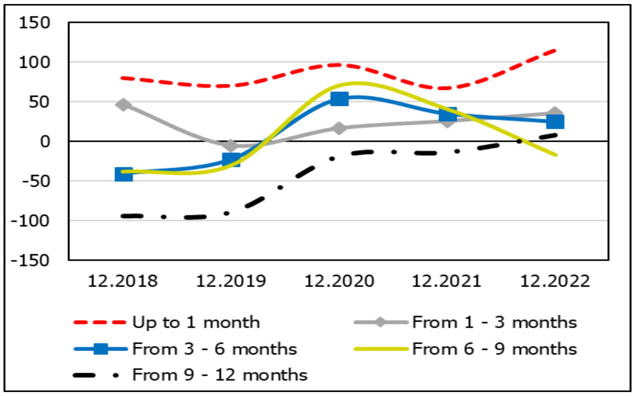
Source: National Bank calculations, based on data submitted by the Ministry of Finance

Capitalization ratio[182] of leasing companies, as equity and reserves to total assets ratio, slightly increased (by 0.2 percentage points) compared to 2021. The growth of this indicator mainly stems from the faster relative growth of equity and reserves (23.5%) compared to the growth of assets (21.8%).

Liquidity risk exposure ratios considerably improved in 2022. Analyzed by contractual original maturity, assets with original maturity of up to one year exceed liabilities with an original maturity of up to one year, by more than three times, in contrast to 2021, when liabilities exceeded assets with original maturity of up to one year. This change in short-term assets to short-term liabilities ratio results from the maturity transformation of liabilities (liabilities with original maturity of up to one year decreased by Denar 1,621 million, or by 75.3%, while liabilities with original maturity of over one year increased by as much as Denar 2,877 million or 83.9%). The decrease in short-term liabilities mostly results from liabilities to connected entities, whose share in total

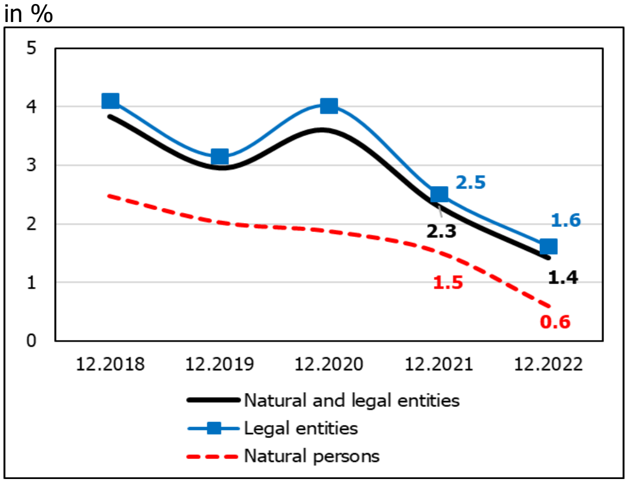
[181] For more details, see Financial System Structure, herein.
[182] There is no special regulations that bind leasing companies to maintain certain capitalization or solvency rate, but only a regulatory requirement for a minimum amount of share capital for incorporation of a financial lease provider of Denar 6 million (the share capital of a leasing company may not fall below this amount).

Chart 114
Financial asset/liability gap to total financial assets, by maturity bucket, according to the contractual residual maturity
In %



Source: National Bank calculations, based on data submitted by the Ministry of Finance

Chart 115
Value of active lease agreements with clients uncollected for longer than 90 days from the due date to total value of active lease agreements
in %



Source: National Bank calculations, based on data submitted by the Ministry of Finance

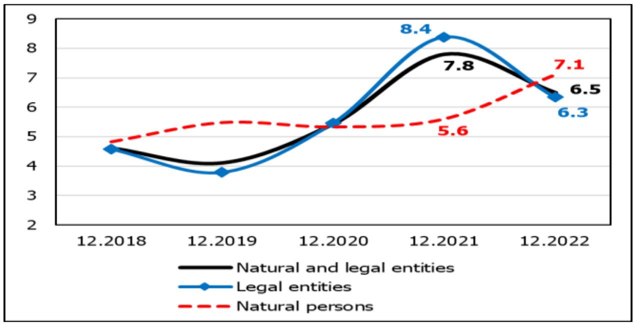
liabilities was reduced to 53.1% (from 77.9% in the previous year), while the growth of long-term liabilities stems from other foreign financial institutions, whose share in total liabilities recorded a significant growth of 25.8 percentage points, to 37.3% (11.5% in 2021). Liabilities to domestic banks are still less represented (4.9% of total liabilities). Having in mind that around 75% of the leasing companies' assets are claims on customers, the liquidity of these companies is largely conditioned by the success in claim collection i.e. their quality.

Leasing sector's indicators of exposure to credit risk have improved. Value of active lease agreements payable with a delay longer than 90 days to total value of all active lease agreements is low and in 2022 decreased by additional 0.9 percentage points to 1.4%. This results from the increase in value of active lease agreements (by Denar 1,563 million, or by 16.9%), amid simultaneous decrease in the value of active lease agreements payable with a delay of more than 90 days (by Denar 59 million or by 27.7%). Claim quality, as a ratio between canceled[183] lease agreements in the current year to the value of active lease agreements at the end of the previous year **also improved**[184]**,** mostly due to the legal entities - leasing beneficiaries. The impairment cost of lease agreements is lower compared to the previous year, which consequently reduced the share of this cost in the total financial result of the leasing sector (from 11.8% in 2021 to 11.0% in 2022).

Leasing companies are exposed to currency risk, due to the gap between

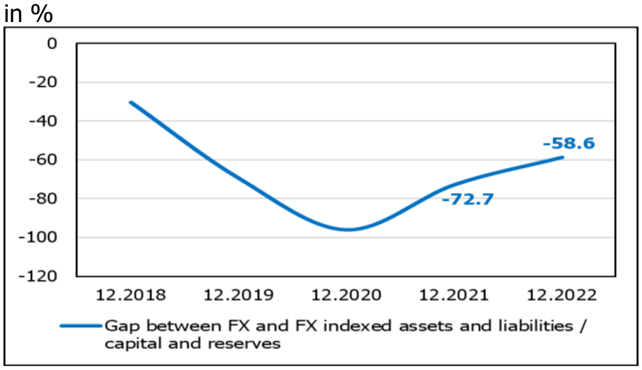
[183]About 77% of the value of canceled lease agreements results from agreements concluded with legal entities.
[184]In 2022, this indicator equaled 6.5% which is by 1.3 percentage points lower compared to 2021, when it was 7.8%

Chart 116
Value of canceled lease agreements in the current year to value of active lease agreements at the end of the previous year
in %



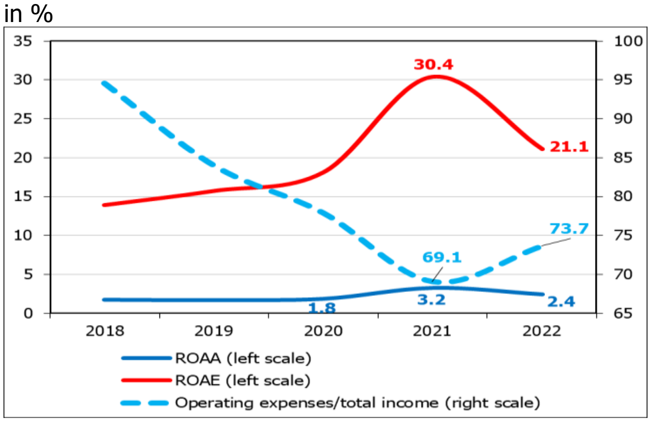
Source: National Bank calculations, based on data submitted by the Ministry of Finance

Chart 117
Financial asset/liability gap with a currency component to equity and reserves
in %



Source: National Bank calculations, based on data submitted by the Ministry of Finance

Chart 118
Selected profitability indicators
in %



Source: National Bank calculations, based on data submitted by the Ministry of Finance

assets and liabilities with currency component in their balance sheets. On an aggregated level, they have a short currency position, which narrowed negligibly in 2022[185], yet the faster growth of equity items significantly reduced its relative importance (by 14.1 percentage points lower currency gap to equity and reserves ratio). In the companies' portfolio, all active lease agreements (above 99%) are in denars with foreign exchange clause, which exposes the leasing companies to a credit risk in the case of materialization of the currency risk their clients are exposed to.

The leasing companies' profitability ratios deteriorated in 2022, but remained solid. The lower net profit compared to the previous year was conditioned by the lower growth of total revenues (which increased by Denar 8 million, or 1% compared to the growth of Denar 142 million, or 20.2% in 2021). The accelerated growth of operating expenses (Denar 45 million, or 7.7% in 2022 versus Denar 36 million, or 6.6% in 2021) contributed to the lower profit, but also deteriorated the operational efficiency of the leasing companies.

[185]The narrowing arises from the higher growth in assets with currency component (by 25.3% or Denar 1,217 million) relative to the increase in liabilities with currency component (by 22.7% or Denar 1,215 million).

2.7. Financial corporations

Financial corporations constitute a small, yet one of the fastest growing segments of the financial system, with an ongoing interest in establishing new financial corporations. The credit activity of these entities is primarily targeted to natural persons and legal entities who has difficult access to bank loans or who have an urgent and short-term need for funds. Financial companies *per se* do not pose a risk to the overall financial stability. They are well-capitalized non-deposit institutions with insignificant connection with other financial system segments.

The risks to the financial stability of these companies are associated with the risk of causing over-indebtedness of certain household segments. This, on the one hand, is due to the high prices (especially high other fees) that some financial companies charge on approved loans, but also to the fact that financial corporations provide access to loans for customers with poorer creditworthiness and who have difficulties qualifying for loans from deposit financial institutions. This is also seen in the balance sheets of financial companies, as a relatively large portion of their credit portfolio is non-performing, or collected with a certain time delay. This creates significant costs for the financial companies, which in turn may be the reason for embedding high-risk premiums in the loan product prices. However, some of these companies apply unreasonably high costs that create a significant credit burden for individual loan users. As a response to such situations in this segment of the financial sector, in July 2023, the Law on Financial Companies was amended, creating a basis for strengthening regulatory requirements and standards in the establishment and operation of financial companies. The amendments to this law, among other things, limit the maximum amount of all loan-related costs[186].

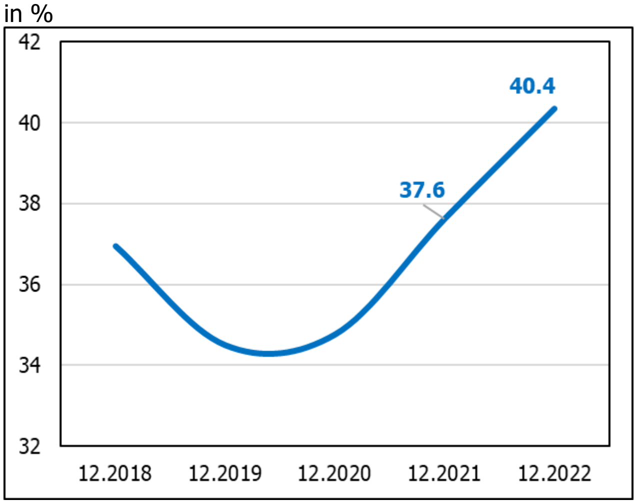
The financial companies' indicators of exposure to credit risk show a deterioration in 2022, but these companies are well capitalized. The exposure to liquidity risk is vigilantly controlled, and largely depends on the regularity of claim collection. Financial corporations register high short currency position, which underlines the importance of the policy of de facto peg of the denar to the euro for the maintenance of the level of their liabilities. Profitability indicators show different trends during 2022.

Financial corporations pay growing attention to the legal and reputational risk, which is due to the information about misuse of personal data of natural persons when taking on-line loan from financial corporations. Customer identification procedures when approving on-line loans need significant strengthening, in order to minimize any such abuses, but also to preserve the reputation and future survival of these companies.

The financial corporations are one of the most dynamic segments of the financial system. In recent years, the number and assets of this financial sector segment have constantly increased,[187] but without significant changes in the relative importance to the financial system, i.e. they remain an insignificant part of the financial system. Financial corporations are mainly focused on those credit market segments that have urgent need for short-term assets, but also on unbanked customers who have difficulties meeting the stricter credit standards of banks, or even of savings houses. Some financial corporations apply an aggressive marketing approach in finding new customers, operate on-line and take advantage of the new digital technology developments, offering customers easy, simple and fast loan approval procedures, without conducting due diligence. These companies, however, incorporate high-risk premiums into the prices of their products, which significantly raises the total price they charge. There is a risk of over-indebtedness of certain household[188] segments, which cannot be assessed due to the unavailability of data on the total debt of an individual natural person to all creditors. This gains in importance given that most probably a fair part of the expensive loans of financial corporations are targeted to households with poorer creditworthiness or higher debt, including natural persons who do not qualify for a loan from a bank or a savings house, or their debt to deposit financial institutions reached the maximum level permissible with the prudential requirements of these institutions. Financial corporations are increasingly criticized by the public for inadequate customer identification when approving on-line loans and the misuse of a third party's personal data for obtaining loans from these corporations. Urgent actions are needed by both financial corporations and the regulator to address this situation and strengthen customer identification criteria when approving loans.

The capitalization ratio of financial corporations, as equity and reserves to total assets ratio, increased (by 2.8 percentage points), compared to 2021, mainly due to the faster growth of equity and reserves (Denar 791 million or by 33.8%) compared to the growth of assets (Denar 1.540 or by 24.7%). Taking into account the legal lending limit to financial company's capital ratio (the ratio between total claims based on loans, guarantees, factoring and credit cards should not exceed 10 times of equity and reserves), there is considerable room for growth of lending by financial companies because at the end of 2022, this ratio was 2.3 times (2.5 times in 2021).

Chart 119
Equity and reserves to total assets ratio
in %

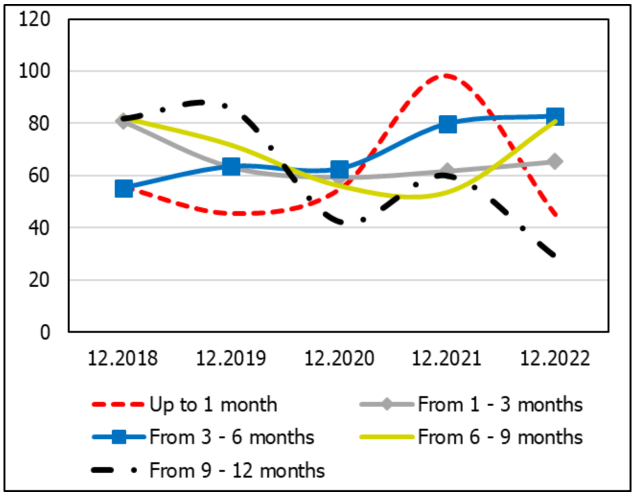


Source: National Bank calculations, based on data submitted by the Ministry of Finance

Financial companies are non-deposit institutions and most of their financing come from connected entities (almost 40% of the financial companies' liabilities[189] arise from the company's connected entities), primarily in the long term. The share of loans and credits from domestic banks in the banks' balance sheets is very small and insignificant, and there is absence of mutual relations with other

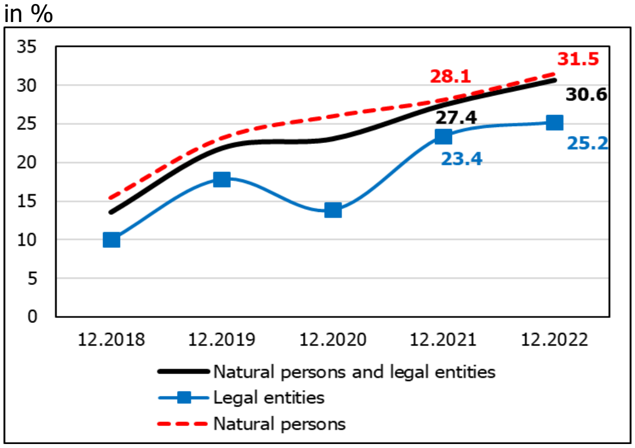
[186] More details about these legislative changes are provided in a text box at the end of this part of the report.
[187] In 2022, the assets of financial corporations increased by 24.7% (31.8% in 2021), while the number of corporations increased by 3 (in 2021, the number of corporations increased by two).
[188] A negligible percentage of the total corporate and household debt is towards financial corporations, which equals 0.2% and 2.8% respectively, at the end of 2022.
[189] Including equity and reserves, sources from connected entities account for about 63% of assets.

Chart 120
Financial asset/liability gap to total financial assets, by maturity bucket, according to the contractual residual maturity
in %



Source: National Bank calculations, based on data submitted by the Ministry of Finance

Chart 121
Claims under active agreements not collected for more than 90 days to total claims
in %



Source: National Bank calculations, based on data submitted by the Ministry of Finance

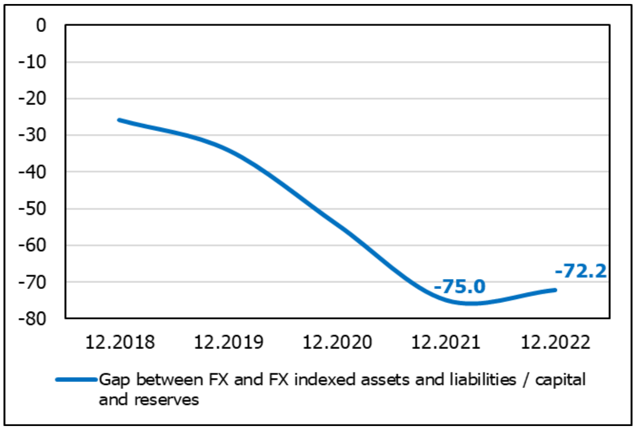
financial institutions. Thus, the small share of these companies' assets in financial system's total assets and their negligible connection with the other financial system segments point to the low relevance of these companies for systemic stability.

The liquidity risk exposure of financial companies is within a controlled range. Analyzing the contractual original maturity, financial companies report full coverage of liabilities with a contractual original maturity of up to one year (assets with original maturity of up to one year are 1.7 times higher than liabilities with the same original maturity, and at the end of 2021, this ratio was 2.7 times). Thereby, the most liquid part of the financial corporations assets (cash and cash equivalents) covers 16.2% of total short-term liabilities. Analyzed by contractual residual maturity, in all maturity buckets up to one year, the asset-liability gaps are positive, which indicates solid liquidity of the financial corporations, assuming that claim collection follows the agreed dynamics and scope. Having in mind that 91% of the financial companies assets are claims on customers, the liquidity of these companies is largely conditioned by the success of claim collection as agreed. Most of the liabilities or 37.92% are to connected entities, followed by liabilities to foreign banks, with a share of 33.6% (liabilities to domestic banks accounted for 1.6% of total liabilities). The derived rate of interest expenses incurred by companies to settle obligations to creditors is 6.2% for 2022[190], while the derived interest income rate[191] earned by financial companies was 26.9% in 2022; if commissions and fees income is added, the rate equals 53.5%.

Credit risk is the major risk the financial corporations are exposed to in their operations. In 2022, the indicators for

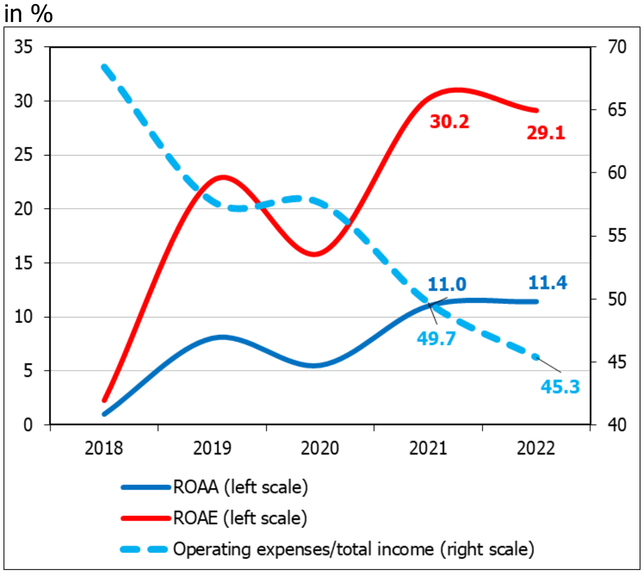
[190] The rate of interest expenses on liabilities settlement is the ratio between the interest expenses in 2022 and the average stock of financial companies liabilities.
[191] Calculated as the ratio between interest income for 2022 and the average amount of claims on active contracts of financial companies.

Chart 122
Financial asset/liability gap with a currency component to equity and reserves
in %



Source: National Bank calculations, based on data submitted by the Ministry of Finance

Chart 123
Selected profitability indicators
in %



Source: National Bank calculations, based on data submitted by the Ministry of Finance

this risk further deteriorated. More than 60% of the claims of financial companies are collected with a certain time delay[192], while almost one third of total claims are collected with a delay longer than 90 days. Hence, not only are financial companies inherently exposed to credit risk, but the level of risk materialization is also quite high.

Financial corporations are exposed to currency risk due to the asset-liability gap with currency component in their balance sheets. Financial corporations have short currency position that accounts for 72.2% of their equity and reserves and underlines the importance of the policy of *de facto* peg of the denar to the euro.

The main profitability ratios of the financial corporations show different trends. While the net profit grew by 195 million denars, or by 32.4%[193], the indicator for the return on average assets, as well as the operating expenses to total income ratio, recorded an improvement (by 0.4 and 4.3 percentage points, respectively). On the other hand, the indicator of the return on invested equity and reserves of financial companies was lower (by 1.1 percentage points), compared to the previous year.

[192] In 2022, 61.2% of the claims of financial companies were collected with a certain time delay, while in 2021 this share was 59.5%.
[193] The net profit increased primarily due to the growth of interest income (by Denar 920 million, or almost twice as much).

Key amendments to the Law on Financial Companies

In July 2023, amendments were adopted to the Law on Financial Companies (Official Gazette of RNM No. 154/2023), which allow for greater protection to citizens who use the services of financial companies, to increase trust in these companies, as well as to establish greater control of risks that may arise from their operations.

The amendments to the Law tend to strengthen the requirements for protection of financial companies' customers and borrowers of consumer loans approved by these companies. Thus they set the maximum amount of loan-related costs, forbid taking of a loan to settle an already due loan from the same financial company, and forbid commercial companies holding a permit or license under the Law on Games of Chance and Entertainment Games to be credit intermediaries of a financial company and offer credit products.

The amendments forbid financial companies to conclude a consumer loan agreement, if the agreement or related services stipulate a fee or multiple fees that are not factored in the average total costs, which alone or in combination with any other fees exceed or may exceed 60% of the amount of the approved loan. Fees in this context are all costs payable or required to be paid by the consumer throughout the agreement validity period, expressed as a percentage or in absolute amount, and which arise from or are in any way related to the consumer loan agreement or with the services related thereto, with the exception of the costs incurred in the enforcement procedure and the legal penalty interest. Any financial company that approves consumer loans is required to publish the tariff list with the above-mentioned fees on its website, and if the financial company does not have a website, it is required to display the tariff list in its business premises. There is also a provision that the financial company should carry out its activities in at least one business premise.

Requirements related to risk management, primarily credit risk, are being strengthened, which will be further elaborated in a Ministry's by-law. Also, the requirements regarding financial companies resilience are being strengthened, increasing the minimum amount of core capital which is to be paid at the establishment and further maintained, by five times, from Denar 6 million to Denar 30 million, an may not be backed by loans or credits. The law also requires that the manager is employed in the financial company, has a reputation, etc., and introduces additional criteria regarding the reputation, integrity and financial condition of the founders when establishing new financial companies.

Furthermore, the list of activities allowed to be performed by financial companies is extended by activity of providing payment services by establishing special payment institutions, i.e. trading companies established in accordance with the Law on Payment Services and Payment Systems, licensed by the National Bank. The legal amendments further regulate the factoring.

The Law also strengthens the supervision of financial companies, which requires special regulation, and tightens the measures against a financial company which is not complied with the Law.

2.8. Open-end investment funds[194]

Open-end investment funds constitute a relatively small segment of the overall financial system[195] and do not have a significant influence on the financial stability. The investment of some types of domestic investors in investment funds are quite trivial compared to their aggregate assets. Hence any challenges faced by investment funds (illiquidity, high downward correction of asset value, etc.) would not have significant negative knock-on effects on the non-financial sector (on an aggregate basis). In 2022, the Russia-Ukraine war, high inflation rates and the tightening of monetary policies suspended the growth trend of these funds and caused the rapid downtrend of the return rates of investment funds, with the exception of money market funds. The steepest annual decline in yield was reported by multi asset funds, which were affected the most by the downward movement of stock and bond prices.

Most of the investment funds' assets have been invested in fixed income instruments, that is, deposits in domestic banks and (mostly domestic) debt securities. Hence, domestic banks stability and liquidity, interest rates movement primarily in the domestic economy, as well as sustainability and efficiency of public finance and debt management of our country are relevant factors for stability, liquidity and performance of open-end investment funds. The funds' portfolio of debt securities is exposed to interest rate risk and tends to incur losses on balance sheets in the event of early sales[196].

After several years of asset growth, in 2022, equity funds dominated the asset structure of investment funds. The predominant share of equity funds and the search for higher rates of return that exceed inflation increased the placements in equity instruments in total assets of investment funds in 2022. These instruments are largely exposed to the macroeconomic developments in the United States and Europe. The expectations of lingering high inflation rates and additional increase in interest rates by central banks rise the exposure of investment funds to the risk of a downward correction of the prices of securities in which they have invested. The turmoil in the US and the Swiss banks in the first quarter of 2023 had a short-term and moderate impact, primarily on investment funds whose strategy is focused on investing in financial institutions.

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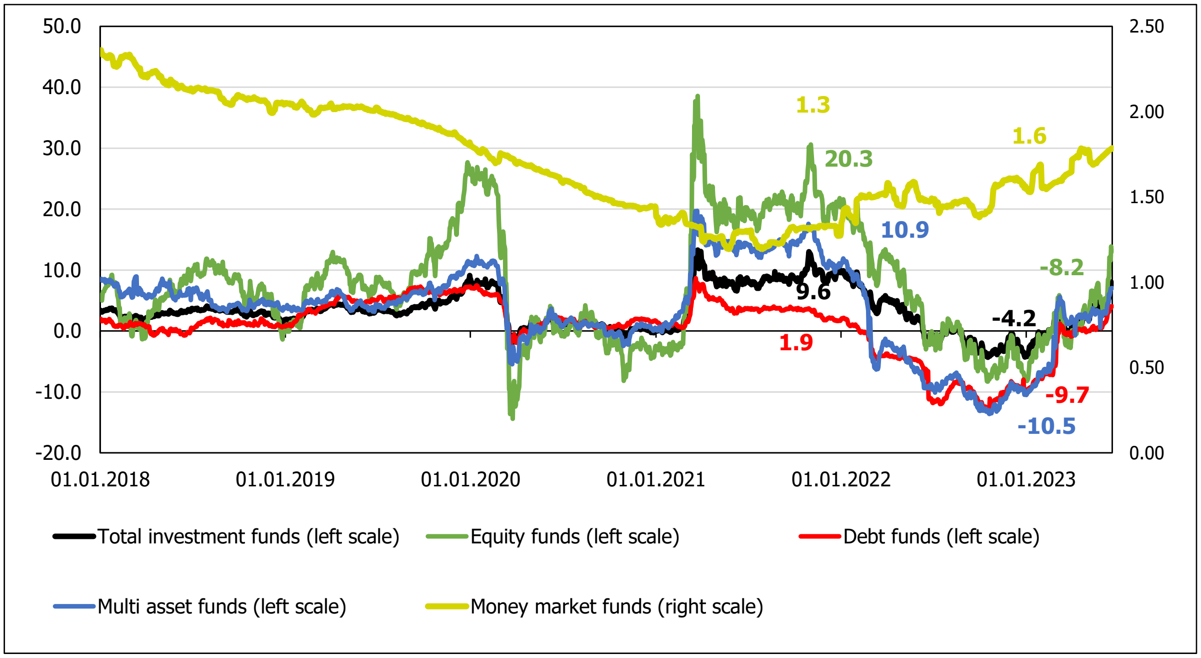
[194] In our country, there are also private investment funds and fund management companies. According to the Law on Investment Funds (Official Gazette of the Republic of Macedonia No. 12/2009, 67/2010, 24/2011, 188/2013, 145/2015, 23/2016 and Official Gazette of the Republic of the RNM No. 31/2020, 150/2021 and 288/2021), these financial institutions are not required to regularly report to the Securities and Exchange Commission. Moreover, these financial institutions are not subject to any control or supervision by the Securities and Exchange Commission. Hence, given the lack of data on private investment funds, this report addresses only open-end investment funds which in the text below are referred to as investment funds or only funds.

[195] For more details, see Financial System Structure, herein.

[196] Pursuant to Article 10 paragraph 2 of the Regulation on determining a net value of assets of an open-end and closed-end investment fund and on calculating the price per unit or per share in the investment fund, in the case of sale of part of the financial instruments held to maturity or after the change in the company's intention or ability to hold it to maturity, the entire asset portfolio held to maturity should be valued at fair value.

Given the high uncertainties in the environment, the annual rates of return of investment funds[197] (excluding money market funds) recorded a pronounced downward trend in 2022. Aggregately, the annual rate of return of all investment funds reduced to -4.2% at the end of 2022 (from 9.6% as of 31.12.2021).

Chart 124
Annual rates of return on investment funds, by type of investment fund[198]
in %



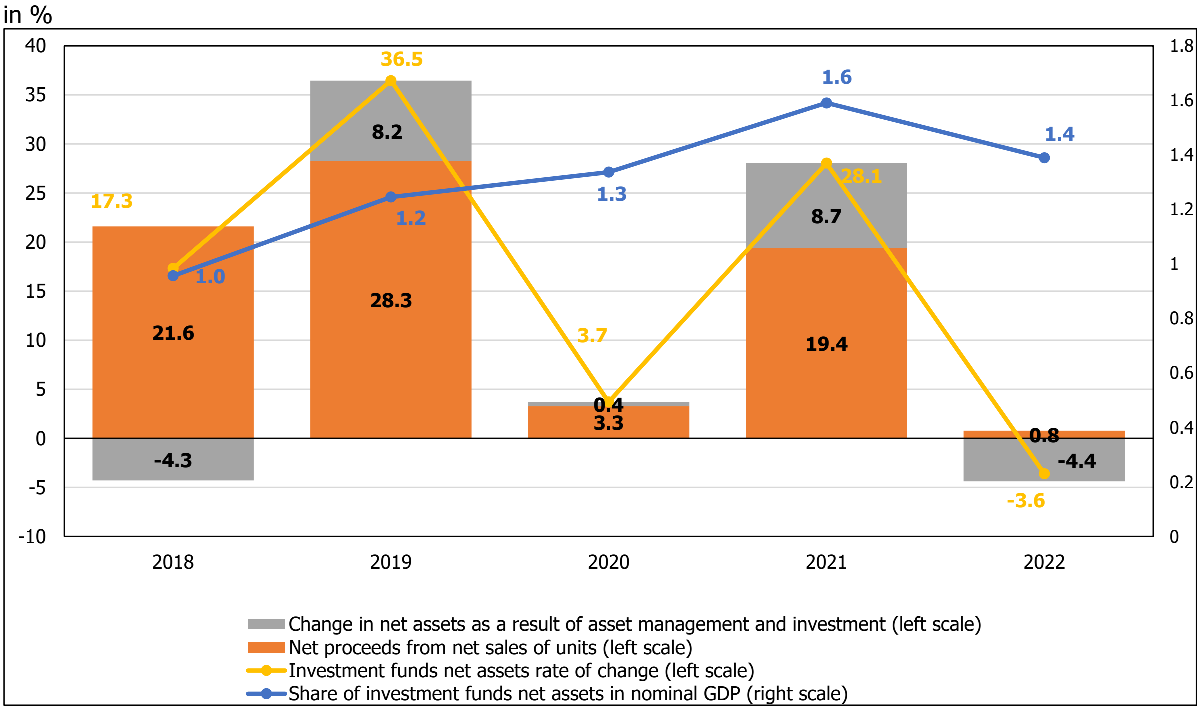
Source: National Bank calculations, based on data from the website of the Macedonian Stock Exchange and SEC.
Note: funds have been classified in accordance with the prospectus statement of each fund and the structure of portfolios at the end of 2022.

The greatest decline in annual rates of return of -10.5% is seen in multi asset funds, where the adverse effect of the change in prices of equity and bonds is most pronounced. The situation is similar with debt funds, which reported a negative return of 9.7% at the end of the year, which is primarily due to the decline in the value of the bond portfolio amid increasing interest rates. In conditions of a higher required return by investors due to the uncertain environment and the fall in equity securities prices, equity funds were also in the negative zone, with a reduced annual rate of return to -8.2% at the end of 2022.

[197] The annual rate of return is the weighted average of the annual growth rates of the funds unit price. The share of net assets of each fund in total net assets of all (or types of) funds is used as a weight.
[198] In 2022, the Securities and Exchange Commission adopted the Investment Fund Categorization Guidelines, which categorize investment funds according to the chosen investment policy and the fund's investments, with a view to ensuring greater transparency for investors. An investment fund can only be categorized in one of the main categories and subcategories defined in these Guidelines in accordance with the property in which the fund invests. Investment funds are divided into six main (basic) categories: equity funds, debt funds, multi asset funds, money market funds, Absolute Return Investment Strategies (ARIS) and other investment funds. These Guidelines entered into force on 25.10.2022, and began to apply from 1.1.2023. They bind open-end and close-end fund management companies to harmonize the operations of open-end funds they manage by the end of 2022. The harmonization refers to the funds' prospectus and statute, requiring from the investment funds to harmonize the investment fund's name, investment policy and structure of investment.

In conditions of growing interest on bank deposits and government securities on the primary market, only the annual rate of return on money market funds recorded a slight growth, which at the end of 2022 equaled 1.6% (1.3% at the end of 2021).

Chart 125
Annual growth structure of investment funds net assets



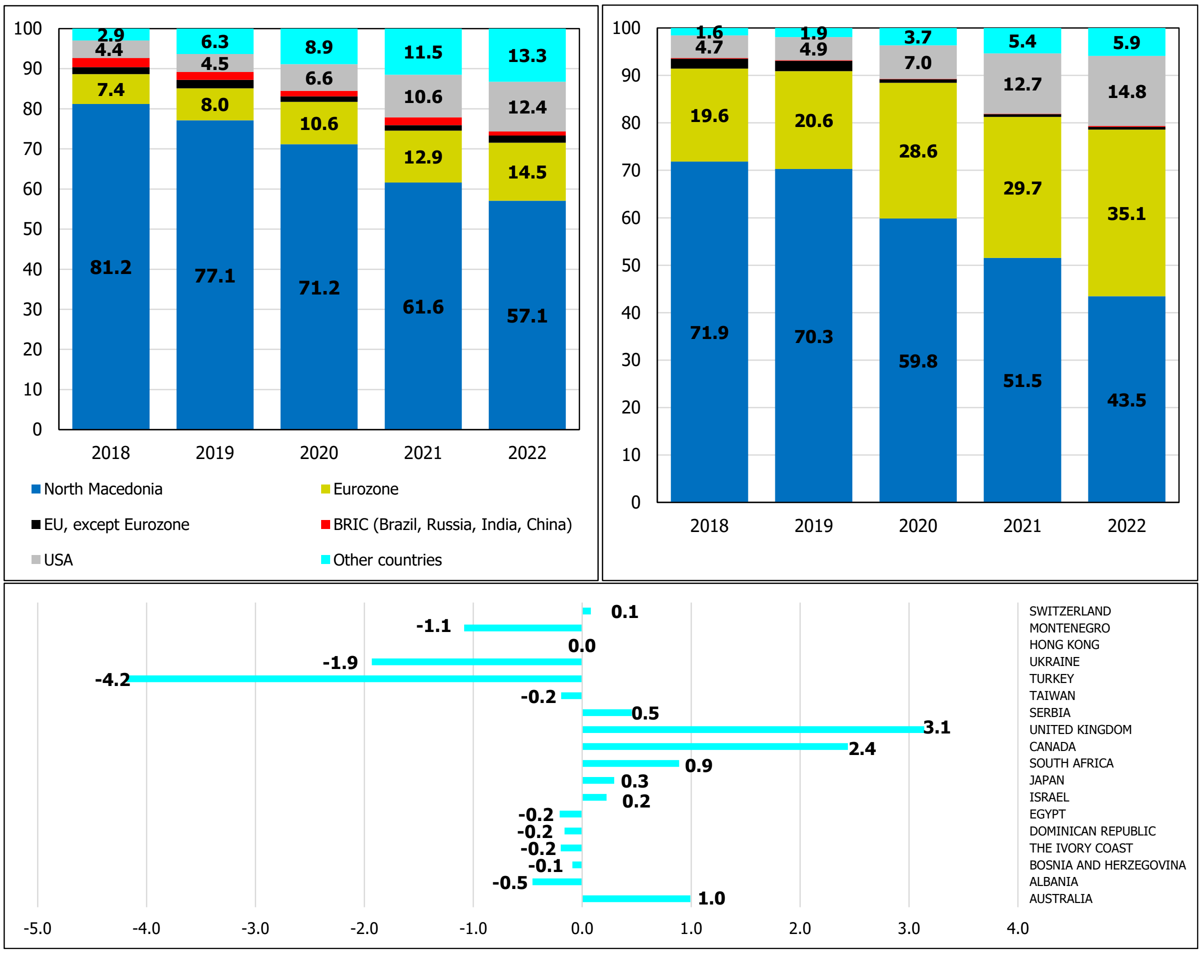
Source: National Bank calculations, based on data submitted by SEC.

The net assets of investment funds reported a negative growth rate of 3.6% in 2022. The negative growth of net assets is entirely a consequence of the assetmanagement and investment (-4.4%). Moreover, net inflows from sale of unitsrecorded a modest growth (0.8%) in contrast to the double-digit growth in 2021. As a result, the share of net assets of investment funds in GDP decreased to 1.4% (annual decrease of 0.2 percentage points).

In 2022, the diversification of the funds' portfolio continued as seen through the downtrend of the instruments in their portfolios whose issuer or trading country is the Republic of North Macedonia, at the expense of the growth of investments in instruments whose issuer and trading country is the United States and the euro area. There is also a noticeable increase in instruments whose issuer or trading country are other countries, which results from the growth of investments in instruments whose domicile country is the United Kingdom, Canada and Australia, while the largest decrease is recorded in instruments whose issuer countries are Turkey and Ukraine[199].

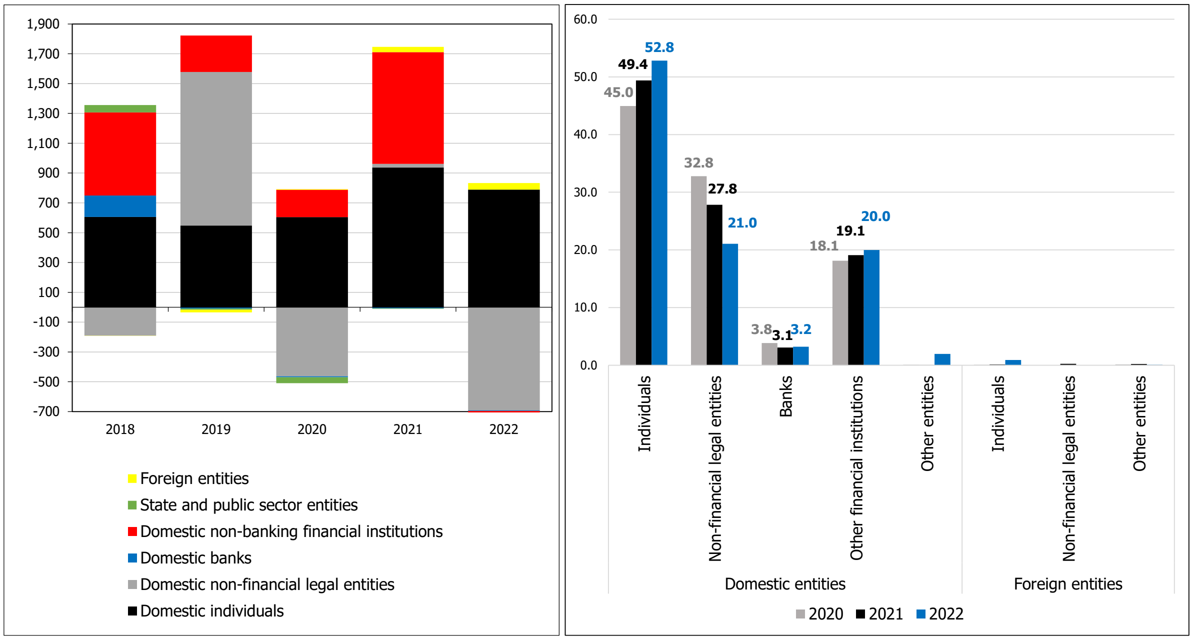
[199] After the onset of the Russia-Ukraine war, investments in instruments whose domicile country of the issuer is Russia (included in the group of BRIC countries) and Ukraine recorded an annual decline of about 84% and 67%, respectively. Thus, their already low share in total investments at the end of 2022 was reduced to 0.19% (1.16% at the end of 2021) and to 0.11% (0.32% at the end of 2021), respectively.

Chart 126
Asset structure of open-end investment funds by domicile country of the issuer of instruments (left), by the trading country of the instruments (right) and annual change of the structure of open-end investment funds by domicile country where issuer of instruments are other countries, in 2022, in percentage points (bottom)
in %



Source: National Bank calculations, based on data from the SEC website.

Chart 127
Structure of net inflows from transactions with units (left) and ownership structure of units (right)
in millions of denars and in %



Source: National Bank calculations, based on data submitted by SEC.

Most of the net assets of investment funds (99%) are owned by domestic entities, mostly individuals, followed by non-financial legal entities and non-banking financial institutions. In 2022, investment funds, net[200], registered net inflows from domestic and foreign individuals, while domestic non-financial legal entities and non-banking financial institutions reported net outflows. Other types of entities reported insignificant net sales of units in 2022. Such movements did not cause significant change in the ownership structure of the units in the investment funds. On an aggregate basis, the investments of certain types of domestic investors in funds are quite small, compared to the total assets at their disposal[201].

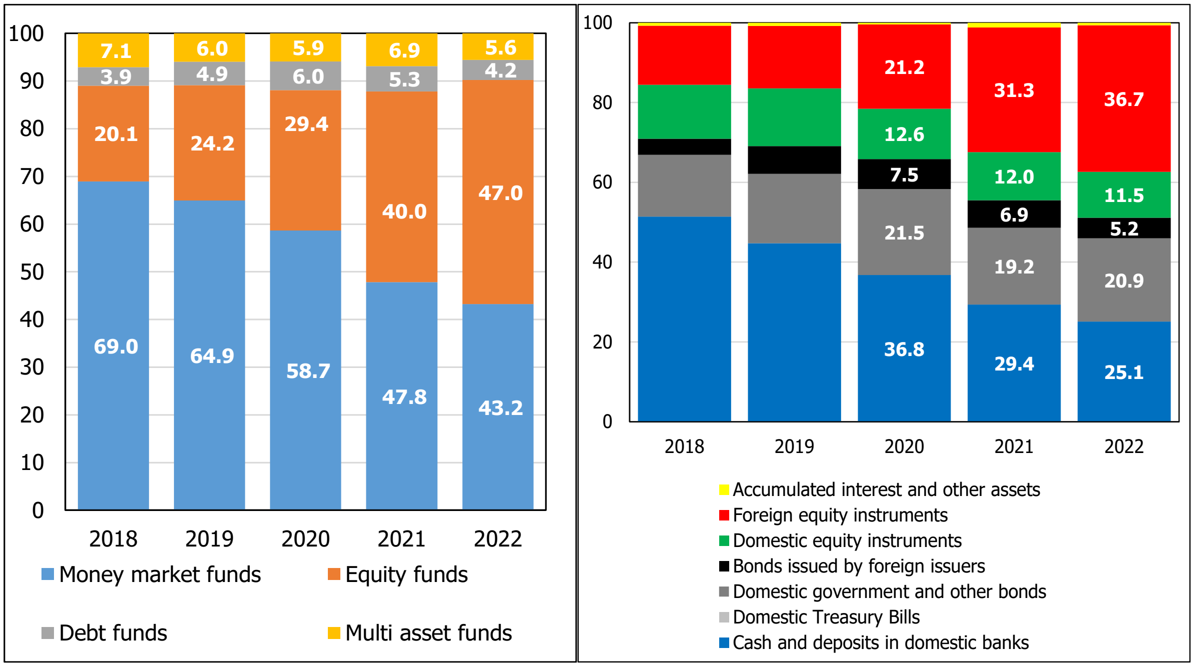
[200] It refers to the value of purchased unitsin investment funds less the value of sold units in investment funds.

[201] Investments of domestic non-financial legal entities and domestic natural persons in mutual funds account for less than 1% of the assets of the domestic corporate sector and of the financial assets of the households, respectively. Investments of non-banking financial institutions in investment funds made up less than 1.5% of the assets of non-banking financial institutions.

Chart 128

Structure of open-end investment funds assets by type of fund and by type of instrument

in %



Source: National Bank calculations, based on data submitted by SEC.

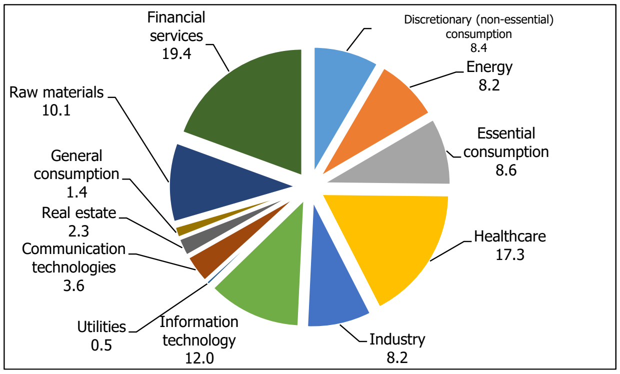
Analyzing the categorization and investment strategy of funds, in 2022, equity funds dominated the structure of total net assets of the funds, despite the slowing trend of assets increase. With an annual growth of their share of 7 percentage points, equity funds became funds with the largest share in the funds' net value structure. The uptrend of interest rates on banking products towards the end of 2022 reduced the money market funds attractiveness for investors on the one hand, and due to the high inflation rate, investors' attention was directed to funds that invest mostly in equity securities expecting higher real rates of return (return that exceeds the rate of inflation) in the long run.

Equities of financial sector companies dominate the structure of equity securities, accounting for 19.4%[202] at the end of 2022, however registering an annual decrease. Equities issued by technology companies registered the steepest annual decrease, while equities issued by health sector companies reported the highest annual growth. Given the high economic uncertainty and risk of a potential recession, investment portfolio managers shift their focus on companies from sectors where demand is inelastic to changes in prices and income, such as the health sector.

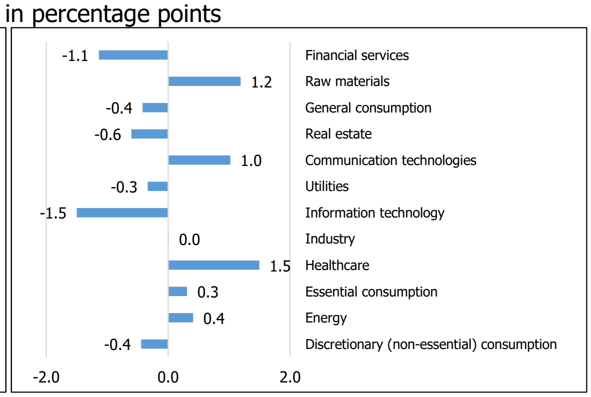
[202] About 40% of investments in equity securities of the financial sector companies or about 8% of total investment in equity securities are investment in equities of domestic financial institutions (banks).

Chart 129
Structure of equities by activity in 2022 (left) and change in shares compared to last year (right)

in %



in percentage points



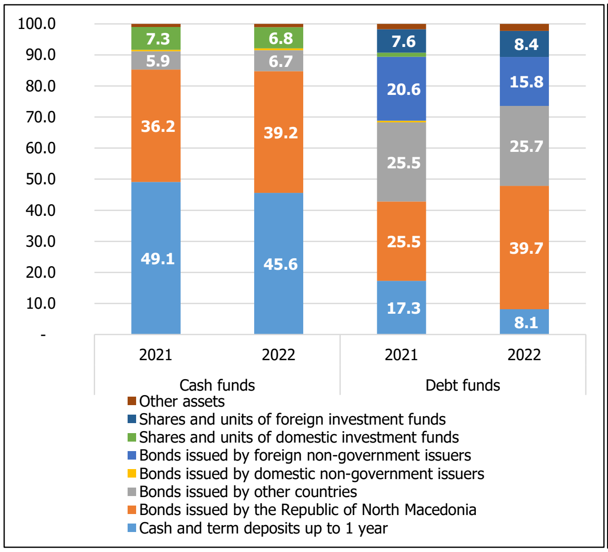
Source: National Bank calculations, based on data from the SEC website.

The growth trend of the individual share of foreign equity instruments continued in 2022 which is still the highest individual share in the investment funds' assets structure. Portfolio diversification and the search for higher returns in 2022 accelerated the growth of foreign equity instruments share in total investment funds' assets, which also propelled the growth of the total investment funds assets. At the end of the year, investments in equity instruments reached 48.2% in the total funds' assets, which is by 4.9 percentage points more compared to 31.12.2021. **However, investments in instruments with a fixed, predetermined payment dynamics and income still dominate the total investment funds' assets, despite the downtrend of their share.** These instruments constitute 51.1% of the investment funds' assets, primarily preserving the value of invested assets and ensuring efficient management of investors' cash (i.e. achieving an optimal rate of return on investment in highly liquid assets). In 2022, the share of fixed-income instruments decreased, at a slower pace though (by 4.4 percentage points), compared to last year, thus continuing the downward trend of the share of these instruments in the investment funds' assets (decline of 19.8 percentage points in the last five years). Among the fixed-income instruments, the largest was the share of cash and deposits in domestic banks (demand and short-term deposits) of 25.1%. Obviously, in the recent period, the relative importance of cash and deposits in domestic banks has been steadily declining, which, on the one hand, is due to the growth of assets of equity funds, and on the other hand, arises from changes in money market funds' investments, which in search for higher returns shifted their focus on placements in bonds, primarily domestic government bonds (as of 31.12.2022, 20.9% of the investment funds' assets were invested in domestic government bonds).

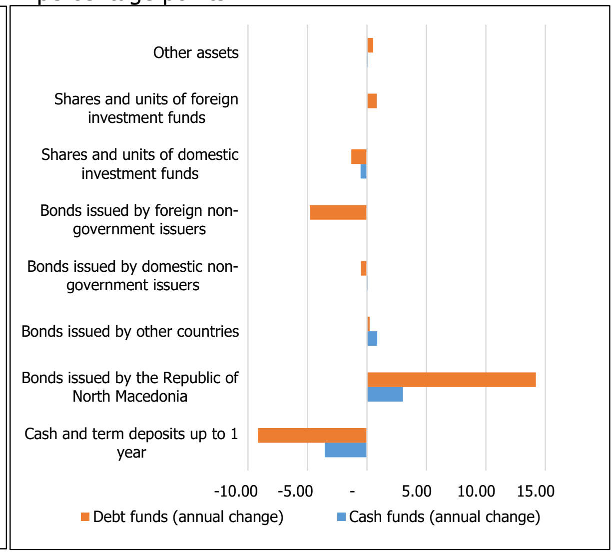
In conditions of monetary policy tightening, the interest rate risk to money market and bond funds comes to the fore. The share of money market and debt funds in funds' total net assets was 47.4% at the end of 2022. The total assets of money market and debt funds are dominated by bonds issued by the Republic of North Macedonia, registering an equal share of 39.2% and 39.7%, respectively.

Chart 130
Asset structure of money market and debt funds in 2021 and 2022 (left) and change in structure in 2022, by position (right)

in %



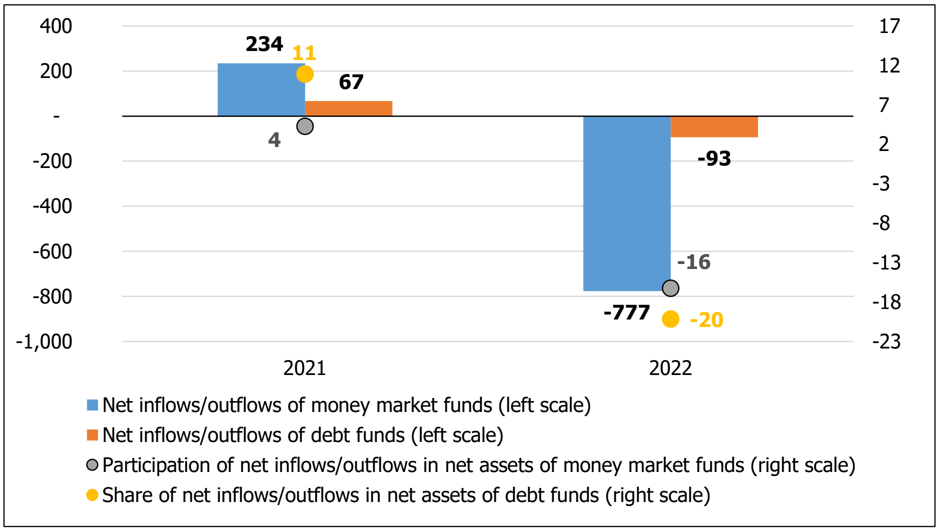
in percentage points



Source: National Bank calculations, based on data submitted by SEC.

The increase in interest rates is a factor that affects bond prices in the portfolio of these funds, thus causing a decrease in the value of these placements and a more expensive reinvestment in instruments with higher interest rates, before they fall due. Such risks intensify when the average weighted maturity of the bond portfolio is longer, which at the end of 2021 ranged between 7 and 8 years for money market funds and between 8 and 9 years for debt funds. With significant amounts of lost potential yield (when market interest rates significantly exceed the coupon interest rates at which the debt securities were issued) and the need for future compliance with the Securities and Exchange Commission's Investment Funds Categorization Guidelines, pressures and motives occurred for reclassification and restructuring of investments in this part of the investment funds' portfolio, in terms of their sale on the markets (at a loss) and subsequent investment in the same or a completely different class of assets (in accordance with the funds' investment strategies). Hence, the average weighted maturity of bond portfolio for these funds decreased and ranged between 5 and 6 years. On the other hand, in 2022, in search of a higher yield, there was a trend of decreasing cash assets and time deposits up to 1 year (the regulatory allowed term), which reduced their share in total assets to 45.6% and 8.1% for money market and debt funds, respectively.

Chart 131
Net inflows/outflows of money market and debt funds and their share in the funds' net assets
in millions of denars and in %



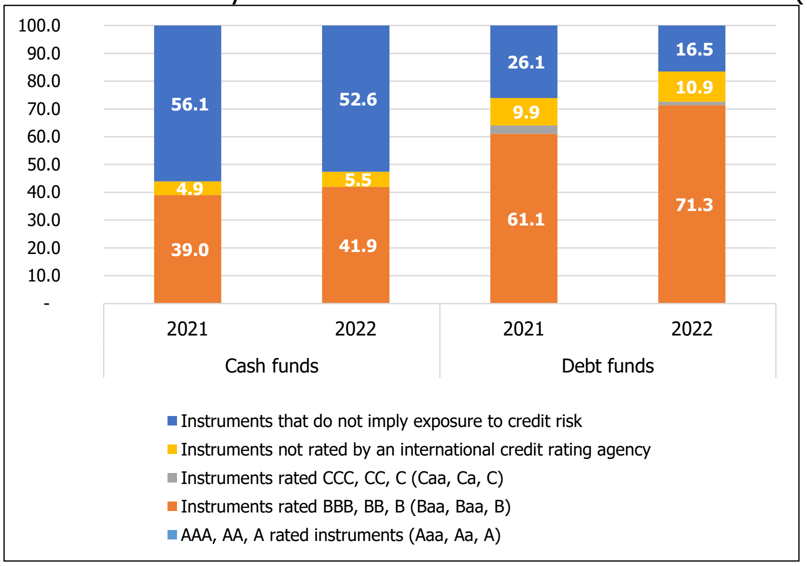
Source: National Bank calculations, based on data submitted by SEC.

In 2022, there were net outflows from the money market and debt funds, which account for about -16% and -20% in total net assets of the funds, respectively.

In uncertain economic times, the credit risk associated with the issuers of those securities also comes to the fore. Analyzed by credit rating of an issuer/creditor of the instrument assigned by an international credit rating agency, the structure of money market and debt funds that have been assigned a rating is dominated by instruments with an investment rating of BBB, BB, B (Baa, Ba, B) with a share of 41.9% and 71.3%, respectively. Instruments that do not entail exposure to credit risk include cash and term bank deposits and are therefore on top by size in the structure of total assets in money market funds with 52.6% and second by size in bond funds. During 2022, a slight increase was noted in the share of instruments that have not been assigned a rating by an international agency (mainly domestic and foreign corporate bonds and investment funds[203]), while the share of instruments with ratings CCC, CC, C (Caa, Ca, C) registered a decrease in the bond funds (sale of positions by Ukrainian issuers), and in money market funds, there are no such instruments.

[203] As of 31.12.2022, there are domestic corporate bonds (issued by banks) only in the portfolio of money market funds, which make up 0.6% of the total assets of these funds.

Chart 132
Structure of total assets of money market and debt funds in 2021 and 2022 (in %)



Source: National Bank calculations, based on data submitted by SEC.

Analysis of sensitivity of debt securities portfolio of money market and debt funds to interest rate risk

Amid increasing interest rates, the fair value of debt securities[204] with a fixed coupon interest rate (which prevail in the total portfolio of these funds) decreased, causing a direct effect on the accounting value of these securities as measured by fair value[205]. Lower fair values of debt securities measured at amortized cost[206], although currently without any direct accounting effect, could still be registered (in the form of net capital losses) in the event of significant liquidity pressures on money market and debt funds and the need from swift and forthwith sale of these securities[207].

204 In 2022, in order to comply with the European directives, the SEC adopted a new Rulebook for determining the net value of the assets of open-end and closed-end fund and for calculating the price per unit or per share in the investment fund (Official Gazette of the Republic of North Macedonia No. 148/2022). This regulation, which entered into force on 1 July 2022, also modified the method of determining the fair value for debt securities for which there is no active market, among which, the domestic government bonds. According to the Rulebook, an active market of debt securities and money market instruments is considered to be the market where these securities were traded for at least 15 trading days during a quarter. The company is required once every quarter to determine whether the market for a particular security is active or inactive. If the market is inactive, it should apply valuation techniques aimed at determining the price at which the security would be sold in the market. All this should be documented in the internal acts of the Company which will be subject to regular annual inspection by the depository bank.

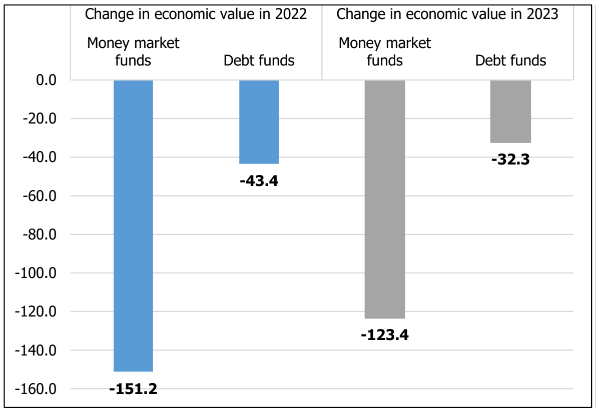
205 Such effects are largely determined by the coupon interest rate which is calculated and charged for debt securities held, i.e. whether and how much lower it is in relation to the current or future market interest rates, more precisely in relation to the coupon interest rates at which debt securities with similar features are issued currently and in the future, as those that are held.

206 As of 31.3.2023, about 75% of investment in debt securities of investment funds is measured at amortized purchase value, i.e. they are mostly held to maturity and a fixed interest rate is applied to almost all investments in these securities.

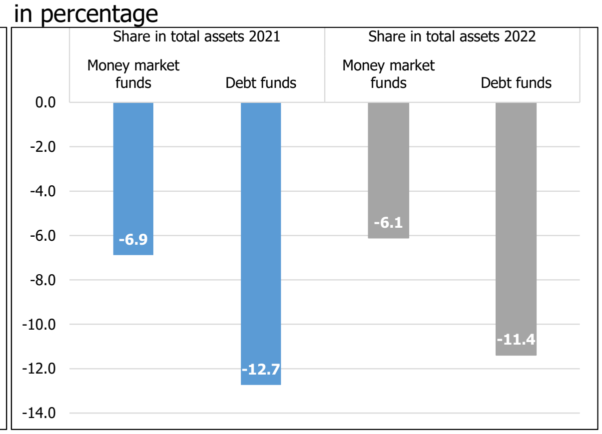
207 According to Article 10 paragraph 2 of the Regulation on determining a net asset value of an open-end and closed-end investment fund and on calculating the price per unit or per share in the investment fund, in the case of sale of part of the portfolio held to maturity or after the change in the company's intention or ability to hold it to maturity, the entire portfolio held to maturity should be valued at fair value.

Chart 1.
Calculation of the approximate actual change in economic value in 2022 and the potential future change of the bond portfolio in money market and debt funds in 2023 (left) and their share in total assets of money market and debt funds (right)

in millions of denars



in percentage



Source: audited financial statements for 2021 and 2022 of each investment fund.
Note: in the absence of classification data and valuation method of each item and taking into account the liquidity level in the domestic secondary bond trading market, the calculation of the approximate value uses a conservative assumption that all bonds in the portfolio are classified as held-to-maturity (recorded at amortized cost).

Calculation of the approximate change in the economic value[208] using an interest rate shock of 2.95 percentage points[209] indicates a decline in the economic value of the bond portfolio during 2022 in the amount of Denar 151.2 million and Denar 43.4 million for money market and debt funds, respectively. This decline accounts for 6.9% of total assets at the end of 2021 for money market funds and 12.7% for debt funds. If we take into account the bond portfolio at the end of 2022, the structure of which underwent a change during the year (reduced average weighted maturity), and apply the same interest rate shock of 2.95 percentage points, the decline in the economic value would be milder, of Denar 123.4 million and Denar 32.3 million for money market and debt funds, respectively (i.e. 6.1% and 11.4% in the total assets of these funds). In other words, if the interest rate in 2023 continues climbing in the same range as last year, the money market and debt funds will suffer a smaller negative change in the economic value of the bond portfolio.

[208] The economic value of the portfolio of debt securities is calculated on the basis of the net position of the investment funds in debt securities, their distribution among maturity buckets by remaining maturity and weighting of each maturity bucket with an appropriate weight as a product of the actual change in interest rates and the estimated modified duration of each maturity bucket. When interest rates grow, the economic value is negative, which means a loss of economic value due to the change in interest rates. The maturity buckets and their estimated modified duration are taken from Table 1 of the Decision on interest rate risk management in the portfolio of banking activities (Official Gazette of the Republic of Macedonia No. 163/08 and 144/09).
[209] Considering the predominant share of domestic government bonds in the bond portfolio of each fund, this interest shock was applied, which is the average of the annual increase in the coupon interest rates of government securities on the primary market during 2022 (denar domestic treasury bills with 1-year contractual maturity, denar government bonds with 15-year contractual maturity and government bonds in denars with euro clause with 15-year contractual maturity).

ANNEXES

Annex 1

Ad-hoc analysis of interest rate risk in the banking book

During 2022, with the normalization of the monetary policy and the transition to higher interest rates, the interest rate risk came to the fore, requiring more vigilant monitoring of the exposure to this risk among banks and other financial institutions. Banks may be exposed to interest rate risk through multiple channels, depending on the structure of assets and liabilities, the method of accounting valuation of assets and the prevailing business model. There could be also positive effects of the growth of interest rates by improving net interest margin and, consequently, banks' earnings. There are also risks, however, if the growth of interest rates lowers the net value of assets or spills over into indirect credit risk due to the exposure of bank customers to interest rate risk. Hence, to maintain banking sector stability, and thus the overall financial stability, it is important to prudently manage the interest rate risk, especially given the rising interest rate.

Domestic banks manage interest rate risk within the regulatory limits, which is regularly monitored and evaluated by the National Bank. For more comprehensive risk assessment, additional analyses have been made together with a questionnaire which helped collecting additional information from banks, along with a simulation of shocks to exposure to interest rate risk[210]. The goal was to meticulously analyze direct and indirect interest rate risk management in the banking book and to evaluate banking system resilience to shocks related to these risks.

The analyses showed that banks generally have the capacity to cope with interest rate risk in their banking book. The interest rate risk exposure of all banks is within the regulatory threshold of total weighted value of the banking book to own funds ratio as the most commonly used quantitative indicator for monitoring the interest rate risk exposure in the banking book[211]. **As of 31.12.2022, all banks are within the regulatory threshold[212] of 20%, and within the internal early warning thresholds and limits.** Banks regularly perform stress testing of the interest rate risk, with some of them applying a more sophisticated and comprehensive method of measuring interest rate risk and stress testing compared to the method prescribed in the regulation. Hence, they are aware of and actively manage interest rate risk from multiple aspects, which indicates readiness to deal with possible stress scenarios. **During the last stress tests, the banks found no significant effects from the simulated shocks that would require taking specific actions to avoid and reduce interest rate risk.**

The analysis covers **loan agreements concluded with households and non-financial legal entities with a combined interest rate (fixed and variable).** The analysis of these agreements is important because of the transition from fixed to variable interest rate, as it leads to higher interest costs that may worsen the borrower's creditworthiness. Bank data showed negligible use of combined interest rate in lending to non-financial legal entities, in contrast to lending to households where such agreements are quite prevalent. According to the data from the end of 2022, about 75% of housing and about half of consumer loans are with a combined

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210 The Development Bank of North Macedonia AD Skopje is not included in this analysis.

211 The most commonly used quantitative indicator for monitoring interest rate risk exposure in the banking book by banks is the total weighted value of banking book applying a standard interest rate shock of 200 bp to own funds ratio, which is prescribed in the bylaws regulating this risk and which is subject to a regulatory threshold of 20%.

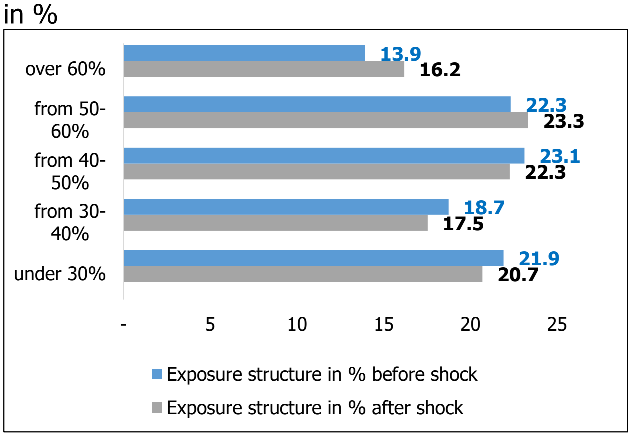
212 The weighted value of the banking book relative to own funds, as a measure for interest rate risk exposure, at the end of 2022 slightly increased to 10.1% at the banking system level.

interest rate. In most consumer loans that have a combined interest rate (69.2% and 61.7% of the total outstanding principal for property-backed and non-property backed consumer loans, respectively), the fixed interest rate will turn into variable in 2023 and 2024. Considering the longer periods with fixed interest rate, in housing loans with a combined interest rate, the transition from a fixed to a variable interest rate for the majority of the portfolio will take place after 2024.

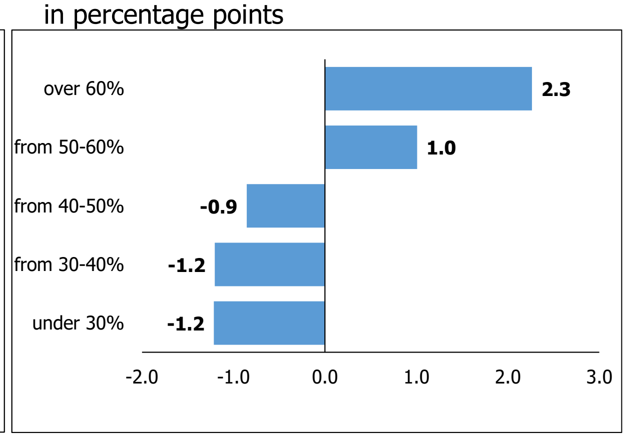
According to the submitted data, **the credit exposure to household sector customers whose interest rate will change, distributed by the DSTI indicator level, is concentrated in the DSTI interval up to 50%, along with the 63.8% of the exposure to this sector.** For the purposes of assessing sensitivity of households' creditworthiness, banks were required to apply an interest shock with an interest rates increase of 4 pp and to evaluate the effect on the distribution of the household portfolio according to the DSTI level. The portfolio structure according to the DSTI level after the simulated shock is similar, although there is a **certain increase in credit exposure in the interval above 60%, i.e. a reduction of the exposure with DSTI up to 50% (by 3.3 percentage points, which makes it equal to 60.5%).** The banks determined that such a restructuring would cause a moderate additional cost in the form of value correction, which would increase the average provisioning of the household loan portfolio by 0.7 percentage points.

Chart 1.
Exposure structure according to DTI interval before and after the shock (left) and the change in structural share after the shock (right)

in %



in percentage points



Source: National Bank calculations, based on data submitted by banks.

The additional cost for such determined additional impairment constitutes about 10% of the overall banking system profit for 2022[213], which means that according to the banks' assessments, **the interest rate risk to which natural persons are exposed has a moderate impact on their creditworthiness, i.e. it poses an insignificant credit risk for banks and does not threaten their profitability and solvency.**

The credit portfolio to legal entities was analyzed through two simulations that assume credit risk materialization through interest risk materialization in the twenty largest customers - legal entities indicated by each bank. Two indicators were analyzed

[213] If we take into account the banks' profit only in the first half of 2023, this share would be about 13%.

for the purposes of monitoring the quality of debt to companies: interest-bearing debt to total assets ratio and coverage of interest expenses with operating profit[214]. Critical values were also defined for these indicators, which enables classification of the company according to the level of each indicator in optimal, sub-optimal and low categories in terms of vulnerability to interest risk, for which there is simulation of higher impairment percentages. The analysis of financial indicators of companies uses data from the 2021 annual accounts when some of the current risks were not present, which may affect and should be taken into account when analyzing the results.

Table 1
Critical values of debt quality indicators, by category

Indicator	Optimal category	Suboptimal category	Low category
Interest bearing debt/ total assets	below 0.3	above 0.3 but below 0.6	above 0.6
Coverage of interest expense with operating profit (or profit before interest, taxes, depreciation and amortization)	over 3	above 1 but below 3	below 1

Source: indicators used by the IMF to monitor the quality of debt to companies.

The simulations aim to determine how any migration of banks' credit exposure to interest-sensitive companies from the twenty largest legal entities of each bank to non-performing exposure, could affect the level of bank's own funds and capital adequacy ratio. Simulation results show that the banking system is satisfactorily resilient to the simulated shocks, with a capital adequacy ratio above the requirement of 8%.

For more comprehensive assessment of the banking system sensitivity to interest rate risk in the exposure to the corporate sector an analysis was made of the structure of **total credit exposure to corporate customers of individual banks, by company size and the level of interest-bearing debt to total assets ratio[215]**. The purpose of this analysis was to determine the proportion of the portfolio that could be sensitive to interest rate risk. Credit exposure to large and medium-sized companies at the level of the banking system accounts for about 62%, while credit exposure to small companies accounts for about 28% of the total credit exposure to non-financial companies[216]. Thus, **within the framework of credit exposure to large and to small and medium-sized enterprises, the prevailing exposure is to companies whose interest-bearing debt/total assets ratio is below 0.3, or between 0.3 and 0.6, i.e. companies that are in the optimal or suboptimal category.** The ratio between the lowest (riskiest) debt category of large and small and medium-sized enterprises to total credit exposure to the corporate sector is relatively lower, of about 15%.

Such credit portfolio structure and results of the two simulations indicate that the **banking system credit portfolio is solid and the risks arising from customers exposure to**

[214] The calculation of indicators uses data from the Central Registry from the 2021 annual accounts submitted by the companies. Here, the term operating profit is used because it is calculated according to the registry pattern from the unaudited financial statements as the difference between operating income and operating expenses. Hence, this item will not always be an adequate indicator of EBITDA (earnings before interest, taxes, depreciation and amortization) used by the IMF to calculate the indicator.
[215] The analysis uses data for 2021.
[216] Micro companies are not included in this analysis due to the absence of data on the analyzed indicator. According to the data as of 31.12.2021, their share in total credit exposure to non-financial companies is about 10%.

interest rate risk are limited for now. Solid profitability contributes to better resilience of the banking sector to shocks, given that the operating profit can offset part of the simulated losses and mitigate the effect of shocks on the banks' capital adequacy ratio. The environment, however, is still uncertain, and amid high, yet falling, inflation rate, central banks continue to tighten monetary policy from the beginning of 2023. This requires increased vigilance in managing the direct and indirect interest rate risk in the banking book in the next period as well. The National Bank will continue to vigilantly monitor risks and is ready to take appropriate measures if it deems necessary to maintain the banking sector stability.

Annex 2

Climate risk analysis for the banks in the Republic of North Macedonia

Climate change is one of the largest challenges worldwide. The climate change effects can be seen through the constant global warming and frequent natural disasters, which cause human suffering, but also severe economic and environmental damage. Direct damages from natural disasters, over the past decade, have been estimated to average about US dollar 1.300 billion, or about 0.2% of the world's GDP, annually[217]. According to the analyses, if the air temperature continues to rise in the period ahead, the global GDP losses would range between 8% and 13% by 2100[218].

Worldwide, numerous initiatives are being undertaken to deal with the climate risks. An important milestone in this context is the adoption of the Paris Agreement[219] in 2015, which established the global climate risk management framework. Since then, 196 countries, including the Republic of North Macedonia (hereinafter: RNM), have committed to implement the Agreement whose main objective is to limit the rise in global temperature to no more than 2.0°C and attempt to limit it to 1.5°C by 2050, compared to pre-industrial levels.

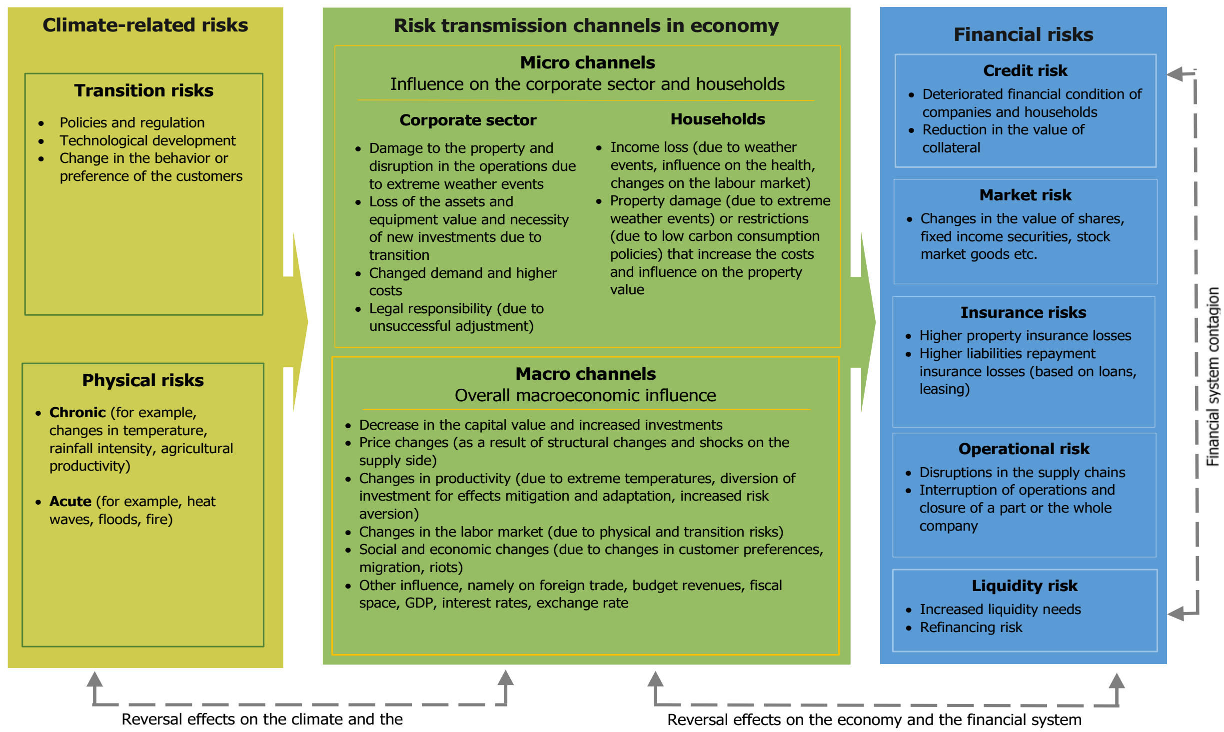
Climate risks are potential risks that may arise from climate change or from efforts to mitigate climate change and the related implications and economic and financial effects. The concept of climate risk drivers help us better understand how climate risks translate into financial risks. According to this concept, which is generally accepted in the literature, the climate risks drivers fall into one of two groups: physical and transitional risks. Physical risks arise from events related to climate and weather conditions and can be acute: such as heat waves, fires, floods and and/or chronic: changes in temperature, precipitation intensity, etc. Transitional risks arise from the adaptation process (changes in policies, regulations, technological development, changes in consumer behavior) due to the transition to an economy with lower greenhouse gas emissions. The key climate risk transmission channels to the economy and the financial system are shown in figure 1.

[217] Source: "Equity Investors Must Pay More Attention to Climate Change Physical Risk", F. Suntheim, J. Vandenbussche, IMF blog, May 2020.

[218] According to the analysis, global warming of 1.5˚C could decrease the global GDP per capita by 8% by 2100. The economic losses would be even greater (13%) if warming reach the 2˚C threshold. Source: Interactive: The impacts of climate change at 1.5C, 2C and beyond | Carbon Brief.

[219] The Paris Agreement is a legally binding international treaty on climate change. It was adopted by 196 Parties at the UN Climate Change Conference (COP21) in Paris, France on 12 December 2015. It entered into force on 4 November 2016. RNM ratified the Paris Agreement in November 2017 Law on Ratification of the Paris Agreement (Official Gazette of the Republic of Macedonia No. 161/217). Key aspects of the Paris Agreement.

Figure 1
Key climate risk transmission channels



Source: Network for Greening the Financial System (NGFS).

Given the potential impact of climate change on price and financial stability, an increasing number of central banks are undertaking activities to monitor and assess the climate risks to financial stability. The text below discusses the results of the initial analysis of the domestic banking system exposure to climate risks in the period March 2017 - June 2022, which is also an integral part of the National Bank's Medium-Term Climate Risk Management Plan 2023 – 2025.

The analysis of the domestic banking system exposure to transition risks is based on the data on the banks' corporate loan[220] portfolio. The goal is to see the extent to which the activities and sectors from this portfolio are sensitive to climate policies. In the absence of a generally accepted methodology, the classification of economic activities sensitive to transition risks follows the approach of Battiston et al. (2017)[221]. These authors classify economic activities into six broad climate policy relevant sectors in their paper: Fossil fuel, utilities, energy-intensive, housing, transport and agriculture.

The analysis starts from the general classification of these activities as the most climate sensitive, while not taking into account the micro-features of each economic entity and the potential measures and activities for transition to more environmentally sustainable operations. Consequently, the analysis provides an initial assessment of the domestic banking sector exposure

[220] The analysis provides an initial assessment of the domestic banking sector exposure to more climate sensitive sectors, but does not measure the magnitude and significance of climate risks for the domestic banking sector, which is conditioned by several factors, including the progress of climate sensitive companies in green transformation.
[221] „A climate stress-test of the EU financial system", Battiston, S., A. Mandel, I. Monasterolo, F. Schütze and G. Visentin, 2017.

to more climate sensitive sectors, but does not measure the magnitude and significance of climate risks for the domestic banking sector, which is conditioned by several factors, including the progress of climate sensitive companies in green transformation. This requires careful interpretation of these results and supplement the analyses with more detailed data and more sophisticated methods of analysis.

Chart 1
Share of sectors that are sensitive to climate policies in the total exposure of banks to non-financial companies

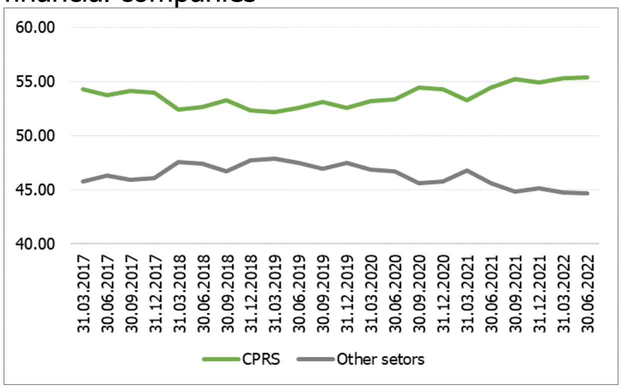
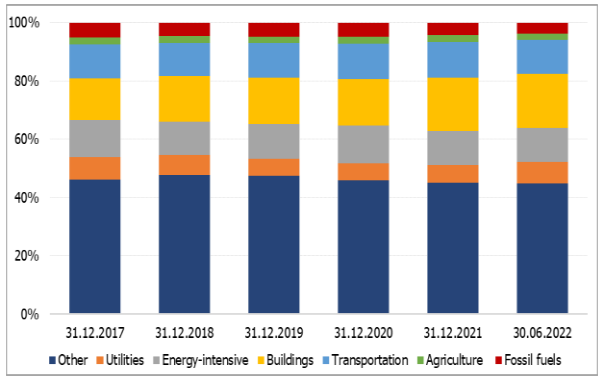


Chart 2
Exposure of banks to sectors that are sensitive to climate policies



Source: National Bank calculations, based on data submitted by banks.

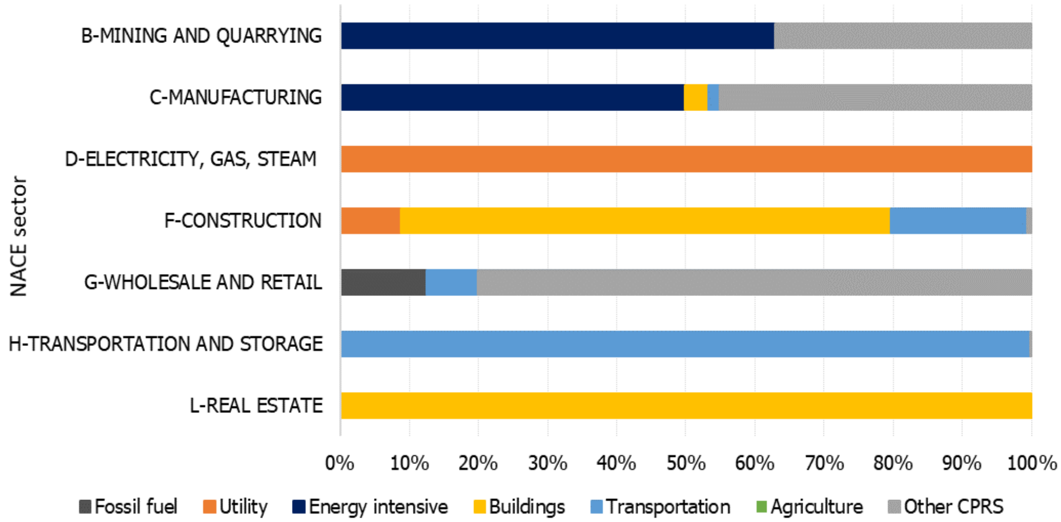
The analysis showed that more than half of the total credit exposure of the domestic banking sector to the corporate sector is to sectors sensitive to climate policies. The share of these sectors in the total banks' credit exposure to the corporate sector ranges around 55% throughout the entire analyzed period, with slight increase in their share since April 2021. However, a positive feature of the domestic banking system is that the share of these sectors is not significantly higher compared to other sectors. The part of the portfolio of sectors less sensitive to climate policies is also significant, which mitigates the banks' exposure to transition risks. **The largest exposure of the domestic banks to the transition risk arises from the exposure to the sector "Buildings"**[222]. The share of this sector in the total banks' credit exposure in the analyzed period ranges between 14% and 18% and is increasing. Unlike the sector "Buildings", the share of domestic banks' exposure to the sector "Transportation"[223] is 12% and remained stable during the analyzed period. The third largest in share (between 11% and 13%) is the so-called energy intensive sector[224]. Agriculture is considered highly sensitive to climate change, but its share in the banks' total credit exposure in the analyzed period is low (2%) and stable. The low banks' exposure to the agricultural sector is associated with the way of financing the agricultural production, which is probably mostly financed from own sources or from government subsidies, and less from bank loans. Agriculture as a sector is exposed rather to physical than to transition risks.

The six defined climate sensitive sectors do not fully coincide with the sectors defined within NACE. To understand the interconnectedness, a mapping of the credit exposure of domestic

[222] This sector includes activities for construction of residential and commercial buildings, as well as activities related to real estate.
[223] This sector includes activities related to the production of motor vehicles, road construction, trade in motor vehicles and transport services.
[224] This sector includes activities with high energy consumption in operations, such as mining and quarrying and other industrial sectors considered energy intensive under the EU list of high carbon emitting industries.

banks to the six climate policies-sensitive sectors and basic economic activities according to NACE was made (Chart 3).

Chart 3
Mapping of the credit exposure to the six climate policies-sensitive sectors and basic economic activities according to NACE



Source: NBRM calculations, based on data submitted by banks.

The mapping aims to see the extent to which the main economic activities that make up the domestic GDP are sensitive to climate policies. The analysis showed that more than 60% of the NACE mining and quarrying sector refers to activities that are sensitive to climate policies, namely, energy intensive. The NACE sectors of supply of electricity, gas, steam and air conditioning, activities related to real estate, transport and storage, and construction are almost entirely sensitive to climate policies. This points to possible effects of climate policies on these sectors, and thus indirectly on domestic banks.

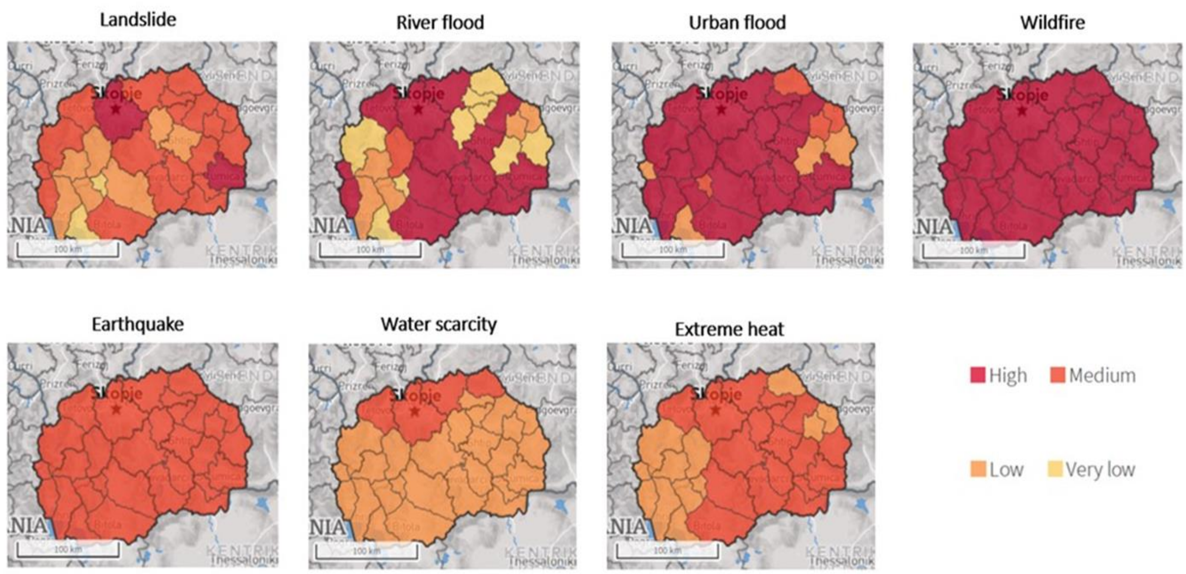
In addition to transition risks, **the exposure of the banking system to physical risks** is equally important, given that their materialization can cause significant losses for the banking system. Our country is at high risk of catastrophic flooding, with probability of occurrence of at least once in the next 10 years. The risk of wildfires is also high, while the risk of extreme heat waves is assessed as medium and there is higher than 25% probability that in the next five years the country will at least once face a protracted period of extremely high temperatures[225].

Banks are exposed to physical risks explicitly, through the possible effects on their business premises and implicitly, through exposure of their customers to climate risks. In the absence of more detailed data, only an initial general overview was made of the exposure of the banking system to various physical risks, starting from the map of physical hazards related to climate change that are significant for the RNM (see Figure 2). It can be noted

[225] It refers to the analyses made using the tool Think Hazard, published in 2020. Think Hazard is a tool developed by the Global Facility for Disaster Reduction and Recovery - GFDRR. GFDRR was established in 2006 as a multi-donor partnership. It supports low- and middle-income countries to understand, manage and reduce natural hazards and climate risks.

that the probability of occurrence of wildfires and earthquakes is equal for the entire territory of the country, while for the other five hazards, the intensity and probability of occurrence are different in different regions[226]. When managing climate risks, it is particularly important to monitor these five hazards, because as they are different in different regions, banks should take different actions to properly manage the risks that may arise therefrom.

Figure 2
Overview of the main physical hazards in the RNM and extremity degree by individual regions

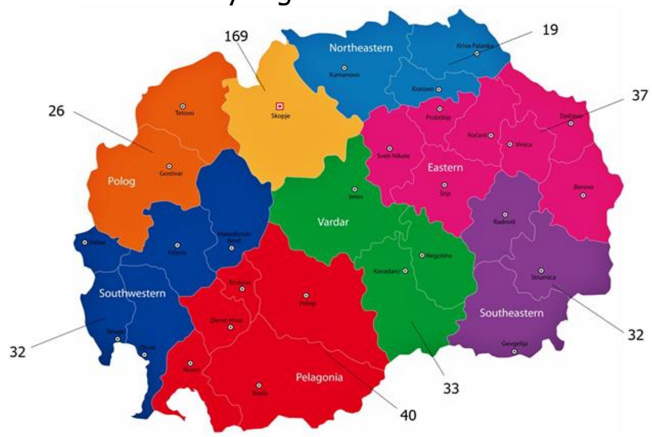


Source: Think Hazard.

The direct exposure of the banking system to physical risks is perceived through the geographical distribution of the banks' business units. The total number of banks' business units in the RNM at the end of 2021 was 388, almost half (43.6%) of which in the Skopje Region. Figure 3 shows the regional distribution of the banks' business units in the country. Apart from the risks that are equally likely throughout the country (fires and earthquakes), business units in the Skopje Region are more exposed to risks of landslides and floods due to overflowing rivers. Business units in the South-East Region are more exposed to risks of landslides, while in the Vardar Region they are more exposed to risk of floods due to overflowing rivers.

[226] For more detailed data on the degree of extremity of physical hazards by region of the country, see Think Hazard Report for RNM, 2020

Figure 3
Business units of banks in the RNM by regions



Source: NBRM calculations, based on data submitted by banks.

For proper indirect physical risk management, the starting point is the identification of geographical distribution of credits, in order to determine the exposure to regions that are more susceptible to natural disasters. In the credit portfolio of households, the exposure to physical risks is most present in the portfolio of housing loans, mainly due to the potential decrease in the value of the pledged real estate (damage to the property due to physical risks). According to data as of June 2022, 35.2% of the total households' credit portfolio are housing and commercial property loans (34.8% for residential and 0.4% for commercial buildings), while the rest of the portfolio is consumer and other loans. Almost half of the total loans approved to households (47.1%) are in the Skopje Region, followed by the Pelagonia Region (10.1% of total loans). Similar to the households' credit portfolio, the largest part of corporate loans (55%) were approved in the Skopje Region, followed by the South-Eastern and Pelagonia Regions, with 8% each of the total corporate loans. As already underlined, the Skopje Region, besides the risks typical for the entire territory of the country, is also marked as a region with a high risk of floods and landslides.

Chart 4
Structure of loans to natural persons, by region

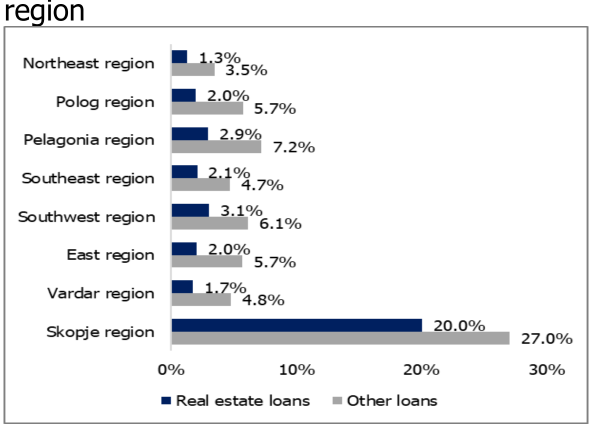
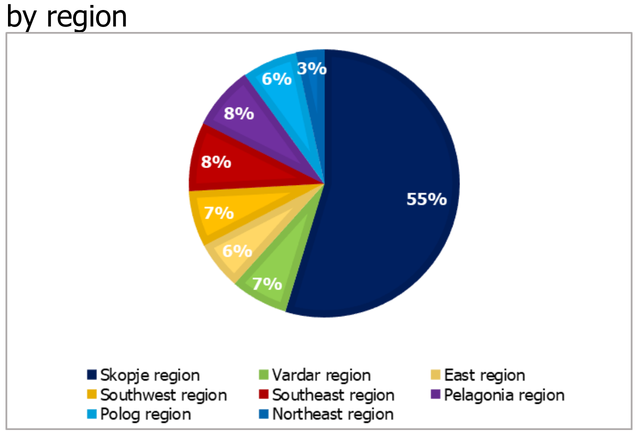


Chart 5
Structure of loans to non-financial corporations, by region



Source: NBRM calculations, based on data submitted by banks.

The National Bank, recognizing the importance of climate risks to the economy and the financial system, has so far undertaken several activities to increase awareness of the effects of climate change and the importance of active contribution of all stakeholders to the creation of a green and sustainable economy. Since March 2021, the National Bank has been a member of the *Network for Greening the Financial System*, and at the end of 2021, it also took part in the Vienna Climate Change Initiative. With the *Strategic Plan 2022 - 2024*, climate change became a strategic goal of the National Bank for the first time, together with mainly analytical and research activities, climate risk monitoring and management as well as analysis of their potential impact on the banking system. In early 2022, the National Bank conducted a *Climate Risk Survey* to understand the current banks and savings houses' practices and policies for monitoring and managing climate risks, and the level of awareness of the climate risks. The end of 2022 marked the start of regular publication of data on green loans approved by banks to households and non-financial companies. The National Bank also changed the *reserve requirement instrument* for banks aimed to encourage lending to projects related to domestic production of electricity from renewable sources. To strengthen the banking system resilience to this type of risks, in September 2023, the National Bank Council adopted a *Medium-Term Plan of Climate Risk Management of the National Bank 2023 - 2025*. Activities in this Plan are in accordance with the National Bank mandate and competences defined by the Law on the National Bank, the Banking Law and the Law on Financial Stability. The medium-term plan mirrors the National Bank endeavors to establish a regulatory and supervisory framework for identification and prudent management of climate risks by banks. Moreover, the National Bank will be focused on creating conditions and building capacities and analytical tools for assessing the climate risks on financial stability. The plan encompasses research activities in the area of climate change, including in the context of monetary policy, as well as further promotion of national and international cooperation, strengthening of institutional capacities and sustainability of the National Bank's operations. The Plan also emphasizes the importance of coordinated activities in the country and the need for cooperation with other government institutions and bodies, given that some crucial climate-related issues are not within the National Bank competence.

Annex 3

Cyber security in the banking sector and the National Bank activities

The need for accelerated digitization and daily use of digital financial services, especially in post-pandemic and the uncertainty caused by global security developments and the war in Ukraine is growing daily. A large portion of financial services in today's modern world is practically unimaginable without digitization, which is markedly changing the financial system. On the other hand, their connection and high dependence on IT systems and electronic communications is constantly increasing the risks of emergence of new, advanced cyber threats that may quickly spread beyond the borders of a country, often including institutions that are not their primary target. They may significantly impede the IT system functioning relatively quickly and have an adverse impact on the functioning and stability of the entire financial and banking sector.

The latest reports of relevant international institutions[227] point to serious increase in cyber risks, including the probability that this type of risk will cause a systemic crisis. Therefore, the European Central Bank defines, as one of its main strategic goals, the need for enhanced management of this risk and the need to strengthen stability and resilience in the entire financial system. For this purpose, the European Parliament and the EU Council adopted a new legislation in December 2022, to strengthen the resilience of digital financial operations. (Digital Operational Resilience Act – DORA). This law required the development of several regulatory technical standards (RTS) which define in more detail the separate areas specified in the law. To comply with the new EU acquis and the latest good practices and standards on this topic, **the National Bank is undertaking activities to update the by-laws on banks' information security as well as to adjust the protection measures against cyber risks.**

The National Bank has been undertaking a series of activities to strengthen banks' resilience to cyber threats. Thus, full-scope on-site inspections have been carried out to check how banks manage this risk, underlining the need for a greater awareness of the growing trend of cyber attacks and the possibility that they will significantly affect their business operations. During these inspections, special attention is paid to the assessment of the need to improve banks' processes for response and handling of incidents related to scenarios of new advanced cyber attacks, which can significantly disrupt the banks' IT systems stability. As part of these activities, in 2022, the National Bank recommended to banks to strengthen their measures and to achieve and maintain the appropriate level of preparedness for potential cyber-attacks, giving them specific guidelines to strengthen their IT system protection against disruption of services, that is, from sophisticated attacks, the so-called Distributed Denial of Service (DDoS). The National Bank has actively participated in the Critical Infrastructure and Cybersecurity Working Group. Within this working group, activities were carried out to define and determine the critical infrastructure in several sectors in the country, the mechanisms for its protection and the need for mutual coordination and cooperation.

The situation with the cyber attacks in the RNM banking system has been stable. The National Bank has registered a small number of critical security incidents related to social

[227] Advancing macroprudential tools for cyber resilience, Feb.2023, Systemic cyber risk, 2020, European Systemic Risk Board, Cybersecurity survey results (The State of Play at Supervisory Authorities), 2022, IMF, CyberThreat Defence Report 2022, CyberEdge Group, etc.

engineering, Distributed Denial of Services (DDoS) and malicious code detection. These attacks, however, has caused intangible financial damage.

In the period ahead, the National Bank will actively monitor both regional and global trends and will respond preventively in order to minimize any risk of such threats to the financial system.