FINANCIAL SUPERVISORY AUTHORITY

REPORT ON THE STABILITY OF NON-BANK FINANCIAL MARKETS

1/2024

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Introduction

Negative events in recent years, such as the pandemic, supply chain disruptions, external geopolitical tensions and their amplification by the conflict in the Gaza Strip, the energy crisis, the turmoil in some US and Swiss banks and the transition to a high inflation regime, combined with rising inflation, have been well managed by most financial institutions without major shocks of systemic importance. However, the European economy is expected to continue to face a period of uncertainty in the future that poses significant risks to financial stability and requires vigilance from all financial market participants.

The conflict between Gaza and Israel could escalate further with spillover effects into the neighbouring geographical area, which produces about 35% of the world's oil exports and 14% of its gas exports. Continued attacks in the Red Sea - through which 11% of world trade flows - and the ongoing war in Ukraine risk generating further negative supply shocks to the global recovery, leading to increases in food, energy, and transport costs.

Thus, commodity prices could become more volatile due to new geopolitical tensions and climate change-related disruptions. Since the end of the second quarter, oil prices have risen by around 25% amid voluntary supply cuts by OPEC+ countries. So far, the impact of the conflict in the Gaza Strip on commodity prices has been limited, but the risk of escalation exists and could lead to higher oil prices due to supply disruptions. Food prices remain high and could be further affected by an escalation of the war in Ukraine, causing significant difficulties for many less developed countries. Meanwhile, despite a downward trend in inflation, the current level remains high, and short-term inflation expectations have risen above anticipated levels.

A slower-than-expected decline in core inflation in major economies, due to factors such as persistent labour market tightness and further supply chain tensions, could trigger a rise in interest rate expectations and a fall in asset prices, similar to early 2023. Such developments could increase risks to financial stability, tighten global financial conditions, trigger flight-to-safety capital flows and strengthen the US dollar, with negative consequences for trade and growth.

Early warning indicators show that economic sentiment has remained relatively stable despite vulnerabilities and tensions. In the European economy, growth prospects have deteriorated, and uncertainty has increased, particularly amid rising geopolitical tensions. Forecasts by European financial institutions indicate that the macroeconomic environment could continue to strain firms and households as fiscal space is reduced. This could generate imbalances in financial markets even though European financial markets are currently stable and liquid.

The euro area economy weakened in the second half of 2023, dragged down by tightening financing conditions, falling confidence and competitiveness losses. It is now expected to recover at a slightly slower pace than projected in the ECB's September 2023 macroeconomic projections Short-term indicators suggest weak economic activity in the fourth quarter of 2023. However, growth is expected to strengthen in early 2024 as real disposable incomes rise, supported by falling inflation, robust wage growth, and resilient employment, and as export growth strengthens with improving external demand.[1]

Locally, on an annual basis, Romania's GDP growth was 2% in 2023 compared to 2022 according to the National Institute of Statistics. This marked the tenth consecutive period of expansion, with foreign trade making a positive contribution to the country's economy, as exports fell at a much slower pace than imports.

Romania's annual inflation rate fell slightly to 6.61% in December 2023 from 6.72% in the previous month, marking the lowest rate since September 2021. ECB forecasts indicate that headline inflation will fall from 5.4% in 2023 to 2.7% in 2024, 2.1% in 2025, and 1.9% in 2026.

Regular monitoring of risks in European non-bank financial markets is a macroprudential policy tool, as the risk factors affecting these markets also impact the non-bank financial markets supervised by ASF. Although risks to financial stability did not increase in 2023, they remained high.

According to the European Supervisory Authorities (ESAs), interest rate risk, liquidity risk, and credit risk have been identified as being of high importance in various sectors of the financial industry. These risks pose a challenge to banks, insurers, asset managers, and other financial institutions, and their proper management is essential to maintaining financial stability and adequately mitigate systemic risk. So far, European financial institutions have generally succeeded in preparing for and adapting to foreseeable risks. However, systemic stress could arise from unforeseen shocks that may materialise quickly.

In 2023, financial markets recovered amid falling energy prices and expectations of a slower pace of monetary policy tightening. Stock market indices reflecting the activity of companies in the financial sector have risen since the beginning of 2023. Moving forward, markets will remain highly sensitive, in particularly to potential deteriorations in economic fundamentals or risks in financial institutions, keeping a close eye on the sustainability of public and private debt in the context of continued high interest rates. Overall, risks

[1] ECB, Eurosystem staff macroeconomic projections for the euro area countries

to European financial markets remain at high or very high levels. From a financial stability perspective, markets will remain sensitive in particular to the market impact of higher long-term interest rates, the macro-financial outlook and geopolitical and peripheral risks. There is a high risk of corrections in the context of fragile liquidity in equity, bond and crypto markets, with particular concern for real estate exposures. Inflation has fallen but continues to impact real investor returns.

Fixed income markets were generally lower towards the end of 2023, with sharp declines in sovereign and corporate bond yields in December. The credit quality of high-yielding non-financial corporate bonds continued to decline, particularly in the real estate sector, with a trend of rising default rates.

The European funds sector partially recovered from its historic decline in 2022, mainly due to valuation effects. Performance returned to positive for both equity and bond funds. Outflows from equity funds were reduced, while bond funds received inflows, in contrast to outflows in 2022. EU fund performance and flows were volatile in H2 2023. Equity fund performance improved, with significant variations over the reporting period. In terms of flows, investors preferred fixed income funds over equity funds. Money market funds, in particular, attracted significant inflows due to rising interest rates and yield curve inversion.

According to the February 2024 edition of EIOPA's Risk Dashboard, based on Q3 2023 data, market risks for the European insurance sector are at a high level, while other risk categories remain at a medium level. While macroeconomic risks persist in the insurance sector, with projections still pointing to a moderate GDP growth outlook, there is a downward trend mainly due to a reduction in projected inflation in all geographical areas considered. Credit risks are stable at a medium level, with spreads for the most relevant categories of fixed-income securities declining slightly by the end of 2023. Market risks are significant as bond volatility remains high and commercial real estate prices have continued to decline. Meanwhile, liquidity and funding risks were at a medium level, with an upward trend driven by developments in catastrophe bond issuance.[2]

[2] A catastrophe bond (CAT) is a high-yield debt instrument designed to raise money for companies in the insurance industry in the event of a natural disaster. A CAT bond allows the issuer to receive funding from the bond only if specific conditions occur, such as an earthquake or tornado.

Risk factors to financial stability for financial markets in 2024 are given by persistently higher interest rates, geopolitical and peripheral risks, risks generated by real estate asset valuations, misleading information from social media, and greenwashing malpractices.

The sudden change in the interest rate environment is impacting financial stability and investor outcomes. Refinancing costs have risen sharply, particularly affecting corporations with debt maturing in 2024 and 2025. Credit ratings have experienced their first downgrades, and the deterioration in credit quality will eventually affect the performance of investors' portfolios.

The combination of external risks continues to influence the economic and market environment. Uncertainty and fragile liquidity are limiting the resilience of the financial system, and external shocks are expected to result in high price volatility.

Commercial and residential real estate have been particularly affected by recent interest rate developments. The crisis is being reflected in financial markets and among investors through falling equity and debt prices of real estate firms, credit rating downgrades, and lower valuations of real estate funds and liquidity risks. Derivative and repo exposures are limited but concentrated.

Investors, especially those less sophisticated with limited knowledge or resources, risk receiving false or misleading information through social media. As finance-related posts spread, investors who do not verify the reliability and quality of information may suffer losses.

Greenwashing and related malpractices risk undermining the credibility of sustainable finance. With the first exits from ESG funds occurring in 2023, future incidents, if not effectively prevented, could further undermine investor confidence.

From a local financial stability perspective, market risk remains at a high level with a tendency to stagnate amid contagion and interconnectedness, with financial markets reacting promptly to the materialisation of any tensions and risk factors in an environment where tightening financial conditions together with the external geopolitical situation have a strong influence on them. All other risks (credit, liquidity, solvency, profitability, and operational) are assessed as medium to high, with increasing or stagnating trends. At the same time, the increase in systemic risk for the Romanian economy is largely explained by exogenous risks. The Romanian capital market is sensitive to the same regional risk factors that influence stock market returns in Austria, Poland, Hungary, and Bulgaria, with large capitalisation capital markets acting by transmitting volatility to less interconnected and smaller capitalisation capital markets.

Thus, there is a strong link between the contagion effect and company returns, as increasing contagion tends to lower the returns of listed companies. The STOXX600 index, which is a proxy indicator for the European equity market, has seen a moderate increase above the equilibrium level in 2023 due to the slower pace of monetary policy tightening, while the index for the Romanian equity market has seen a sustained increase above the equilibrium level due to developments in the local market especially the listing of Hidroelectrica, the largest IPO in Europe in 2023.

In the insurance market, rising inflation has a negative impact from two perspectives: the increase in acquisition and administration costs and in the value of claims leads to an increase in costs for insurers, and on the other hand, the decrease in purchasing power of the population as a result of general price increases may lead to a contraction in demand. Insurance companies are therefore exposed to two potential risks: rising costs and a potential fall in income. However, locally, the insurance market remains dominated by the compulsory motor insurance segment, which mitigates the risk of a significant drop in insurers' revenues. The exposure of Romanian insurance companies to government bonds remains significant, maintaining the risk of a sharp increase in government yields impacting the market value of government bonds in insurers' portfolios.

At the same time, the fragile macroeconomic context has led to an increase in credit and liquidity risk, which may also introduce additional risks to insurance companies' assets. Rising interest rates have compounded a number of pre-existing vulnerabilities in the financial system, including high levels of both private and public indebtedness. Thus, the outlook for high indebtedness has worsened as interest rates have risen, exacerbating the vulnerabilities of financial institutions.From this point of view, the risks of a deterioration in the credit ratings of issuers as well as of financial instruments, and even risks related to potential insolvencies of insurers' counterparties remain relevant.

The decline in the inflation during 2023 has had a positive influence on financial markets, which have recovered some of the depreciation suffered previously. Going forward, the outlook for financial stability at the European level remains fragile, with adverse market dynamics potentially creating and propagating further shocks, accompanied by liquidity pressures. Private pension funds in Romania recorded significant increases in assets in 2023, with the system currently still in an accumulation phase and there is no pressure to sell, as the level of payouts is very low. During 2023, payments of RON 919 million (0.73% of total assets at the end of December) were made in Pillar II and RON 113 million in Pillar III (2.38% of total assets). Liquidity risk is also at a low level, with 1.14% of the assets of the entire system held in current accounts and short-term deposits (approx. RON 1.5 billion). The investment policy within the private pension funds'

portfolios continues to be focused on the local financial market (about 93% of assets with Romanian issuers), mainly oriented towards fixed income instruments (73%), and equities (23%). At the end of December 2023, private pension funds had investments worth RON 17.07 billion in a number of 14 equity issuers with an ESG score, representing 55.5% of total equity investments, respectively 13% of total assets.

The European Central Bank conducted its second stress test on climate risk, complementing the ECB's Banking Supervision Climate Stress Test on risks to banks by broadening the scope to include firms and households. The objective was to test the resilience of firms, households, and banks in three transition scenarios: accelerated transition, late-push transition, and delayed transition. The results showed that delayed transition and total inaction are costlier in the long term compared to a faster transition, which, although involving higher investment and energy costs initially, would decrease financial risks in the medium term. Investments in renewable energy would pay for themselves faster and ultimately reduce energy costs. As interest in ESG investing grows, so do the risks of environmental misinformation. In addition to causing losses to individual investors to individual investors, environmental misinformation can have profound consequences for the confidence of the wider investment community in the effectiveness of sustainability disclosure regimes, with negative spillover effects on the financing needed for the transition to a more sustainable economy. As interest in ESG investing grows, so do the risks of environmental misinformation. In addition to causing losses to individual investors to individual investors, environmental misinformation can have profound consequences for the confidence of the wider investment community in the effectiveness of sustainability disclosure regimes, with negative spillover effects on the financing needed for the transition to a more sustainable economy.

In terms of climate change impacts, there has been a global increase in the frequency and severity of natural disasters in recent years. These developments significantly impact insurance companies due to the rising value of claims paid for weather/climate-related natural catastrophe events. Regarding Romania, the World Bank confirms in its Climate and Development Country Report the country's vulnerability to natural disasters caused by climate change. Floods and droughts are the main categories of natural disasters identified by the WB to which the country is exposed, potentially generating significant macro-financial risks. Given the low level of insurance coverage in Romania, there is also a need to increase public awareness of the risks arising from climate change and the potential losses generated by them. Natural catastrophe insurance is a key tool for mitigating losses from extreme weather-related events, providing financing to households, and businesses in the event of such risks materialising.

1.Analysis of the local and international macroeconomic and financial context

In recent years, there have been several negative events, such as the pandemic, supply chain disruptions, Russian aggression against Ukraine, the energy crisis, the UK pension fund crisis, and the turmoil in mid-sized banks in the US and Switzerland, which most financial institutions have weathered well.

While the EU banking sector enjoys strong profitability, a solid liquidity position, and is well-positioned to face challenges arising from the risk environment, the European economy will continue to face a period of uncertainty that poses significant risks to financial stability and requires vigilance from all financial market participants. The recent EBA stress test showed that European banks remain resilient under an adverse scenario.

The conflict between Gaza and Israel could escalate further with spillover effects into the neighbouring geographical area, which produces about 35% of the world's oil exports, and 14% of its gas exports. Continued attacks in the Red Sea - through which 11% of world trade flows - and the ongoing war in Ukraine risk generating further negative supply shocks to the global recovery, with increases in food, energy and transport costs.

A slower-than-expected decline in core inflation in major economies, due, for example, to persistent labour market tightness and further tensions in supply chains, could trigger a rise in interest rate expectations and a fall in asset prices, similar to early 2023. Such developments could increase risks to financial stability, tighten global financial conditions, trigger flight-to-safety capital flows, and strengthen the US dollar with negative consequences for trade, and growth.

Fiscal consolidation is needed in many economies to cope with rising debt ratios. But too abrupt a shift to tax increases and spending cuts, beyond what is expected, could have adverse effects on growth in the short term.[3]

Oil prices have been volatile, averaging USD 83/barrel compared to USD 100/barrel in 2022, influenced by events such as the Middle East conflict. Natural gas and coal prices have also fallen considerably as European countries have reduced energy demand. Natural gas prices are expected to fall further in 2024 and 2025 due to increased production and exports of liquefied natural gas. Metal prices fell by 10% in 2023 due to weak demand from major economies, especially China, which accounts for 60% of global metal consumption. Food prices, the largest component of the agricultural price index, are down 9% in 2023 due to ample supplies of major crops, especially grains.

[3] IMF, World Economic Outlook Update, Moderating Inflation Steady Growth Open Path to Soft Landing, Ianuarie 2024.

Despite the weak performance in 2023, world trade is expected to accelerate to 2.3% in 2024, in line with the expected growth in world output[4].

Thus, commodity prices could become more volatile due to new geopolitical tensions and climate change-related disruptions. Since the end of the second quarter, oil prices have risen by around 25% amid voluntary supply cuts by OPEC+ countries. So far, the impact of the conflict in the Gaza Strip on commodity prices has been limited, but the risk of escalation exists and could lead to higher oil prices amid supply disruptions. Food prices remain high and could be further affected by an escalation of the war in Ukraine, causing significant difficulties for many less developed countries. Meanwhile, despite a downward momentum for inflation, the current level remains elevated, and near-term inflation expectations have risen above the expected level.

1.1. International macroeconomic and financial developments

The global economic recovery in the wake of the COVID-19 pandemic, Russia's invasion of Ukraine, and the cost-of-living crisis has proved surprisingly strong amid falling inflation and reflects the success of monetary policy tightening by central banks in keeping inflation expectations anchored. However, the IMF assesses that high interest rates to combat inflation and the withdrawal of fiscal support amid high debt could affect growth in 2024[5].

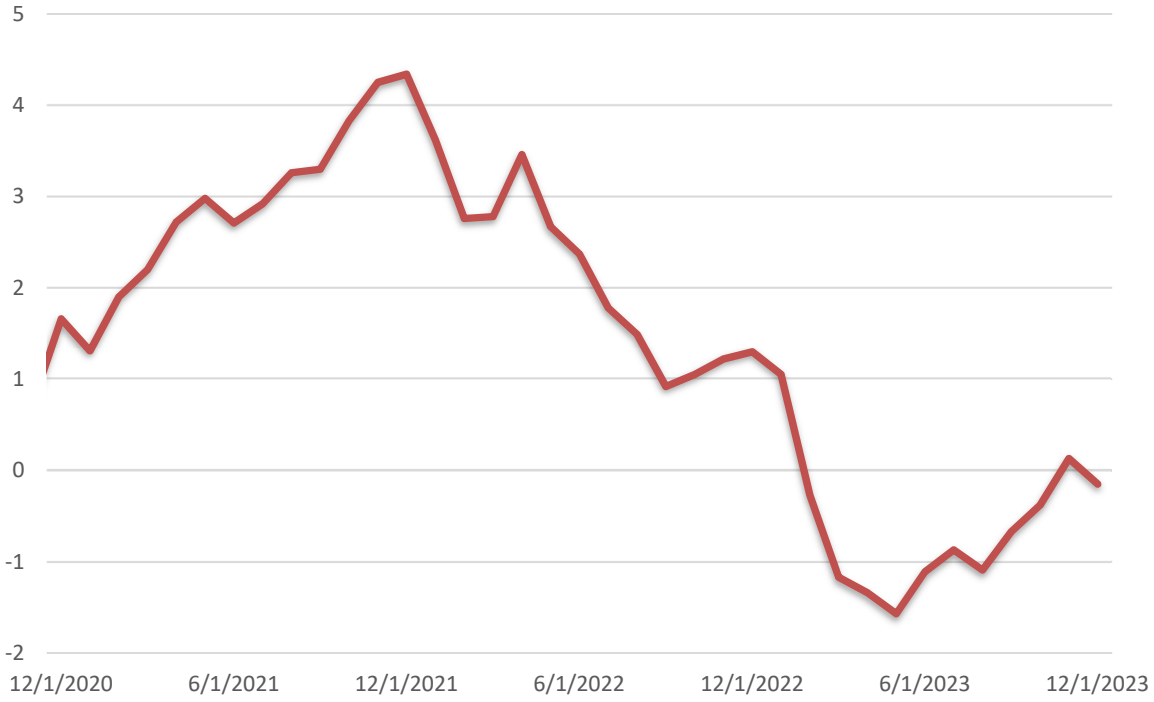
Favourable developments on the supply side are also reflected in the dynamics of the GSCPI index. The GSCPI (Global Supply Chain Pressure Index) measures supply chain disruptions and is calculated on the basis of a series of indicators such as the Baltic Dry Index (BDI), the Harpex index, the BLS air freight cost indices for freight flights between Asia, Europe, and the United States and components from the Purchasing Managers' Index (PMI) surveys, focusing on manufacturing firms in seven interconnected economies: China, the Eurozone, Japan, South Korea, Taiwan, the United Kingdom, and the United States.

The evolution of the GSCPI in 2023 indicates a continuation of the downward trend in tensions recorded in 2020 and 2021 in the supply chain structure. The decrease in the index is associated with lower global inflation for goods and producer prices.

[4] World Bank, Global Economic Prospects, January 2024.

[5] IMF, World Economic Outlook Update, Moderating Inflation Steady Growth Open Path to Soft Landing, January 2024.

Figure 1 Evolution of the GSCPI (Global Supply Chain Pressure Index)



Source: US Federal Reserve (FED), ASF processing

Globally, inflation fell at a faster pace than expected, largely due to positive global supply developments. Recent monthly assessments indicate inflation levels close to the pre-pandemic average for both headline and core inflation. In the fourth quarter of 2023, headline inflation is expected to be 0.3 percentage points lower than projected in the October 2023 World Economic Outlook report on a seasonally adjusted quarterly basis. This reduction is attributed to the diminishing impact of relative price shocks, particularly energy prices, and their reduced pass-through to core inflation. Short-term inflation expectations have declined in the major economies, while long-term expectations remain stable[6].

In the European economy, inflation is on a downward trend as a result of falling energy prices, tighter monetary policy, and easing supply bottlenecks. Although there was a brief increase to 2.4% in November 2023, this is expected to pick up temporarily due to a rebound in energy inflation. The underlying disinflationary process is expected to continue despite strong increases in labour costs, which currently drive HICP inflation, excluding energy and food. Headline HICP inflation is forecast to fall from 5.4% in 2023 to 2.7% in 2024, 2.1% in 2025, and 1.9% in 2026.[7]

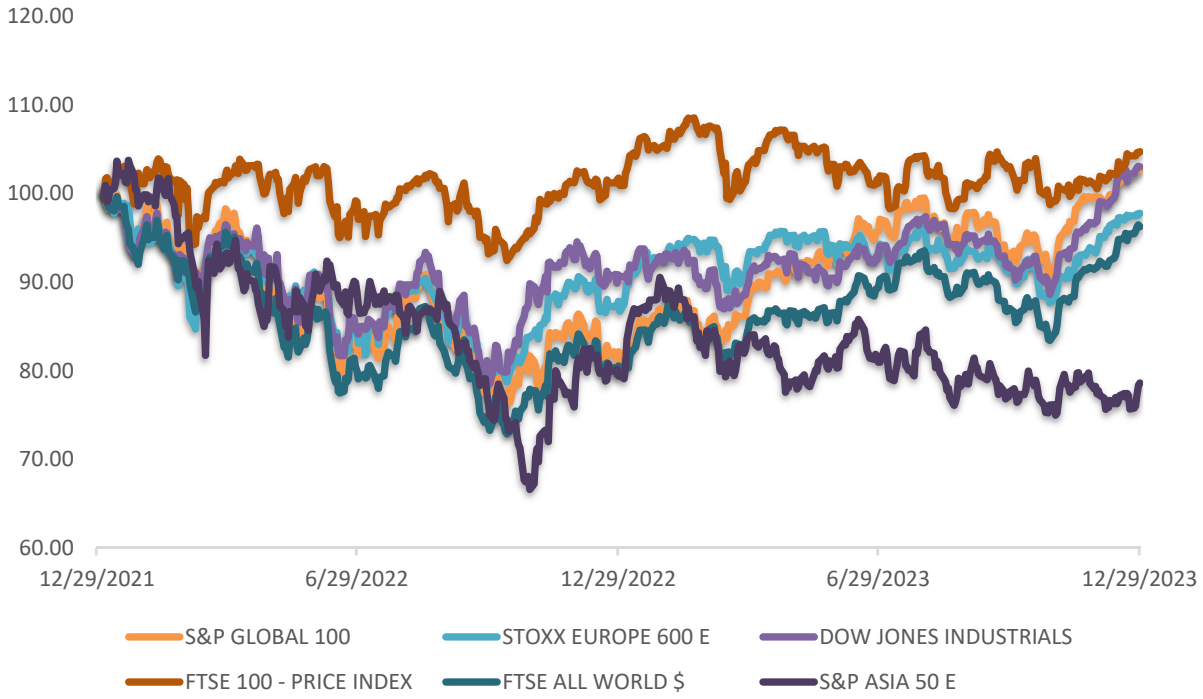
[6] IMF, World Economic Outlook Update, Moderating Inflation Steady Growth Open Path to Soft Landing, January 2024.
[7] ECB, Eurosystem staff macroeconomic projections for the euro area countries.

In 2023, major central banks raised monetary policy interest rates to curb inflation, leading to higher mortgage costs, difficulties in refinancing debt, greater availability of credit, and weakened business and residential investment.

The commercial real estate sector, facing both higher borrowing costs and post-pandemic structural changes, has been particularly hard hit.

As inflation eases, expectations of future cuts in long-term interest rates have boosted equity markets. The dynamics of the main international indices are shown in Figure 2 for the period from January 2022 to December 2023. The indices have been normalised to 100 to facilitate comparison. The dynamics of the indices suggest a normalising trend globally and a slight reduction as a result of the easing of quantitative tightening monetary policy. Compared to the beginning of 2023, all the indices analysed have increased.

Figure 2 Main international indices (1 January 2022=100)

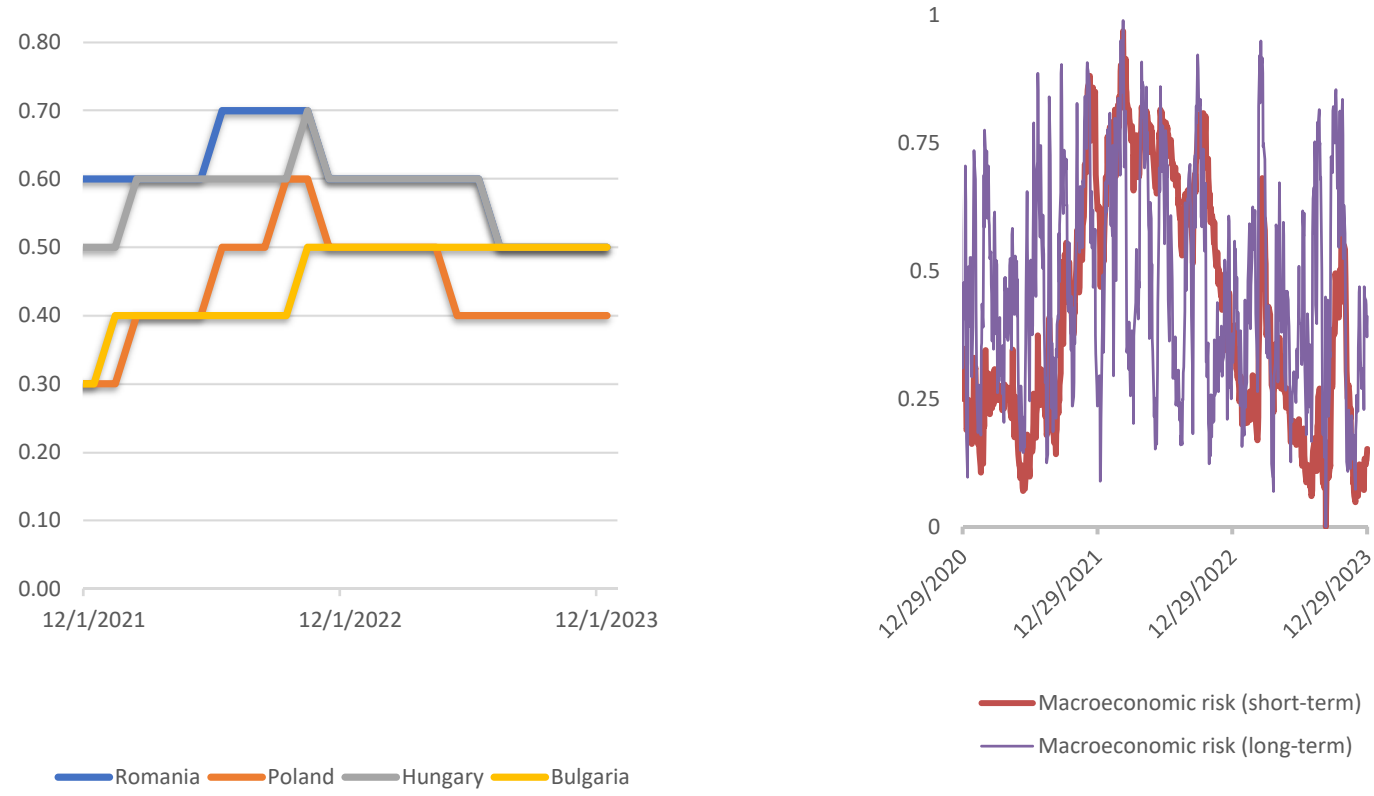


Source: Refinitiv, ASF processing

Economic sentiment remained stable despite the turmoil in the financial sector. This is also reflected in early warning indicators that are constructed to anticipate the likelihood of an economic crisis occurring amid macroeconomic imbalances.

In 2023, the early warning indicator for Romania showed a downward trend. The early warning indicators for the neighbouring economies of Poland, Hungary, and Bulgaria are very close, as the economies are exposed to a common mix of macroeconomic shocks. Short-term economic risk for the global economy has been on a downward trend in the last three quarters of 2023.

Figure 3 Early warning indicators and macroeconomic risk



Source: Refinitiv, ASF processing

1.2. Local macroeconomic and financial developments

Figure 4 shows the evolution of economic growth between 2020 - Q4 2023[8]. The breakdown of GDP dynamics for Romania by quarters over the 2021 - 2023 period is summarised in Table 1. Romania's Gross Domestic Product (GDP) reached USD 300.69 billion in 2022, according to official World Bank data. Romania's GDP value represents 0.13% of the world economy.

Table 1 presents signal estimates for GDP dynamics at the fourth quarter level in 2023[9]. According to them, compared to 2022, GDP increased by 2%. For the fourth quarter, real GDP was 0.4% lower than the previous quarter.

Table 1 Evolution of quarterly gross domestic product

		Q1	*Q2*	*Q3*	*Q4*	*Year*
- in % compared to the corresponding period of the previous year -						
GROSS SERIES	**2021**	99.9	115.2	106.3	102.5	105.7
	2022	105.0	105.1	103.8	104.6	104.1
	2023	102.4	101.0	101.1	102.9	102.0
SEASONALLY ADJUSTED SERIES	**2021**	101.0	112.7	107.1	102.7	-
	2022	105.0	103.9	103.3	104.4	-
	2023	101.0	102.8	103.2	101.0	-
- in % compared to the previous quarter -						
SEASONALLY ADJUSTED SERIES	**2021**	100.4	100.5	101.0	100.7	-
	2022	102.6	99.5	100.4	101.8	-
	2023	99.3	101.3	100.8	99.6	-

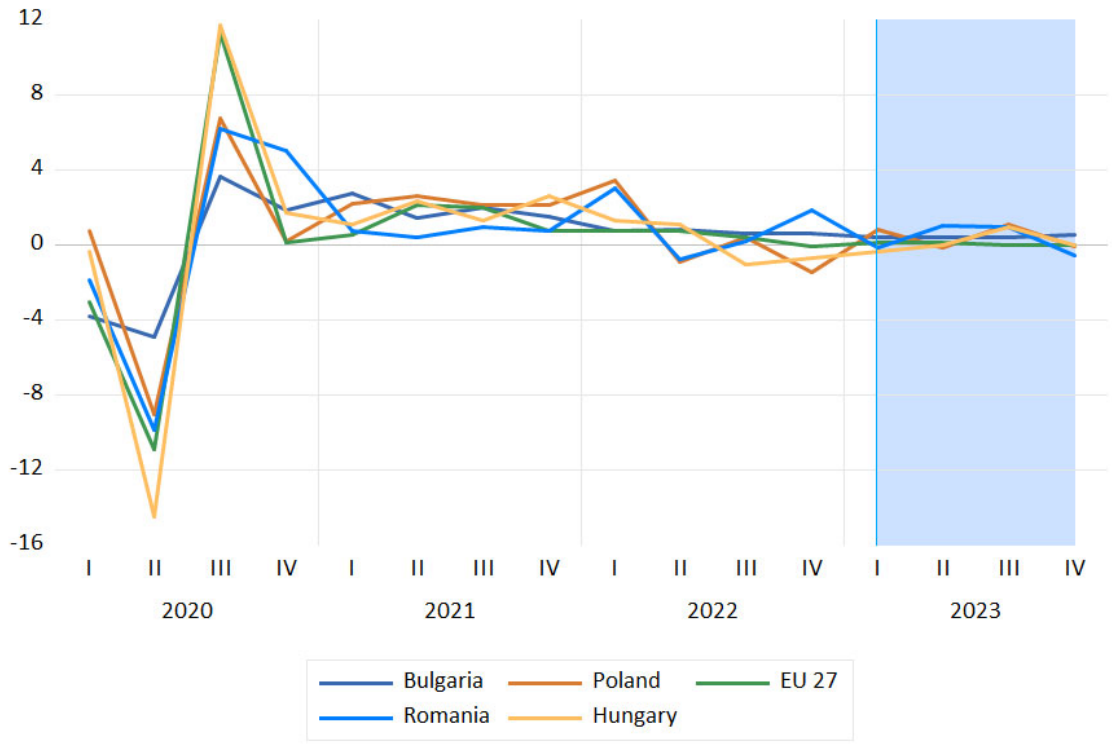
Source: NSI data

[8] The data for the charts below were collected from the Eurostat page on 13.02.2024 and adjusted with the signal estimates for GDP issued subsequently, as adjusted by Eurostat on 22.02.2024.

[9]Press release issued by the National Institute of Statistics (INS) on 14.02.2024, https://insse.ro/cms/sites/default/files/com_presa/com_pdf/pib_tr4r2023_0.pdf

Despite this, compared to the same quarter of 2022, GDP in Q4 2023 grew by 2.9% on a gross basis and by 1.0% on a seasonally adjusted basis. High inflation and low growth in private credit constrained domestic demand in 2023, while external demand was weak. Strong growth in gross fixed capital formation, boosted by EU-funded public infrastructure investment, offset slowing private consumption and falling inventories, while the negative contribution of net exports to growth eased[10].

Figure 4 Quarterly economic growth (as a percentage change over the previous period)



Source: Eurostat, ASF processing

On an annual basis, Romania's GDP growth was 1.1% in the third quarter of 2023, unchanged from preliminary estimates and up from 1% growth in the previous quarter, according to the National Institute of Statistics. This marked the tenth consecutive period of expansion, with foreign trade contributing positively to the country's economy, exports (-3.6%) falling at a much slower pace than imports (-6.5%). In addition, gross fixed capital formation (11.9% vs. 9.1% in the second quarter) grew at a faster pace. Meanwhile, household consumption (2.6% vs. 4%) grew more slowly, while government expenditure (-7.1% vs. 11.7%) collapsed. On a seasonally adjusted quarterly basis, Romania's GDP grew by 0.9% in the third quarter of 2023, slowing from 1.3% growth in the previous three-month period.

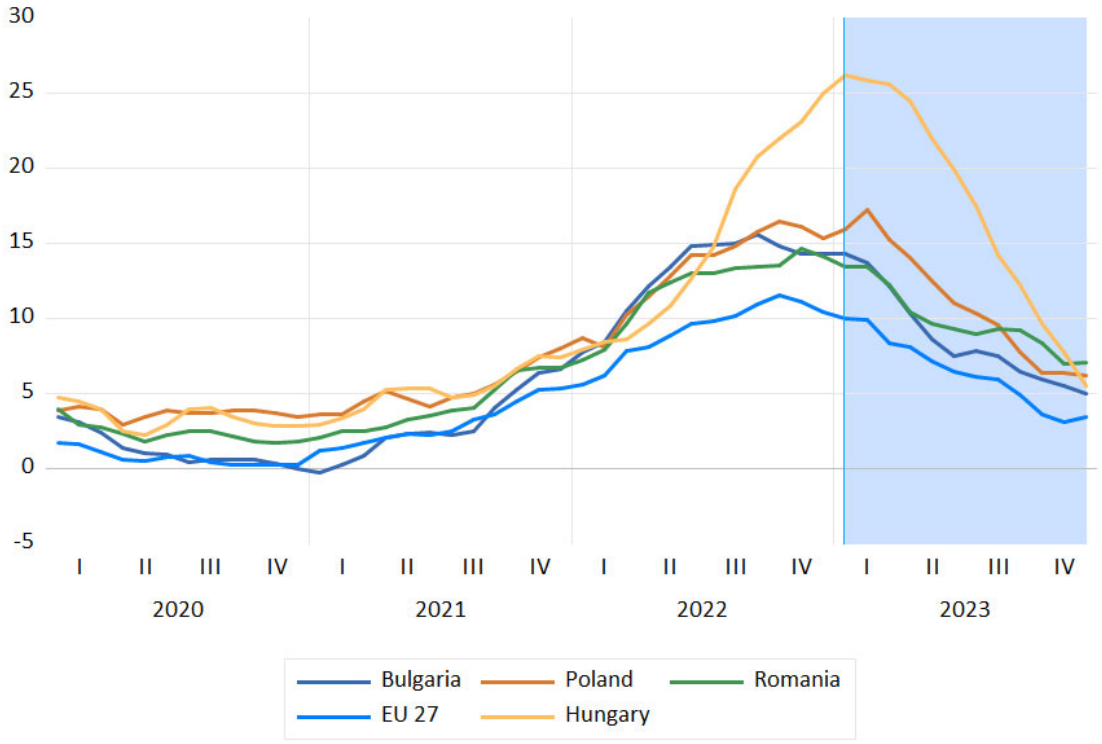
[10] European Commission, Economic forecast for Romania, Winter 2024 Economic Forecast.

According to Eurostat data, the European Union economy stagnated in the fourth quarter of 2023, following a contraction of 0.1% in the previous period.

Inflation dynamics

Romania's annual inflation rate fell slightly to 6.61% in December 2023 from 6.72% in the previous month. This was the lowest since September 2021, as food prices moderated (5.82% vs. 6.84% in November) due to lower costs of oil, butter, and fats (-25.32% vs. -25.02%), according to the National Institute of Statistics. In contrast, inflation rose slightly for non-food items (5.51% vs. 5.08%) and services (11.21% vs. 11.18%). On a monthly basis, consumer prices rose 0.26% in December, rebounding from a 0.01% drop in November.

Figure 5 Inflation rate



Source: Eurostat, ASF processing

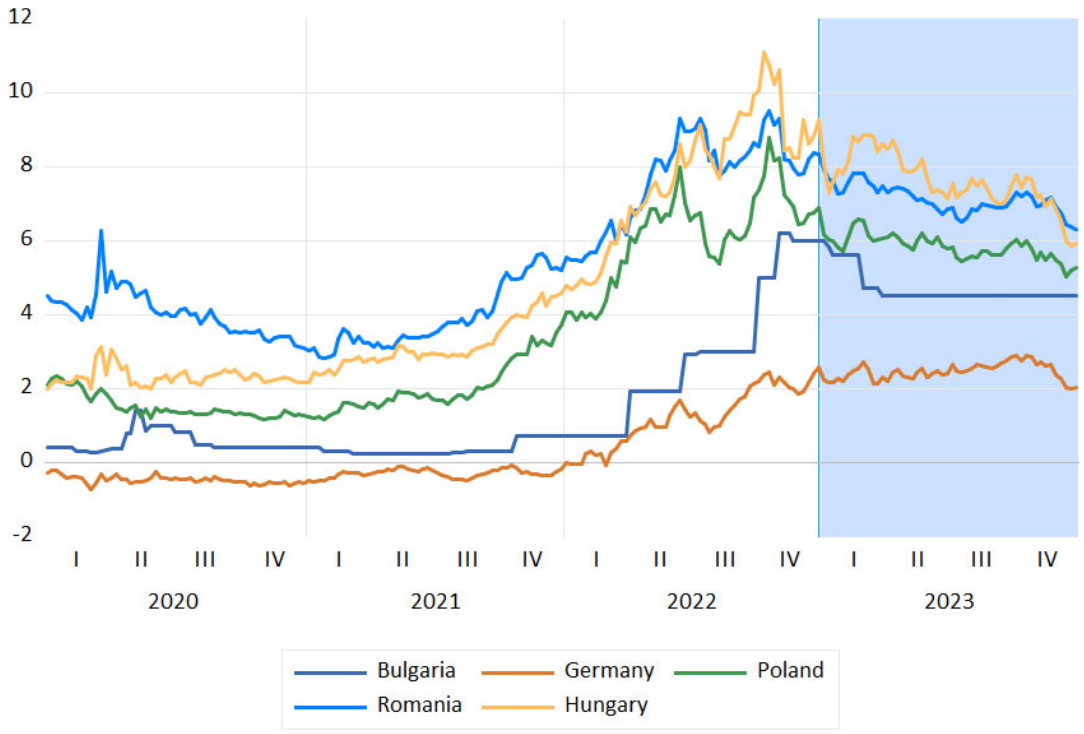
Inflation in the European Union rose to 3.40% in December from 3.1% in November 2023, according to Eurostat reports.

Interest rate

Figure 6 shows the 10-year sovereign bond dynamics for the countries included in the analysis. Germany is treated as a benchmark for European developments. Government bond yields continued their downward trend but showed a slight upward trend at the end of 2023.

In the fourth quarter of 2023, the National Bank of Romania did not change the values of the monetary policy rate and the lending and deposit facility rates from the previously recorded values.

Figure 6 Sovereign bond yields (10 years)



Source: Refinitiv, ASF processing

2. Risk overview of non-bank financial markets

Regular monitoring of risks in European non-bank financial markets is a macroprudential policy tool as risk factors affecting these markets also affect the non-bank financial markets supervised by ASF.

Although risks to financial stability did not increase in 2023, they remained high.

In the European economy, growth prospects have deteriorated and uncertainty has increased, including amid rising geopolitical tensions. Forecasts by European financial institutions show that the macroeconomic environment could continue to put strains on firms and households as fiscal space is reduced. This could generate imbalances in financial markets, even though European financial markets are currently stable and liquid.

2.1 European capital markets

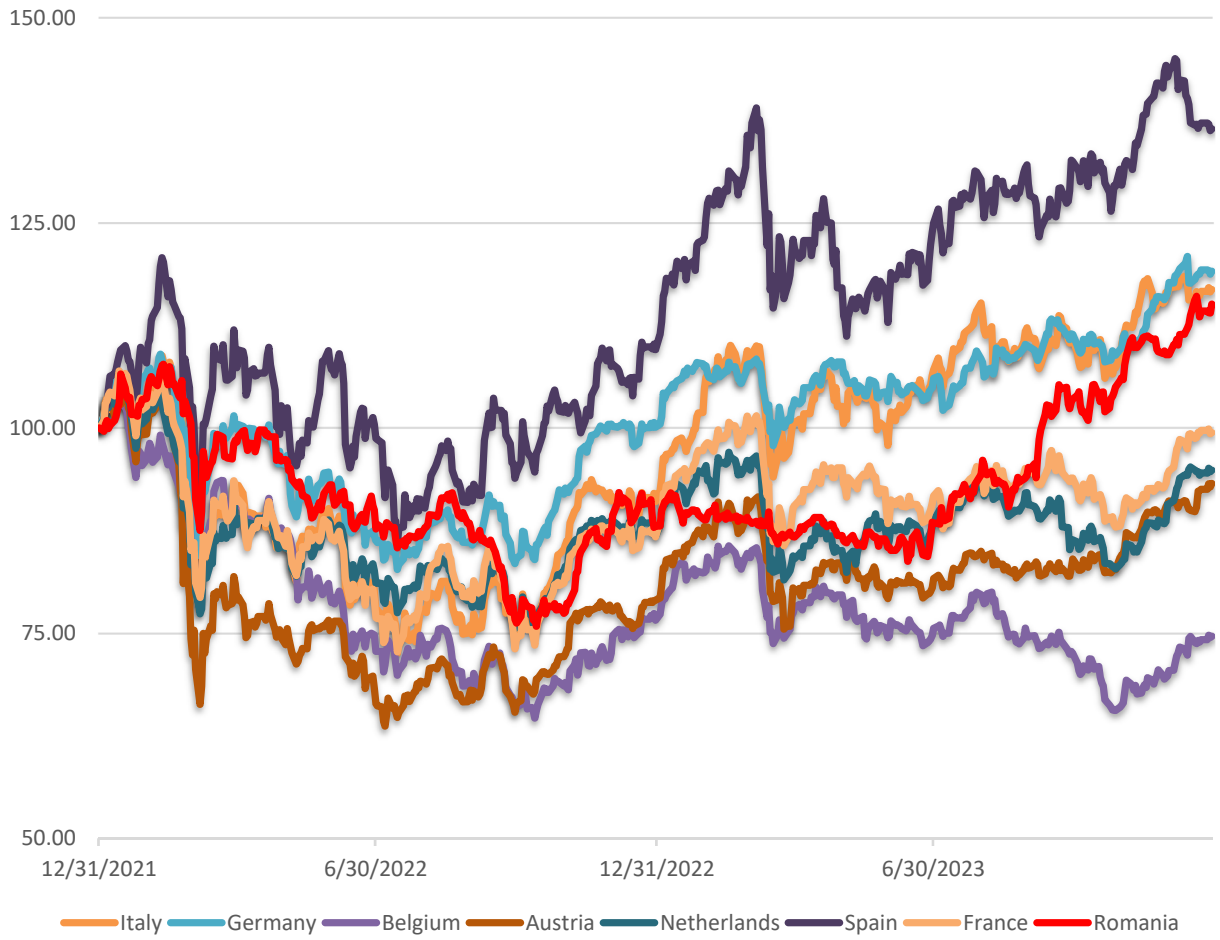
ESMA Report on Trends, Risks and Vulnerabilities No. 1/2024[11]

Equity valuations rose moderately in H2 2023, due to a year-end increase linked to expectations of lower interest rates in 2024. Volatility remained limited, while bid-ask spreads were relatively high, underscoring market nervousness.

Figure 7 shows the main sectoral stock market indices, reflecting the evolution of the EU financial sector in 2023. The sample is composed of Romania, Italy, Germany, Belgium, Austria, the Netherlands, Spain, and France.

[11] https://www.esma.europa.eu/sites/default/files/2024-01/ESMA50-524821-3107_TRV_1-24_risk_monitor.pdf

Figure 7 Stock market indices (financial sector)



Sursa: Refinitiv, prelucrare ASF

In 2023, financial markets recovered amid falling energy prices and expectations of a slower pace of monetary policy tightening. Stock market indices reflecting the activity of companies in the financial sector have risen since the beginning of 2023.

Going forward, markets will remain highly sensitive, in particular to any deterioration in economic fundamentals or risks within financial institutions, keeping a close eye on the sustainability of public and private debt in the context of continued high interest rates.

Financial markets rose in 2023 in the European Union amid rising volatility and inflation, coupled with short-term risks for consumers.

Overall, risks to European financial markets remain at high or very high levels. From a financial stability perspective, markets will remain sensitive, in particular to the market impact of higher long-term interest rates, the macro-financial outlook, and geopolitical and peripheral risks. There is a high risk of corrections in the context of fragile liquidity in the equity, bond and crypto markets, with a particular focus on real estate exposures. Inflation has fallen but continues to impact real investor returns.

Fixed income markets were generally lower towards the end of 2023, with sharp declines in sovereign and corporate bond yields in December. High-yielding non-financial corporate credit quality continued to decline, particularly in the real estate sector, with an upward trend in default rates.

The funds sector has partially recovered from its historic decline in 2022, mainly due to valuation effects. Performance returned to positive for equity and bond funds. Outflows from equity funds were down, while bond funds received inflows, which contrasts with outflows in 2022. EU fund performance and flows were volatile in H2 2023. Equity fund performance improved, with significant variations over the reporting period. In terms of flows, investors preferred fixed income funds to equity funds. Money market funds, in particular, attracted significant inflows on the back of rising interest rates and yield curve inversions.

Investor sentiment remained weak amid geopolitical uncertainty and low economic growth, despite falling inflation. With higher interest rates, investors increased their holdings of bonds, both directly and through investment funds. Real estate exposures through retail AIFs are a source of risk.

The EU market for ESG and sustainable investment products continued to grow at a robust pace, despite a slowdown in ESG bond issuance in H1 2023, and demand for funds with a sustainable investment objective remained strong. After several years of uninterrupted growth, ESG investment uptake and ESG market growth have stabilised in recent quarters. The ESG bond market grew at a slower pace, with a total outstanding amount of EUR 1.9 trillion in Q4 2023, up 21% year-on-year, while gross issuance volume declined. SFDR Article 9 funds with a sustainable investment objective experienced net outflows for the first time in Q4 2023, and outflows from SFDR Article 8 funds promoting social or environmental features accelerated, with the use of ESG-related terms in fund names being a key differentiator between these funds.

Cryptoasset valuations rebounded in 2023, fuelled by hopes that crypto spot ETFs would get US SEC approval, which happened in January 2024. However, at EUR 1.5 billion, the total market capitalisation of cryptoassets remains half the historic peak in 2021. The use of artificial intelligence in finance is growing across a wide range of applications, even if dedicated AI investment tools remain limited. Financial markets have started to explore the potential implications of artificial intelligence after various generative AI tools were launched in 2023. Their effect could be transformational, and authorities are analysing the benefits and risks for consumers and financial stability.

Risk dashboard[12]

Risk factors		
Category	Level	Outlook
Liquidity risks		→
Market risks		↘
Credit risks[13]		↗
Contagion risks		→
Operational risks		→
Environmental risks		→

Securities markets

Risks — **Level** — **Outlook**

- -The continuing uncertainty caused by the Russian invasion, the recent geopolitical tensions, and market volatility risks;
- -Continuing macro-financial uncertainties related to tightening global financial conditions and the weak macroeconomic environment;
- -Increasing credit risks as low economic growth increases already high indebtedness and the need and cost of refinancing debt increase;
- -Market nervousness is linked to the strong reaction to adverse events.

Asset management

Risks — **Level** — **Outlook**

- -Continuing pressures on the real yields of portfolios due to the weak medium-term economic outlook and supply and inflation pressures;
- -Shocks affecting both the liquidity of assets and liquidity demand could put funds exposed to liquidity mismatches in difficulty;

[12] Assessment of key risks by risk categories and sources for markets within the scope of ESMA since the last assessment and outlook for the next quarter. The risk assessment was based on the classification of the Joint Committee of European Supervisory Authorities. Coding: green = potential risk; yellow = significant risk; red = very high risk. Arrows pointing up = increasing risk intensity; arrows pointing down = decreasing risk intensity; horizontal arrows = no change. Change is measured relative to the previous quarter; outlook refers to the next quarter. ESMA's risk assessment is based on quantitative indicators and analysts' assessments.

[13] Credit risk is the risk that the issuer of the product or a company with which it is connected will default and be unable to meet its contractual obligations to repay the investment.

- -Continued adaptation to the new interest rate environment, especially in sectors exposed to unrealised losses.

Investors

Risks	Level	Outlook
- -Exposure to real estate through retail AIFs; - -Aggressive marketing , especially in terms of high-risk and crypto-active structured products; - -Digitisation, including use emerging artificial intelligence tools for customer services; - -Lack of consumer competence in terms of social media trading and copy trading; - -Potential greenwashing and limited knowledge on the subject ESG investment; - -High costs and poor communication.		

Infrastructures and services

Risks	Level	Outlook
- -The ongoing operational risk of cyber-attacks; - -Significant and ongoing operational risk for infrastructures in general, including exposure due to increasing digitisation and use of cloud services in core production processes; - -High reactivity at market events increases the risks of margin breaches and trading disruption.		

2.2 The EU insurance and occupational pensions market

According to the February 2024 edition of EIOPA's Risk Dashboard, based on Q3 2023 data, market risks for the European insurance sector are at a high level, while the other risk categories are all at a medium level. While macroeconomic risks persist in the insurance sector, with projections still pointing to a moderate GDP growth outlook, there is a downward trend, mainly underpinned by a reduction in projected inflation in all geographical areas considered. Credit risks are stable at a medium level, with spreads for the most relevant categories of fixed-income securities declining slightly by the end-2023. Market risks are significant as bond volatility remains high and commercial real estate prices have continued to decline.

Liquidity and funding risks were at a medium level, with an upward trend driven by developments in catastrophe bond issuance[14]. Median cash holdings decreased slightly from the previous quarter. Profitability and solvency risks remain stable, with a slight decrease in the median asset/liability ratio and the average solvency ratio of insurance groups. The median SCR of general insurance companies reported an increase, while the distribution for life insurance companies is broadly unchanged.

The risks of interconnections and imbalances are also stable at a medium level. Median exposures to banks, national sovereign debt, and derivative holdings, as well as the reinsured portion of premiums, decreased slightly from previous quarters. Insurance exposures remain at a medium level, with a positive year-on-year median premium growth for both life and non-life insurance and a further deterioration in the loss ratio.

Market perceptions show an underperformance of life and non-life insurance stocks compared to the overall market for the fourth quarter of 2023.

ESG risks remain stable at a medium level. The median exposure to climate-relevant assets is around 3.3% of total assets, while green bond investments represent around 7% of total green bonds outstanding.

Digitisation, and cyber risks have decreased to a medium level but are expected to increase further, according to the assessment of the national insurance supervisory authorities. Negative sentiment on cyber risks also points to growing concern in Q4 2023. The annual rate of change in the frequency of cyber incidents with impact on all business sectors, as measured by the latest publicly available data, remained high in the third quarter of 2023, but down from the previous quarter.

[14] A catastrophe bond (CAT) is a high-yield debt instrument designed to raise money for companies in the insurance industry in the event of a natural disaster. A CAT bond allows the issuer to receive funding from the bond only if specific conditions occur, such as an earthquake or tornado.

Table 2 EU insurance market risk dashboard, EIOPA, February 2024 [15]

	Riscuri	Nivel/Trend	Perspective
1.	Macroeconomic risks		
2.	Credit risks		
3.	Market risks		
4.	Liquidity and funding risks		
5.	Profitability and solvency		
6.	Interconnections and imbalances		
7.	Insurance risks (underwriting)		
8.	Market perceptions		
9.	Risks related to ESG factors		
10.	Cyber and digitisation risks		

Source: EIOPA, EU Insurance Market Risk Dashboard (February 2024)

EIOPA has published the first edition of the Risk Dashboard on Institutions for Occupational Retirement Provision (IORP)[16].

Based on individual occupational pension regulatory reports, the Dashboard summarises the main risks and vulnerabilities in the IORP sector in the European Economic Area (EEA) for the different schemes, namely defined benefit (DB) and defined contribution (DC). It includes a set of risk indicators covering traditional risk categories such as market and credit risks, liquidity risks, reserve and funding risks, as well as emerging threats such as ESG and cyber risks.

[15] The reference date for company data is Q3-2023 for quarterly indicators and 2022-YE for annual indicators.
[16] https://www.eiopa.europa.eu/tools-and-data/occupational-pensions-risk-dashboard_en

The Risk Dashboard has been developed in cooperation with the competent national authorities with the objectives of: (1) monitoring and assessing risks and their evolution in the IORP sector from a macro-prudential perspective; and (2) analyse potential vulnerabilities in the financial position of the IORP and their implications for financial stability at the EEA level.

The first edition shows that IORP's exposure to market and asset return risks is at a high level, making this risk category the most relevant for the sector, given the still high volatility in bond markets.

Macroeconomic risks are at a medium level there are positive developments related to a reduction in projected inflation, partly offset by a GDP growth outlook that remains weak by historical standards. Liquidity risks are at a medium level, but show an upward trend compared to the previous quarter, driven by developments in derivative positions.

The net asset value of IORP's derivative positions moved further into negative territory due to the continued increase in interest rates in Q3-2023.

All other risk categories are currently rated at a medium level, with increases expected for credit risk, as well as digitalisation and cyber risk over the next 12 months.

Table 3 EU occupational pension market risk dashboard, EIOPA, February 2024[17]

Risks	Level	Trend (last 3 months)	Outlook (next 12 months)
Macro risks			
Credit risks			
Market and asset return risks			
Liquidity risks			
Reserve and funding risks (DB schemes)			
Concentration risks			
ESG risks			
Digitisation and cyber risks			

[17] The reference date for IORP data is Q3-2023 for quarterly indicators and 2022-YE for annual indicators. The reference date for indicators that rely on externally sourced data is end-December 2023. Level (colour) corresponds to the risk level at the reference date, Trend is shown for the 3 months prior to the reference date and Outlook is shown for the 12 months after the reference date. The latter is based on the responses received from 21 by national competent authorities (NCAs) and is classified according to the expected change in the materiality threshold of each risk (substantial decrease, decrease, unchanged, increase and substantial increase).

2.3. National risks and vulnerabilities from a financial stability perspective

The global economic and financial situation remains fragile and vulnerable to turbulence that may generate further shocks, while external geopolitical tensions have intensified amid the conflict in the Gaza Strip. Inflation is persistent, although its pace has moderated due to the outcomes of restrictive monetary policies. The factors analysed lead to the macroeconomic risk assessment remaining at a high level, with upward trends, in the context of external vulnerabilities and uncertainties.

Market risk remains at a high level, with a tendency to stagnate, amid contagion and interconnectedness, with financial markets reacting promptly to the materialisation of any tensions and risk factors, in an environment where tightening financial conditions together with the external geopolitical situation have a high influence on them. All other risks (credit, liquidity, solvency, profitability, and operational) are assessed as medium to high, with increasing or stagnating trends.

Table 4 National risk dashboard[18]

Risk categories			Determinants
	Level	Outlook	
Macroeconomic risk	O	↗	Deterioration of macroeconomic prospects and recessionary risks, despite improving short-term performance amid heightened geopolitical tensions
Market risk	O	→	Financial market volatility, contagion, and interconnectedness; geopolitical uncertainties
Credit risk	O	↗	The inflationary environment characterised by high interest rates, rising private and sovereign debts as purchasing power declines
Liquidity risk	O	→	Materialising market risk in the context of persistent macro-financial vulnerabilities and amplification of shocks or tensions in financial markets
Solvency risk	O	→	Economic interconnections that can lead to knock-on effects related to honouring payment obligations
Profitability risk	O	→	Inflationary pressures, rising trends in the context of continued economic vulnerabilities
Operational risk	O	↗	Large-scale growth of digitisation and implicitly cyber incidents, including amid external geopolitical tensions

Source: ASF

[18] For the reporting unit, the same risk coding was used as that performed by ESMA

3.Stability of financial instruments and investments market

Overall financial conditions reflected the pass-through of monetary conditions into higher borrowing costs, while credit flows declined. The March 2023 turmoil in the banking sector, following the failures of some mid-sized US banks and Credit Suisse in Switzerland, led to a temporary market knee-jerk reaction and a temporary sharp fall in European bank share prices, albeit to a lesser extent than for US regional banks, amid transitory fears of contagion.

The market implications of the March events highlight the continued sensitivity of the European financial system to exogenous shocks and the high uncertainty that persists in the market. Market nervousness and negative news about parts of the financial system can spread rapidly and lead to a general increase in risk aversion. Despite the benefits of rising interest rates for banks' net interest income, concerns remain about potential unrealised losses on fixed - income securities, real estate valuations, and private financial services.

The current uncertainty is also exacerbated by the continuing high level of geopolitical risk. Although the initial economic impact of the war in Ukraine has diminished, there is still no sign of an end to the conflict. In addition, tensions between the US and China remain high. Ultimately, this could lead to further fragmentation of world trade, with a significant economic impact on the EU.

The analysis of the market for financial instruments and investments focused in particular on the dynamics of stock market indices, the contribution of significant local capital market companies to systemic risk, the sensitivity of company returns to systemic risk, and specific tests to identify speculative bubbles that might form amidst investors' expectations of growth.

An analysis of the evolution of systemic risk for six companies included in the BET index, from the perspective of value-at-risk (VaR) and conditional value-at-risk (CoVaR), shows that in 2023 the contributions of selected companies to systemic risk were at a lower level.

On the other hand, analysing the sensitivity of the six companies to systemic risk, the risk contributions show relatively stable dynamics, which are at low values in the year 2023 compared to the average for the period 2018-2023, with similar results as those recorded for the CoVaR specification.

The Supremum Augmented Dickey-Fuller (SADF) test was applied to detect whether the BET index is currently experiencing explosive dynamics on both the monthly and weekly series of the Price/Dividend indicator. The test results showed no explosive dynamics that can be associated with speculative rational bubbles.

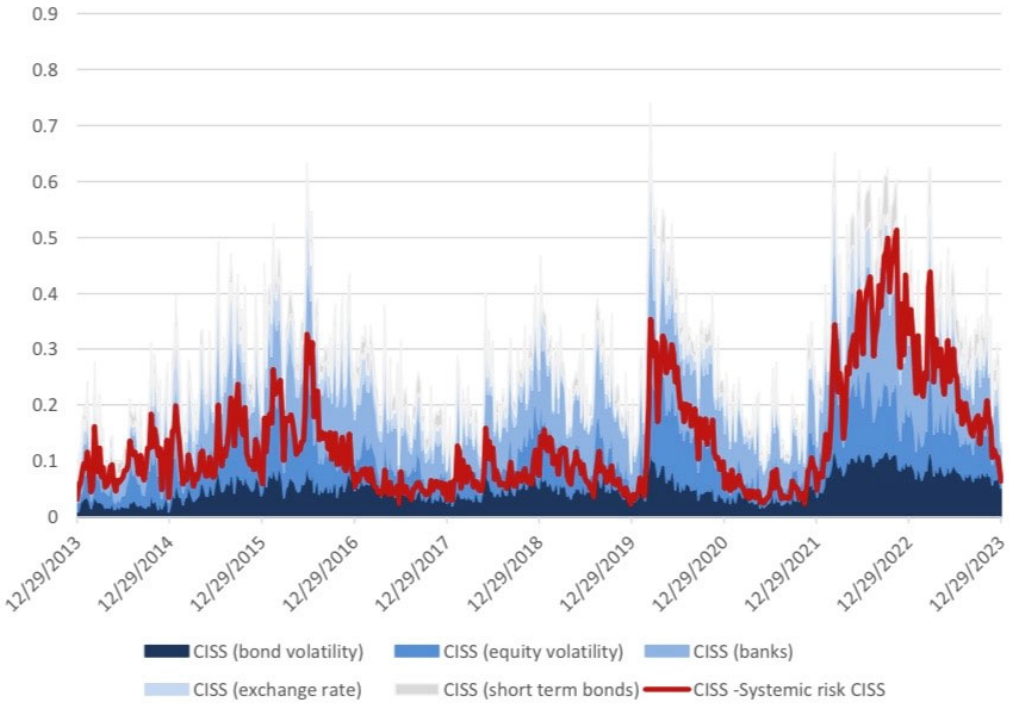
3.1 Financial instruments and investment market in the European context

Systemic risk measurement for European markets is carried out using the CISS indicator[19], which is a composite indicator for systemic risk calculated by the European Central Bank. The CISS indicator is constructed to show the extent to which systemic financial stress contributes to financial instability in European markets.

The indicator takes into account different sectors of the European financial system: stock and bond markets, foreign exchange and money markets, etc. The value of the indicator is constrained to be in the range (0, 1), so that higher values indicate periods of financial stress for European markets.

The CISS indicator, as well as the CISS sub-indicators, which measure stock, bond, and foreign exchange market volatility, trended down in 2023, but are still at high values.

Figure 8 Composite systemic risk indicator for European financial markets



Source: European Central Bank, ASF processing

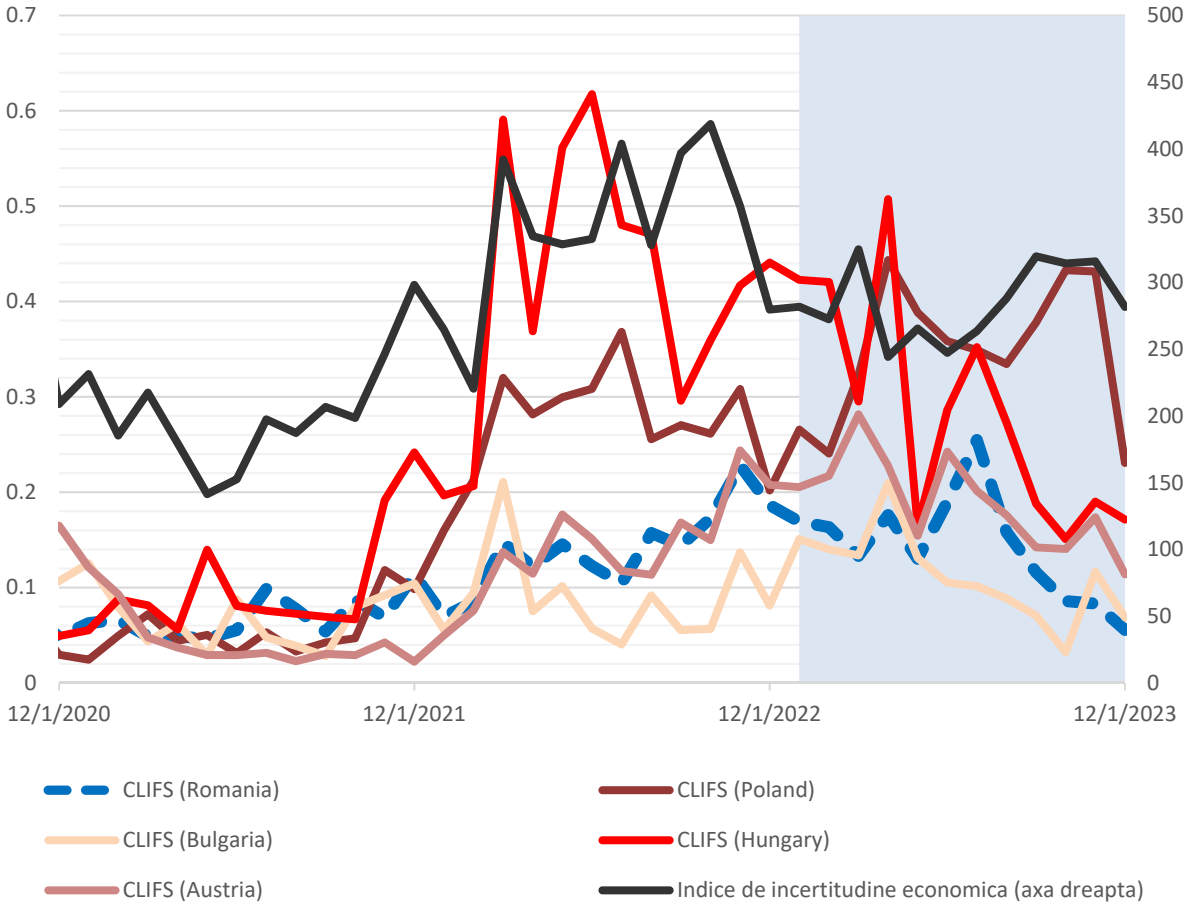
According to the CLIFS indicator, an index calculated by the European Central Bank to measure and compare the level of financial stress at the country level, Romania was characterized by an increase in financial stress in 2022 amid increased economic uncertainty at the international level. In 2023 the CLIFS

[19] CISS - Composite Indicator of Systemic Stress

index calculated for Romania experienced an increasing trend followed by a rapid reduction in the degree of financial stress.

The increase in systemic risk for the Romanian economy is largely explained by exogenous shocks. Figure 9 shows the high degree of co-dependence of the CLIFS indicator on the economic uncertainty index calculated for the European economy for 2023.

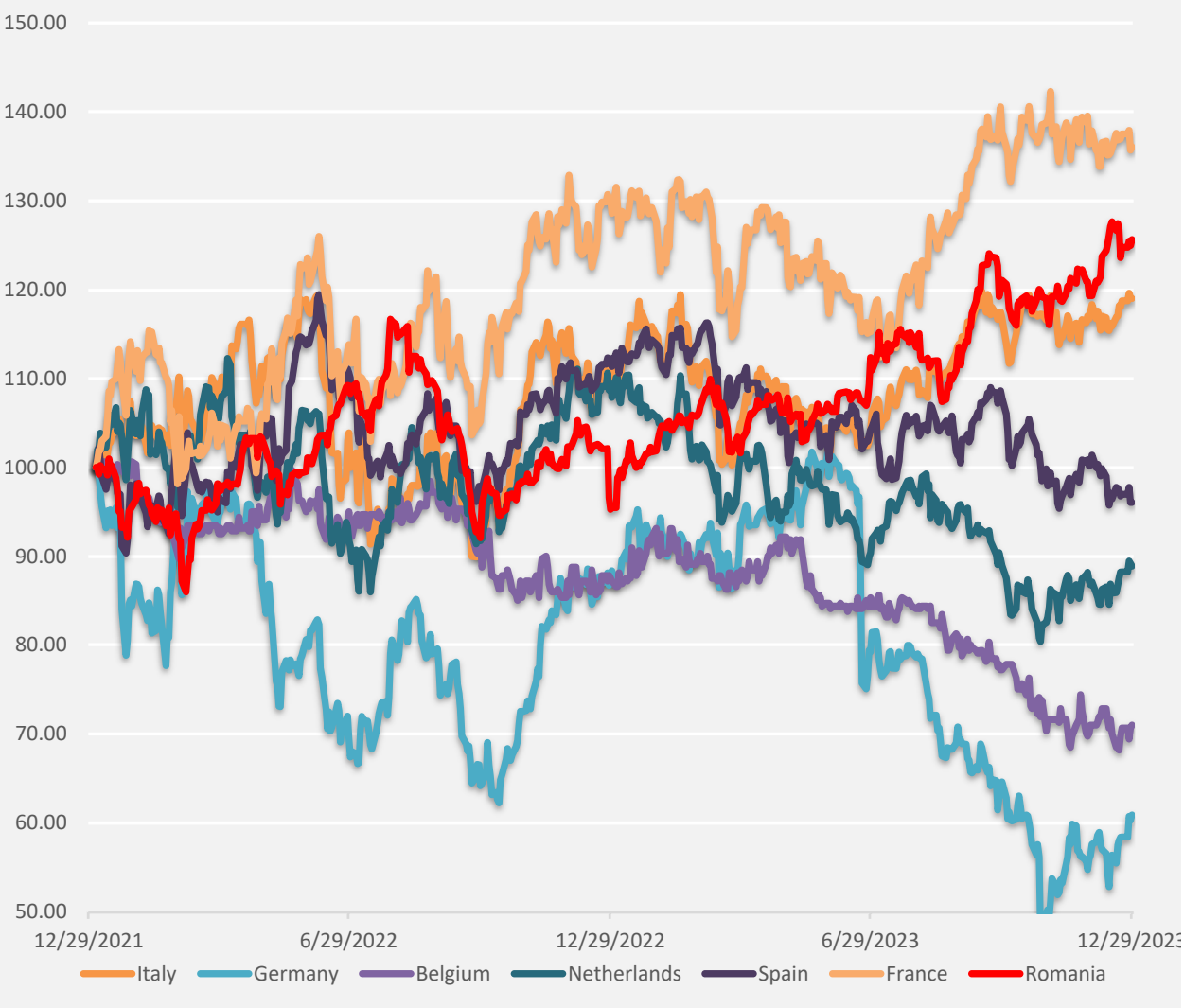
Figure 9 Financial Stress Indicators (CLIFS): Austria, Bulgaria, Poland, Romania, Hungary



Source: European Central Bank, Economic Policy Uncertainty, ASF processing

Valuations of energy-listed companies posted mixed returns in 2023. The sector index reflecting developments in the Romanian energy sector experienced a rapid increase in 2023.

Figure 10 Energy sector developments by country (1 Jan 2022=100)



Source: Refinitiv, ASF calculations

3.2 Equilibrium levels in European capital markets

The departure from the trend of equilibrium in European capital markets is a fact observed and included as a significant risk to financial stability by the world's leading financial institutions.

The equilibrium level of the capital market is the normal market level, an unobservable (latent) variable that can be estimated statistically. Estimating the equilibrium level is important for the analysis of capital market stability because it provides a reference level.

Exceeding the equilibrium level may indicate a period of unsustainable financial market growth or a change in the equilibrium level due to changes in fundamental factors affecting the economy (e.g., technological progress). Market declines below the equilibrium level may indicate a temporary period of financial stress, contagion effects, or a change in the equilibrium level following a period of economic recession.

The evolution of the index can be represented as the sum of the averaging process and the process of economic shocks. The estimation of the equilibrium level of the Romanian capital market index was performed with a Local Level model[20] estimated with the Kalman filter.

Index t = mean t + shocks t, shocks t ~$NID(0, \sigma 2\varepsilon)$

Mean t+1 = mean t + errors t, errors t ~$NID(0, \sigma 2\epsilon)$

The dynamics of the mean is given by the previous day's value plus measurement errors and is modelled as a stochastic process. Measurement errors are due to changes in the composition of the index, the weights of existing companies, etc. The equilibrium level of the stock market index is plotted by the average, whose dynamics are latent (unobservable).

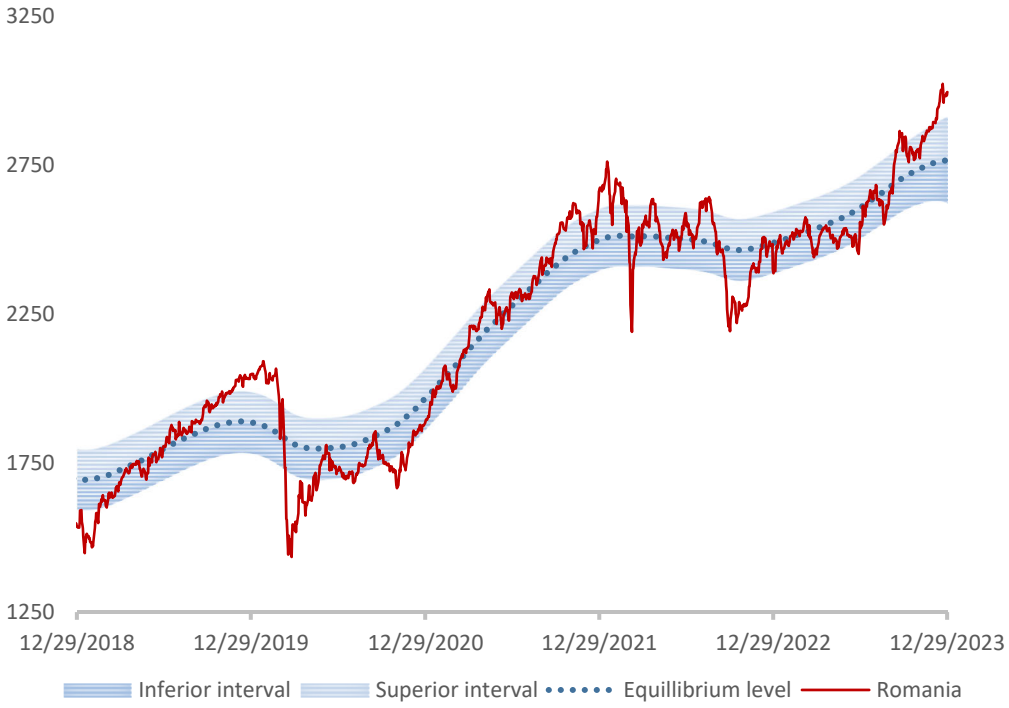
The graphical representation of the equilibrium level and confidence bands (90%) shows the equilibrium level, the confidence intervals for it, and the daily closing values for the represented indices.

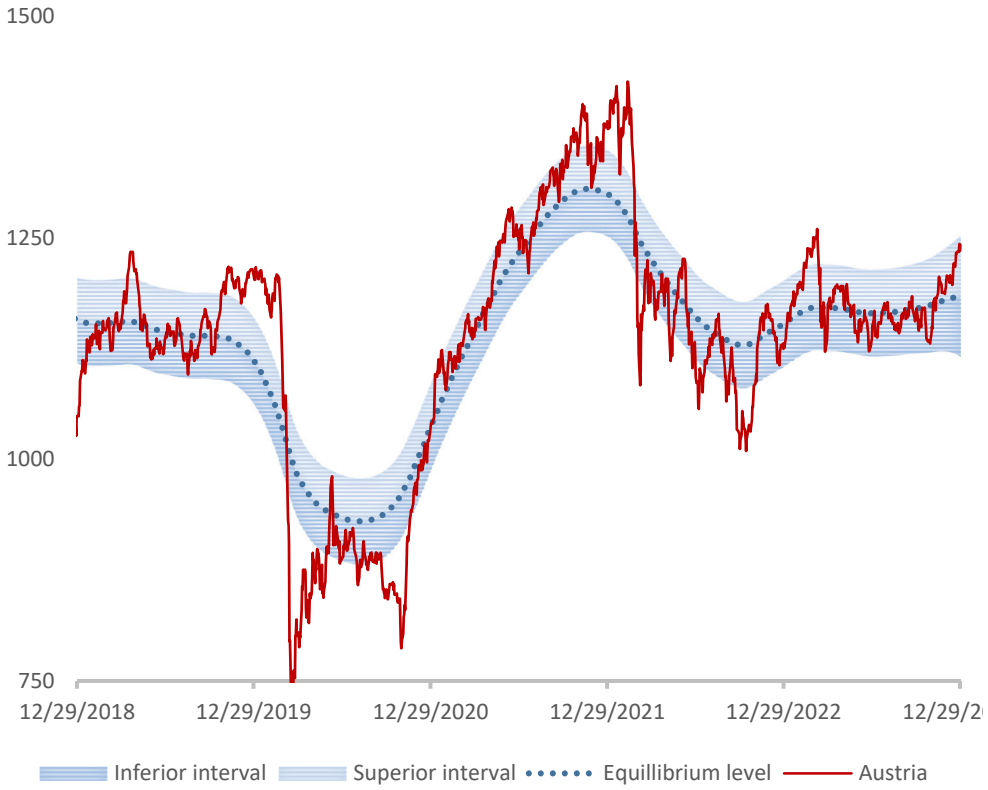
The STOXX600 index, which is a proxy for the European equity market, rose moderately above breakeven in 2023 amid expectations of a moderation in quantitative tightening policies. Figure 11 shows only developments in the Austrian, Romanian, and Polish equity markets, together with the STOXX 600 Index.

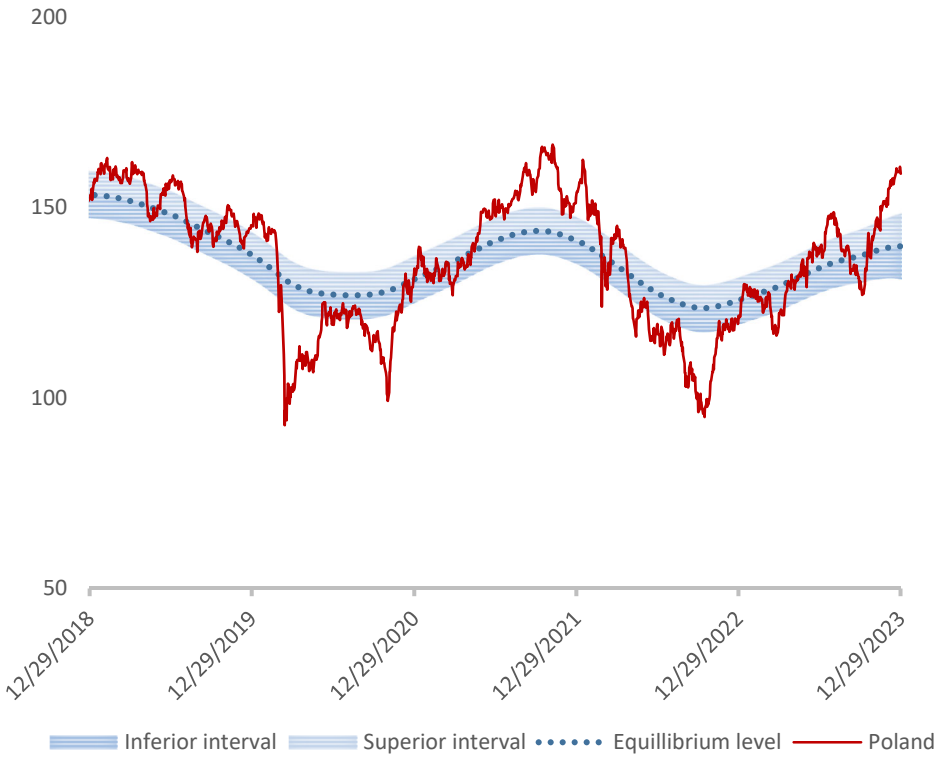
Romania's capital market index has seen sustained growth above breakeven as a result of developments in the local market, especially the listing of Hidroelectrica, Europe's largest IPO, in 2023.

[20] Durbin, J. and Koopman, S.J., 2012. Time series analysis by state space methods. Oxford University Press.

Figure 11 STOXX600, Austria, Romania and Poland stock market indices compared to equilibrium level






200
150
100
50
12/29/2018
12/29/2019
12/29/2020
12/29/2021
12/29/2022
12/29/2023
Inferior interval
Superior interval
Equillibrium level
Poland

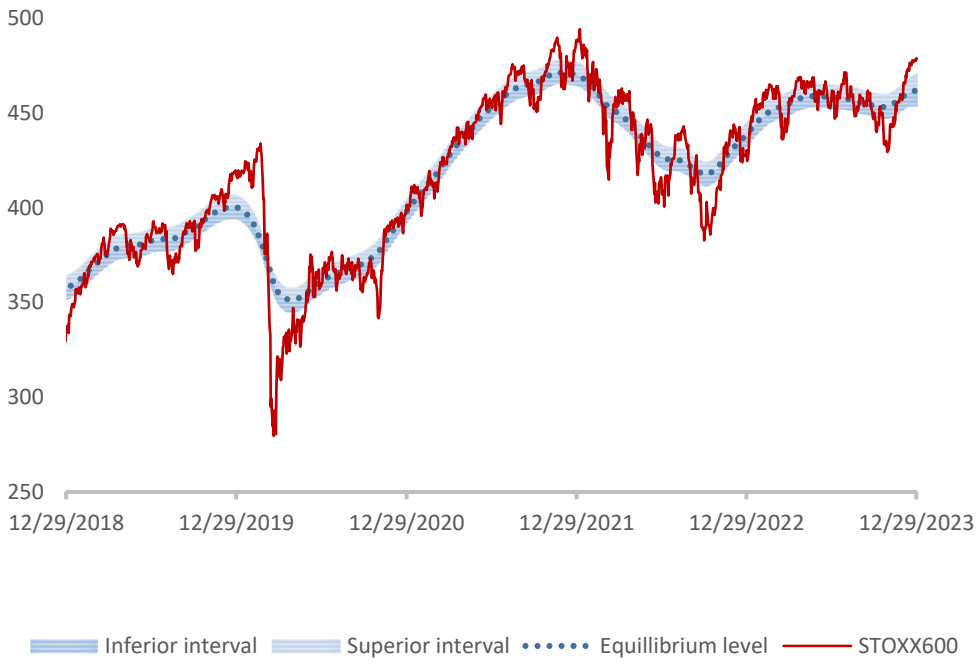
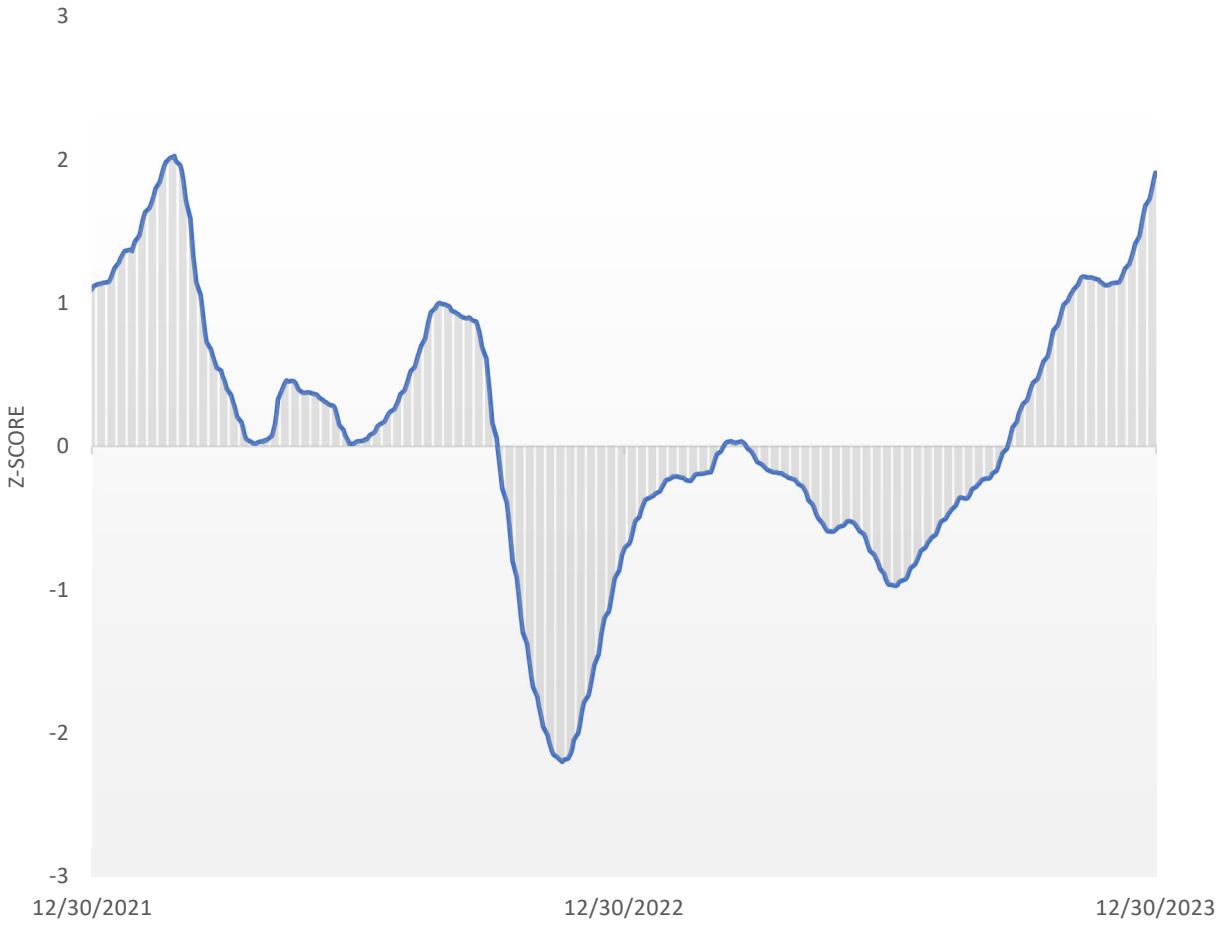

500
450
400
350
300
250
12/29/2018
12/29/2019
12/29/2020
12/29/2021
12/29/2022
12/29/2023
Inferior interval
Superior interval
Equillibrium level
STOXX600

Figure 12 Cyclical patterns of financial developments. Financial cycle patterns for the Romanian capital market



Source: Refinitiv, ASF calculations

Based on the model estimated above, the financial cycle for assets traded on the Romanian stock market was extracted. The extracted cyclical component was calculated as the difference between the index level for the Romanian capital market and the estimated equilibrium level. The results indicate sustainable growth above the equilibrium level in the first half of 2023, while the increase in the second half is due to the listing of Hidroelectrica.

The results confirm the tests obtained in Chapter 3.4.2 with the ADF test that the Romanian capital market experienced an episode of sustained growth above the econometrically estimated equilibrium level. By analysing the growth rate, we can assess that the Romanian capital market did not experience a speculative bubble episode.

3.3. Short-term dynamics of the Romanian capital market

At the end of 2023, the European indices analysed showed positive developments amid looser monetary policies by the major central banks in 2024. The DAX index (DE: +8.87%) recorded the most significant increase, followed by the EUROSTOXX index (EA: +7.54%).

At the same time, the main US and Asian indices saw similar changes to the European indices, with the exception of the SSEA index (SHG: -4.36%). The DJIA index (US: +12.48%), which tracks the performance of the top 30 blue chips in the United States, had the most considerable increase at the end of 2023, due to the fact that the US economy grew in the fourth quarter of 2023 at a faster pace than expected and inflation slowed down. The NIFTY 50 Index (IN: +10.66%), which represents the most important 50 companies in India, ended 2023 with a considerable performance, marking the eighth consecutive year of positive returns. Indian equities continued to be preferred by institutional investors due to the country's macroeconomic stability and earnings momentum.

The BVB stock exchange indices showed positive developments. The listing of Hidroelectrica was the main internal factor in the local stock market evolution, with the shares of most of the companies in the BET having increased substantially in the last six months of the year. The recorded dynamics (3 months) ranged from +4.85% in the case of the BET-NG index (which reflects the evolution of companies listed on the regulated market of the BVB whose main activity is energy and related utilities) to +9.63% in the case of the BET-FI index (which reflects the evolution of financial investment companies (SIFs) and other similar entities).

Table 5 Stock market returns on 29 December 2023

International indices	3 months	6 months	12 months
EA (EUROSTOXX)	7,54%	2,78%	15,66%
FR (CAC 40)	5,72%	1,93%	16,52%
DE (DAX)	8,87%	3,74%	20,31%
IT (FTSE MIB)	7,47%	7,51%	28,03%
GR (ASE)	6,93%	1,14%	39,08%
IE (ISEQ)	4,08%	0,43%	23,23%
ES (IBEX)	7,15%	5,31%	22,76%
UK (FTSE 100)	1,65%	2,68%	3,78%
US (DJIA)	12,48%	9,54%	13,70%
IN (NIFTY 50)	10,66%	13,25%	20,03%
SHG (SSEA)	-4,36%	-7,08%	-3,68%
JPN (N225)	5,04%	0,83%	28,24%

Indici BVB	3 months	6 months	12 months
BET	7,21%	23,13%	31,79%
BET-BK	7,90%	22,89%	31,08%
BET-FI	9,63%	21,25%	17,95%
BET-NG	4,85%	16,85%	31,42%
BET-TR	8,24%	27,24%	39,93%
BET-TRN	8,15%	25,26%	37,45%
BET-XT	6,93%	22,12%	29,96%
BET-XT-TR	7,71%	25,61%	37,27%
BET-XT-TRN	7,64%	23,82%	35,02%
BETAeRO	6,85%	12,76%	19,98%
BETPlus	6,89%	22,62%	30,42%
ROTX	7,88%	22,72%	31,24%

Source: Refinitiv, ASF calculations

Note: 3 months=29.12.2023 vs. 29.09.2023; 6 months=29.12.2023 vs. 30.06.2023; 12 months=29.12.2023 vs. 30.12.2022

The contagion index[21] measures the marginal contribution of foreign capital markets to the Romanian stock market. The Romanian stock market is sensitive to the same regional risk factors that influence stock market returns in Austria, Poland, Hungary, and Bulgaria. Extending the data sample to cover all capital markets in Europe shows that capital markets that are important in terms of capitalisation act by transmitting volatility to less interconnected and smaller capital markets in terms of capitalisation.

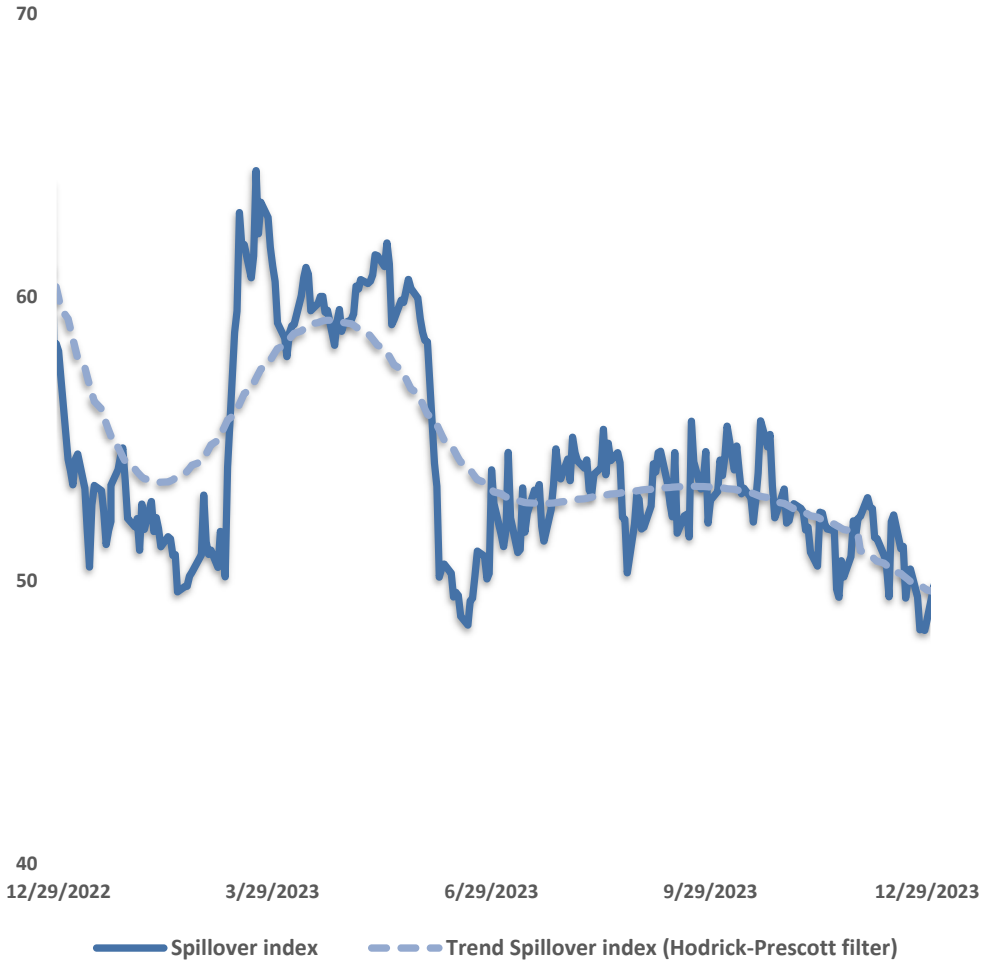
There is a strong link between the contagion effect and company returns, as increasing contagion tends to lower the returns of listed companies.

The contagion index exhibited stationary dynamics and reduced volatility in 2023 compared to the previous year, due to decreased financial tensions in the analyzed markets amid a trend of rising market yields. The reduction of financial tensions in European financial markets is briefly represented above in the downward trend of the CISS index.

The evolution of the intensity of the contagion phenomena is carried out by comparison with the previous values of the index and indicates a reduction in contagion for the stock market indices analysed.

[21] The calculation methodology used is adapted from "Measuring Financial Asset Return and Volatility Spillovers with Application to Global Equity Markets" (Diebold, F.X and Yilmaz, K.,2009). The index is constructed from 5 representative stock indices for the stock markets of Germany, Austria, Romania, Hungary and Poland based on a Vector Autoregressive (VAR) model with 10 forecast steps for an estimation window of 200 days by summing the forecast variance error of the indices. The sample used contains daily data over the interval December 2011-December 2023.

Figure 13 Spillover index



Source: Refinitiv, ASF calculations

3.4. Risks and vulnerabilities of the financial instruments and investments market

In a general sense, systemic risk denotes the possibility of financial instability becoming so widespread that it affects the financial system to the extent that economic growth and welfare are affected.

Financial stability[22] refers to the state in which the financial system can withstand shocks without significant disruption and in which the financial system, including financial intermediaries, markets, and market infrastructures, is able to cope with adverse shocks and dynamics generated by financial imbalances that have a negative impact on real economic activity.

A stable financial system is able to allocate resources efficiently, assess and manage financial risks, maintain employment levels close to the natural real rate of interest, and eliminate relative price movements of real or financial assets that will affect monetary stability or employment levels. Under stable conditions, the system will absorb shocks mainly through self-correcting mechanisms, reducing adverse effects on the real economy.[23]

In times of financial instability, banks are more reluctant to finance even profitable projects, asset prices deviate excessively from their intrinsic values, and payments are made late. A major level of instability can lead to failures for financial institutions, hyperinflation, or stock market crashes. This can seriously shake confidence in financial and economic systems.

Currently, core inflation is still at a high level, which motivates central banks to maintain a tighter monetary policy for a longer period of time.

Although the acute tensions in the global banking system have eased, there is still a risk of triggering corrections in financial markets in the event of a sudden tightening of financial conditions, which could again test the resilience of the international financial system. In particular, the global credit cycle has started to reverse as borrowers' ability to repay their debts is weakening and credit growth is slowing.

The IMF's Growth-at-Risk measure summarises this assessment, indicating that risks to global growth are at a high level, similar to the assessment made in April 2023.[24]

[22] European Central Bank, The Concept of Systemic Risk.

[23] The World Bank, Global Financial Development Report.

[24] International Monetary Fund, Global Financial Stability Report October 2023: Financial and Climate Policies for a High-Interest- Rate Era.

3.4.1.Analysis of systemic risk developments for companies included in the BET index

Systemic risk is one of the key concepts in contemporary macro-financial analysis. This risk undermines financial stability by affecting the functioning of a large part of the financial system and exerting negative effects on the real economy (Freixas, Laeven, & Peydró, 2015). The accumulation of systemic risk is one of the repercussions of financial globalisation, which has increased the interconnectedness between financial markets and institutions (Evanoff, Hoelscher, & Kaufman, 2009).

Largely neglected by researchers and practitioners prior to the 2008 global financial crisis, systemic risk has gained a much greater dose of attention that has been materialised in a consistent series of investigations, the findings of which are relevant to banking risk management, regulation, and macroprudential policy. Many of these have focused on the global dimension of systemic risk and its negative effects on the world economy, e.g. Ellis et al., 2014, Kanno, 2015, Bostandzic and Weiβ, 2018, McLemore et al., 2022. Systemic risk is a phenomenon impacting all dimensions of the financial system, with academic investigations covering a wide spectrum of forms: banking institutions (Lehar, 2005, Bostandzic & Weiss, 2018), financial markets (Caporin et al., 2021, Umar et al., 2022), valuation markets (Borri, 2018), or cryptoassets (Akhtaruzzaman et al., 2022, Shahzad et al., 2022).

The literature has identified two main classes of models used in systemic risk detection. The first is based on the concept of Value-at-Risk (VaR), while the second is built around the concept of Expected Shortfall (ES).

The models used in this analysis for the companies in the BET index are CoVaR and Marginal Expected Shortfall. The main methodological construction details are presented in Appendix 1.

This analysis focuses on a number of 6 companies that have been selected according to their weight in the BET index. The data set contains the following companies: BANCA TRANSILVANIA S.A. (TLV - 19.99%), S.P.E.E.H. HIDROELECTRICA S.A. (H2O - 18.28%), OMV PETROM S.A. (SNP - 16.83%) S.N.G.N. ROMGAZ S.A. (SNG - 9.26%), %), BRD - GROUPE SOCIETE GENERALE S.A. (BRD - 7.83%), and S.N. NUCLEARELECTRICA S.A. (SNN - 4.78%)[25]. For these companies and for the BET index, we collected daily prices from the Refinitiv platform for the interval 01.01.2018 - 29.12.2023. Table 6 gives a brief overview of the above companies.

[25] Company weights in the index are specific to the periodic adjustment on 08.12.2023. For more details see www.bvb.ro .

Table 6 Description of the companies analysed

Symbol	Description
TLV	Banca Transilvania (TLV) is at the forefront of the Romanian banking system in terms of look at the assets. Its activity is structured around three main business lines: Corporate, SME and Retail.
H2O	HIDROELECTRICA S.A. was formed on July 13 2000, following the reorganisation of National Electricity Company "CONEL". Given its production capacity, Hidroelectrica supplies about 30% of national production. At the same time, over the last 10 years, the average volume of system services has averaged around the following coordinates: 70% of the total secondary regulation service, approximately 84% of the fast tertiary reserve service and 100% of the reactive energy service of the National Energy System requirements.
SNP	*OMV Petrom* is the largest energy company in Southeast Europe. The company is active across the entire energy value chain, including oil and gas exploration and production, fuel refining and distribution, and power generation, along with natural gas and electricity trading.
SNG	S.N.G.N. ROMGAZ S.A. has extensive experience in the field of natural gas exploration and production, making it one of the largest producers and main supplier of natural gas in Romania. As of November 12 2013, the shares issued by S.N.G.N. ROMGAZ S.A. are traded on the regulated market administered by the Bucharest Stock Exchange. At the same time, the company's shares serve as a backing for global depository receipts (GDRs) issued by The Bank of New York Mellon, GDRs that are traded on the London Stock Exchange.
BRD	BRD Groupe Société Générale is the second largest bank in Romania in terms of total assets and ranks fourth in terms of market capitalisation on the Bucharest stock exchange.
SNN	Societatea Națională Nuclearelectrica S.A. is the sole producer of nuclear energy in Romania and the exclusive supplier of CANDU 6 technology specific fuel. In October 2013, SNN was listed on the Bucharest Stock Exchange, and the shares issued by SNN have been included in category I of the Bucharest Stock Exchange since November 4 2013.

Source: ASF processing

Figure 14 Closing prices[26]

Source: Refinitiv, ASF processing

Figure 14 shows the closing prices for the financial assets included in the analysis. It comprises 7 quadrants, the first one being dedicated to the BET index and the remaining 6 companies in the sample. The shaded area marks the period covered by this report. An upward trend is observed for all financial stocks, generally showing peaks at the end of the fourth quarter of 2023. The most representative increases are visible for H2O, SNG, BRD, and TLV.

Series of Tables 7 and 8 summarize the estimated Spearman correlation matrices for the sample companies and the BET index. The first analysis covers the extended sample (2018:01 - 2023:12) and the second covers the dynamics for the year 2023.

Table 7. Spearman correlations for the period 2018 – 2023

	BET	BRD	H2O	SNG	SNN	SNP	TLV
BET	1.000000	0.596086	0.437647	0.618340	0.508777	0.632331	0.783245
BRD	0.596086	1.000000	0.176618	0.394793	0.356974	0.390519	0.458964
H2O	0.437647	0.176618	1.000000	0.187777	0.108684	0.146420	0.233063
SNG	0.618340	0.394793	0.187777	1.000000	0.377282	0.427506	0.487734
SNN	0.508777	0.356974	0.108684	0.377282	1.000000	0.279899	0.379873
SNP	0.632331	0.390519	0.146420	0.427506	0.279899	1.000000	0.368955
TLV	0.783245	0.458964	0.233063	0.487734	0.379873	0.368955	1.000000

Source: Refinitiv, ASF processing

[26] The data sample used for Hidroelectrica is limited by the company's listing date.

The values shown in Table 7 indicate positive correlations between financial assets. These are at significant values (p-values) given the position and the field of activity of the selected companies. In Table 8, which is dedicated to the year 2023, positive correlations can also be observed. These are generally less strong, with lower coefficient values compared to the initial results.

Table 8 Spearman correlations for the period 2023 (January - December)

	BET	BRD	H2O	SNG	SNN	TLV	SNP
BET	1.000000	0.596086	0.437647	0.618340	0.508777	0.783245	0.632331
BRD	0.596086	1.000000	0.176618	0.394793	0.356974	0.458964	0.390519
H2O	0.437647	0.176618	1.000000	0.187777	0.108684	0.233063	0.146420
SNG	0.618340	0.394793	0.187777	1.000000	0.377282	0.487734	0.427506
SNN	0.508777	0.356974	0.108684	0.377282	1.000000	0.379873	0.279899
TLV	0.783245	0.458964	0.233063	0.487734	0.379873	1.000000	0.368955
SNP	0.632331	0.390519	0.146420	0.427506	0.279899	0.368955	1.000000

Source: Refinitiv, ASF processing

Note that the results of the correlation analysis in this case have a particular dynamic that derives from the size of the data sample for Hidroelectrica.

Figure 15 Returns and conditional volatility for the BET index

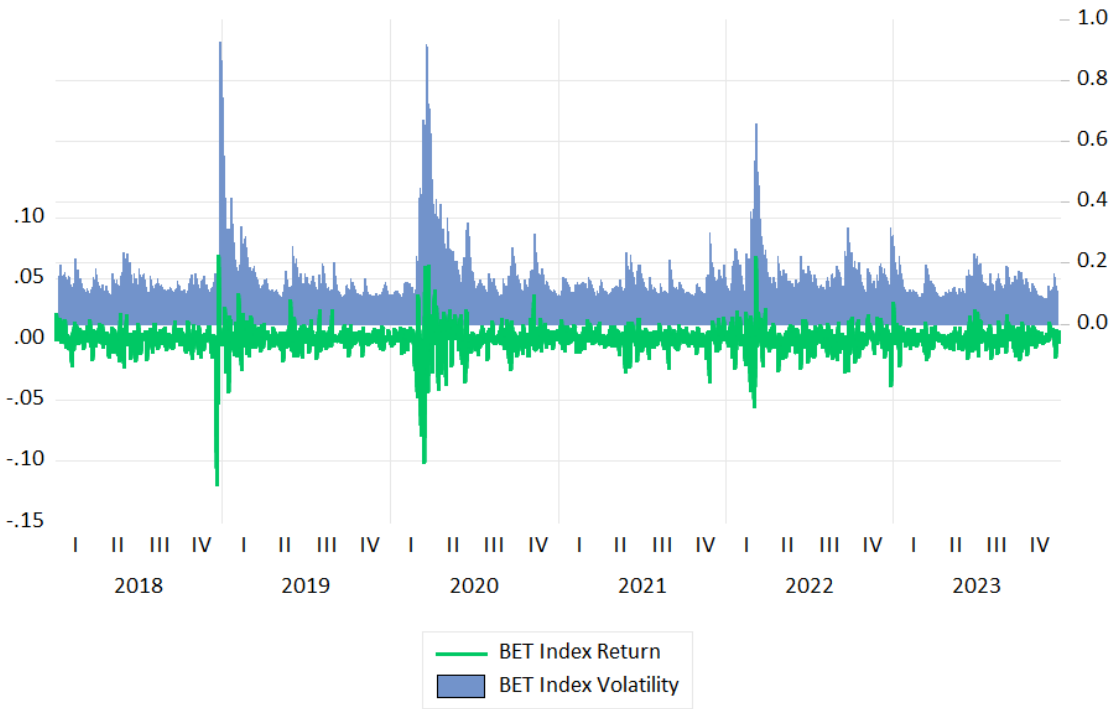


Figure 16 Returns and conditional volatility for BRD

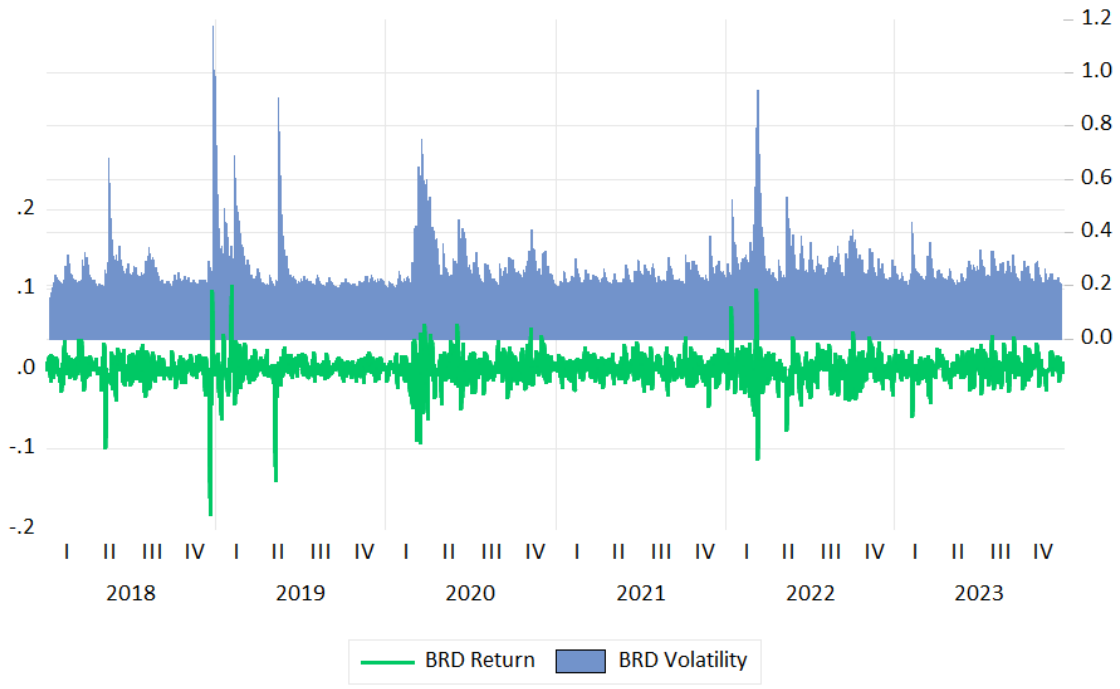


Figure 17 Return and conditional volatility for H2O

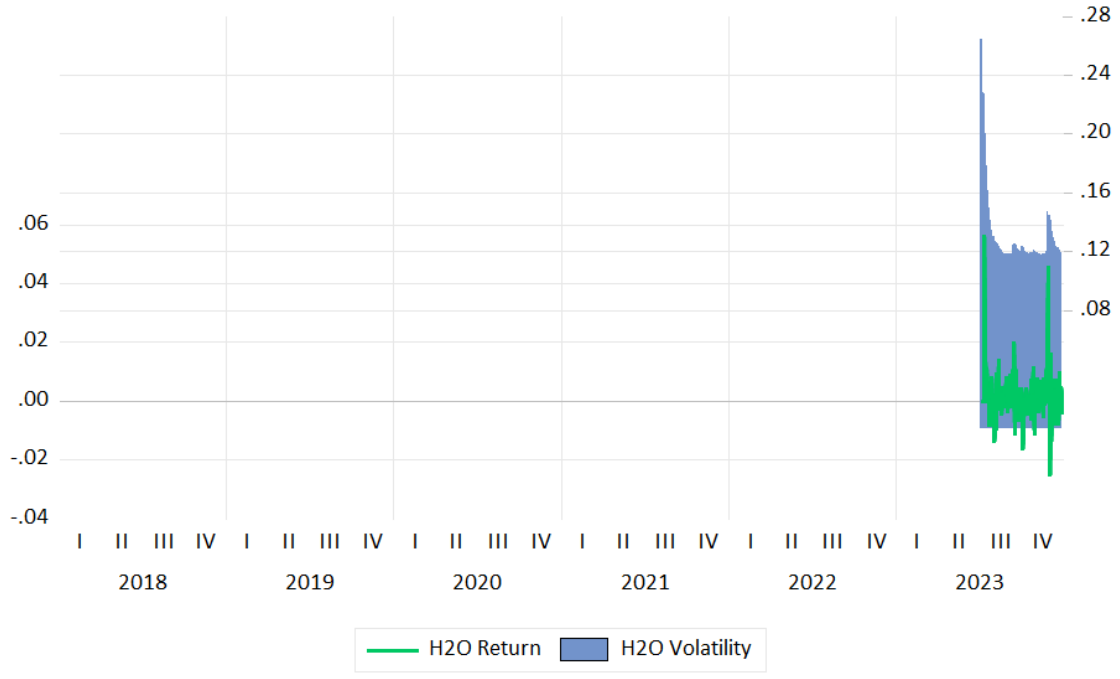


Figure 1 Return and conditional volatility for SNG

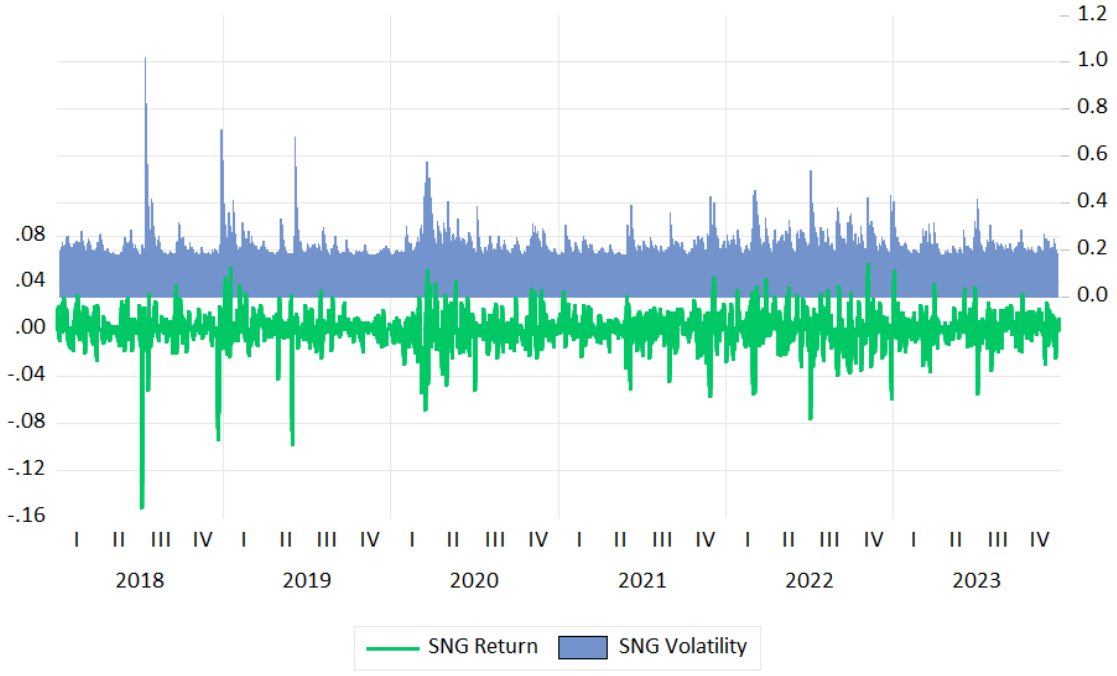


Figure 19 Returns and conditional volatility for SNN

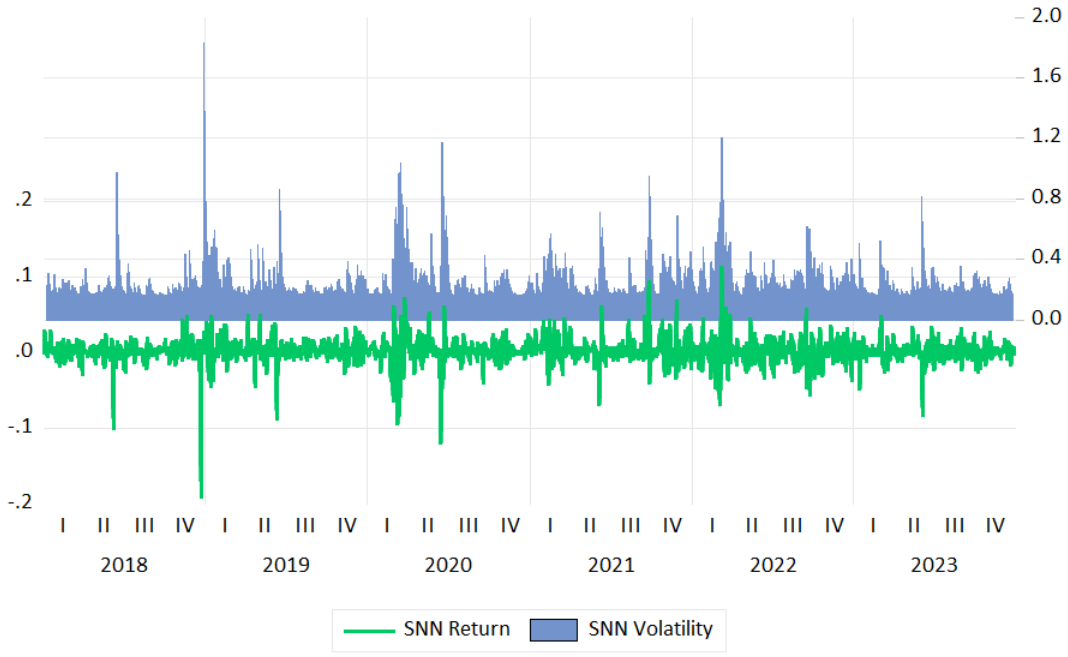


Figure 20 Returns and conditional volatility for SNP

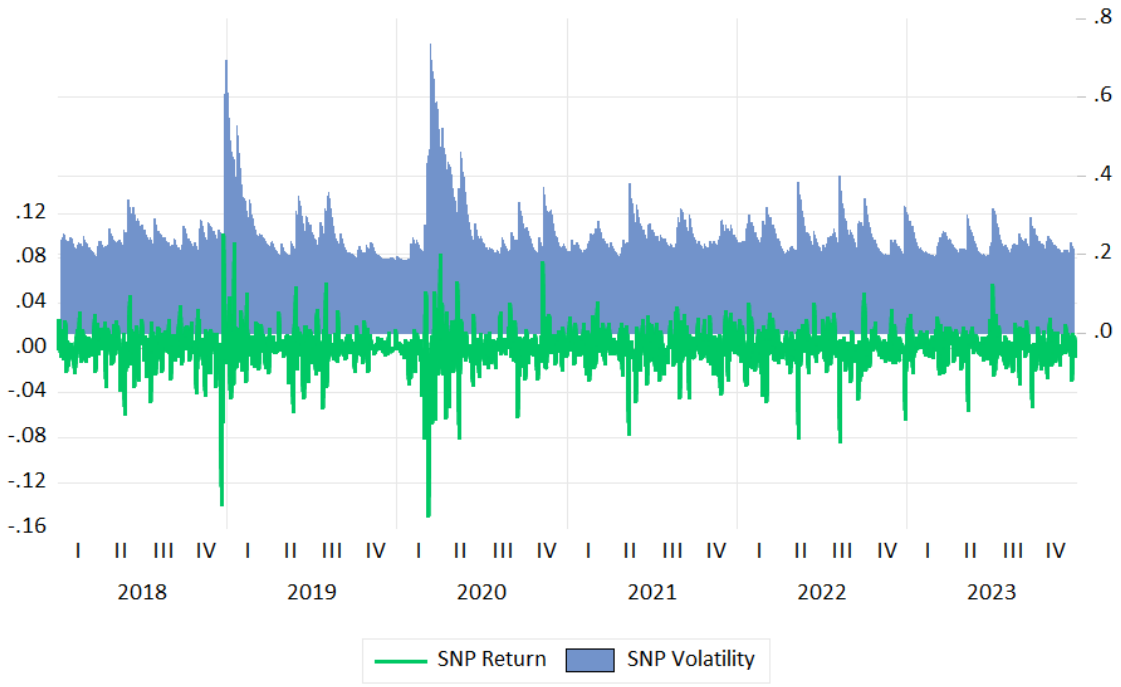
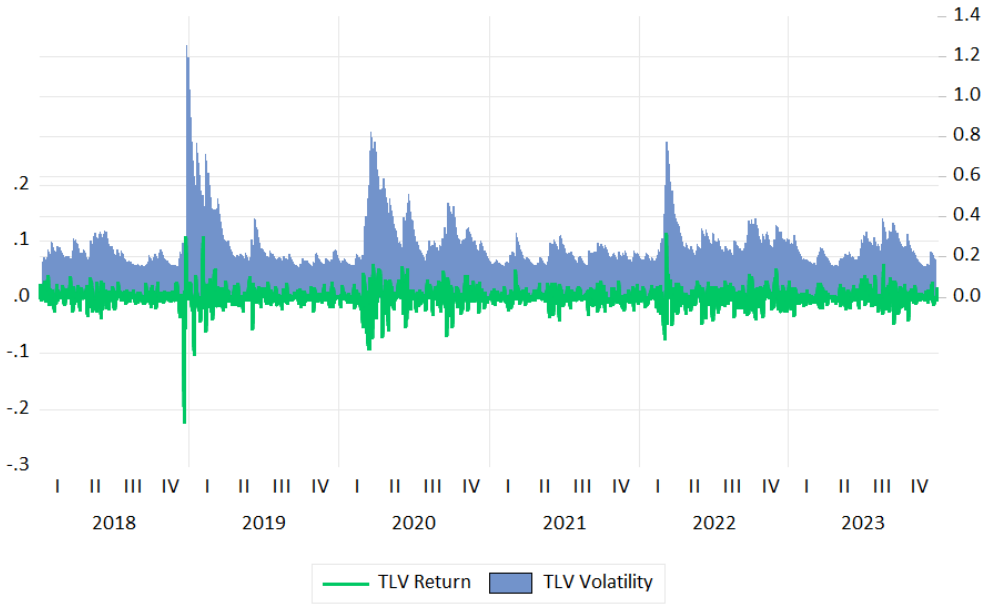


Figure 21 Returns and conditional volatility for TLV

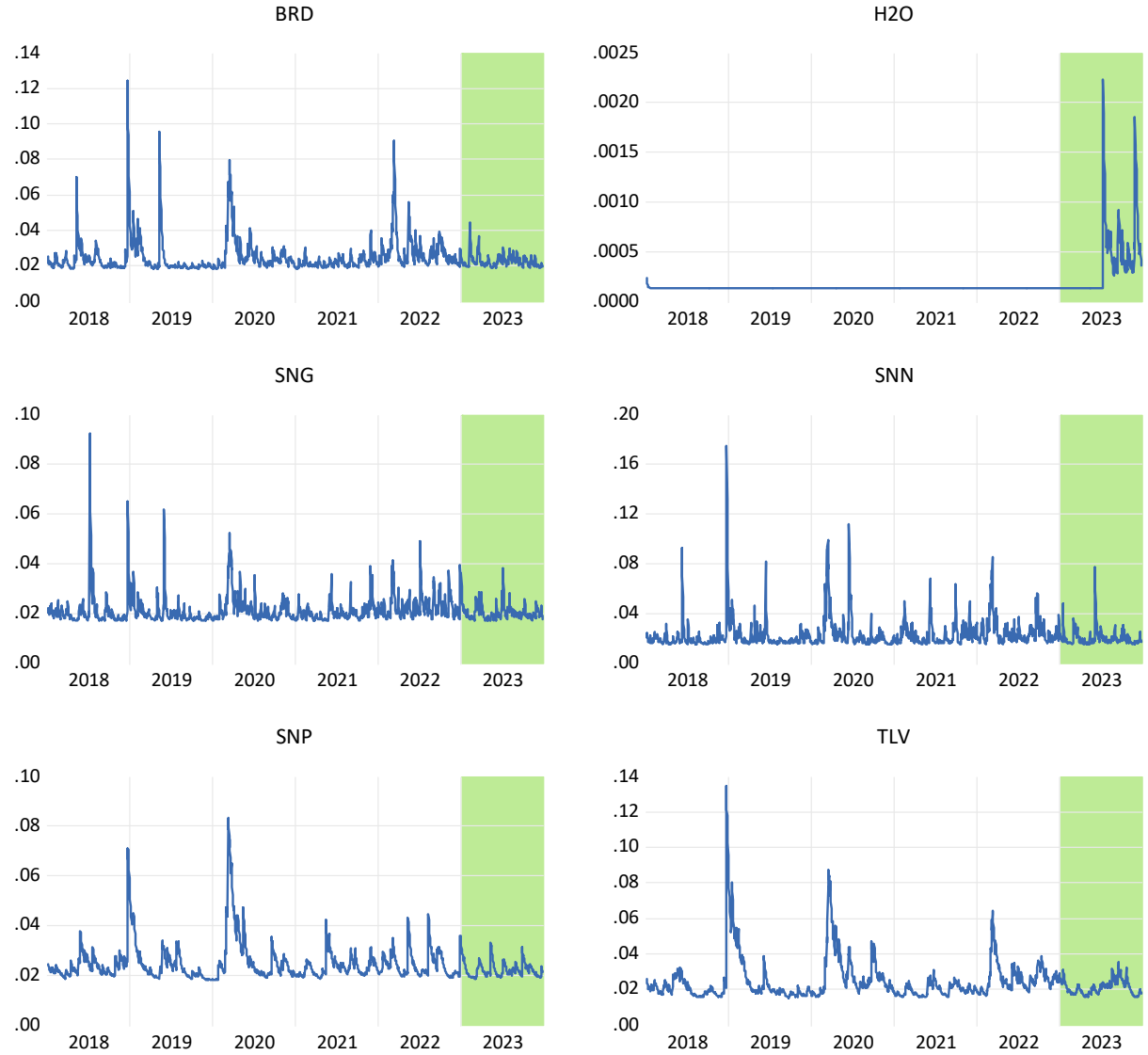


Source: BVB, ASF processing

Figures 15-21 show simultaneously the evolution of the returns on financial assets compared to the dynamics of their conditional variance. Volatility estimation was performed with a GARCH (1,1) model, with the values obtained placed on the left axis. Returns are plotted on the right axis. We note that financial assets tend to exhibit common dynamics in terms of both return and volatility around key moments.

We observe spikes in volatility at the 2023 level in January, March, June, and September. A flattening of the conditional variances towards the end of December 2023 can also be observed.

Figure 22 Value-at-Risk (VaR, 95%)



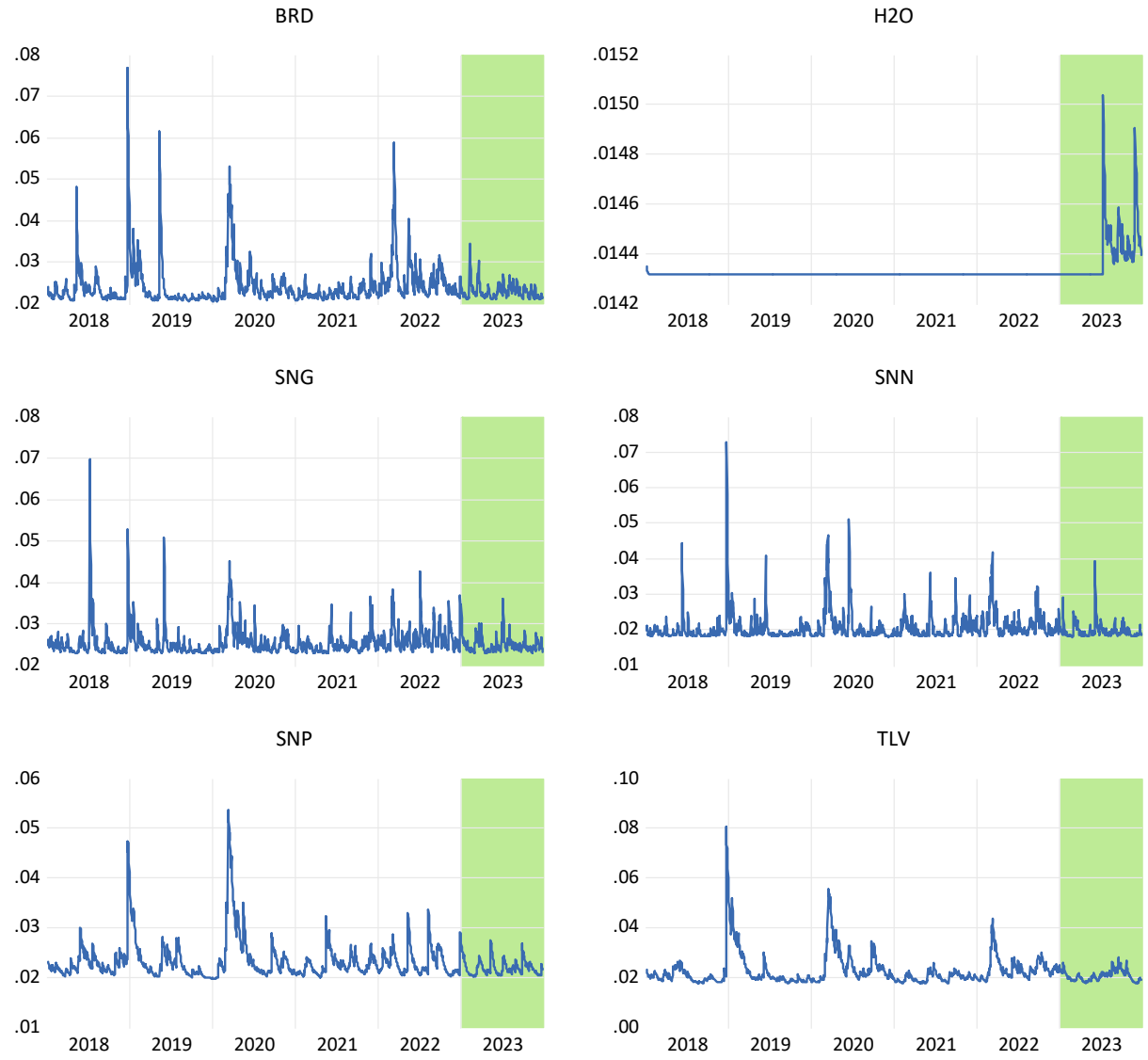
Source: Refinitiv, ASF processing

Figure 22 shows the results for the Value - at - Risk statistic for the companies in the sample. The shaded area represents the period of analysis directly covered by this report. In this range, we note average growth trends for all assets and a particular trajectory for H2O.

Figures 23 and 24 show the results obtained using two systemic risk measures. The charts presented in Figure 23 show the evolution of the systemic risk detected using the CoVaR specification.
As we noted in the previous report, we still observe a significant variation in the CoVaR model results for the companies in the sample. The main reason for this result is that the firms included in the analysis come from different economic sectors characterized by particular dynamics. Other elements identified in the literature as factors determining this level of heterogeneity are market perception, financial position, market conditions, size and index weight.

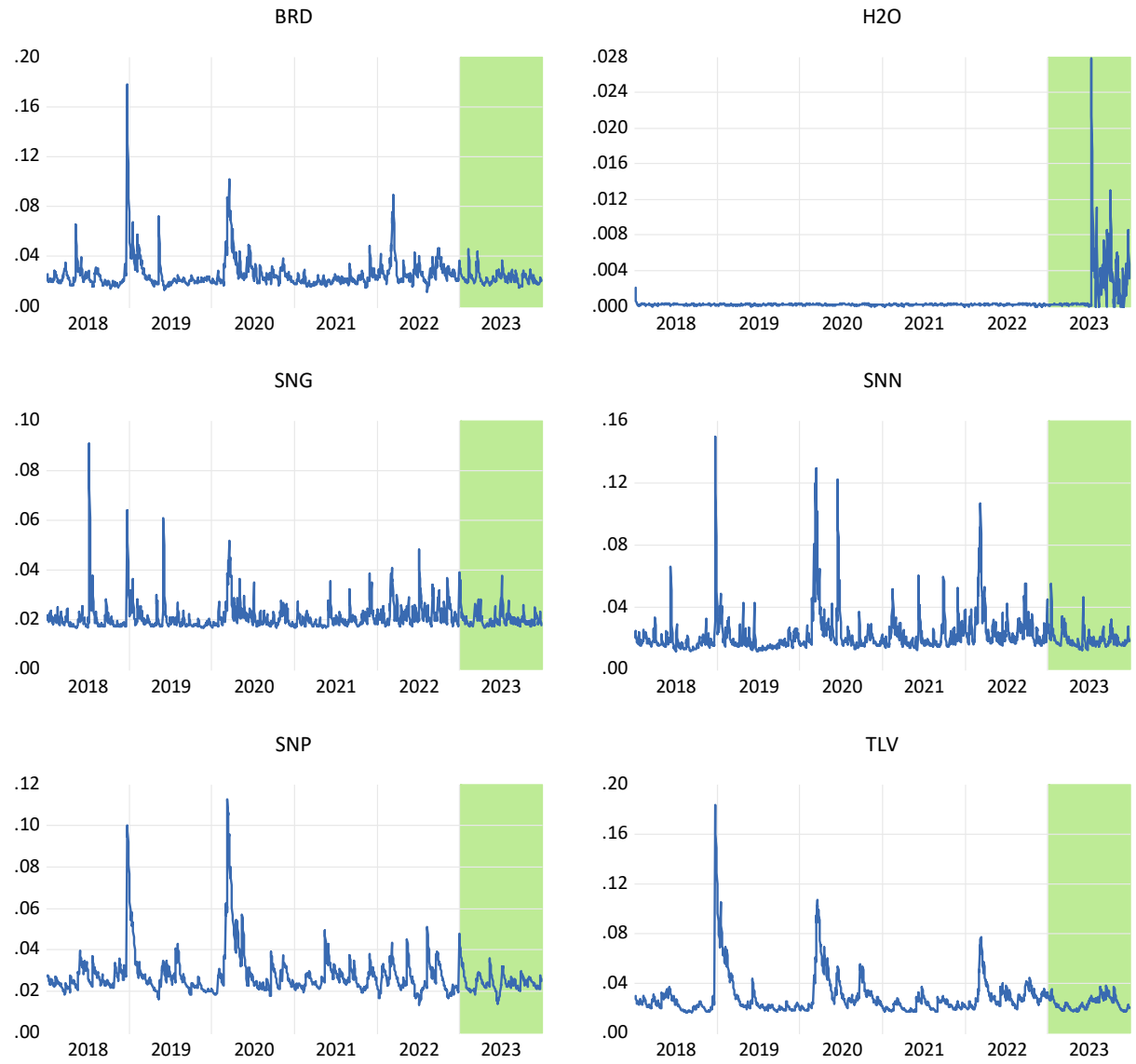
For the 2018 - 2023 interval, instances of simultaneous increases in risk contributions are visible in the following periods: December 2018 - February 2019, May 2019, March 2020 - June 2020, March - May 2022, and September 2022. In comparison, during 2023, on aggregate, systemic risk contributions were lower. The highest 10% values observed for the CoVaR specification were present for the months of January, March, June, and August, while the lowest 10% of the results were detected for the months of November and December.

Figure 23 Conditional Value-at-Risk (CoVaR, 95%)



Source: Refinitiv, ASF processing

Figure 24 Marginal Expected Shortfall (MES, 95%)



Source: Refinitiv, ASF processing

The specification entitled Marginal Expected Shortfall, MES captures the expected loss for a given company in the event of a systemic shock at a 95% confidence level and a 5% significance level. For the interval 2018 - 2023 the highest values are observed for the periods: May - July 2018, December 2018 - March 2019, February - May 2020, March 2022, September - October 2022 and December 2022. In aggregate, lower values than the average for the interval 2018 - 2023 are observed for 2023. The highest 10% values observed for the MES specification are present in the months: January, March, July, and September. The lowest 10% values returned by this statistic correspond to the months: May and the interval November - December. The contributions of the companies in the sample to systemic risk show similar results for the two risk measures used.

3.4.2. Analysis of speculative bubbles in the BET index

Rational bubble theory is a concept in economic theory that explains the existence of accelerated increases (bubbles) in asset prices caused by rational investor behaviour. This contrasts with the traditional view that bubbles are purely irrational phenomena generated by speculation and mimetic investment behaviour. Thus, an irrational bubble refers to a situation where the price of an asset rises artificially due to speculation and excessive trading despite the fundamental characteristics of the asset.

Rational bubble theory considers that asset prices can sometimes rise to levels that exceed their fundamental values (intrinsic value) that need to be estimated by other quantitative models, and that these price increases are determined by rational investors making decisions based on economic fundamentals and information available at the time. Both irrational and rational bubbles are difficult to identify in real time because market participants tend to be convinced that the current price reflects the true value of the asset.

In the case of rational bubbles, investors buy assets in the hope that prices will continue to rise in the future. These expectations of future returns are based on rational assessments of economic conditions, such as expected future earnings or profit growth. Investors anticipate that these deviations will eventually correct as economic conditions change, and are willing to buy at high prices because they believe they can sell the assets in the future at an even higher price. Rational bubble theory is often associated with the efficient market hypothesis, which assumes that asset prices reflect all the information available in the market and are therefore always at fair value. In this view, even if prices temporarily deviate from fundamentals, their dynamics are considered to be a rational response to new information.

Some of the commonly used tests and approaches for identifying asset price bubbles are based on: price-to-equity (P/E) ratio, price-to-book (P/B) ratio, fundamental valuation models such as Discounted Cash Flow, DCF, or Dividend Discount Model, DDM. Interpretation of these indicators can be subjective and often generate false positive results, i.e., they fail to identify real asset price bubbles or explosive movements in time series data when they exist.

In a series of papers of great influence on academic research, Phillips, Wu, and Yu (2011) and Phillips, Shi, and Yu (2015) have developed substantial theoretical support for testing the existence of speculative bubbles. Following these contributions, the most relevant test procedures - the Supremum Augmented Dickey- Fuller (SADF) and the generalized version of the test (GSADF) - have been used in a number of empirical studies in which the explosive nature of the data is interpreted as the presence of a speculative bubble. The scope of this research has spanned the entire spectrum of financial markets, from investigations of equity markets (Nguyen and Waters, 2022) to studies of currency dynamics (Hu and Oxley, 2017).

The Phillips et al. (2011, hereafter referred to as PWY) and Phillips et al. (2015) tests used the dividend discount model (DDM)[27] and were applied to the inverse of the dividend yield, Price/Dividend, meaning that the test examines whether the price deviates significantly from the expected dividend. The basic idea behind the tests is to detect situations where a time series exhibits explosive upward behavior, which is often associated with asset price bubbles.

The rational bubble can simply be expressed as the difference between the market price of the asset at a given time Pt and its fundamental value

$$B_t = P_t - P_t^*$$

Asset price bubbles are deviations from fundamental value. If $B_t > 0$, , then there is a bubble inducing an explosive dynamic in the Pt price time series.

The SADF test is based on the ADF test, which tests whether a time series is nonstationary, with explosive behaviour in the right tail of the distribution. Phillips et al. (2015) rational bubble tests can generate false positive results for the following reasons:

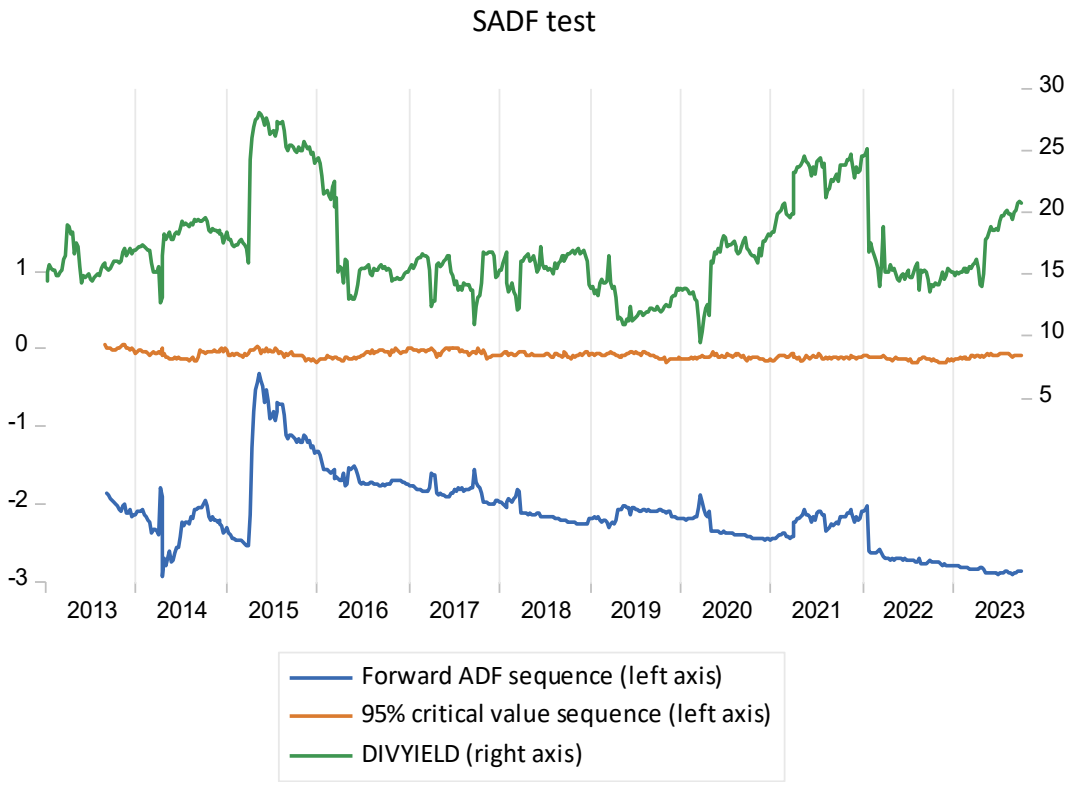
- Short-term volatility or temporary fluctuations in stock prices can sometimes lead to the critical values of the test statistic being exceeded, suggesting explosive behaviour or the existence of a speculative bubble;
- Strong fundamentals: if the company has strong and improving financial fundamentals, such as growing revenues, profits, and market share, a long-term increase in its share price could be justified. Since the test does not take such fundamental factors into account, it may produce false positive results. Speculative bubbles can be driven by both financial market dynamics and economic fundamentals, and the test may not effectively capture the latter;
- Market sentiment: The test can also be influenced by market sentiment and speculative behaviour. If there is a temporary increase in positive sentiment or in speculative equity trading, this could lead to a false positive, even if the underlying fundamentals remain strong;
- Limited historical data: Test accuracy may be affected by the length of historical data available. Where time series are relatively short, tests generate false positive results because there is less information to distinguish between short-term volatility and genuine explosive behaviour;
- Datasets containing structural breaks: for example, test statistics may be biased for companies that did not pay dividends during the pandemic period or restricted dividend payments;
- Robustness of tests: the frequency at which the test is performed can influence the results.

In Figure 25 the SADF test is applied to detect whether the BET index is currently experiencing explosive dynamics, as the stock market has been growing rapidly above the expected equilibrium level (see subsection 3.2). The SADF test was applied for robustness on both the monthly series and the weekly series of the Price/Dividend indicator. The data series were extracted from the Refinitiv platform for a 10-year period (2013 - December 2023).

[27] The tests are briefly explained in Annex 2.

The test results showed no explosive dynamics that can be associated with speculative rational bubbles

Figure 25 SADF test for detecting a rational bubble dynamic for the BET index



Source: Refinitiv, ASF calculations

Legend: DIVYIELD=is the inverse of the dividend/price ratio, 95% critical value; Forward ADF=value of the statistical test

4. Insurance market stability

The main macroeconomic developments point to modest economic growth globally, but also to a slowdown in inflation and expectations of a gradual transition to a more accommodative monetary policy over the coming years.

However, the shorter-term expectation for the level of interest rates is for a continuation of tight monetary policy for most of 2024, with no signs of a return to the macroeconomic context of very low interest rates prior to 2021-2022.

As regards the inflation rate, although it has slowed down, additional inflationary pressures remain. A high degree of uncertainty relates to the future evolution of energy prices in the context of the current geopolitical tensions. A potential escalation of geopolitical tensions in Ukraine or the Middle East could lead to supply disruptions and, thus higher energy prices.

Therefore, the fragile macroeconomic context has led to an increase in credit and liquidity risk, which may introduce additional risks to insurance companies' assets. Rising interest rates have exacerbated several pre-existing vulnerabilities in the financial system, including high levels of both private and public indebtedness. Consequently, the outlook for high indebtedness has worsened as interest rates have risen, increasing the vulnerabilities of financial institutions.

From this point of view, the risks of a deterioration in the credit ratings of issuers as well as of financial instruments and even risks related to potential insolvencies of insurers' counterparties, remain relevant.

In the current context, both the International Monetary Fund[28] and EIOPA have launched analyses of the exposure of US and European insurance companies to alternative assets in an effort to measure the credit risk exposure of the insurance market.

Given the main developments in the US insurance market, IMF's analysis focused on life insurance companies owned by private equity firms.

The long period of extremely low interest rates has put pressure on traditional life insurance, especially for guaranteed return products, where companies were bearing most of the risks (investment, mortality, and longevity).

Life insurers faced several challenges related to asset valuation and the capital requirements necessary for solvency. In response, companies have shifted their business models towards unit-linked insurance.

Particularly after the 2008 financial crisis, private equity firms have taken over several life insurance companies to benefit from exposure to long-term liabilities on life insurers' balance sheets.

[28] https://www.imf.org/en/Publications/global-financial-stability-notes/Issues/2023/12/13/Private-Equity-and-Life-Insurers-541437

However, the IMF notes that PE-owned life insurers are changing also their risk profiles by increasing exposure to illiquid investments in complex structured products.

Regarding EIOPA, the European Authority has recently carried out an exercise to assess the exposure of insurance companies in the European Economic Area (EEA) to alternative/non-liquid assets, the results of which are also presented in the Financial Stability Report published by EIOPA in December 2023[29].

The alternative asset classes considered by EIOPA for exposure assessment are real estate: land and buildings, real estate funds, private equity, infrastructure funds, alternative funds, loans excluding mortgages, mortgages, collateralised securities, and structured bonds. This classification is based on previously published analysis by the European Central Bank (May 2019 - Financial Stability Review - Insurers' investment in alternative assets, Box 9 and May 2023 - Financial Stability Review, Chart 4.8).

EIOPA's objective was to analyse the realignment of insurers' portfolios towards traditional fixed income investments in the context of rising interest rates. The previous macroeconomic environment, characterised by prolonged periods of extremely low interest rates, led insurance companies to seek better returns by increasing their exposure to alternative investments. Although expectations in the current economic environment were for a return to traditional investments, EIOPA's analysis shows that insurers continued to increase their investments in alternative assets.

Locally, insurance companies invest predominantly in fixed income financial instruments, with a high exposure to government bonds. Most of these are government bonds issued by the Ministry of Finance. Therefore, Romanian insurance companies are more prudent in this respect, with no high exposure to complex financial instruments or alternative assets.

It should be noted, however, that the analysis concerns the direct exposures of insurers and does not consider counterparty exposures. For example, companies cede a part of their gross written premiums to reinsurance, with the degree of cession to reinsurance of gross premiums written by companies for general insurance business varying between 33% and 40% over the last five years, and general insurance business currently accounts for 84% of the Romanian insurance market. With regard to reinsurers, EIOPA data show that investments by European Economic Area (EEA) reinsurance companies in unlisted shares account for 56% of their total investments. They have a high exposure to this asset class, and EIOPA notes that most of the unlisted shares are held in affiliated companies. Hence, the significant investments of Romanian insurance companies in government bonds show an exposure of their portfolios to interest rate risk, while the risk of falling share prices would have a lesser impact on the local insurance market, given the limited holdings in this asset class.

With expectations of continued tight monetary policy through 2024 and additional inflationary pressures, credit risk remains a potential concern locally as well. Despite the limited exposure to alternative/non-liquid assets of Romanian insurance companies, an important factor to consider in the context of increasing credit

[29] https://www.eiopa.europa.eu/system/files/2023-12/EIOPA%20Financial%20Stability%20Report%20December%202023_1.pdf

risk is the valuation method used by companies. Inadequate/inaccurate methods can significantly distort the company's solvency position.

As for the liquidity ratio, it increased locally in December 2023 compared to December 2022 for both general and life insurance business, according to company reports. This development shows that companies have a higher level of liquid assets available to cover short-term liabilities.

Solvency ratios in the Romanian insurance market remain above unity, according to reports, but are below the European level. Compared to the previous quarters (Q1-Q3 2023), a decrease in solvency ratios is observed in Q4 2023, on the back of a faster increase in capital requirements compared to the amount of own funds eligible to cover capital needs.

4.1. The insurance market in the European context

The volume of gross written premiums in Romania, including both non-life and life insurance business, increased at an annual rate throughout the period under review. Compared to other Member States in the region, which experienced contractions on the underwriting side in the period January-September 2020 compared to the same period in 2019, the Romanian insurance market has seen an advance supported by growth in the general insurance segment. The contractions recorded by the other markets in the period mentioned occurred amid the restrictions imposed during the pandemic period, but the effects were not felt in the same way in the local insurance market.

Figure 26 Volume of gross written premiums (EUR million) for the period January – September 2019 - 2023 in Romania and other countries in the region

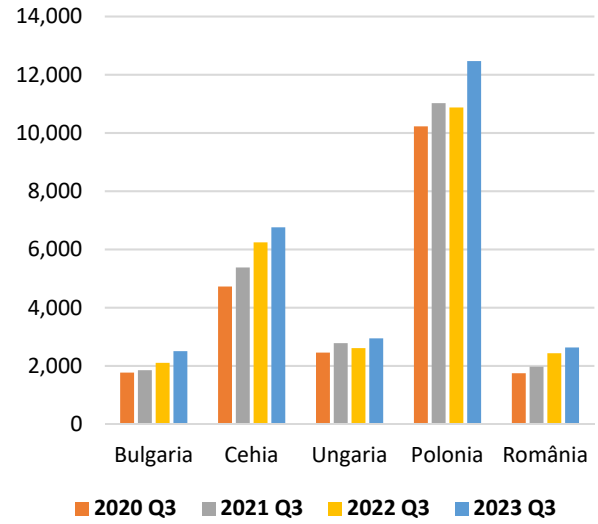
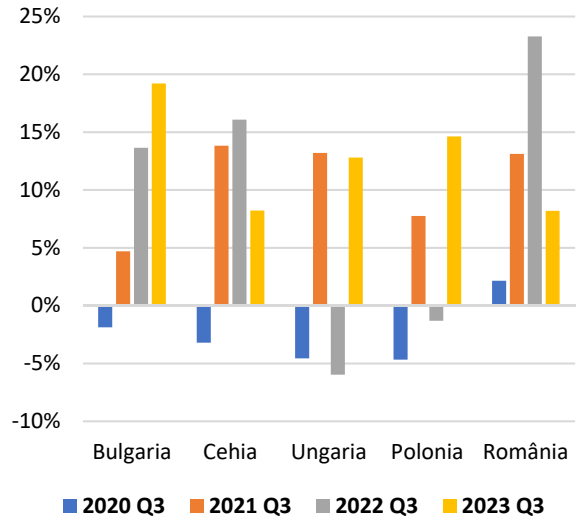


Figure 27 Annual rate of change in volume of gross written premiums for the period January – September 2020 - 2023 in Romania and other countries in the region



Source: EIOPA, ASF calculations, Solvency II solo quarterly reports, S.05.01; includes both direct insurance business and inwards reinsurance

An analysis of the structure of the insurance markets in Romania and other Member States in the region shows that in Romania, with the exception of Bulgaria, the life insurance sector is the most underrepresented in terms of gross written premiums. Thus, the share of gross written premiums for life insurance varied between 15% and 18% during the period under review. The insurance market in the Czech Republic, Hungary, and Poland is more diversified, with the life insurance segment accounting for more than 20% of the insurance market.

Table 9 Structure of underwriting activity by category of activity

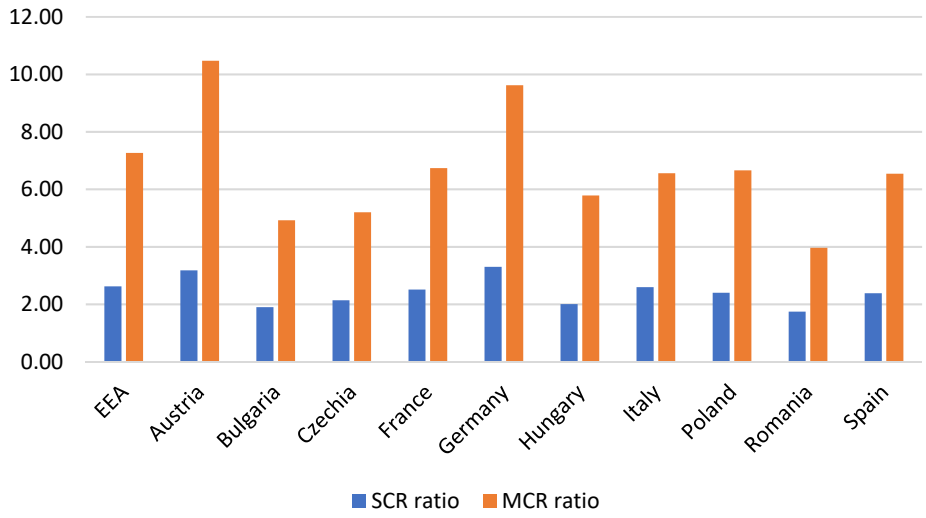
Country	Type of activity	2019 Q3	2020 Q3	2021 Q3	2022 Q3	2023 Q3
Bulgaria	AG	93%	93%	91%	92%	91%
	AV	7%	7%	9%	8%	9%
Czech Republic	AG	68%	74%	75%	77%	78%
	AV	32%	26%	25%	23%	22%
Hungary	AG	58%	58%	56%	58%	64%
	AV	42%	42%	44%	42%	36%
Poland	AG	67%	68%	69%	71%	72%
	AV	33%	32%	31%	29%	28%
Romania	AG	82%	83%	81%	85%	84%
	AV	18%	17%	19%	15%	16%

Source: EIOPA, ASF calculations, Solvency II solo quarterly reports, S.05.01; includes both direct insurance business and inwards reinsurance

With regard to the solvency of the European insurance system, statistics published by EIOPA show that the SCR ratio for the European Economic Area (comprising the 30 countries reporting to EIOPA) was 262% in Q3 2023, and the MCR ratio was 727%. These figures demonstrate a solid level of capitalization at the European level.

In Romania, the SCR ratio in the insurance market was 174% in Q3 2023 and 168% in Q4 2023.

Figure 28 Solvency Capital Requirement (SCR) and Minimum Capital Requirement (MCR) ratios (Q3 2023)



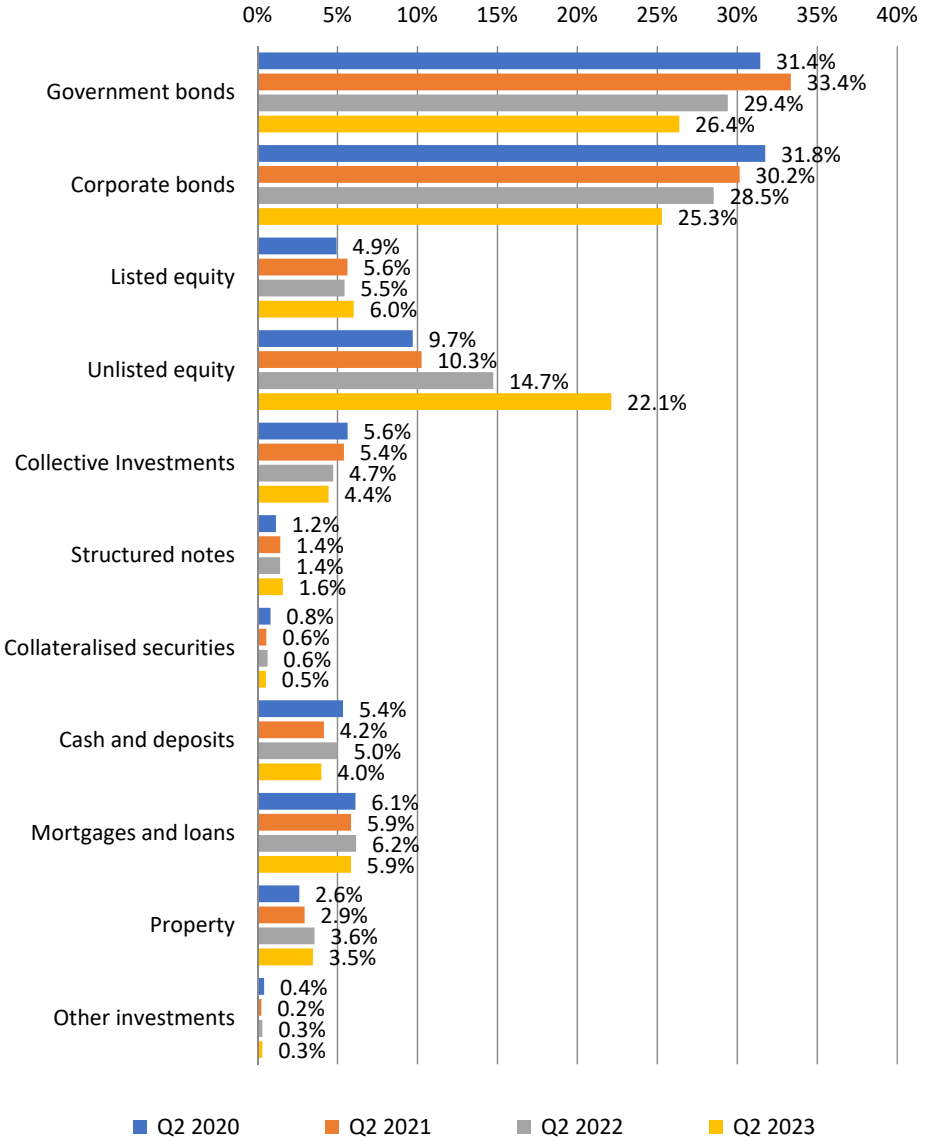
Source: EIOPA, ASF processing

According to the Financial Stability Report published by EIOPA in December 2023, insurers' investments remained dominated by fixed - income assets, followed by equity investments. Government and corporate bonds account for more than half of the total investment portfolio[30], followed by equities (listed and unlisted). This exposes portfolios to market (interest rate and equity price falls) and credit risk.

Although the share of investments in government and corporate bonds in total investments decreased at the end of Q2 2023 compared to the same period in 2022, there was an increase in exposure to equities, particularly unlisted equities.

[30] Assets held for unit-linked contracts are excluded; fund analysis is used to determine exposure by asset class

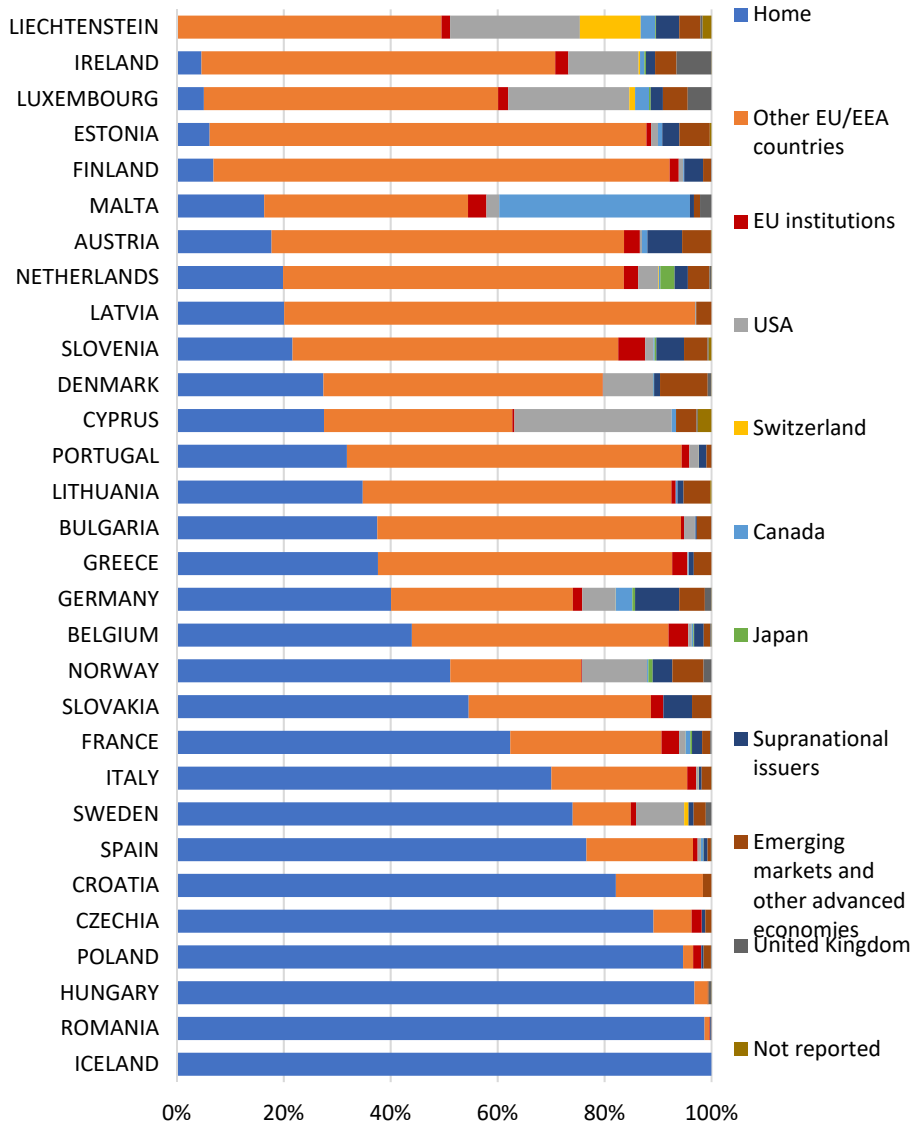
Figure 29 Investment structure in Q2 2023 compared to Q2 2020, Q2 2021 and Q2 2022



Source: EIOPA, Financial Stability Report (December 2023), S2 quarterly solo reports, not including assets held for unit-linked contracts; figures based on fund verification/analysis

The structure of corporate investment in government bonds by country of issue differs from country to country. In Iceland, Romania, Hungary, and Poland the exposure to locally issued government bonds exceeds 95%, while at the other end of the spectrum, Liechtenstein, Ireland, Luxembourg, and Estonia have predominantly invested in government bonds issued by countries other than their home country, the European Union, the European Economic Area, and the US.

Figure 30 Exposure of insurance companies to government bonds by issuing country

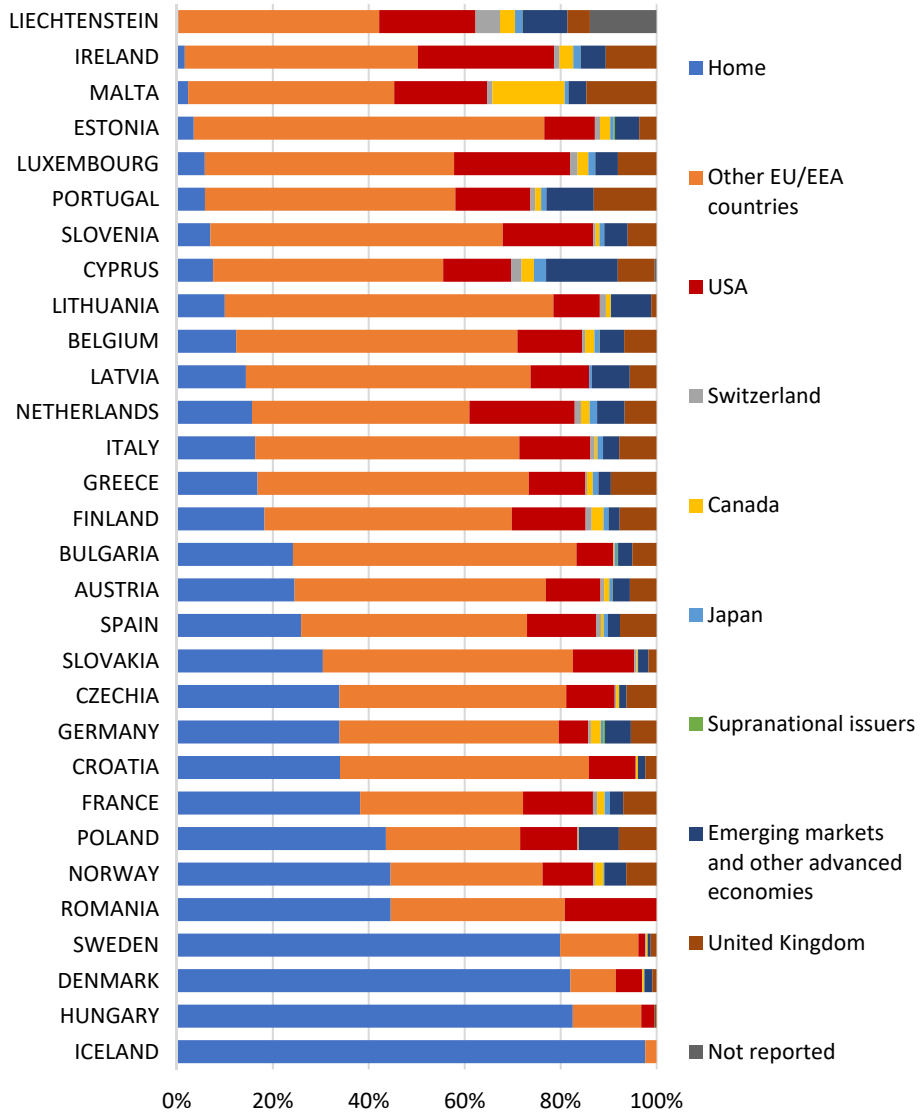


Source: EIOPA, Financial Stability Report (December 2023), S2 quarterly solo reports; reference date: Q2 2023;

includes assets held for unit-linked contracts

As regards investments in corporate bonds of Romanian insurance companies, the exposure is more diversified. The share of investments in corporate bonds issued by Romanian companies is 45%, while investments by Romanian insurers in corporate bonds issued by companies from other European Union or European Economic Area (EEA) countries stood at 36% of the total value of investments in this asset class.

Figure 31 Exposure of insurance companies to corporate bonds by country of issue



Source: EIOPA, Financial Stability Report (December 2023), quarterly solo reports; reference date: Q2 2023;

includes assets held for unit-linked contracts

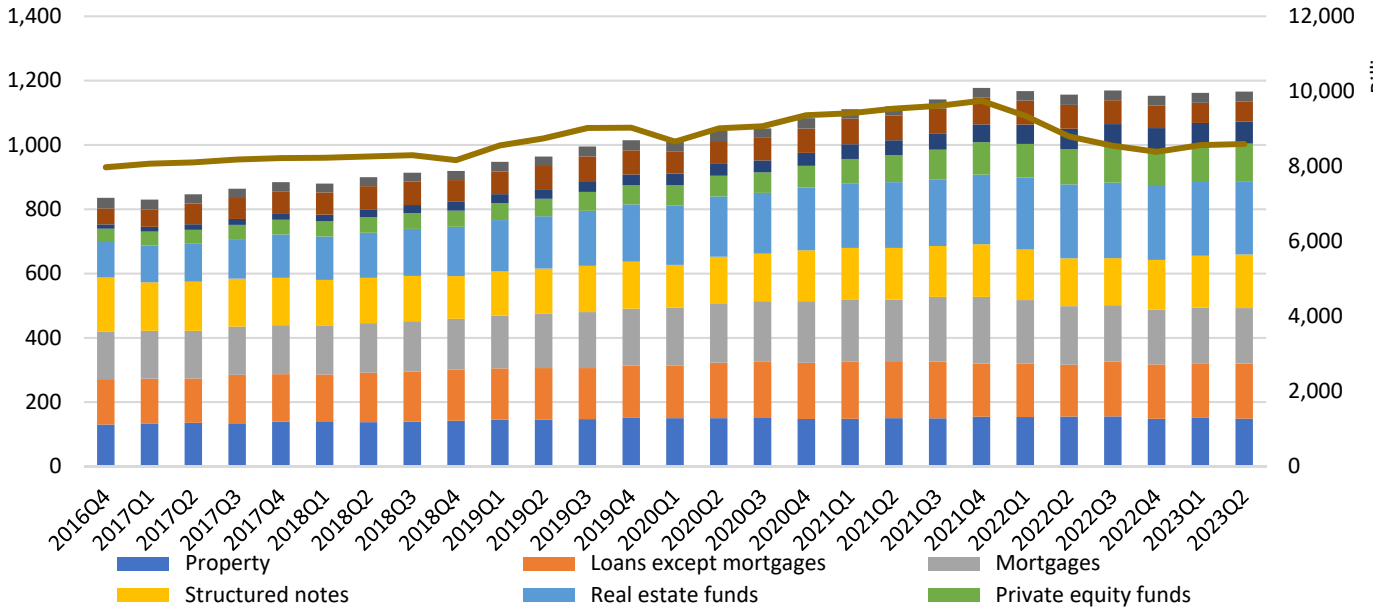
Alternative assets have a number of common characteristics, depending on the type of asset. However, in general, alternative assets imply limited access for retail investors and reduced liquidity, which should be compensated by an illiquidity premium.

Investing in alternative assets became more attractive during the period of very low interest rate environment when companies were seeking investments offering higher returns. Additionally, they also provide investors with diversification benefits, given the lower correlations between alternative asset prices and bond and equity prices.

Alternative assets are less liquid than traditional assets, but the degree of liquidity varies by asset class. Some alternative assets offer regular, long-term payments, while others involve payments only after the sale of investments and involve locking up capital for a longer term (private equity investments).

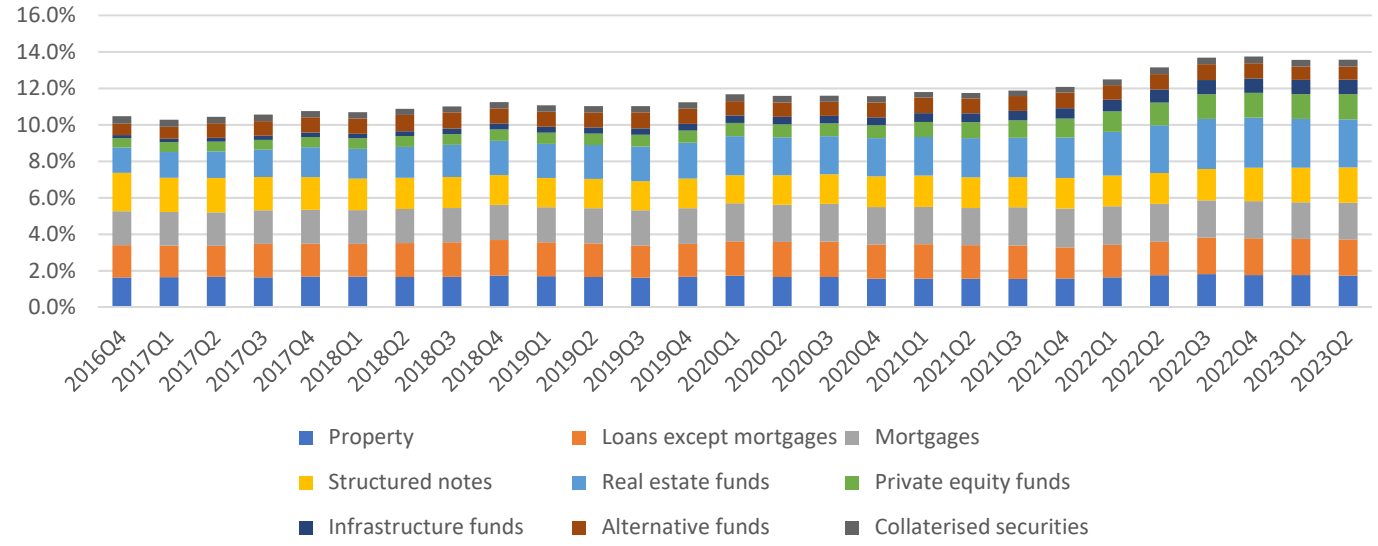
The value of alternative investments, excluding mortgages, as counted in the Financial Stability Report published by EIOPA, has steadily increased from 10.5% of total investments in Q4 2016 to 13.6% in Q2 2023.

Figure 32 Insurance companies' investments in alternative assets (EUR billion)



Source: EIOPA, Financial Stability Report (December 2023), S2 quarterly solo reports, list of assets S.06.02, assets held for unit-linked contracts are included

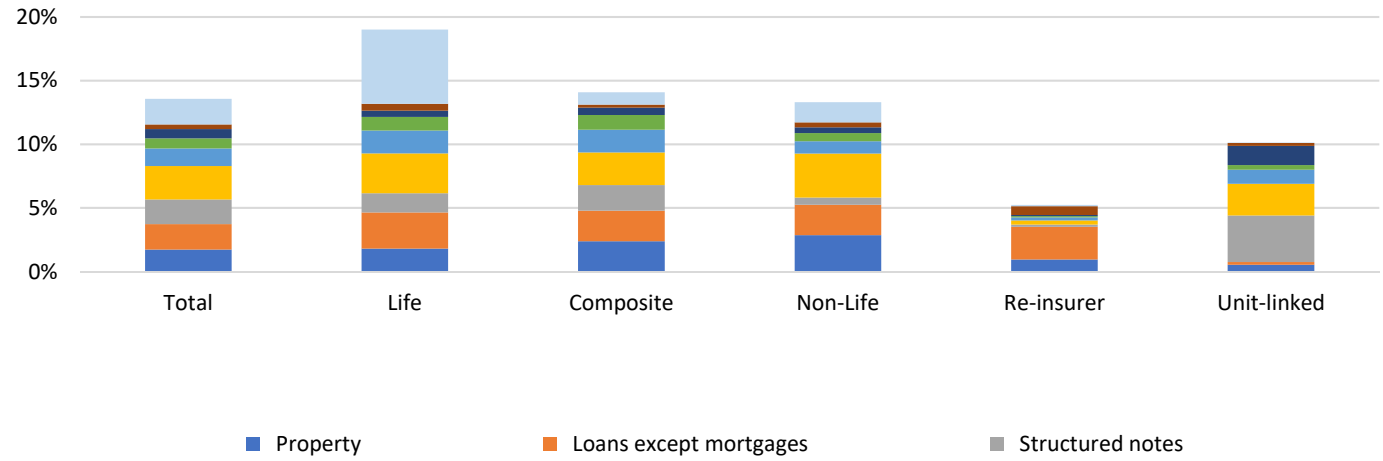
Figure 33 Insurance companies' investments in alternative assets (% of total investments)



Source: EIOPA, ASF calculations, Financial Stability Report (December 2023), quarterly solo S2 reports, asset list S.06.02, assets held for unit-linked contracts are included

The share of alternative assets in total assets differs between types of insurers. The largest share is held by life and composite insurers, with approximately 19% and 14% in Q2 2023, respectively.

Figure 34 Insurance companies' investments in alternative assets by category of company (% of total investments)



Source: EIOPA, ASF calculations, Financial Stability Report (December 2023), S2 quarterly solo reports, asset list S.06.02, assets held for unit-linked contracts are included

Gross written premiums

The volume of gross written premiums (GWP) of companies authorised and regulated by ASF stood at RON 18.2 billion in 2023, of which RON 15.2 billion (84% of GWP) represents premiums written for general insurance business. The positive dynamics of the indicator were mainly supported by the increase in general insurance (+ RON 1.3 billion), but the life insurance segment also made a positive contribution, with underwriting activity increasing by RON 319 million. Thus, the annual growth rate recorded by the general insurance segment was 10%, and the life insurance segment grew by 12% in 2023 compared to 2022.

Figure 35 Annual rate of change in gross written premiums for non-life and life insurance business respectively

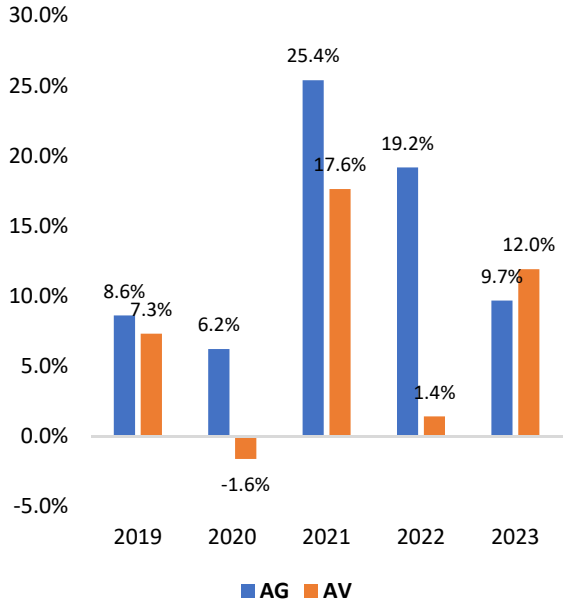
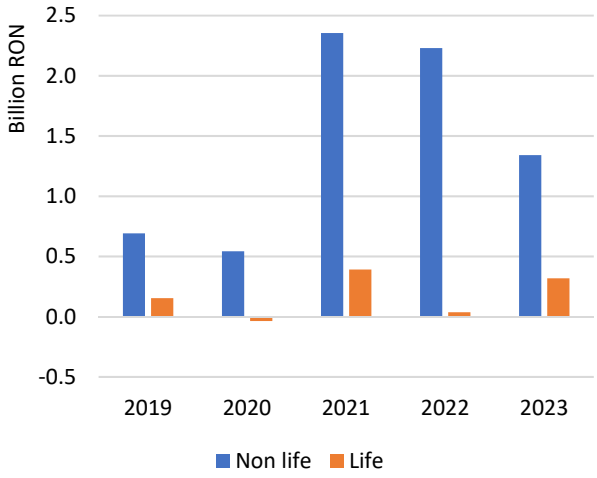


Figure 36 Year-on-year change in gross written premiums for non-life and life insurance business respectively



Source: ASF

The largest increases were recorded in gross written premiums for classes A3 (+ RON 487 million), A10 (RON 416 million) and A8 (+RON 280 million) in 2023 compared to 2022. With regard to the life insurance segment, the positive dynamics recorded were supported by the increase in the volume of gross written premiums for classes C3 (+RON 315 million) and A2 (+ RON 69 million), partially offset by the decrease of RON 72 million in the underwriting activity related to class C1.

Figure 37 Change in gross written premium volume by class of general insurance in 2023 compared to 2022

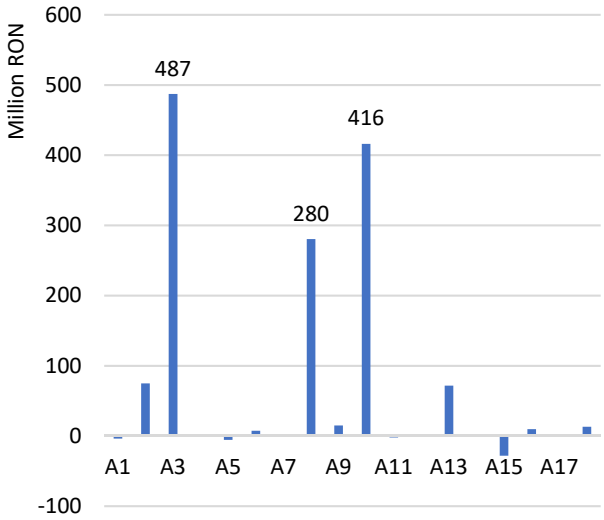
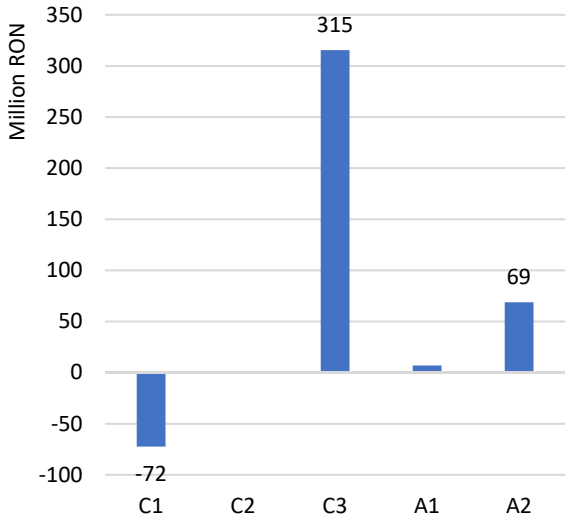


Figure 38 Change in gross premium volume by class of general insurance in 2023 compared to 2022



Source: ASF

4.2. Solvency

The excess of assets over liabilities and the level of own funds show the amount of capital that insurance companies have available to cover their capital requirements, and a sufficient level of own funds is an indicator of the financial stability of insurance companies.

This dynamic is also explained by the adjustments made by ASF following supervisory and control actions at Euroins Romania as of September 30, 2022, which are reflected in the information as of December 31, 2022.

The amount of own funds eligible to cover the Solvency Capital Requirement stood at approximately RON 8.2 billion at the end of December 2023, marking a 63% increase compared to the same period of the previous year. Similar to the dynamics of the excess of assets over liabilities, the significant increase in eligible own funds is attributed to the inclusion of ASF adjustments for Euroins Romania in the insurance market data as of Q4 2022.

Valoarea fondurilor proprii eligibile să acopere cerința de capital de solvabilitate se afla la finalul lunii decembrie 2023 la nivelul de circa 8,2 miliarde lei, în creștere cu aproximativ 63% comparativ cu perioada similară din anul anterior. Ca și în cazul dinamicii excedentului de active față de obligații, creșterea semnificativă a valorii fondurilor proprii eligibile derivă și din faptul că datele la nivelul pieței asigurărilor la trimestrul IV 2022 includ ajustările ASF pentru societatea Euroins România.

Figure 39 Excess of assets over liabilities (billion RON)

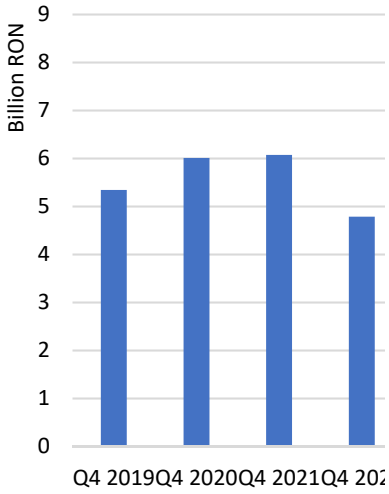
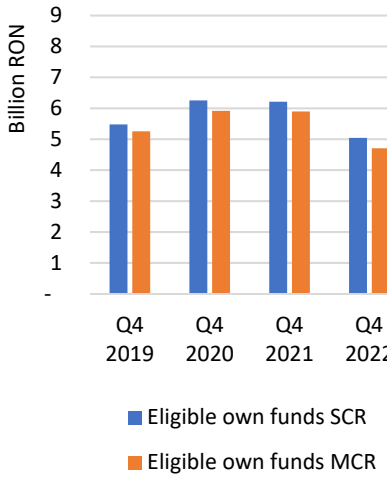
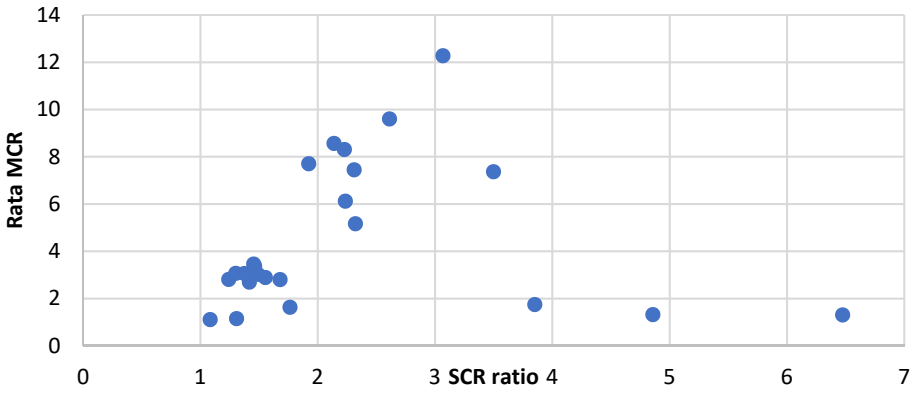


Figure 40 Amount of eligible own funds that covers capital requirements (billion RON)



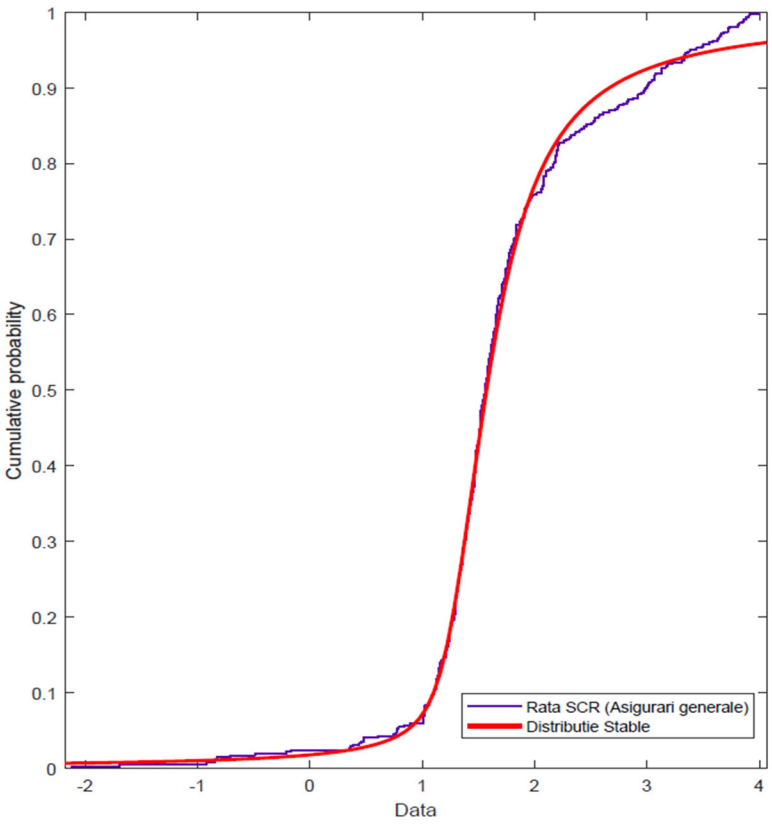
Source: ASF; for Q4 2022 Euroins data as at 30.09.2022 are included, as adjusted by ASF following supervisory and control actions.

Figure 41 Capital requirement coverage ratios (SCR and MCR) for insurance companies at the end of Q4 2023



Source: ASF

Figure 42 Distribution of SCR ratios for general insurance companies



Source: ASF, N= 423

It can be observed that the probability associated with a sub-unit SCR ratio remains below 10% if we consider the SCR ratios for companies carrying on general insurance business over the period 2016 to 2023 (423 observations).

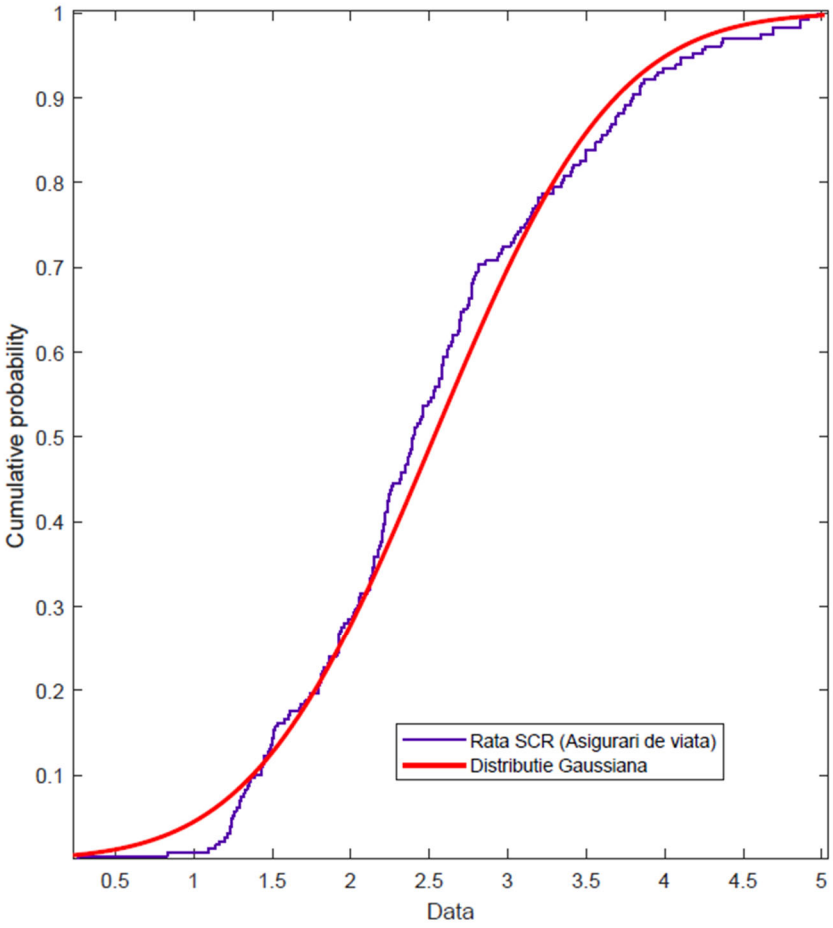
The stability index of the distribution (α, tail exponent or characteristic exponent) generally takes values between 0 and 2 and shows the speed at which the tails of the distribution taper. The smaller the value of the parameter α, the frequency size of extreme events are higher. In this case, the α parameter takes values slightly exceeding 1, indicating a mean distribution equal to the μ parameter (151%).

The asymmetry parameter, β, takes values between -1 and 1. Given that for the distribution of SCR ratios for general insurance companies, the β parameter is 0.57, the positive value of the parameter indicates that the distribution is skewed to the right.

The scale parameter, which determines the width and hence the dispersion of the density probability, is 0.28. The location parameter (1.51) represents in the stable distribution what the mean represents in the normal distribution.

Compared to the long-term average calculated for the period 2016 to 2023, four of the 12 companies that carried on general insurance business reported an SCR ratio below the long-term average.

Figure 43 Distribution of SCR rations for companies practicing life insurance business



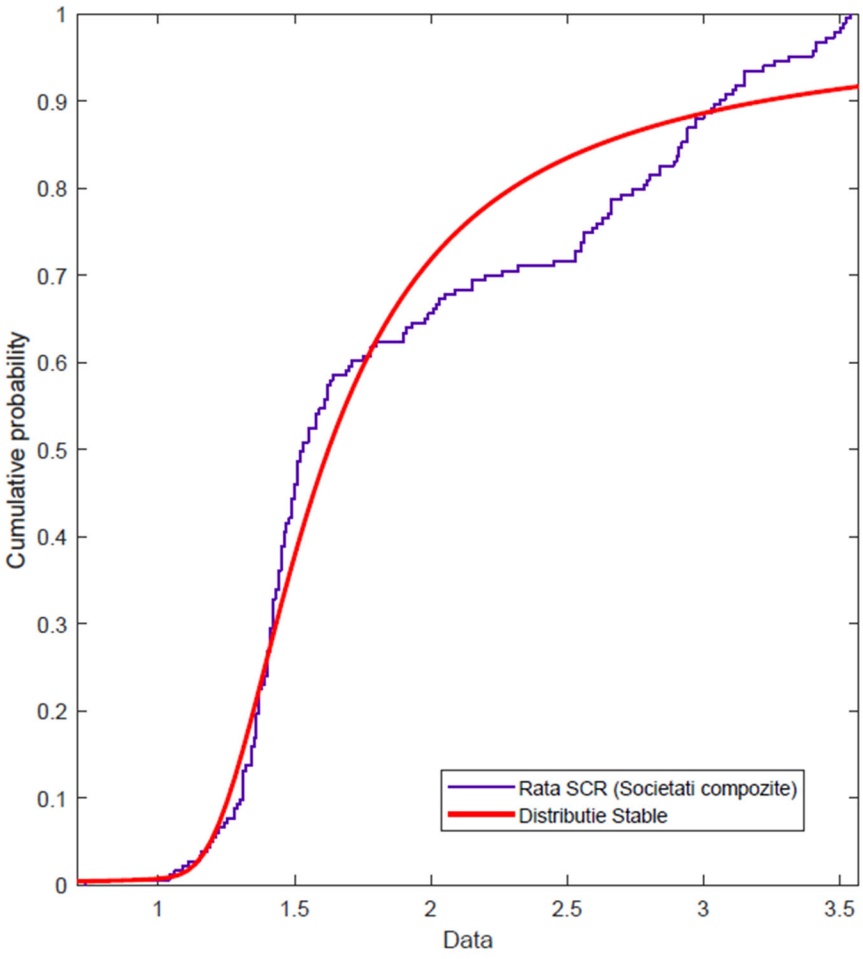
The SCR ratios average distribution for life insurance companies for the period 2016-2023 (quarterly frequency: 229 observations) was 253%.

Of the six companies that reported to ASF and exclusively practice life insurance, three companies had a SCR ratio below the long-term average of the distribution of SCR ratios at the end of the fourth quarter of 2023. Thus, for the three insurers there is a worsening of the solvency ratio compared to the long-term average. On the other hand, three companies had SCR ratios at least 0.1 standard deviations above the long-term average.

Source: ASF, N=229

The largest deviation from the long-term average was recorded by a life insurance company whose rate at the end of Q4 2023 was 0.7 standard deviations below the average.

Figure 44 Distribution of SCR ratios for composite companies



Source: ASF, N=183

If we consider the SCR ratios for the six composite companies in the period 2016 -2023 (quarterly frequency; 183 observations), we observe that only one company reported a subunit SCR ratio in the interval analysed, when the Solvency II regime came into force (Q1 2016). Subsequently, from Quarter 2 2016, the company recorded over unity SCR ratios as reported.

Using the stable distribution for SCR ratios related to composite companies, estimates of specific parameters (α - stability index and β - asymmetry parameter) show values close to 1 for both parameters.

Thus, in this case, the distribution of SCR ratios for composite companies is close to a particular case of stable distribution: the Landau distribution.

4.3. Liquidity

The liquidity indicator is a measure of the ability of insurance companies to meet their short-term obligations to policyholders by holding assets that allow the timely and efficient mobilisation of financial resources to pay claims to policyholders.

Thus, the liquidity ratio is determined as the ratio of liquid assets to insurers' short-term obligations to policyholders, and according to legal requirements, its value must be super-unit.

As of 31 December 2023, the liquidity ratio for each of the insurance categories and the items contributing to it were as follows:

Table 10 Liquidity indicator by each insurance category as at 31 December 2023

	Government bonds (Billion RON)	Municipal bonds (Billion RON)	Securities Traded (Billion RON)	Deposits (Billion RON)	Current account and Cash (Billion RON)	Short-term liabilities (Billion RON)	Liquidity indicator
AG*	11.300	79	678	1.716	259	4.461	3,15
AV	5.109	68	1.620	201	124	1.940	3,67

*Source: ASF; *not including Euroins Romania data*

Table 11 Liquidity indicator by insurance category as at 31 December 2022

	Government bonds (Billion RON	Municipal bonds (Billion RON)	Securities Traded (Billion RON)	Deposits (Billion RON)	Current account and Cash (Billion RON)	Short-term liabilities (Billion RON)	Liquidity indicator
AG*	7.584	32	442	1.619	204	3.524	2,80
AV	4.152	50	1.432	227	130	1.749	3,43

*Source: ASF; *not including Euroins Romania data*

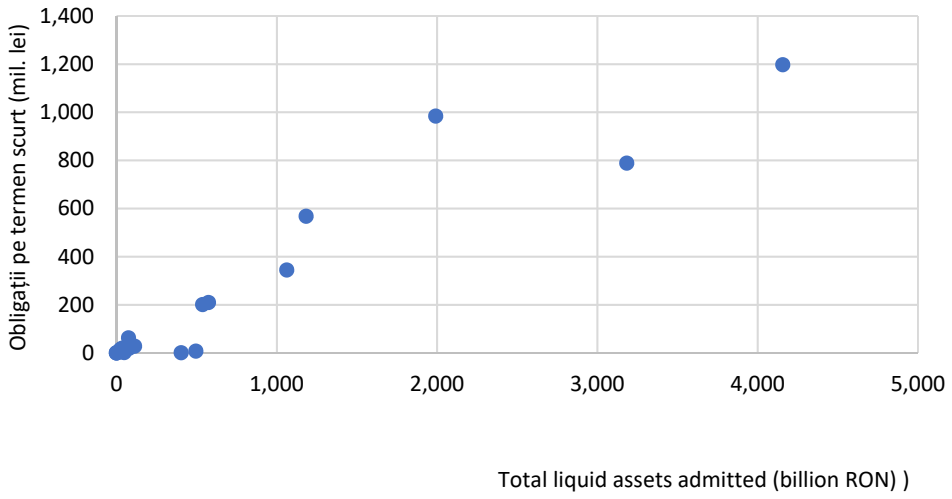
Non - life insurance

At the insurance market level, the liquidity indicator for general insurance activity (3.15) increased in December 2023 compared to December 2022 (2.80).

The value of liquid assets stood at a level of about RON 14 billion, up by 42% compared to the situation at the end of 2022, according to reports submitted by insurance companies. The increase occurred for all asset classes except listed equities. However, the total number of investments in traded shares is extremely small, having no influence on the dynamics of liquid assets.

The value of deposits stood at RON 1.72 billion, up by 6% in December 2023 compared to the end of 2022. On the other hand, insurers' short-term liabilities, represented by the gross claims reserve endorsed, increased by 27%, from RON 3.5 billion (December 2022) to RON 4.5 billion (December 2023).

Figure 45 Liquid assets vs. short-term liabilities for general insurance business - December 2023



Considering the liquidity indicator by company for the general insurance business, with monthly frequency, over the period 2016 - 2023, we observe that the average distribution of the indicator over the period analysed was 2.26. The associated probability of recording a sub-unit liquidity indicator is below 10%, if we consider all the values recorded by companies in the period 2016 -2023 (N=1,419 observations).

In December 2023, most companies had a liquidity indicator for general insurance business exceeding 4. Of all companies conducting business in the general insurance segment in December 2023, only five insurers had a liquidity ratio below the long-term average calculated for the period 2016 - 2023. The deviation from the long-term average of the five companies ranged from 0.2 to 1.3 standard deviations below the average. The liquidity indicator remains above unity for all companies, as reported by insurers.

Figure 46 Cumulative distribution of the liquidity indicator for general insurance business

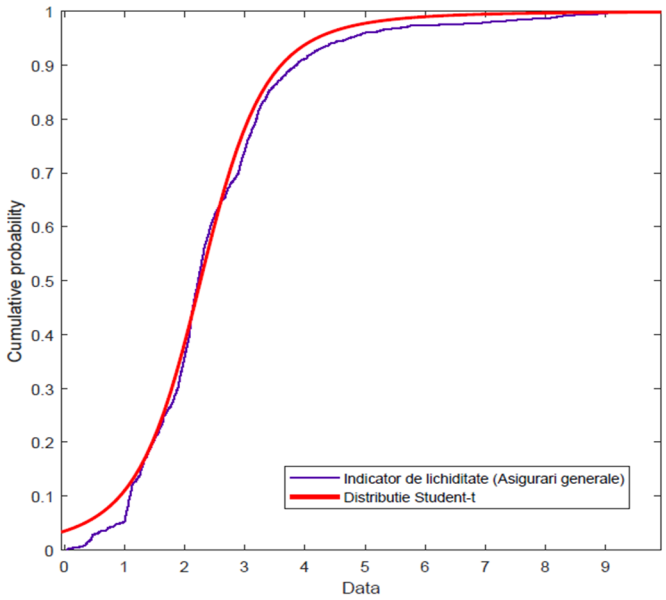
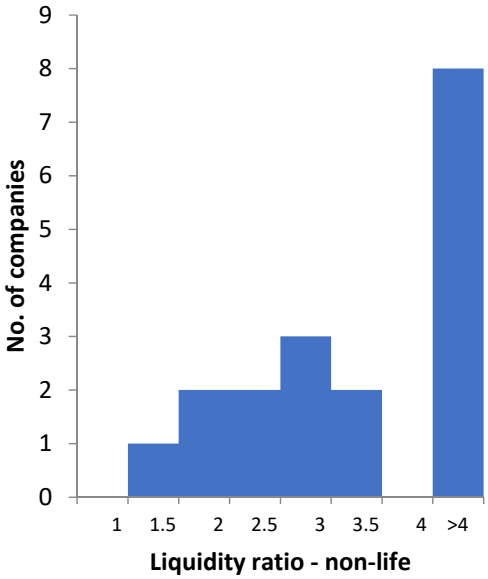


Figure 47 Distribution of liquidity ratio for general insurance business in December 2023



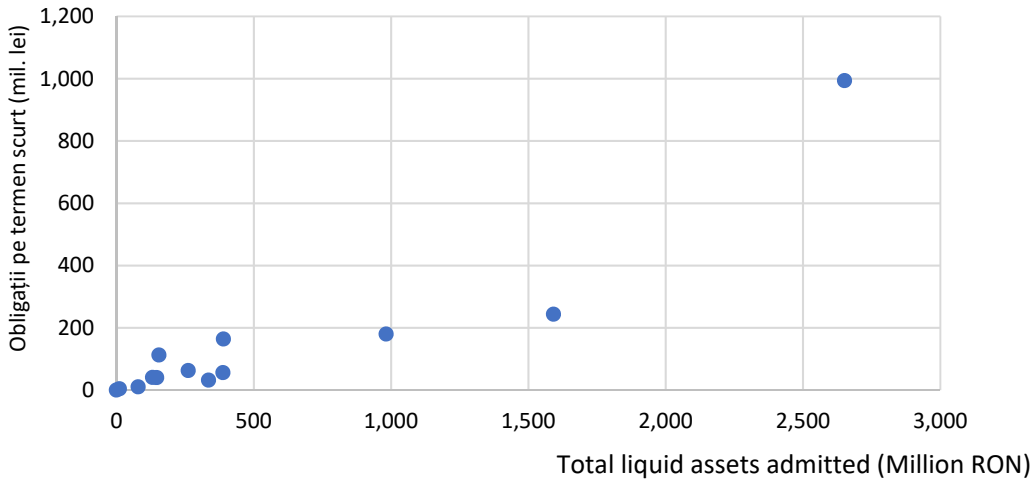
Source: ASF, N=1419; monthly frequency, 2016 - 2023

Life insurance

As regards the liquidity indicator for the life insurance market, there is an increase from a level of 3.43 (December 2022) to 3.67 (December 2023).

The value of liquid assets stood at RON 7.1 billion, up by about 19% in December 2023 compared to the end of the previous year. The increase was mainly influenced by the increase in the value of investments in government bonds and UCITS securities. Short-term bonds amounted to RON 1.94 billion, up by about 11% compared to December 2022.

Figure 48 Liquid assets vs. short-term liabilities for life insurance business - December 2023



The distribution of the liquidity indicator for the life insurance business shows that only about 10% of observations are below 2, with a long-term average of 4.66, taking into account companies' monthly reporting from 2016 to 2023.

Figure 49 Cumulative distribution of the liquidity indicator for life insurance business

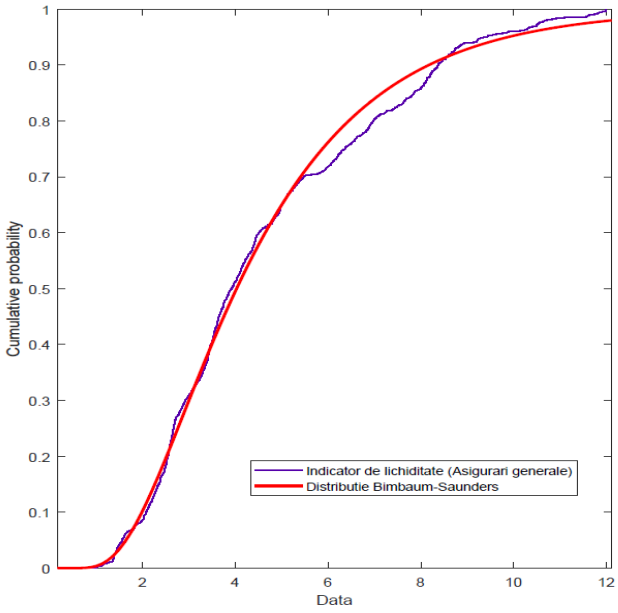
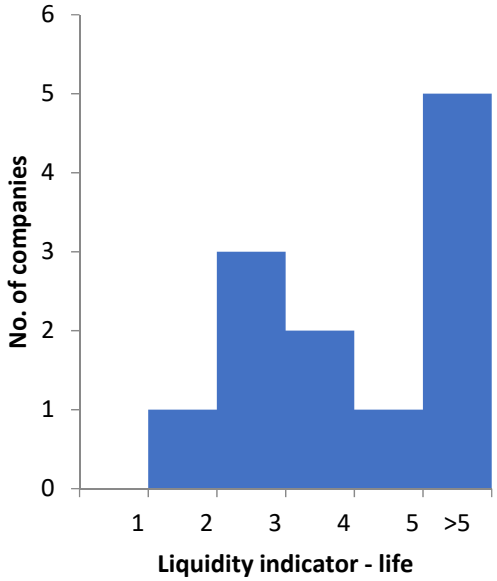


Figure 50 Distribution of the liquidity indicator for life insurance business in December 2023



In December 2023, five companies had a liquidity ratio above 5.

Among the 12 companies that were also involved in writing life insurance business in December 2023, seven had a liquidity ratio below the long-term average of 4.66. The largest deviation from this average was recorded by a company with a market share of approximately 10% in the life insurance market, although its liquidity ratio was reported to be above unity.

4.4. Technical reserves

One of the most important mechanisms underpinning the efficient functioning of the insurance market is the establishment of technical reserves by insurance companies to ensure that their obligations to policyholders are met in the event of insured events. Thus, the establishment of a sufficient level of technical reserves to support the payment of all obligations to policyholders is an important pillar of risk management for insurance companies, helping to ensure the financial stability of those companies.

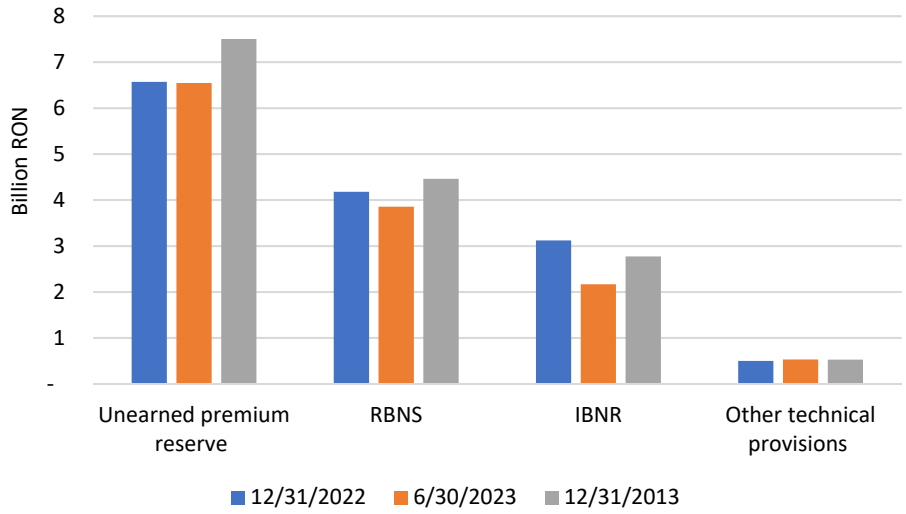
At the end of December 2023, insurance companies had gross technical reserves totalling RON 25.6 billion, according to statutory reporting, up by about 9% compared to the end of 2022 (RON 23.5 billion, including the technical reserves set up by Euroins Romania, according to the financial statements), broken down by the two categories of insurance as follows: rezervele tehnice brute constituite pentru asigurările generale au înregistrat un volum de 15,3 miliarde lei, reprezentând 60% din totalul rezervelor tehnice;

- Gross technical reserves for general insurance amounted to RON 15.3 billion, representing 60% of total technical reserves;
- For life insurance, companies have set up reserves amounting to RON 10.3 billion, representing 40% of total technical reserves.

General insurance

For general insurance business, at the end of December 2023, insurance companies had gross technical reserves of RON 15.3 billion.

Figure 51 Evolution of technical reserves by category established for general insurance business



Source: ASF; for 31.12.2022 technical reserves constituted by Euroins Romania are included, according to the financial statements

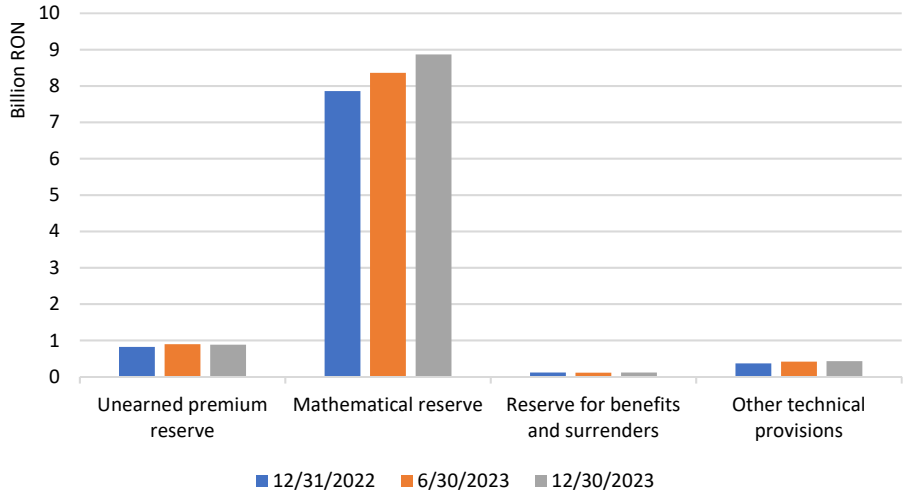
Table 12 Structure of gross technical provisions for general insurance as at 31 December 2023

	31.12.2023	Share in total	A10	A3	A8	Share of significant classes
	lei	(%)	lei	lei	lei	(%)
Premium reserve	7.503.004.750	49,2%	3.845.509.409	1.849.294.362	888.252.426	87,7%
Reserve for advised claims	4.461.432.223	29,2%	2.308.171.085	845.782.067	548.457.136	83,0%
Reserve for unadvised claims	2.770.678.015	18,2%	2.357.839.719	133.555.951	88.438.861	93,1%
Other technical reserves	526.074.824	3,4%	5.318.098	106.294.453	304.159.481	79,0%
Total reserves	**15.261.189.812**	**100,0%**	**8.516.838.311**	**2.934.926.833**	**1.829.307.903**	**87,0%**

Life insurance

For life insurance business, as of 31 December 2023, insurance companies had gross technical reserves of RON 10.3 billion.

Figure 52 Changes in technical provisions by category for life insurance business



Source: ASF

Table 13 Structure of gross technical provisions for life insurance as at 31 December 2023

	30.12.2023 (lei)	**Share in total (%)**
Premium reserve	883.348.652	8,6%
Mathematical reserve	8.866.021.009	86,1%
Reserve for benefits and surrenders	117.640.810	1,1%
Other technical reserves	428.244.020	4,2%
Total life insurance technical provisions	**10.295.254.491**	**100,0%**

Source: ASF

4.5. Reinsurance

General insurance

For a significant proportion of general insurance products (e.g., catastrophe insurance, liability insurance), as part of their risk management strategy, insurers frequently use various forms of ceding reinsurance contracts, thereby limiting the maximum loss incurred in the event of insured events with significant financial impact.

At the end of December 2023, approximately 34% of gross written premiums were ceded under reinsurance.

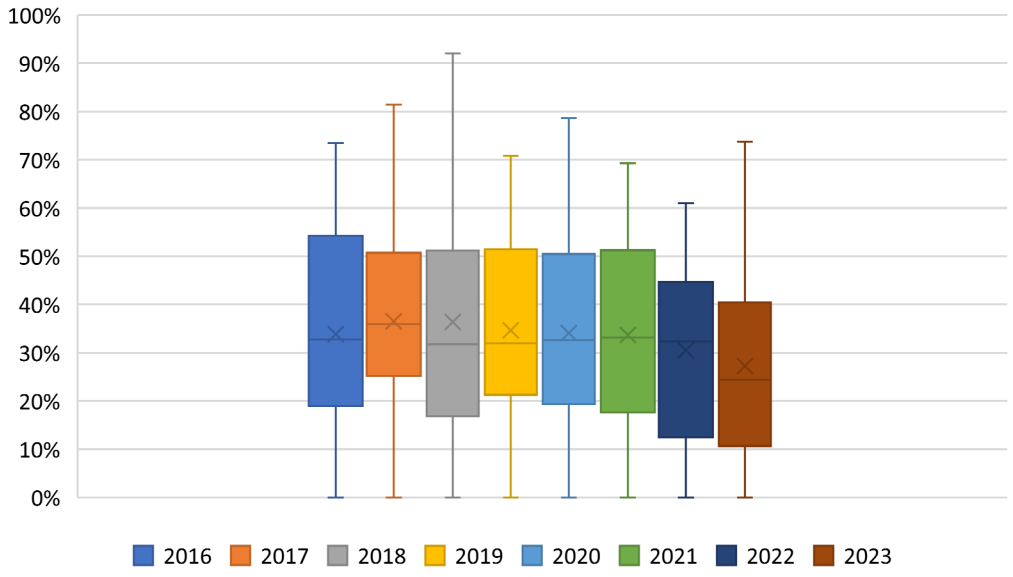
Table 14 Evolution of GWP and net reinsurance premiums for the period 2019 -2023 for general insurance business

Period	GWP (RON)	Net reinsurance premiums (RON)	Degree of retention	Degree of cession under reinsurance (%)
2019	8.734.210.208	5.426.479.935	62,13%	37,87%
2020	9.276.298.576	5.549.407.679	59,82%	40,18%
2021	11.630.849.176	7.521.877.687	64,67%	35,33%
2022	13.859.994.108	9.242.937.544	66,69%	33,31%
2023	15.200.643.338	10.061.763.605	66,19%	33,81%

Source: ASF

The reinsurance cession ratio of gross written premiums is an indicator calculated as the ratio of reinsurance ceded premiums (the part of the premiums transferred to the reinsurance company in order for it to take over the insured risks) to total gross written premiums.

Figure 53 Distribution of the reinsurance cession ratio of gross premiums written by companies from 2016 to 2023 for general insurance business



Source: ASF; excludes Euroins data for 2023

As an indicator of the size of the reinsurance programmes run by companies and therefore of risk transfer, the degree of reinsurance cession for general insurance business ranged from 0% (in the case of a company that only practices general insurance) to 74% (the maximum value observed, but excluding Euroins

Romania's data for the first quarter of 2023, which reflects the effects of the reinsurance contract concluded by the company) in 2023.

Life insurance

Traditionally, there have been important differences in reinsurance policies between life and general insurance business. In the case of life insurance, insurance companies generally retain a much higher proportion of the risk underwritten.

Because insurance premiums are generally paid in advance and the compensation in the event of an insured event is fixed by contract for each event and is therefore more predictable, life insurance companies do not use reinsurance cession as often as general insurance companies.

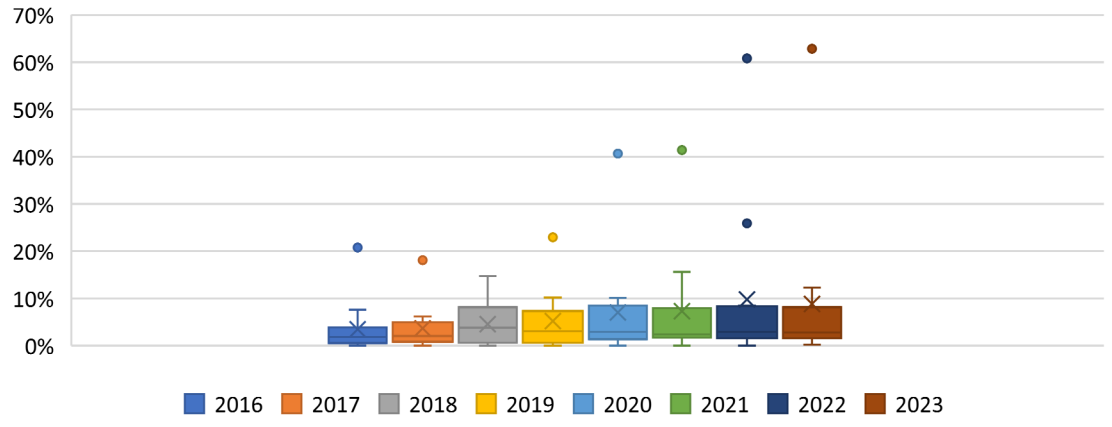
Table 15 Development of GWP and net reinsurance premiums for the period 2019 - 2023 for life insurance business

Period	Gross written premiums (RON)	Reinsurance net premiums (RON)	Degree of retention	Degree of ceding under reinsurance
2019	2.256.015.186	2.106.855.807	93,39%	6,61%
2020	2.219.296.835	2.047.536.678	92,26%	7,74%
2021	2.610.269.095	2.396.932.537	91,83%	8,17%
2022	2.646.990.610	2.359.998.726	89,16%	10,84%
2023	2.965.632.432	2.688.595.684	90,66%	9,34%

Source: ASF

The reinsurance cession ratio for life insurance business ranged from 0.2% (for a company with a market share of around 9% in the life insurance segment) to 63% (the maximum value recorded) in 2023.

Figure 54 Distribution of the reinsurance cession ratio of gross premiums written by companies in the period 2016 - 2023 for life insurance business



Source: ASF

4.6 Risks and vulnerabilities to the local insurance sector

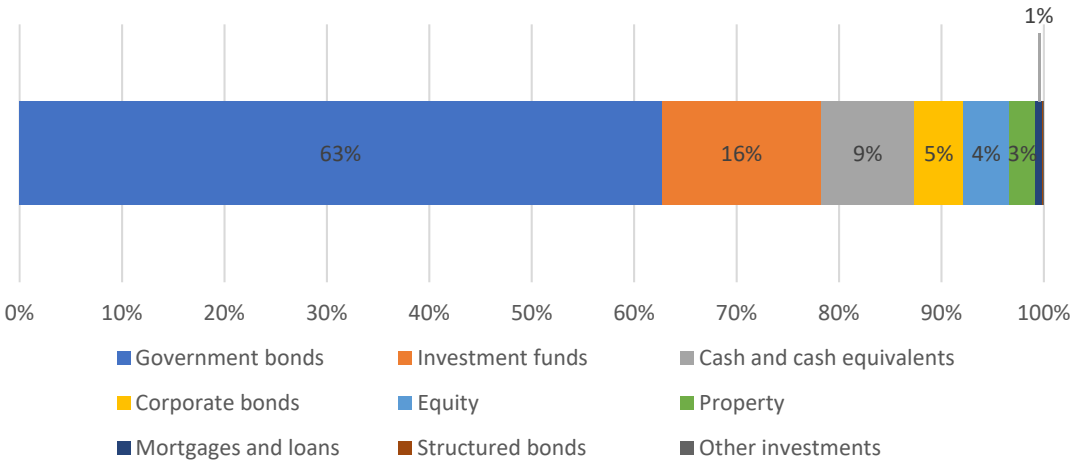
Investment structure - asset allocation

The total value of investments by insurance companies authorised and supervised by ASF (including assets held for unit-linked contracts) was about RON 27 billion as of 31 December 2023.

Insurance companies' investments in the counterparty sector show a significant exposure to the financial sector (financial and insurance activities), with a total investment value of RON 8.9 billion, representing 33% of total investments. Of the total exposure to the financial sector, the exposure to banks (deposits, corporate bonds, and shares) was about RON 3.5 billion, i.e., 13% of the total value of insurers' investments. Moreover, mainly as a result of the high value of investments in government bonds, the most significant exposure of insurance companies is to the general government sector, with insurers' placements of RON 16.9 billion, representing about 63% of the value of placements.

Insurance companies authorised and supervised by the ASF invest mainly in government bonds. If we consider total investments (including assets held for unit-linked contracts), companies' investments in government bonds account for 63%, followed by investments in investment funds (16%) and holdings of cash and deposits (9%).

Figure 55 Total investments of insurance companies by asset class at 31 December 2023



Source: ASF, S2 solo reporting, asset list S.06.02; incl. assets held for unit-linked contracts

Government bonds

The value of investments in government bonds related to insurance companies in Romania was RON 16.9 billion. An analysis by country of origin of issuers shows that 98.8% of government bond investments are issued by financial institutions in Romania.

Thus, the main exposure of companies is to the Ministry of Finance, with investments in government bonds issued by the central government accounting for 97.8% and 0.9% in municipal bonds.

Figure 56 Insurance companies' investments in government bonds by country of issue as at 31 December

Source: ASF, S2 solo reporting, asset list S.06.02; incl. assets held for unit-linked contracts

Exposure to issuers in other countries from the perspective of government bond investments is extremely low.

In order to estimate the credit risk associated with corporate exposures, we analysed the credit quality of insurance companies' investments in government bonds. The credit quality level scale ranges from 0 (extremely low credit risk) to 6 (extremely high credit risk, similar to the D rating, which indicates insolvency or failure to pay).

In the case of insurance company investments in government bonds, 98% of placements in government bonds have a credit quality level of 3, similar to a BBB rating, indicating an average credit risk.

Given the significant exposure to the Ministry of Finance, the level of credit quality is mainly determined by Romania's country rating. Therefore, the credit risk is at a medium level, but a potential deterioration of the country rating may lead to an increase in the cost of funding and thus in the expected returns for investors, which may result in a decrease in the market value of government bonds held by insurers.

1.2% of the value of investments in government bonds are unrated government bonds.

Table 16 Investment in government bonds by credit quality level

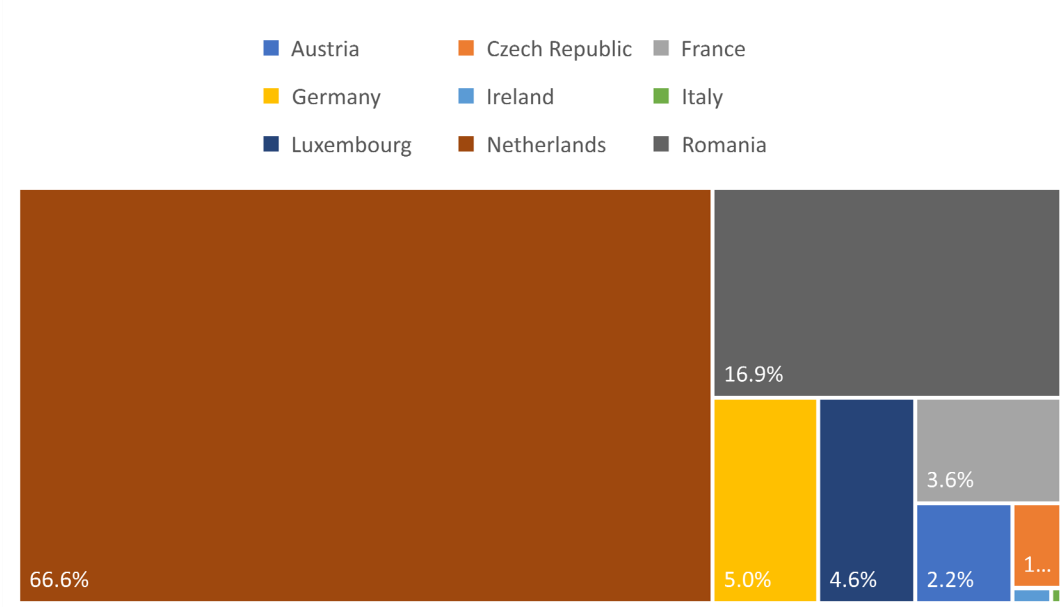
Credit quality level	Share of total investment in government bonds
0	0.4%
1	0.4%
2	0.0%
3	98.0%
4	0.0%
Without rating	1.2%

Source: ASF, S2 solo reporting, asset list S.06.02; incl. assets held for unit-linked contracts

Investment funds

The value of investments in collective investment schemes stood at RON 4.2 billion, of which about 67% were investments in funds domiciled in the Netherlands.

Figure 57 Insurance companies' investments in collective investment undertakings by country of origin of the issuer as at 31 December 2023



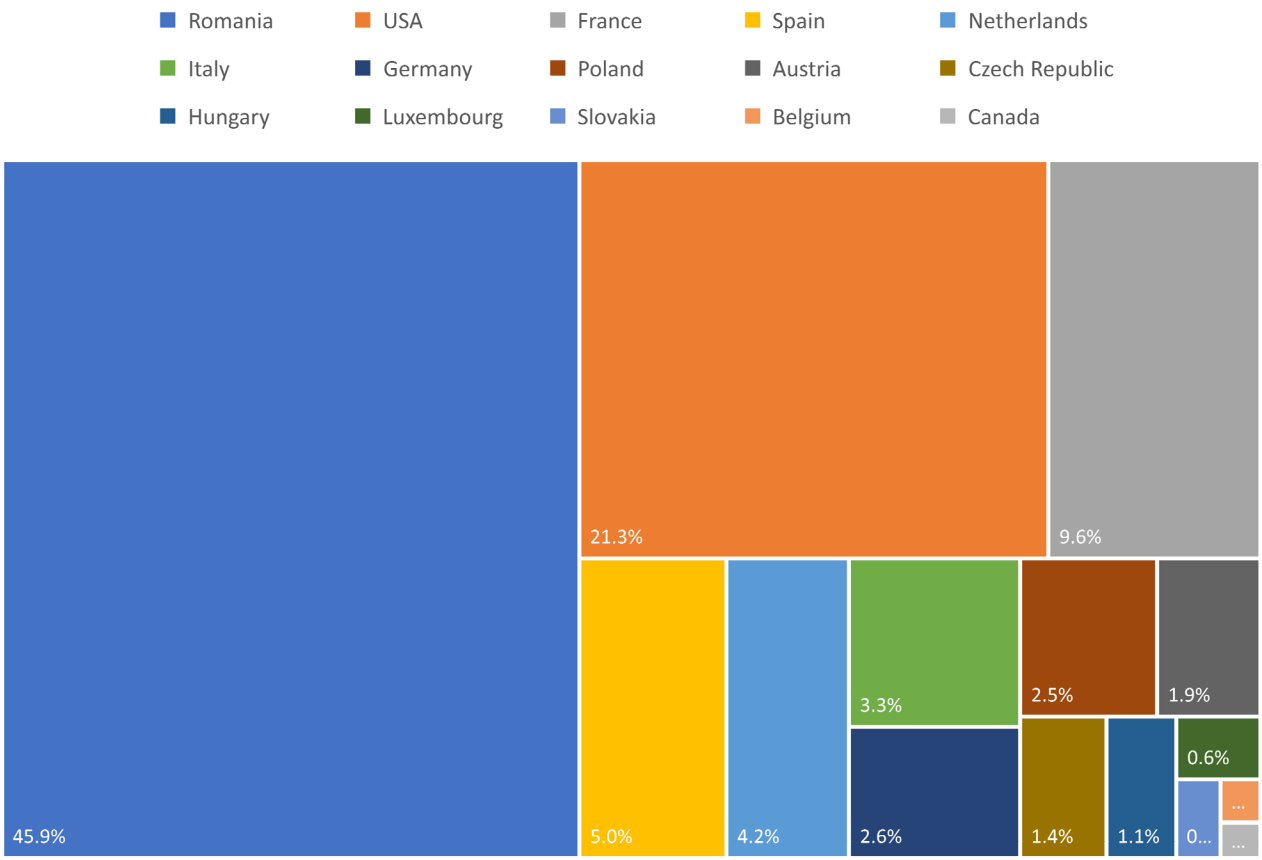
Source: ASF, S2 solo reporting, asset list S.06.02; incl. assets held for unit-linked contracts

Corporate bonds

The value of investments in corporate bonds of insurance companies was about RON 1.3 billion, representing 5% of the total investments of insurers.

In terms of the country of origin of issuers of corporate bonds held by companies, the degree of diversification is higher, with only 46% of corporate bond investments issued by counterparties from Romania. 21% of the value of corporate bond investments is issued by US companies.

Figure 58 Insurance companies' investments in corporate bonds by country of origin of issuer as at 31 December 2023



Source: ASF, S2 solo reporting, asset list S.06.02; incl. assets held for unit-linked contracts

54% of corporate bond investments are investments in bonds with a credit quality rating of 3, while 10% of corporate bond investments are investments in unrated bonds.

Table 17 Corporate bond investments by credit quality level

Level of credit quality	Share of total investment in corporate bonds
0	0.4%
1	1.6%
2	29.6%
3	53.8%
4	4.1%
5	0.3%
Without rating	10.2%

Source: ASF, S2 solo reporting, asset list S.06.02; incl. assets held for unit-linked contracts

Exposure of insurance companies to the real estate sector

A topic of global interest is exposure to the real estate sector, mainly the commercial real estate market. The European Systemic Risk Board (ESRB) has issued a recommendation to address these categories of vulnerabilities to the financial system and has also recommended to European and national authorities that they improve the monitoring of the commercial real estate sector.

The higher risks from this perspective stem from key macroeconomic developments, rising inflation, and deteriorating growth prospects.

The European authorities' increased interest in monitoring exposure to the housing sector has come amid indications that the European housing market has peaked after a prolonged period of rising prices. The current macroeconomic environment, characterised by high interest rates and inflation, may adversely affect the short-term outlook. Higher interest rates have increased the cost of financing, discouraging investment. At the same time, high inflation rates have eroded households' purchasing power. Moreover, the pandemic period has led to persistent structural changes, resulting in a decrease in demand for commercial/headquarters real estate as activities are carried out in a hybrid system with both physical presence and remote working.

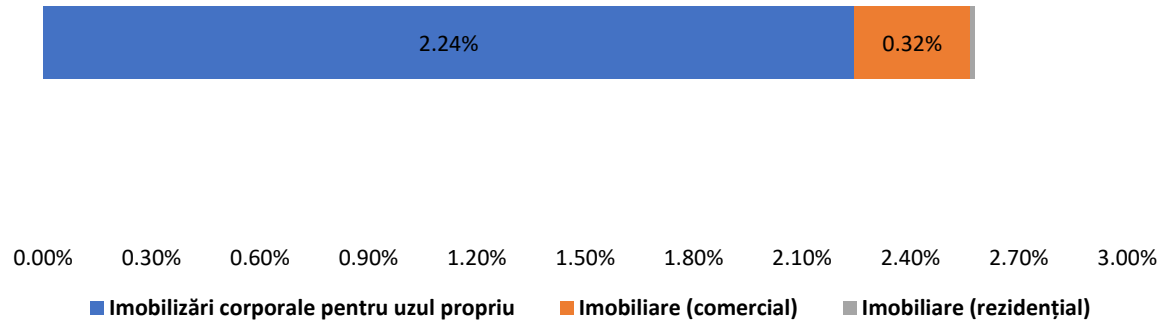
Insurance companies' investments in the real estate sector amounted to RON 695 million, representing 2.6% of total investments. The value of investments includes both tangible fixed assets for personal use (land, buildings, and equipment) and investments in commercial and residential real estate.

Figure 59 Exposure of Romanian insurance companies to the real estate sector as a share of total investments as at 31 December 2023

Source: ASF, S2 solo reporting, total investments include assets held for unit-linked contracts

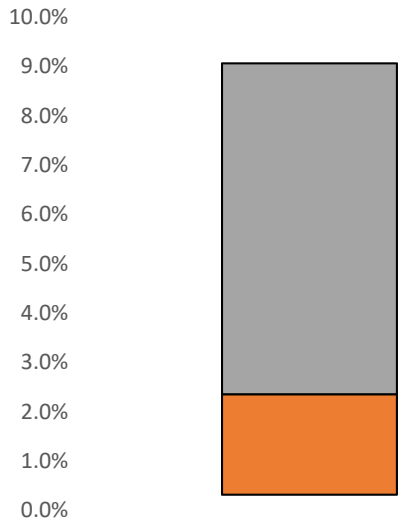
Exposure to the commercial real estate sector stood at 0.3% as a share of total investments, with a value of about RON 87 million, according to insurance company reports.

Figure 60 Exposure of Romanian insurance companies to the real estate sector by investment category as a share of total investments as at 31 December 2023



Source: ASF, S2 solo reporting, total investments include assets held for unit-linked contracts

Figure 61 Distribution of insurance companies' exposure to the real estate sector



Source: ASF, S2 solo reporting; N=24; chart shows 10th percentile, median and 90th percentile.

An analyse of exposure by insurance shows that the median value of the indicator is 2.4%, while the 90th percentile is 9.07%, which shows that 21 of the 24 companies reporting under Solvency II (not including Geroma) have a lower exposure than 9.07%.

Thus, three companies have an exposure to the real estate sectors higher than 9.1%, the highest level being 29%. However, companies do not have high exposure to the commercial and real estate sector, but most of the investments are in tangible fixed assets for their own use. Investments in the real estate sector residential related to companies with the largest exposure (29%) account for 5.5% of total investments, the remainder being tangible fixed assets for personal use.

Valuation methods for assets reported under Solvency 2

The analysis of the investment structure of Romanian insurance companies shows that the highest exposure is to government bonds, with the main counterparty of insurers being the Ministry of Finance.

Although the asset allocation structure shows that locally active companies are more prudent and do not invest heavily in complex financial instruments, with exposure to alternative/non-liquid assets being relatively limited both at the market level and on a company-by-company basis, macroeconomic developments in recent years have led to an increase in credit and liquidity risk. Moreover, international bodies and European authorities (IMF, EIOPA) have taken steps to analyse insurance companies' investments from the point of view of the risks they may pose to financial stability.

In this context, in addition to the investment structure analysis, an important factor to consider, especially in the context of increasing credit risk, is the valuation method used by companies.

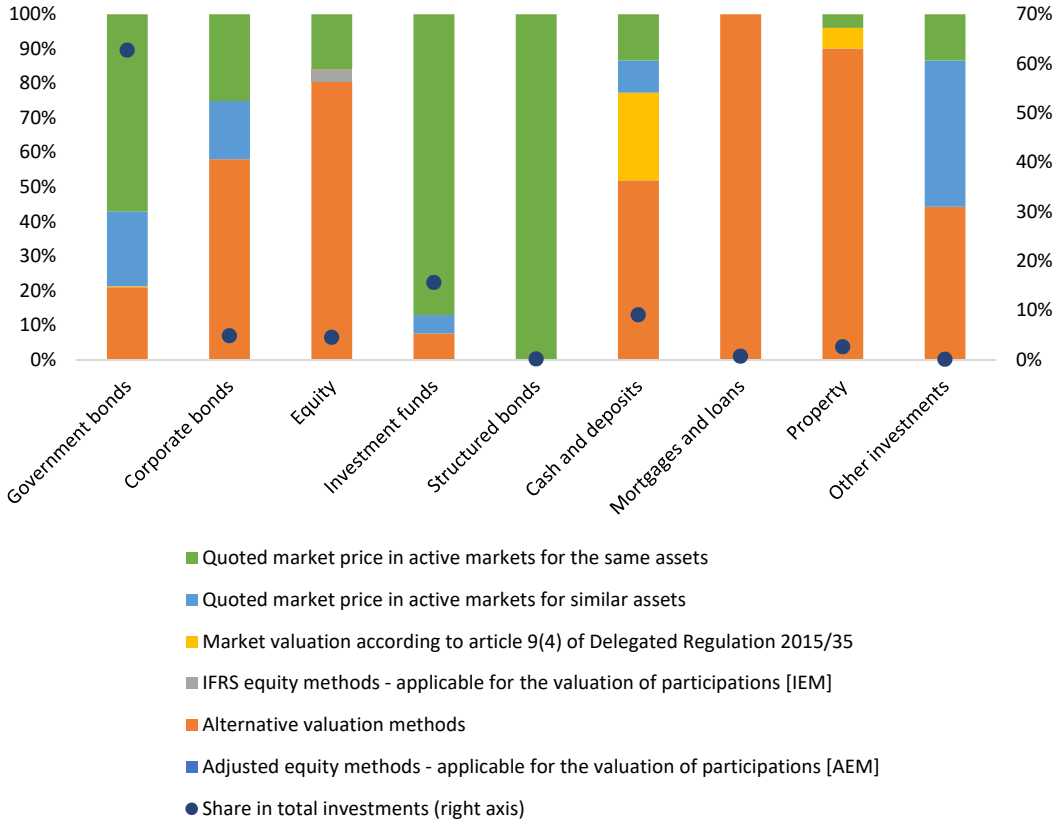
Inappropriate/inaccurate methods can significantly distort the company's solvency position. Therefore, we have identified below the methods used by companies supervised by ASF to value assets, as reported by the companies.

Table 18 Reliability of asset valuation methods used by insurance companies

Valuation method used		
Quoted market price in active markets for the same assets	The default method of valuing how companies should value assets	
Quoted market price in active markets for similar assets		
Alternative valuation methods	When using alternative valuation methods, insurance companies should rely mainly on relevant market inputs (e.g., yield curves, interest rates, implied volatilities, etc.) and as little as possible on company-specific inputs	
Adjusted equivalence methods	Applicable for the valuation of shareholdings	
Equivalent IFRS methods	Applicable for the valuation of shareholdings	
Market assessment according to Article 9(4) of Delegated Regulation 2015/35	Only if it is proportionate to the nature, scale and complexity of the risks inherent in the company's business, insurance companies may recognise and value an asset on the basis of the valuation method they use for the preparation of their annual or consolidated financial statements.	

Source: EIOPA, ASF processing

Figure 62 Share of assets reported under Solvency 2 by valuation method used in total investments

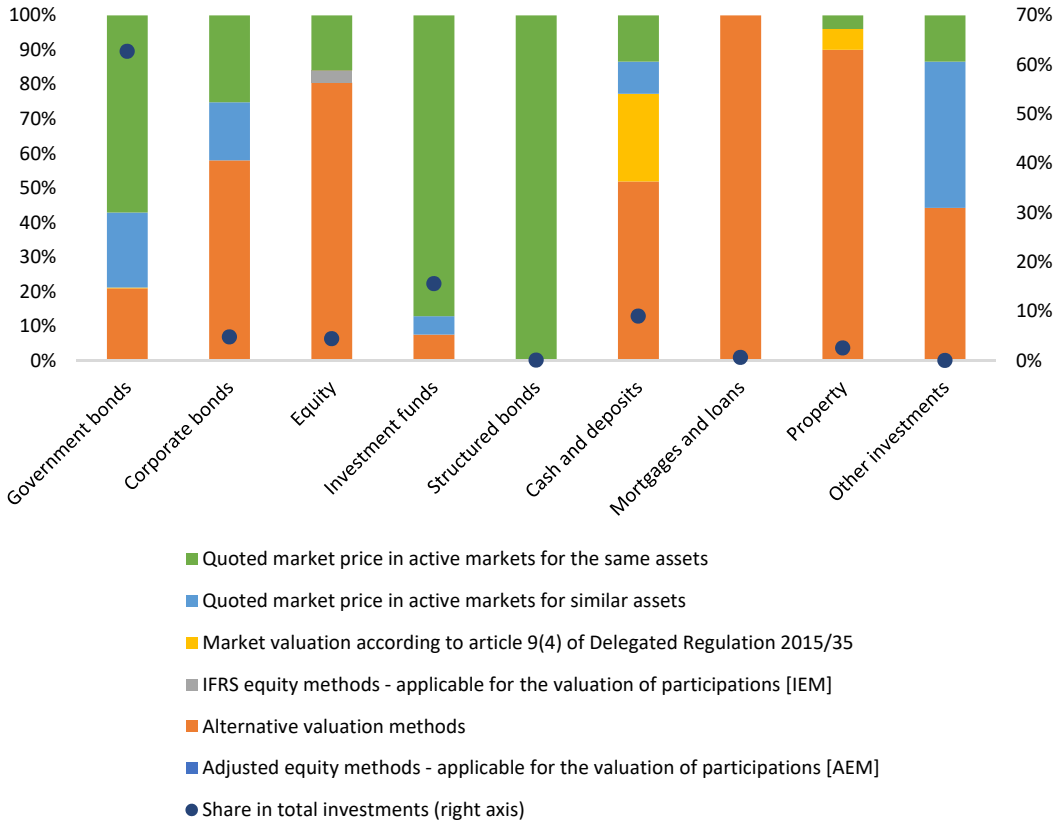


Source: ASF, S2 solo reporting, Q4 2023; incl. assets held for unit-linked contracts

At the end of Q4 2023, 53% of insurance companies' investments (including assets held for unit-linked contracts) were valued according to a highly credible method using quoted market prices in active markets for the same assets.

However, 28% of the value of investment assets was valued using alternative valuation methods.

Figure 63 Assets reported under Solvency 2 by asset class and valuation method used



Source: ASF, S2 solo reporting, Q4 2023; incl. assets held for unit-linked contracts

Systemically relevant entities

The value of total assets of insurance companies reporting under the Solvency II regime was about RON 31 billion as of 31 December 2023, representing a share of 2% of gross domestic product (GDP).

Table 19 Total assets of insurance corporations (S2) and share in GDP

Company	Q4 2022* (billion RON)	% GDP	Q4 2023 (billion RON)	% GDP
ALLIANZ - TIRIAC ASIGURARI S.A.	4.083	0,29%	5.673	0,37%
GROUPAMA ASIGURARI S.A.	3.926	0,28%	5.406	0,35%
NN ASIGURARI DE VIATA SA	4.206	0,30%	4.868	0,31%
OMNIASIG VIENNA INSURANCE GROUP S.A.	2.528	0,18%	3.204	0,21%
ASIGURAREA ROMANEASCA - ASIROM VIENNA INSURANCE GROUP S.A.	1.847	0,13%	2.339	0,15%
GENERALI ROMANIA ASIGURARE REASIGURARE S.A.	1.565	0,11%	1.968	0,13%
BCR ASIGURARI DE VIATA VIENNA INSURANCE GROUP S.A.	1.610	0,11%	1.818	0,12%
GRAWE ROMANIA ASIGURARE S.A.	942	0,07%	1.588	0,10%
UNIQA ASIGURARI S.A.	743	0,05%	772	0,05%

Company	Q4 2022* (billion RON)	% GDP	Q4 2023 (billion RON)	% GDP
BRD ASIGURARI DE VIATA S.A.	641	0,05%	771	0,05%
POOL-UL DE ASIGURARE IMPOTRIVA DEZASTRELOR NATURALE S.A.	439	0,03%	488	0,03%
ONIX ASIGURARI S.A.	437	0,03%	485	0,03%
UNIQA ASIGURARI DE VIATA S.A.	217	0,02%	282	0,02%
SIGNAL IDUNA ASIGURARE REASIGURARE S.A.	181	0,01%	262	0,02%
ALLIANZ-TIRIAC UNIT ASIGURARI S.A.	189	0,01%	191	0,01%
COMPANIA DE ASIGURARI - REASIGURARI EXIM ROMANIA	144	0,01%	149	0,01%
ABC ASIGURARI-REASIGURARI S.A.	90	0,01%	130	0,01%
SIGNAL IDUNA ASIGURARI S.A.	107	0,01%	114	0,01%
GARANTA ASIGURARI S.A.	106	0,01%	95	0,01%
EUROLIFE ERB ASIGURARI DE VIATA S.A.	87	0,01%	85	0,01%
ASITO KAPITAL S.A.	62	0,00%	64	0,00%
NN ASIGURARI S.A.	36	0,00%	52	0,00%
EUROLIFE ERB ASIGURARI GENERALE S.A.	34	0,00%	35	0,00%
EAZY ASIGURARI S.A.	-	0,00%	29	0,00%
SIGNAL IDUNA ASIGURARI DE VIATA S.A.	117	0,01%	-	0,00%
Total assets	**24.337**	**1,7%**	**30.869**	**2,0%**

*Source: ASF, S2 solo reporting, so not including Gerroma not reporting under Solvency II; *not including Euroins Romania as of 31.12.2022*

Allianz Țiriac has the highest value of total assets, with a share of around 0.4% of GDP, followed by Groupama (0.35%) and NN Asigurări de Viață (0.31%).

Table 20 Market shares of insurance companies in 2023 (general and life insurance)

Company	GDP (RON)	Market share
GROUPAMA ASIGURARI S.A.	4.087.128.393	22,5%
ALLIANZ - TIRIAC ASIGURARI S.A.	3.492.340.904	19,2%
OMNIASIG VIG	2.381.726.531	13,1%
ASIROM VIENNA INSURANCE GROUP S.A.	1.602.425.889	8,8%
GENERALI ROMANIA ASIGURARE REASIGURARE S.A.	1.426.601.804	7,9%
NN ASIGURARI DE VIATA SA	1.019.391.746	5,6%
GRAWE ROMANIA ASIGURARE S.A.	986.692.078	5,4%
EUROINS ROMANIA ASIGURARE REASIGURARE S.A.	701.524.294	3,9%
BCR ASIGURARI DE VIATA VIENNA INSURANCE GROUP S.A.	478.636.130	2,6%
UNIQA ASIGURARI S.A.	414.855.122	2,3%
BRD ASIGURARI DE VIATA S.A.	295.024.962	1,6%
SIGNAL IDUNA ASIGURARE REASIGURARE S.A.	274.042.129	1,5%
POOL-UL DE ASIGURARE P.A.I.D.	205.290.467	1,1%
UNIQA ASIGURARI DE VIATA SA	177.020.607	1,0%
ALLIANZ-TIRIAC UNIT ASIGURARI S.A.	111.107.439	0,6%
SIGNAL IDUNA ASIGURARI S.A. (FOSTA ERGO ASIGURARI S.A.)	93.141.920	0,5%
ONIX ASIGURARI S.A.	90.021.643	0,5%
ABC ASIGURARI - REASIGURARI S.A.	79.748.939	0,4%
EXIM ROMANIA S.A.	76.606.999	0,4%
GARANTA ASIGURARI S.A.	55.471.508	0,3%
EUROLIFE FFH ASIGURARI GENERALE S.A.	41.156.556	0,2%
ASITO KAPITAL S.A.	35.907.909	0,2%
NN ASIGURARI S.A.	19.203.320	0,1%
EUROLIFE FFH ASIGURARI DE VIATA S.A.	16.101.301	0,1%
SIGNAL IDUNA ASIGURARI DE VIATA S.A.*	3.481.391	0,0%
GERMAN ROMANIAN ASSURANCE S.A.	1.625.789	0,0%
Total	18.166.275.770	100,0%

*Source: ASF; * during August 2023, Signal Iduna Asigurări de Viață, formerly Ergo Asigurări de Viață, received approval to transfer its portfolio to Signal Iduna Asigurare Reasigurare*

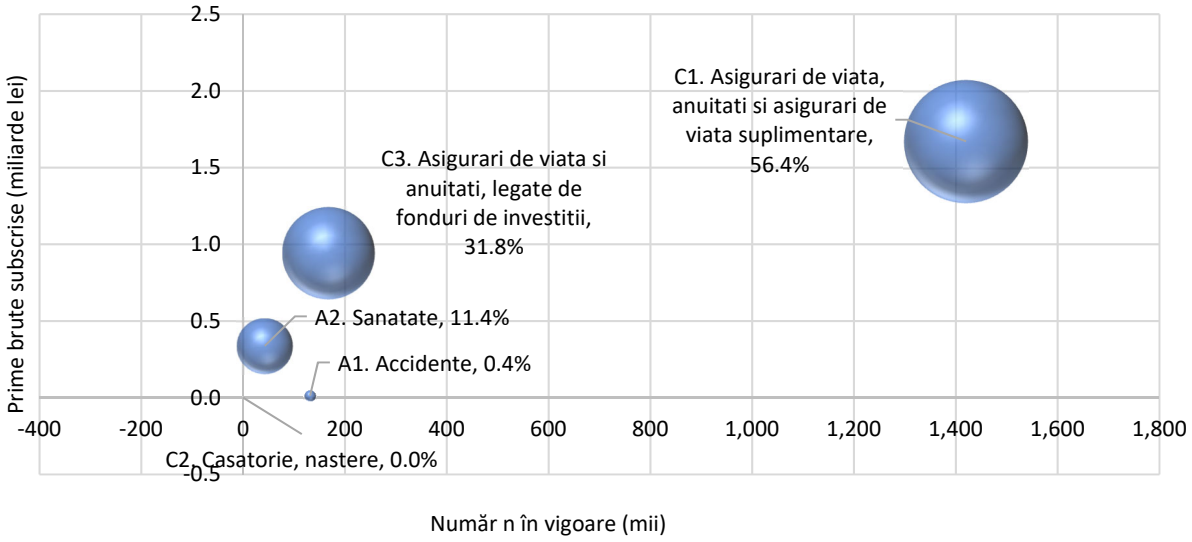
In terms of size (however measured - gross written premiums, assets, technical reserves), no insurance company exceeds 1% of GDP, so there would be no argument for it to be considered systemic according to this criterion.

From the perspective of analysing the degree of substitutability in the Romanian insurance market, ASF has identified several vulnerable segments, due to the high degree of concentration and the significant volume of gross written premiums, but also due to the existence of a relatively small number of insurers authorised by ASF to carry out these activities:

- life insurance market;
- MTPL market;
- CASCO market (class A3);
- guarantee insurance market (class A15).

As of 31 December 2023, 12 companies were writing life insurance business, of which six were writing life insurance business exclusively and six were composite companies.

Figure 64 Size of the life insurance market



Source: ASF

The degree of concentration is high in both the voluntary and compulsory motor insurance (MTPL) markets.

The top 3 companies in the MTPL market have a combined share of 57% of the MTPL insurance portfolio in Romania (including branches), down compared to previous periods, amid the increase in the volume of gross premiums written by the two branches operating in this segment.

Table 21 Size of the MTPL market at 31 December 2023

	Gross written premiums	Market share	No. of contracts concluded	No. of annual units exposure
ALLIANZ - TIRIAC ASIGURARI S.A.	1.928.386.481	20,8%	1.359.217	1.325.824
ASIROM VIENNA INSURANCE GROUP S.A.	856.525.842	9,3%	735.827	563.141
GENERALI ROMANIA ASIGURARE REASIGURARE S.A.	584.454.427	6,3%	435.180	427.960
GRAWE ROMANIA ASIGURARE S.A.	901.260.682	9,7%	1.075.109	963.137
GROUPAMA ASIGURARI S.A.	2.433.482.759	26,3%	2.554.484	2.161.122
EUROINS ROMÂNIA	651.973.484	7,0%	734.092	693.322
OMNIASIG VIG	555.528.487	6,0%	370.615	357.086
AXERIA IARD	789.074.634	8,5%	1.071.830	971.490
HD Insurance	551.628.552	6,0%	675.727	564.475
TOTAL	**9.252.315.348**	**100,0%**	**9.012.081**	**8.027.556**

Source: ASF; including branches

The value of gross premiums written by companies authorised and regulated by ASF stood at about RON 3.5 billion for the optional motor insurance segment (Class A3), up by 16% compared to 2022 (RON 3.1

billion). The top 3 insurers have a market share of 74% in terms of gross written premiums for class A3 (without branches).

Table 22 Ranking of companies by market share for class A3 in 2023

	2023		2022	
Company	**Gross written premiums**	**Market share**	**No. of contracts concluded**	**Market share**
OMNIASIG VIG	1.088.963.584	30,7%	944.858.457	30,9%
GROUPAMA ASIGURARI S.A.	1.024.991.050	28,9%	812.604.807	26,6%
ALLIANZ - TIRIAC ASIGURARI S.A.	513.985.376	14,5%	483.996.413	15,8%
GENERALI ROMANIA ASIGURARE REASIGURARE S.A.	399.347.761	11,3%	307.944.943	10,1%
ASIROM VIENNA INSURANCE GROUP S.A.	298.600.054	8,4%	247.388.968	8,1%
Total 1-5	**3.325.887.825**	**93,8%**	**2.796.793.588**	**91,4%**
UNIQA ASIGURARI S.A.	121.138.732	3,4%	147.978.149	4,8%
ALLIANZ-TIRIAC UNIT ASIGURARI S.A.	43.866.561	1,2%	41.601.572	1,4%
GARANTA ASIGURARI S.A.	17.147.860	0,5%	20.325.300	0,7%
GRAWE ROMANIA ASIGURARE S.A.	15.231.955	0,4%	8.800.785	0,3%
SIGNAL IDUNA ASIGURARI S.A. (FOSTA ERGO ASIGURARI S.A.)	14.562.481	0,4%	12.943.558	0,4%
Other	8.445.485	0,2%	30.602.617	1,0%
Total	**3.546.280.899**	**100,0%**	**3.059.045.569**	**100,0%**

Source: ASF; Euroins Q1 2023 data included

In 2023, gross written premiums for guarantee insurance stood at around RON 270 million, a decrease of about 9.5% compared to the previous year.

Table 23 Ranking of companies by market share for Class A15 in 2023

Company	Gross written premiums	Market share
ONIX ASIGURARI	90.021.643	33,32%
ABC ASIGURARI - REASIGURARI	54.846.814	20,30%
EXIM ROMANIA	48.664.940	18,01%
OMNIASIG VIG	17.351.442	6,42%
GROUPAMA ASIGURARI	17.338.231	6,42%
Total 1-5	228.223.070	84,46%
ALLIANZ - TIRIAC ASIGURARI	14.896.353	5,51%
ASIROM VIG	11.010.185	4,07%
ASITO KAPITAL	10.296.124	3,81%

Table 24 Ranking of companies by market share for Class A15 in 2022

Company	Gross written premiums	Market share
ONIX ASIGURARI S.A.	136.967.404	45,9%
EXIM ROMANIA S.A.	41.827.944	14,0%
ABC ASIGURARI - REASIGURARI	39.153.557	13,1%
EUROINS ROMANIA	28.558.866	9,6%
ALLIANZ - TIRIAC ASIGURARI S.A.	14.035.048	4,7%
Total 1-5	260.542.819	87,3%
OMNIASIG VIG	12.111.060	4,1%
ASITO KAPITAL S.A.	10.230.362	3,4%
GROUPAMA ASIGURARI S.A.	9.555.465	3,2%

EUROINS ROMANIA ASIGURARE REASIGURARE	4.801.867	1,78%
ALLIANZ-TIRIAC UNIT ASIGURARI	871.541	0,32%
Total 1-10	**270.099.140**	**99,96%**
Altele	106.477	0,04%
Total	**270.205.617**	**100,00%**

ASIROM VIG S.A.	4.493.722	1,5%
ALLIANZ-TIRIAC UNIT ASIGURARI	1.373.291	0,5%
Total 1-10	**298.306.719**	**99,9%**
Altele	216.205	0,1%
Total	**298.522.924**	**100.0%**

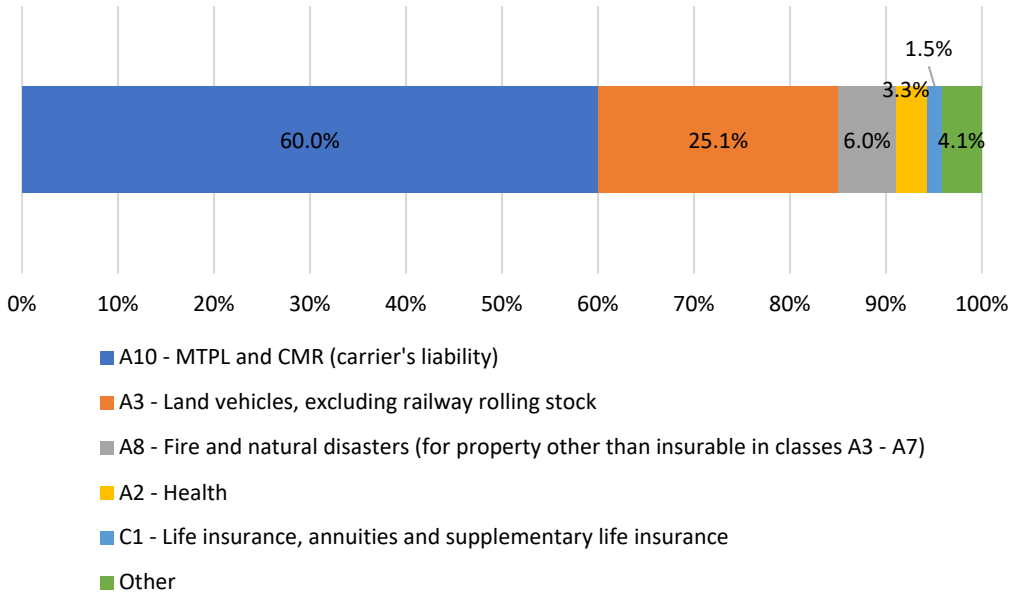
Source: ASF

In terms of interconnections, the largest exposure of insurance companies is to government bonds, with investments in this asset class accounting for 63% of total investments (taking into account assets held for unit-linked contracts). Of these, 97.8% are investments in government bonds issued by the central government, showing that the main exposure of insurance companies in terms of investment structure is to the Ministry of Finance.

Although in terms of size, interconnectedness (credit risk), and degree of substitutability there is no evidence to classify a company as systemically relevant, the high degree of concentration and dependence of the local insurance market on motor insurance confirms the sectoral relevance of Groupama Asigurări and Allianz Țiriac. The arguments underlying the classification of companies as sectorally relevant financial entities (in the insurance market) are related to the size of the companies and the high number of insurance contracts concluded, as both companies are authorised to practice MTPL.

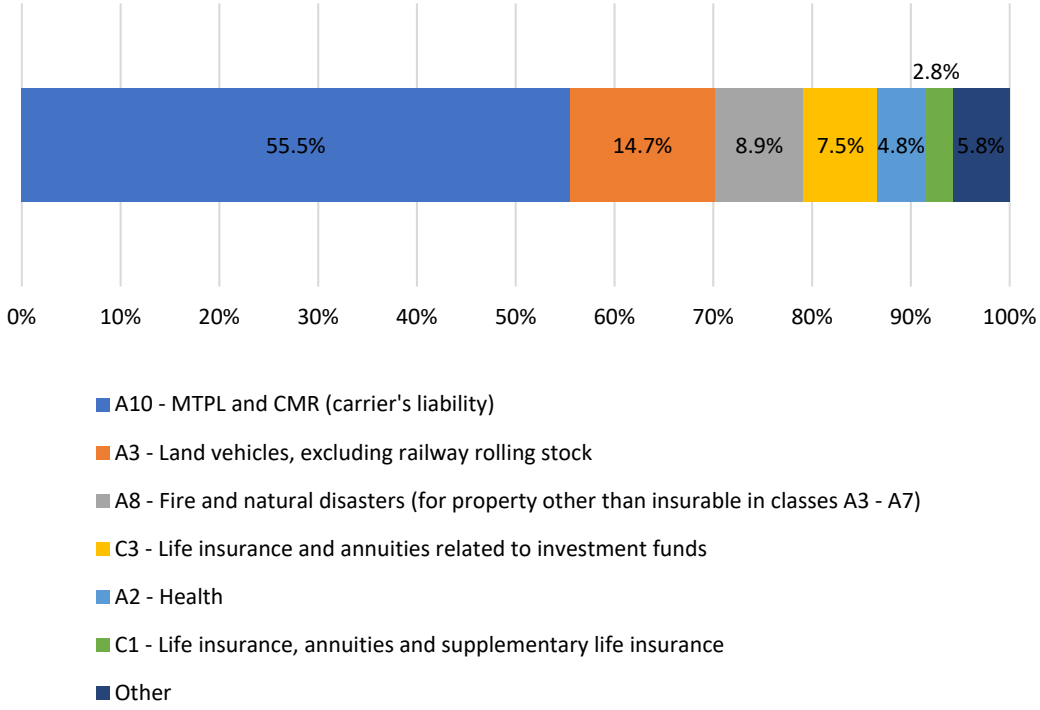
The highest volume of gross premiums was written for motor insurance (class A3 and A10), which accounted for 85% of Groupama's total gross written premiums in 2023, and 70% for Allianz Țiriac.

Figure 65 Structure of Groupama by insurance class (general and life insurance)



Source: ASF

Figure 66 Structure of Allianz Țiriac by insurance classes (general and life insurance)



Source: ASF

Concentration

The degree of concentration in the Romanian insurance market remains high, measured both in terms of gross written premiums by class of insurance and by company.

At the same time, the insurance sector remains dominated by general insurance, which accounts for 84% of total gross written premiums, while the share of life insurance business remains relatively low at 16%.

General insurance

In terms of general insurance business, motor insurance accounts for 76% of this sector in terms of gross written premiums, a relatively similar level to that recorded in 2022 (76.9%). There is a slight decrease in the share of premiums written for compulsory motor third party liability (MTPL) insurance, but this does not represent a downward trend in the dependence of the local market on MTPL insurance. The statistics presented in this chapter cover the business carried out by companies authorised and regulated by ASF, without taking into account the branches carrying out business in Romania under the Freedom of Establishment (FoE).

Currently, in addition to the companies authorized and regulated by ASF, two branches (Axeria Iard and Hellas Direct) are active on the MTPL market in Romania, which in 2023 had gross premiums of over RON 1.3 billion.

Figure 67 Evolution of concentration degree by class of general insurance according to gross written premiums

	2018	2019	2020	2021	2022	2023
A1	0.7%	0.7%	0.6%	0.5%	0.4%	0.4%
A2	2.9%	2.6%	3.0%	2.6%	2.9%	3.1%
A3	25.8%	26.5%	26.0%	23.4%	22.1%	23.3%
A4	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%
A5	0.1%	0.1%	0.2%	0.1%	0.2%	0.1%
A6	0.3%	0.2%	0.2%	0.1%	0.1%	0.2%
A7	0.4%	0.4%	0.3%	0.2%	0.3%	0.2%
A8	13.2%	13.3%	13.3%	11.4%	10.9%	11.8%
A9	1.9%	2.0%	2.1%	1.8%	1.7%	1.7%
A10	46.5%	45.6%	45.1%	52.6%	54.8%	52.7%
A11	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%
A12	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
A13	3.1%	3.1%	3.2%	2.6%	2.7%	3.0%
A14	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A15	2.9%	3.2%	5.0%	3.0%	2.2%	1.8%
A16	0.3%	0.3%	0.2%	0.4%	0.3%	0.4%
A17	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A18	1.5%	1.6%	0.7%	1.0%	1.2%	1.2%

Source: ASF, only companies authorised and regulated by ASF are included (without branches, FoE, and companies operating under the freedom to provide services, FoS)

The largest volume of gross premiums was written by Groupama, which had a 26.5% market share in the general insurance segment, up 5.5 pp compared to 2022, followed by Allianz Țiriac with a share of 20.6% (+1.8 pp compared to 2022).

Therefore, in terms of the degree of concentration in terms of gross premiums written by companies, the top three companies have a combined market share of around 63% in the general insurance segment, up from 60% in 2022.

Table 25 Market shares of companies authorised and regulated by ASF for general insurance business

Company	2022		2023	
	GWP, RON	Market share	GWP, RON	Market share
ABC ASIGURARI - REASIGURARI S.A.	56.766.379	0,4%	79.748.939	0,5%
ALLIANZ - TIRIAC ASIGURARI S.A.	2.604.124.398	18,8%	3.133.839.022	20,6%
ALLIANZ-TIRIAC UNIT ASIGURARI S.A.	99.957.607	0,7%	111.107.439	0,7%
ASIROM VIENNA INSURANCE GROUP S.A.	1.051.696.329	7,6%	1.505.985.852	9,9%
ASITO KAPITAL S.A.	31.864.016	0,2%	35.907.909	0,2%
EAZY ASIGURARI S.A.	N/A	N/A	0	0,0%
EUROINS ROMANIA ASIGURARE REASIGURARE S.A.	2.781.419.881	20,1%	701.524.294	4,6%
EUROLIFE FFH ASIGURARI GENERALE S.A.	28.823.149	0,2%	41.156.556	0,3%

EXIM ROMANIA S.A.	62.215.065	0,4%	76.606.999	0,5%
GARANTA ASIGURARI S.A.	47.956.688	0,3%	49.549.975	0,3%
GENERALI ROMANIA ASIGURARE REASIGURARE S.A.	793.168.513	5,7%	1.302.312.278	8,6%
GERMAN ROMANIAN ASSURANCE S.A.	1.819.059	0,0%	1.625.789	0,0%
GRAWE ROMANIA ASIGURARE S.A.	485.097.667	3,5%	932.224.819	6,1%
GROUPAMA ASIGURARI S.A.	2.916.702.802	21,0%	4.024.814.464	26,5%
NN ASIGURARI S.A.	11.315.267	0,1%	19.203.320	0,1%
OMNIASIG VIG	2.119.615.437	15,3%	2.381.726.531	15,7%
ONIX ASIGURARI S.A.	136.967.404	1,0%	90.021.643	0,6%
POOL-UL DE ASIGURARE P.A.I.D.	177.966.857	1,3%	205.290.467	1,4%
SIGNAL IDUNA ASIGURARI S.A.	70.324.274	0,5%	93.141.920	0,6%
UNIQA ASIGURARI S.A.	382.193.316	2,8%	414.855.122	2,7%
TOTAL	**13.859.994.108**	**100,0%**	**15.200.643.338**	**100,0%**

Source: ASF, only companies authorised and regulated by ASF are included (without branches, FoE, and companies operating under the freedom to provide services, FoS)

Life insurance

The life insurance segment is dominated by traditional life insurance (class C1) and life insurance with an investment component (class C3), which together account for 88% of total gross written premiums for the life insurance business.

Figure 68 Evolution of concentration degree by class of life insurance according to gross written premiums

	2018	2019	2020	2021	2022	2023
C1	70.7%	62.8%	64.9%	63.6%	66.0%	56.5%
C2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
C3	24.0%	29.9%	26.9%	28.5%	23.6%	31.8%
A1	0.3%	0.2%	0.3%	0.2%	0.2%	0.4%
A2	5.0%	7.0%	8.0%	7.6%	10.2%	11.4%

Source: ASF, only companies authorised and regulated by ASF are included (without branches, FoE, and companies operating under the freedom to provide services, FoS)

The increase in the share of class C3 from 24% to 32% was the result of a 50% increase in the value of gross written premiums in this segment, while there was a slight reduction (-4%) in the volume of gross written premiums for class C1.

Table 26 Market shares of companies authorised and regulated by ASF for life insurance business

Company	2022		2023	
	GWP, RON	Market share	GWP, RON	Market share
ALLIANZ - TIRIAC ASIGURARI S.A.	274.708.980	10,4%	358.501.882	12,1%
ASIROM VIENNA INSURANCE GROUP S.A.	96.154.689	3,6%	96.440.037	3,3%
BCR ASIGURARI DE VIATA VIENNA INSURANCE GROUP S.A.	459.925.545	17,4%	478.636.130	16,1%
BRD ASIGURARI DE VIATA S.A.	232.148.052	8,8%	295.024.962	10,0%
EUROLIFE FFH ASIGURARI DE VIATA S.A.	14.670.094	0,6%	16.101.301	0,5%
GARANTA ASIGURARI S.A.	4.841.693	0,2%	5.921.533	0,2%
GENERALI ROMANIA ASIGURARE REASIGURARE S.A.	113.568.809	4,3%	124.289.526	4,2%
GRAWE ROMANIA ASIGURARE S.A.	51.278.195	1,9%	54.467.259	1,8%
GROUPAMA ASIGURARI S.A.	57.345.972	2,2%	62.313.929	2,1%
NN ASIGURARI DE VIATA SA	970.098.062	36,6%	1.019.391.746	34,4%
SIGNAL IDUNA ASIGURARE REASIGURARE S.A.	205.011.432	7,7%	274.042.129	9,2%
SIGNAL IDUNA ASIGURARI DE VIATA S.A. (FOSTA ERGO ASIGURARI DE VIATA S.A.)	13.266.064	0,5%	3.481.391	0,1%
UNIQA ASIGURARI DE VIATA SA	153.973.023	5,8%	177.020.607	6,0%
TOTAL	**2.646.990.610**	**100,0%**	**2.965.632.432**	**100,0%**

Source: ASF, only companies authorised and regulated by ASF are included (without branches, FoE, and companies operating under the freedom to provide services, FoS)

The largest volume of gross premiums was written by NN Life Insurance, which had a 34.4% market share in the life insurance segment, down 2.2 pp from 2022, followed by BCR Life Insurance with a 16.1% share (-1.3 pp from 2022).

Therefore, in terms of concentration by gross written premiums, the top three companies have a combined market share of 62.6% in the life insurance segment, slightly down from 64.4% in 2022.

5. Stability of the private pension market

The decline in the inflationary advance during 2023 has had a positive influence on financial markets, which have recovered some of the depreciation suffered previously. Going forward, the outlook for financial stability at the European level remains fragile, with adverse market dynamics potentially creating and propagating further shocks, accompanied by liquidity pressures. Private pension funds in Romania recorded significant increases in assets in 2023, with the system currently still in an accumulation phase and there being no pressure to sell as the level of payouts is very low. During 2023, payments of RON 919 million (0.73% of total assets at the end of December) were made in Pillar II and RON 113 million in Pillar III (2.38% of total assets). Liquidity risk is also at a low level, with 1.14% of the assets of the entire system held in current accounts and short-term deposits (approx. RON 1.5 billion). The investment policy within the private pension funds' portfolios continues to be focused on the local financial market (about 93% of assets with Romanian issuers), mainly oriented in fixed income instruments (73%), and equities (23%).

Market risk is generally managed by managers through diversification, but also by monitoring the price volatility of the main financial instruments while actively managing short-term portfolios. We assess that market risk remains at a medium to high level due to expectations of persistently high interest and inflation rates in a context of continued global uncertainties, amplified by the intensification of geopolitical pressures following the outbreak of a new armed conflict in the Middle East. In a long term, the real economy may be negatively affected, with financial markets eventually reflecting the vulnerabilities created and naturally adjusting their risk premia associated with expectations of returns.

Credit risk remains low due to the high-quality requirements of the issuers of fixed income instruments held by the funds, the vast majority of which are government and corporate bonds.

For structural reasons of the private pension fund market in Romania, a high degree of concentration is maintained, with the top three privately managed pension funds accounting for 69% of Pillar II assets, while the top three voluntary funds accounted for 72% of Pillar III assets. The custodial services market also shows a high degree of concentration, with BRD GSG holding more than 82% of private pension fund assets in custody.

Operational risk is at a low level, with pension fund managers continuously monitoring/evaluating operational processes to mitigate this risk. So far, no cyber attacks on the pension fund industry have been reported.

5.1. The private pension market in the European context

According to the OECD report, Pensions at a Glance 2023, published in December 2023, substantial retirement assets have been built up globally. Pension plan assets stood at 87% of all OECD countries' GDP at the end of 2022, less than the 100% recorded two years ago. Almost two-thirds of OECD countries have also established public pension reserves to support the operation of public pension systems as payments are made. For these countries, assets in public pension reserve funds[31] represented 12% of GDP at the end of 2022, down from 14% two years ago.

Pension plan assets in the OECD area would amount to USD 51.5 trillion at the end of 2022. The United States was the largest private pension market in the OECD area, with assets worth USD 35 trillion, representing 67.9% of the OECD total. Other OECD countries with significant pension systems are Canada, with USD 3.1 trillion in assets and a 6.1% share of the OECD pension market in 2022; the UK, USD 2.6 trillion and a 5% share; Australia, USD 2.1 trillion and a 4.1% share; the Netherlands, USD 1.5 trillion and a 3% share; Switzerland, USD 1.3 trillion and a 2.5% share; and Japan, USD 1.3 trillion and a 2.5% share.

In seven OECD countries, assets exceeded the size of GDP: Denmark (192.3%), Iceland (186.1%), Canada (152.8%), Switzerland (152.4%), the Netherlands (150.7%), the United States (137.5%) and Australia (131.4%). These countries have long-standing pension plans and, with the exception of Canada and the United States, have mandatory or quasi-mandatory private pension schemes. In contrast, the assets-to-GDP ratio was below 20% in 18 OECD countries, including some with relatively recent mandatory or automatic enrolment schemes (such as Latvia, Lithuania and Poland) or with relatively low participation of the working age population (such as France, Greece, and Italy). Greece had the lowest assets-to-GDP ratio among OECD countries (below 1%).

In non-OECD G20 economies, the size of pension plan assets also varied widely, from 78.2% in South Africa to 1.7% of GDP in Indonesia (for employer pension funds and financial institution pension funds).

Table 27 Evolution of private pension penetration in 2022 (total assets of retirement savings instruments % GDP)

	Assets % GDP 2012	Assets % GDP 2022
Denmark	190.0	192.3
Iceland	139.1	186.1
USA	122.7	137.5
Sweden	65.6	97.9
Croatia	15.9	28.2
Kosovo	15.0	27.1
Latvia	7.6	16.3
Estonia	9.8	13.0
Slovakia	9.3	13.7
North Macedonia	4.6	14.6
Bulgaria	6.9	11.7
Spain	13.3	11.8
Italy	6.6	11.3
France	8.2	10.9

[31] (PPRFs-public pension reserve funds)

Lithuania	4.3	8.7
Czech Republic	6.7	8.8
Slovenia	6.3	7.0
Romania	1.6	7.1
Hungary	3.8	4.2
Serbia	0.4	0.7
Albania	0.0	0.3

Source: OECD - Pension Markets in Focus preliminary 2022 date, December 2023 edition

At the European level, the private pension fund markets are structurally different from the Romanian market. Most products are voluntary, and occupational pension funds predominate in many countries. In this context, the much larger aggregate portfolios of European pension funds are invested in a mix of financial assets, mainly bonds and equities.

The investment structure of portfolios influences the returns earned by investment vehicles. Thus, a large portfolio allocation to risky assets implies higher potential returns but also higher volatility in returns. Assets in pension plans and public pension reserve funds are mainly invested in bonds and equities. The proportions of stocks and bonds in portfolios vary considerably across countries, but there is generally a greater preference for bonds.

In most countries, bonds and equities were the two main asset classes in which pension plan assets were invested at the end of 2022, accounting for more than half of investments in 32 of the 38 OECD countries and three non-OECD G20 jurisdictions. The combined proportion of bonds and equities was highest (relative to portfolio size) in Chile (97.7%), Mexico (96.2%), and Poland (95.2%). Pension plan assets may have been invested in these instruments either directly or indirectly through collective investment undertakings (CIUs).

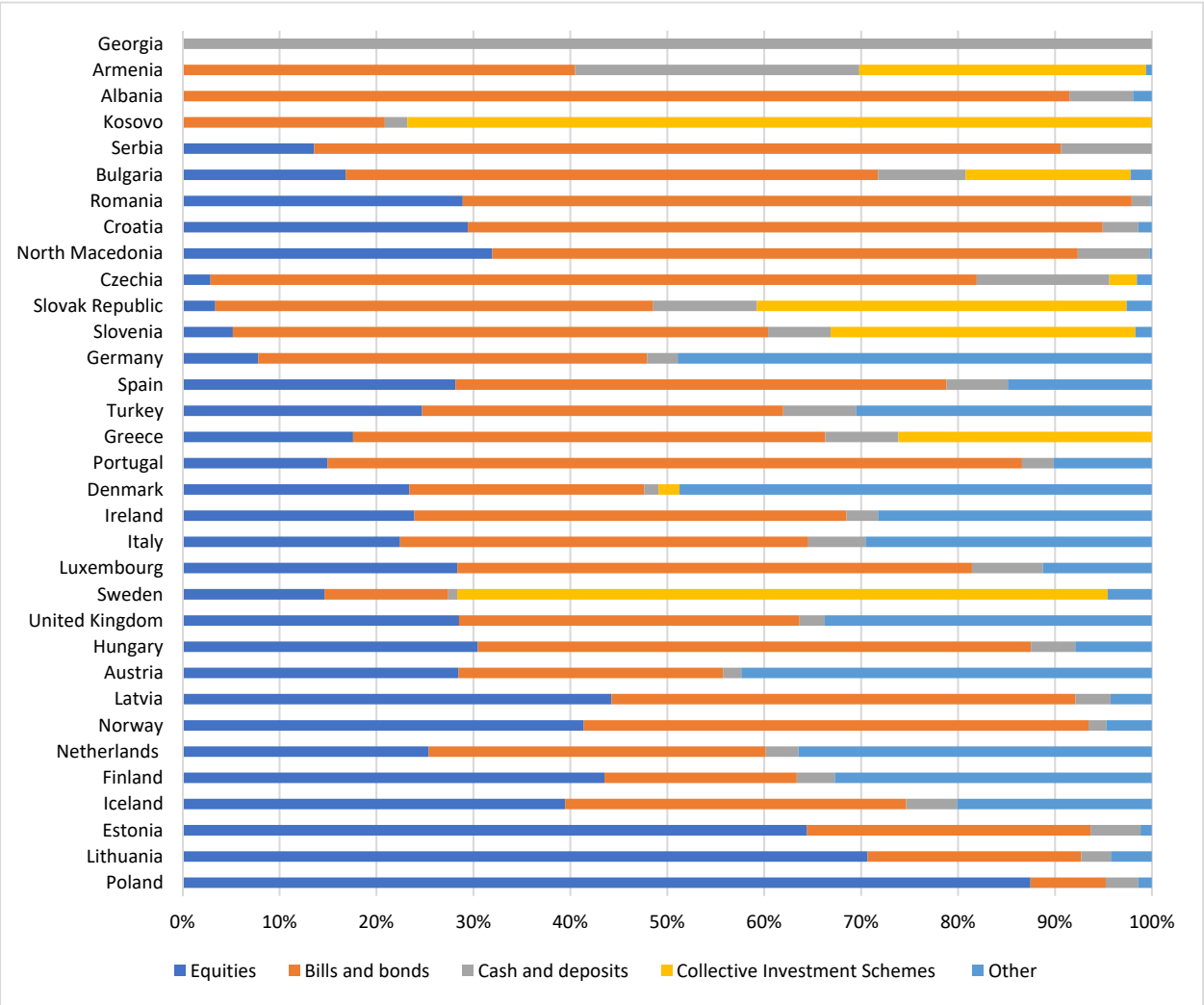
Investment regulations in some countries may also require pension providers to invest a certain proportion of their assets in specific financial instruments. Pension funds invested even more than 50% of their assets in equities in three reporting jurisdictions: Poland (91%), where open pension funds (OFEs) are not allowed to invest in government bonds, Lithuania (74.6%), and Estonia (59.1%) among OECD countries.

Bank deposits and current accounts also accounted for a significant share of pension plan assets in some OECD countries and in Indonesia at the end of 2022. For example, the proportion of cash and deposits was 26.9% of pension plan assets in Indonesia, 20.4% in Korea, 13.7% in the Czech Republic, 11.7% in Australia, and 10.7% in Slovakia[32] .

In most reporting countries, less liquid investments such as loans, real estate (land and buildings), or private equity funds (shown as "other financial instruments" in the chart) represented only relatively small shares of pension plan asset investments at the end of 2022, although there were some exceptions. Real estate assets were a significant component of pension providers' portfolios (directly or indirectly through mutual funds) in countries such as Canada (12.4% of total assets) and Switzerland (23.6%).

[32] Pension funds in Slovakia needed liquidity and increased their cash holdings by 8 percentage points in 2022 to make the transfer of assets from bond funds to the new default life-cycle pension funds in 2023.

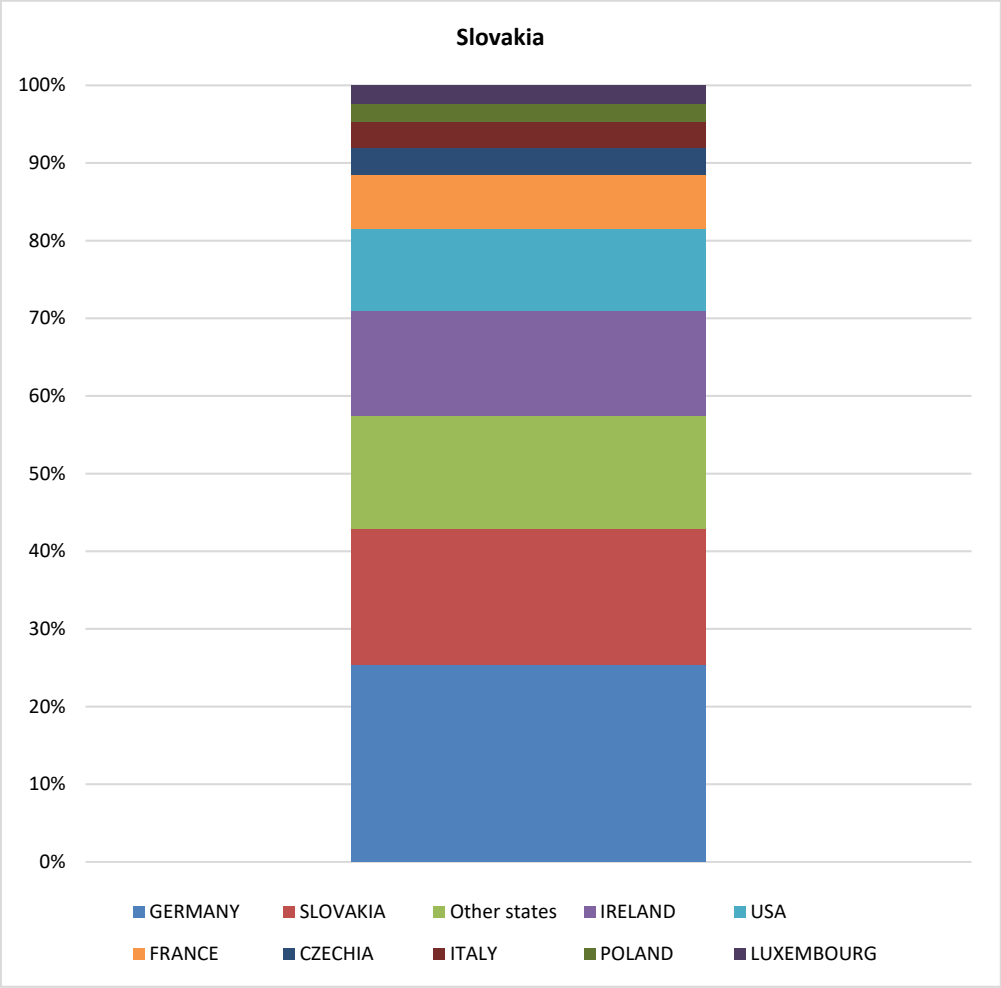
Figure 69 Investment structure of retirement savings in European countries in 2022 or in the last available year (%)



Source: OECD (2023), Pension Markets in Focus 2023 and Pensions at a Glance 2023

Regarding the country exposure of pension fund assets, according to data published by EIOPA, in the third quarter of 2023, Germany had a share of around 74% in German assets, 12% in Luxembourg assets, and 14% in other countries. Spain held about 24% in Luxembourg assets, 17% in US assets and 59% in other countries. Slovakia had a share of 25% in German assets, 18% in Slovak assets and 57% in other countries. Romania had a 93% share in Romanian assets, 1% in US assets, and 5% in other countries.

Figure 70 Country exposure of pension fund assets at 30 September 2023

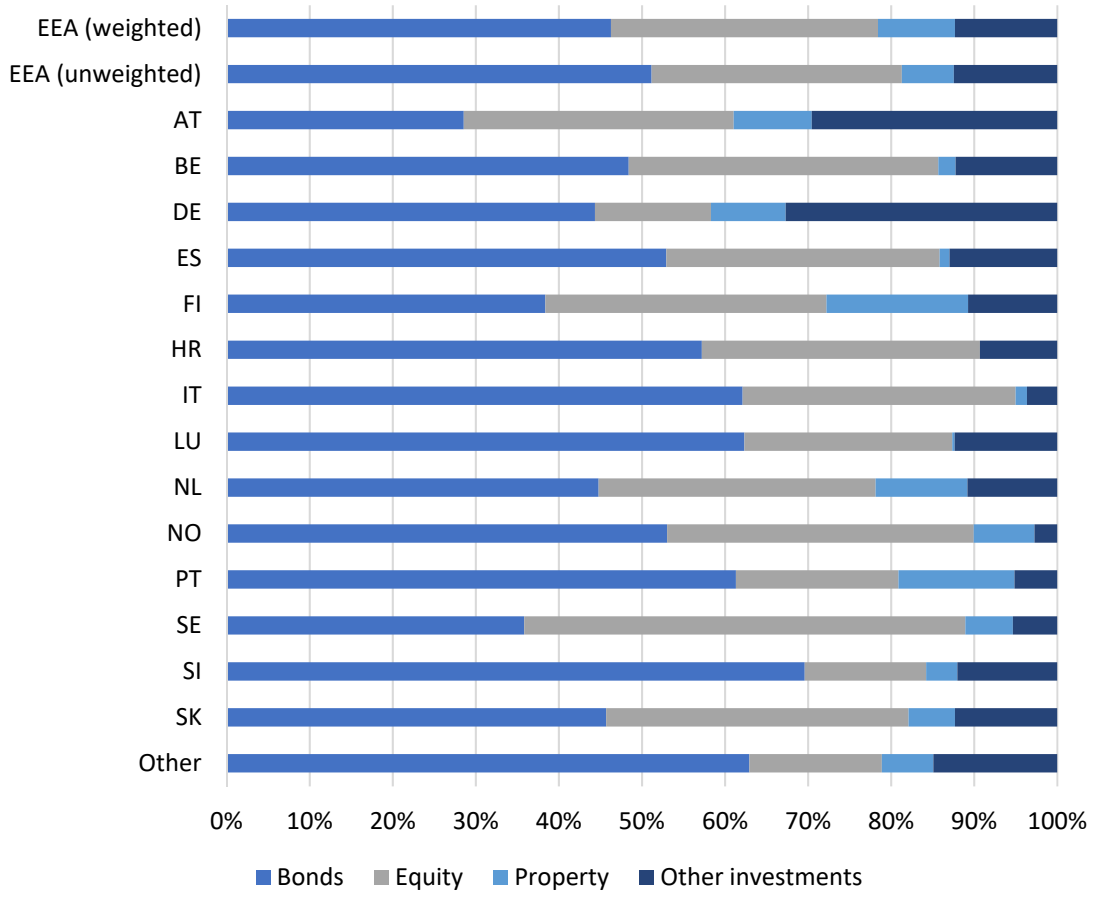


Source: EIOPA, Occupational Pensions Statistics, Asset Exposures Q3 2023

Portfolio performance remains a key concern for IORP, as investment returns could be adversely affected by a potential deterioration in economic and financial market conditions. In the case of defined benefit pension plans, this may require additional support from the employer sponsoring the pension plan, while for beneficiaries of defined contribution plans, this translates into lower pension payments. The potential impact depends on the particularities of IORPs in Member States and their asset allocation.

The macroeconomic situation can also create risks for investment portfolios. A downturn in economic activity and aggregate demand could have a negative impact on non-financial corporations, which could lead to a credit rating downgrade or insolvencies and could have a serious impact on the investment portfolios of occupational pension institutions.

Figure 71 Investment structure of occupational pension funds in European countries in Q2 2023 (%)



Source: EIOPA Financial Stability Report - December 2023, EIOPA IORP Statistics.

Note: The category "bonds" includes government bonds, corporate bonds, mortgages and loans, debt funds and money market funds. The category 'shares' includes direct shares, equity funds and private equity funds. The category 'Land and buildings' consists of direct real estate, real estate funds and infrastructure funds, and 'other investments' consists of other direct investments, asset allocation funds, hedge funds and other funds. EEA (w) is the weighted average for the European Economic Area. EEA (un-w) is the unweighted average for the European Economic Area.

In the second quarter of 2023, occupational pension funds in European countries invested mostly in bonds, equities, and the "other investments" category. Among the countries analysed, Slovenia had the most significant percentage of its investment portfolio in bonds (70%), while Austria was at the opposite end of the spectrum with 29%.

According to EIOPA assessments[33], the main risks for pension funds at European level are related to climate change, and climate change is a key priority. Cyberattacks are also on the rise and concerns about possible hybrid geopolitical conflict remain. The surveillance assessment of digitalisation and cyber risks has increased in the first half of 2023.

[33] February 2024 IORP Risk Dashboard

The Risk Table published by EIOPA shows that IORP's exposure to market and asset return risks is currently at a high level, making this risk category the most relevant for the sector, given the still high volatility of the bond markets. Macroeconomic risks are at a medium level; there are positive developments related to a reduction in projected inflation, partly offset by a GDP growth outlook that remains weak by historical standards. Liquidity risks are also at a medium level, but show an upward trend compared to the previous quarter, driven by developments in derivative positions. All other risk categories are currently assessed at a medium level, with increases expected for credit risks as well as digitalisation and cyber risks in the following 12 months.

5.2. Systemically relevant entities

Total accumulated assets for Pillar II and III exceeded RON 131 billion at the end of December 2023; in relation to GDP, the total accumulated assets of the Romanian private pension system represented about 8.48% of annual GDP (calculated as the sum of the last 4 quarters).

Table 28 Size of the Romanian private pension sector (total assets relative to GDP)

	2015	2016	2017	2018	2019	2020	2021	2022	2023
Private pension funds	3,64%	4,39%	4,88%	5,17%	6,06%	7,32%	7,79%	7,10%	8,48%
GDP calculated as the sum of the last 4 quarters (Q3 2022 - Q2 2023)									

Source: NSI, ASF calculations

The main indicator for assessing the size of private pension funds is the value of total assets.

Table 29 Systemic size of private pension funds

Tip fond	Fund	Total assets (million RON) 31 dec. 2023	% in GDP as at 31 Dec. 2023
P2	**FPAP NN**	**43,148**	**2.78%**
P2	**FPAP AZT VIITORUL TAU**	**26,655**	**1.72%**
P2	**FPAP METROPOLITAN LIFE**	**17,937**	**1.16%**
P2	FPAP VITAL	12,914	0.83%
P2	FPAP ARIPI	11,603	0.75%
P2	FPAP BCR	9,032	0.58%
P2	FPAP BRD	5,445	0.35%
P3	FPF NN OPTIM	2,083	0.13%
P3	FPF BCR PLUS	752	0.05%
P3	FPF NN ACTIV	587	0.04%
P3	FPF AZT MODERATO	462	0.03%
P3	FPF BRD MEDIO	232	0.01%
P3	FPF PENSIA MEA	218	0.01%
P3	FPF RAIFFEISEN ACUMULARE	194	0.01%
P3	FPF AZT VIVACE	160	0.01%
P3	FPF STABIL	45	0.00%
P3	FPF AEGON ESENTIAL	15	0.00%
P2	**Total Pilon II**	**126,735**	**8.17%**
P3	**Total Pilon III**	**4,747**	**0.31%**
P2+P3	**Grand Total**	**131,483**	**8.48%**

Source: ASF calculations

Three Pillar II private pension funds have total assets above 1% of GDP, of which only one pension fund is above the 2% threshold, i.e., the fund managed by NN Pensii Societate de Administrare a unui fond de pensii administrat privat SA. It can be considered systemically relevant in terms of the size criterion.

Due to the long-term institutional investor nature of pension funds and the accumulation phase they are currently in, it is unlikely at this stage that they will cause liquidity and price shocks to financial markets through forced asset sales generated by a high flow of personal asset payments.

For the Romanian private pension system, the risks to the stability and smooth functioning of pension funds remain at low levels, given the implementation and functioning of the defined contribution type with absolute and relative guarantees. In addition, one of the important mechanisms to protect the rights of participants, which contributes to the stability of the private pension system, is the separation of the assets of the administrators from the assets of the private pension funds.

5.3. Recent developments in the Romanian private pension market

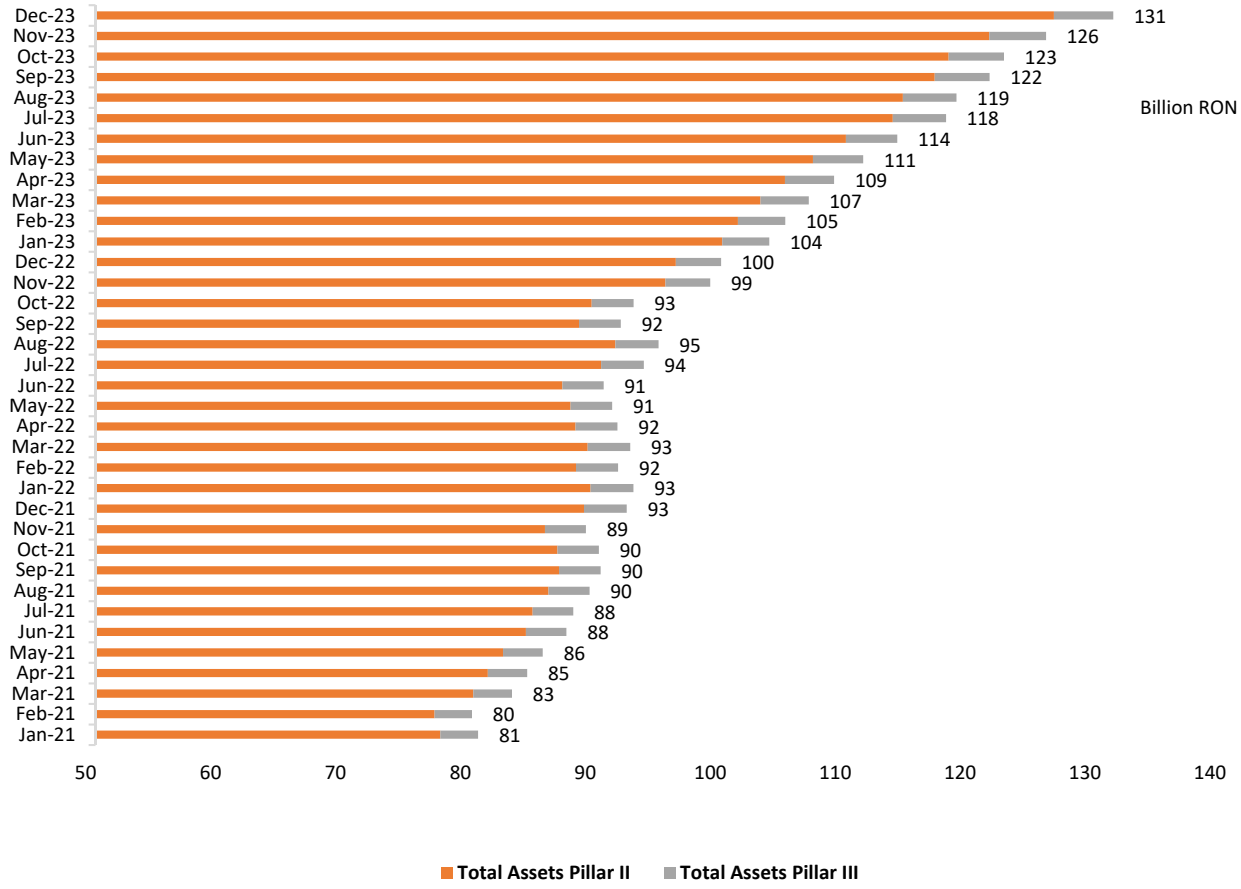
The private pension system in Romania is a stable source of domestic capital, which, through its investments, contributes to the financing of the Romanian state and the private sector, while playing a stabilizing role on the financial markets, thanks to its long-term investment horizon. The fundamental objective of private pension funds is to invest prudently in quality assets in order to provide additional income for their participants after retirement age.

In 2020, the fourth pension pillar, the occupational pension scheme, was established. At the beginning of 2020, the Parliament adopted Law No. 1/2020 on occupational pensions, which transposes the provisions of EU Directive 2341/2016 on the activities and supervision of institutions for occupational retirement provision (IORP II). The objective of this new system is to provide a supplementary pension component, financed mainly by employers and subsidiarily by employees. In 2022, the first occupational pension fund administrator was authorised, namely BCR PENSII, Societate de Administrare a Fondurilor de Pensii Private SA. There are currently no occupational pension funds established.

The total assets under management of the entire private pension system reached RON 131.5 billion (EUR 26.4 billion) at the end of December 2023, with 8.86 million participants.

As of December 31 2023, the investment policy within the asset portfolios of private pension funds continues to be focused on the local capital market. The share of investments in fixed-income instruments accounted for about 73% of the total investment portfolio of private pension funds, while 23% was invested in equities.

Figure 72 Value of total private pension scheme assets



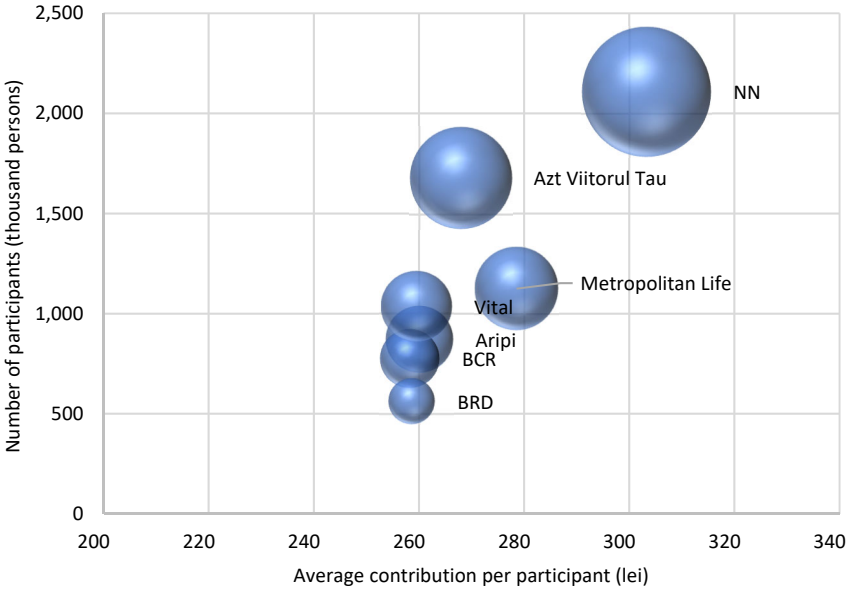
Source: ASF processing

Pillar II fund assets represent more than 96% of total private pension assets in Romania, while the size of Pillar III remains small.

During 2023, gross contributions to privately managed pension funds amounted to RON 12.82 billion, 17% more than the previous year. Gross contributions of RON 601 million were paid into Pillar III, an increase of 20% compared to 2022.

At the level of privately managed pension funds, the average contribution of participants in December 2023 was about RON 276, an increase of 17% compared to the same date last year. The privately managed pension fund with the highest average contribution per participant but also with the most participants enrolled was FPAP NN, with a market share of about 34% (calculated by net assets).

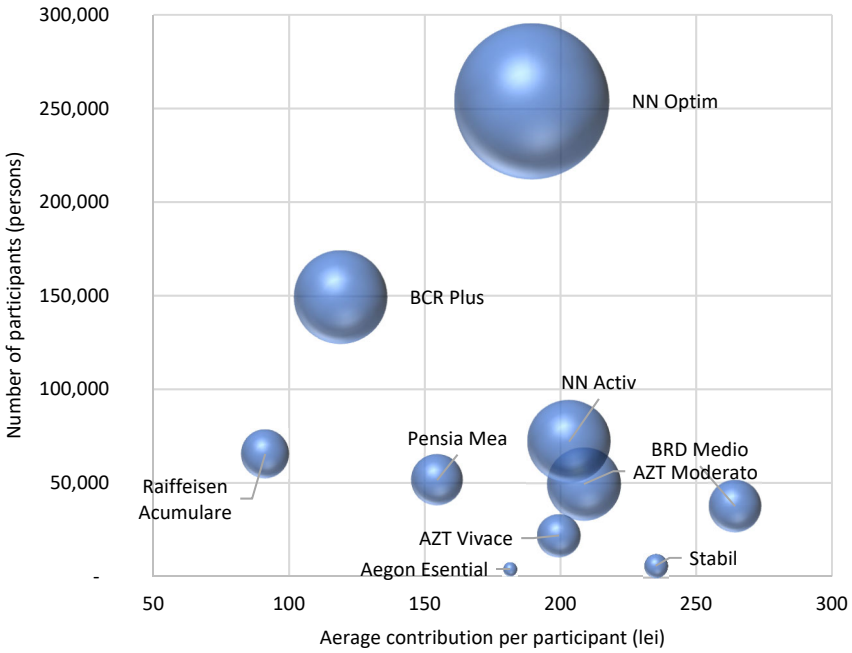
Figure 73 Distribution of privately managed pension funds by average contribution per participant, total number of participants and market share as at 31 December 2023



Source: ASF processing

As for voluntary pension funds, the average contribution per participant in December 2023 was about RON 168, down by 0.7% compared to the same period in 2022. The voluntary pension fund with the largest number of participants is FPF NN Optim, also recording the highest market share by net assets (44%).

Figure 74 Distribution of voluntary pension funds by average contribution per participant, total number of particioants and market share as at 31 December 2023



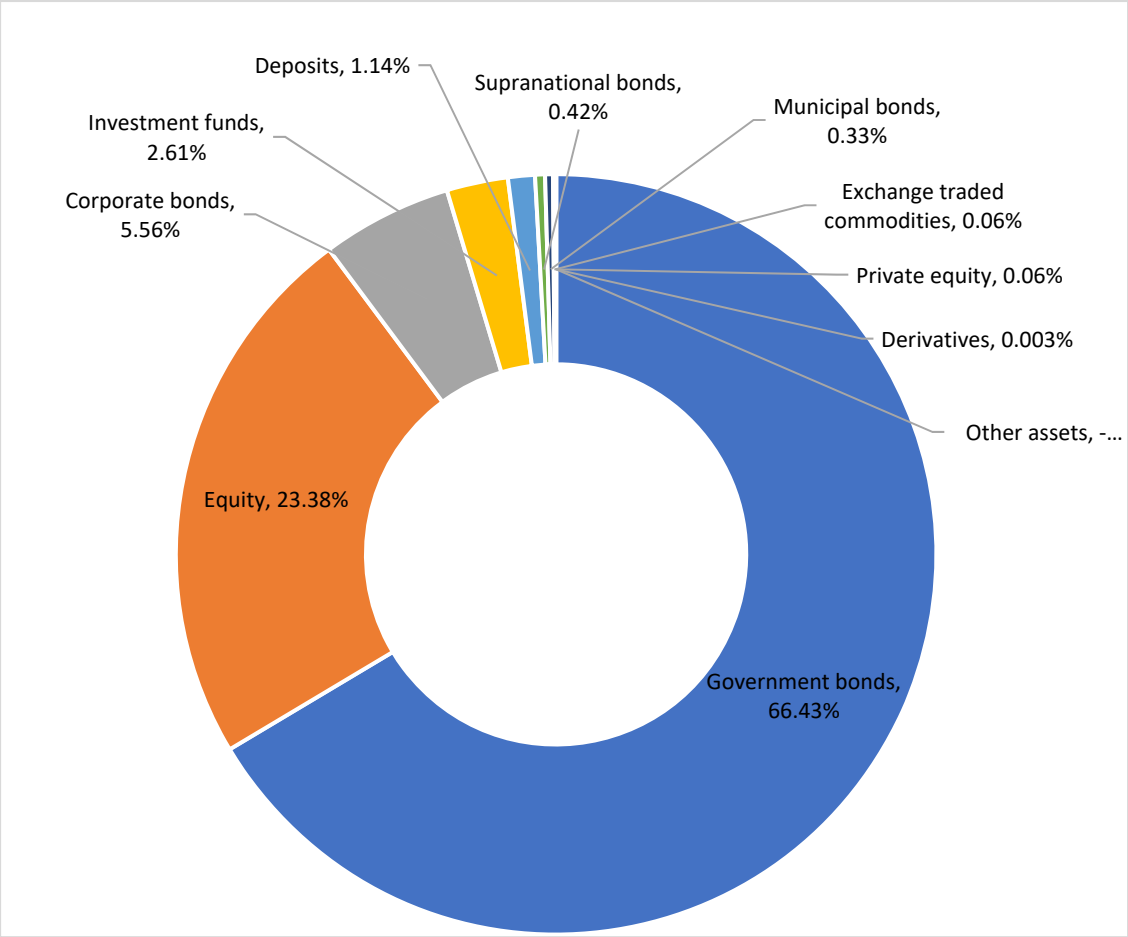
Source: ASF processing

Private pension funds have a moderate risk profile, and the low-risk assets they invest in are predominantly government bonds. Thus, private pension fund investments are predominantly in sovereign bonds, followed by listed companies that are transparent and comply with corporate governance, thus stimulating the development of the primary and secondary markets.

The investment policy aims to diversify the portfolios of private pension funds, reducing market risk in periods of vulnerability in the financial markets, i.e., falls in asset prices. Pension funds invest in a mix of equities, corporate bonds, municipal bonds, supranational bonds, government bonds, UCITS units, and bank deposits. At the same time, the private pension scheme has historically complied with the legal requirements of prudential and portfolio security for the benefit of participants to ensure the quality, liquidity, and profitability of assets.

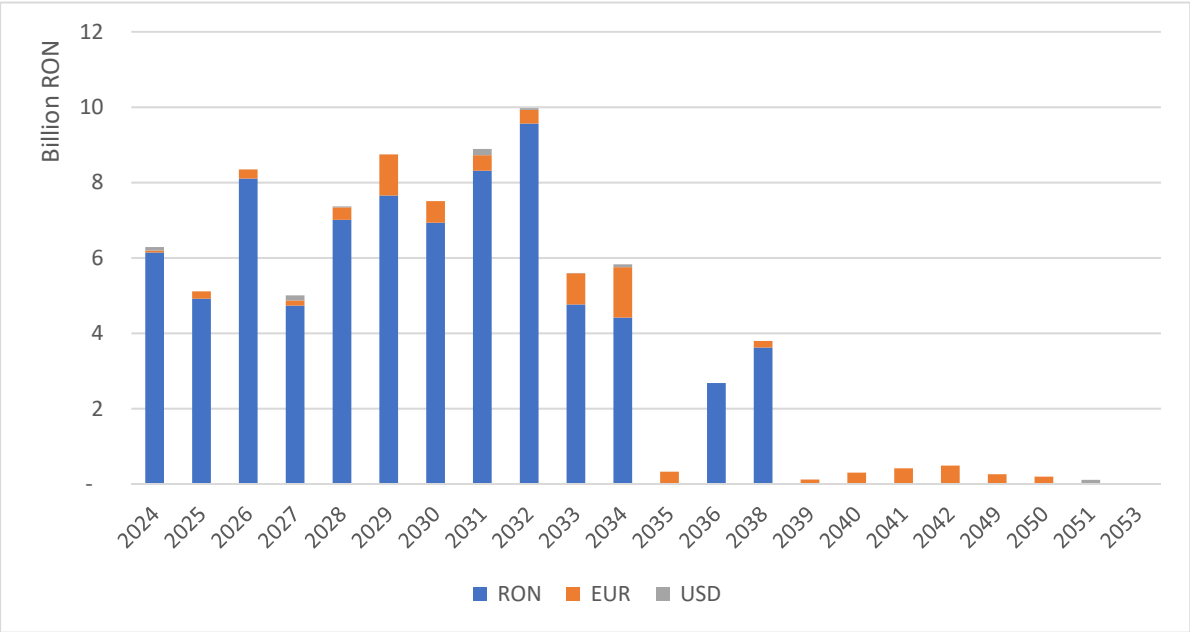
The largest share of private pension funds' portfolios has always been held by fixed-income financial instruments (mainly government bonds, followed by corporate bonds, As of December 31 2023, the share of fixed-income instruments was about 73% of private pension funds' portfolios, and 66.4% of assets were invested in securities issued by the Romanian state. Since the establishment of the private pension funds, their investments have been mainly in Romanian issuers, and at the end of December 2023, 93.1% of the pension funds' investments were made locally. The majority of Romanian instruments are represented by government bonds, shares listed on the Bucharest Stock Exchange, corporate bonds, investment funds, and bank deposits.

Figure 75 Asset structure of private pension funds (Pillar II and Pillar III) at 31 December 2023



Source: ASF processing

Figure 76 Maturity year of government bonds held in private pension fund portfolios as at 31 December 2023



Source: ASF processing

The government bonds in the portfolios of private pension funds are issued by the Romanian state and are denominated in RON (90.3%), EUR (9.0%), and USD (0.8%). In terms of investment horizon, most of them are held for the medium term, maturing up to 2034 (about 90% of all government bonds), with the rest being long-term issues, maturing up to 2053.

Table 30 Main equity investments of private pension funds (P II + P III) at 31 December 2023

Name of issuer	Value of holdings (RON)	% of total portfolio of listed shares
Hidroelectrica SA	5.893.709.568	19,2%
Banca Transilvania SA	5.302.450.728	17,3%
OMV Petrom SA	5.092.103.079	16,6%
Romgaz SA	3.346.046.686	10,9%
BRD - Groupe Societe Generale SA	2.283.741.000	7,4%
Nuclearelectrica SA	1.384.515.908	4,5%
Electrica SA	919.037.565	3,0%
Med Life SA	833.075.849	2,7%

Transgaz SA	764.45 1.248	2,5%
Digi Communicatio ns NV	629.83 6.548	2,0%
Alți emitenți	4.287.0 57.133	13,9%
Total	**30.736. 025.31 2**	**100,0%**

Source: ASF processing

Private pension funds are significant institutional investors in the capital market, investing in issuers that comply with corporate governance and transparency requirements. As of December 31 2023, the private pension system in Romania had 23.38% invested in equities, and 86% of this percentage is represented by 10 companies, which are among the most traded companies in the main segment of the BVB.

Table 31 Investments in corporate bonds of private pension funds (P II + P III) as at 31 December 2023

Name of issuer	Issuer name	Value of holdings	% total corporate bond portfolio
Banca Comerciala Romana	RO	2.093.888.550	28,7%
Raiffeisen Bank SA	RO	1.104.576.378	15,1%
Banco Santander SA	ES	947.554.312	13,0%
Citigroup Global Markets Holdings Inc	US	511.428.757	7,0%
BNP Paribas	FR	457.976.419	6,3%
Citigroup Inc	US	437.736.977	6,0%
The Goldman Sachs Group INC	US	316.291.338	4,3%
Banca Transilvania SA	RO	231.438.231	3,2%
Unicredit Bank SA	RO	230.083.245	3,1%
CEC Bank SA	RO	158.990.294	2,2%
Alți emitenți		815.933.074	11,2%
Total		**7.305.897.575**	**100,0%**

Source: ASF processing

Pension fund investments in corporate bonds accounted for 5.56% of total private pension scheme assets. Thus, private pension funds invested in corporate bonds issued both in Romania and abroad, mostly by financial or banking groups. A large proportion of corporate bonds were issued in Romania (52.7%), the US (18.8%), and Spain (13.0%).

Table 32 Investments in undertakings for collective investment in transferable securities of private pension funds (P II + P III) as at 31 December 2023

UCITS Name / Manager	UCITS country	Value of holdings	% Total UCITS portofolio
Xtrackers Euro Stoxx 50 UCITS ETF 1C / Xtrackers	LU	1.395.460.154	40,7%
iShares Europe ex - UK Index Fund (IE) / BlackRock Inc	IE	642.006.579	18,7%
iShares S&P 500 Information Technology Sector UCITS ETF USD (Acc) / BlackRock Inc	IE	364.422.071	10,6%
BT Obligatiuni / BT Asset Management	RO	165.350.332	4,8%

iShares US Index Fund (IE) - USD Acc / BlackRock Inc	IE	148.870.124	4,3%
Xtrackers Artificial Intelligence & Big Data UCITS ETF 1C / Xtrackers (IE) PLC	IE	96.932.723	2,8%
GuardCap Global Equity Fund / GuardCap Asset Management Limited	GB	79.287.584	2,3%
BT Maxim / BT Asset Management	RO	79.270.829	2,3%
iShares Emerging Markets Index Fund (IE) - EUR Flex Acc / BlackRock Inc	IE	66.712.869	1,9%
Erste Equity Romania / Erste Asset Management	RO	59.316.610	1,7%
Alți emitenți		331.989.958	9,7%
Total		**3.429.619.833**	**100,0%**

Source: ASF processing

Pension fund investments in undertakings for collective investment in transferable securities accounted for 2.61% of total private pension scheme assets. Private pension funds invested in UCITS issued mainly in Luxembourg (46.9%), Ireland (38.5%), and Romania (11.9%), with the remaining 2.8% issued in the UK and Germany. Investments in funds and precious metals amounted to approximately RON 83 million (0.06% of total assets) and were backed by gold.

Table 33 Investments in bank deposits of private pension funds (P II + P III) as at 31 December 2023

Bank name	Value (RON)	% of total deposits and current accounts
ING Bank Romania	829.407.551	55,1%
Banca Comerciala Romana	332.158.574	22,1%
BRD - Groupe Societe Generale SA	205.517.874	13,7%
Exim Banca Romaneasca SA	110.938.989	7,4%
Raiffeisen Bank SA	19.311.693	1,3%
Citibank Romania	5.613.437	0,4%
Unicredit Bank SA	1.116.294	0,1%
Garanti Bank SA	7.750	0,0%
Intesa SanPaolo	5.255	0,0%
Banca Transilvania SA	4.065	0,0%
Other issuers	1.603	0,0%
Total	**1.504.083.085**	**100,0%**

Source: ASF processing

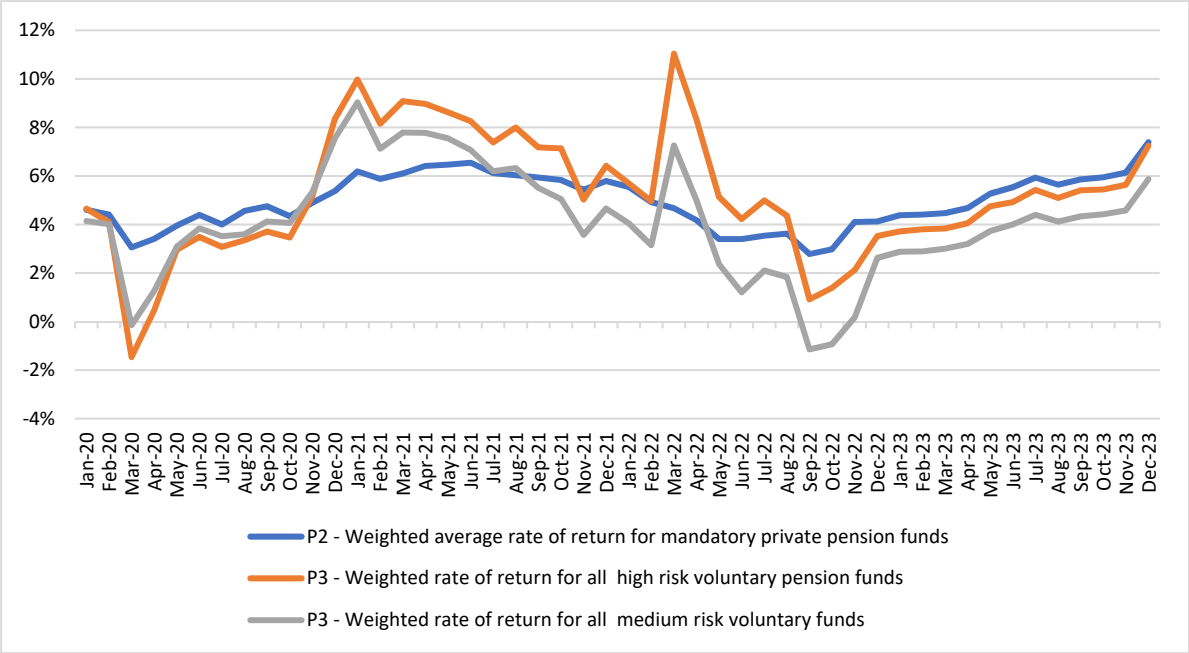
Investments in bank deposits and current accounts of private pension funds accounted for 1.14% of total assets (down from 4% at the end of the previous year) and were made exclusively with Romanian banks. Of these, 91.9% were deposits in RON, 5.2% in EUR, and the remaining 2.9% in other currencies. Deposits with ING Bank Romania, Banca Comercială Română, and BRD-GSG accounted for 90.9% of deposits.

Private equity investments by private pension funds amounted to approximately RON 83 million (0.06% of total assets) and were made through private equity shares (RON 17.7 million) and private equity funds (RON 65.5 million) in Luxembourg issuers.

Fund unit returns

As of December 31 2023, the weighted average rate of return of all privately managed pension funds (Pillar II) was 7.3922%, and for voluntary pension funds (Pillar III), the weighted average rate of return of all voluntary high-risk pension funds was 7.2436%, while the weighted average rate of return of all voluntary medium-risk pension funds was 5.8650%.

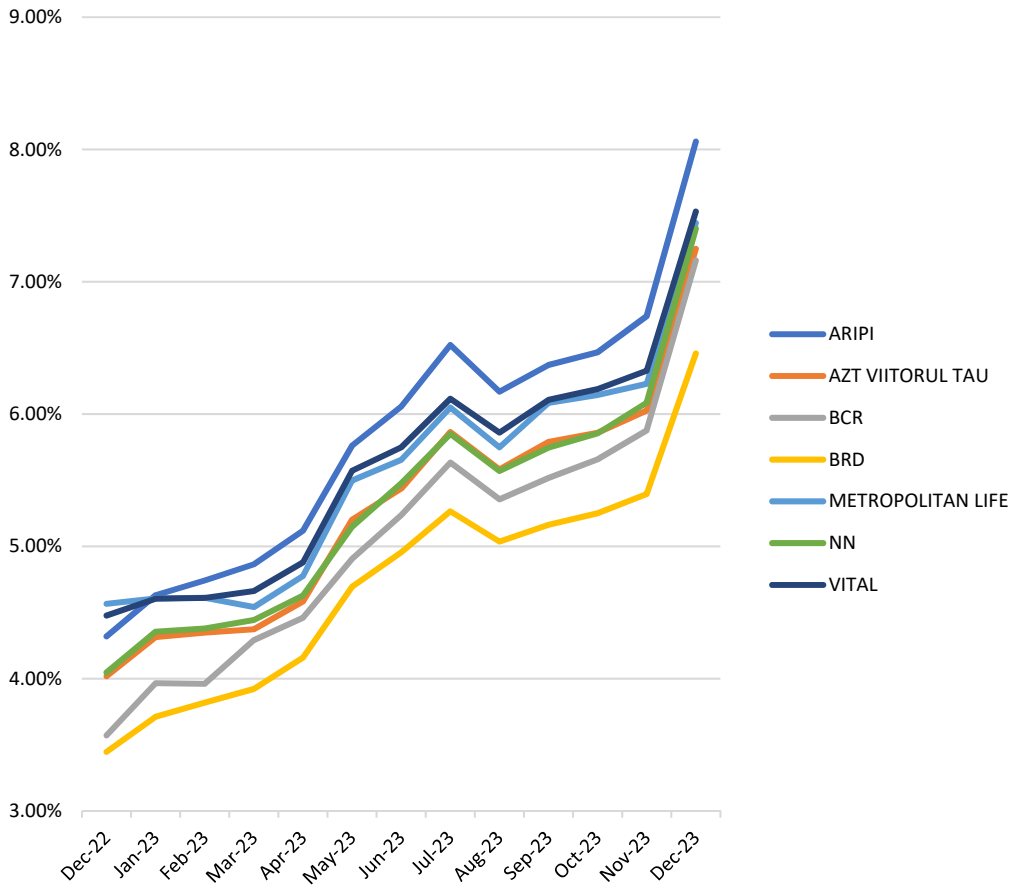
Figure 77 Evolution of average rates of return of private pension funds



Source: ASF processing

The rate of return of a privately managed pension fund over a period is the difference between the value of the fund unit on the last business day of the period and the value of the fund unit on the last business day preceding that period, all in relation to the value of the fund unit on the last business day preceding that period. The annualised rate of return of a privately managed pension fund shall be measured for the period of the last 60 months preceding the calculation.

Figure 78 Evolution of annualised rates of return of privately managed pension funds



Source: ASF processing

All privately managed pension funds saw increases in annualised rates of return at the end of 2023 compared to the same period last year.

In the long term, over the entire period of operation of private pension funds, their annualised return[34] has remained high.

Table 34 Annualized return of NAV in Pillar II from inception to end of December 2023 (calculated as of 21.05.2008)

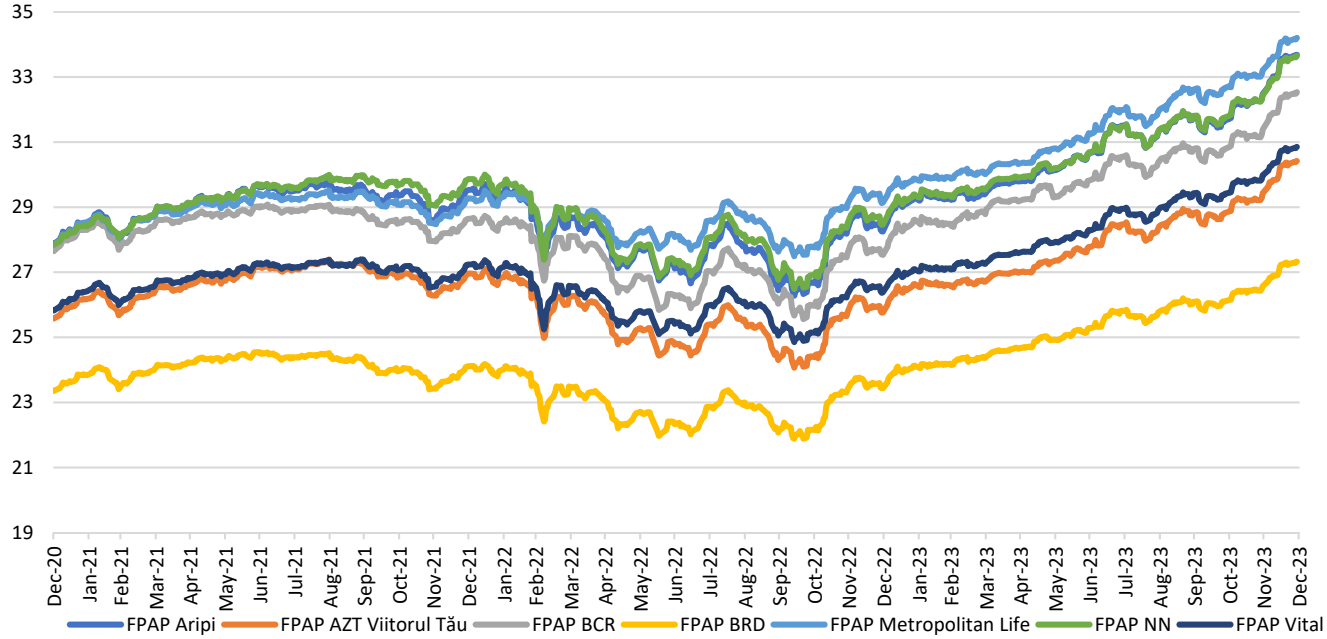
FPAP Aripi	FPAP AZT Viitorul Tău	FPAP BCR	FPAP BRD	FPAP Metropolitan Life	FPAP NN	FPAP Vital
8,09%	**7,38%**	**7,85%**	**6,65%**	**8,19%**	**8,08%**	**7,48%**

Source: ASF processing

[34] Annualised return is the average annual return calculated over the long term from the inception of the private pension scheme to the present day

The net asset value of the fund (NAV) is the ratio of the net asset value of the pension fund on a given date to the total number of units in the fund on the same date.

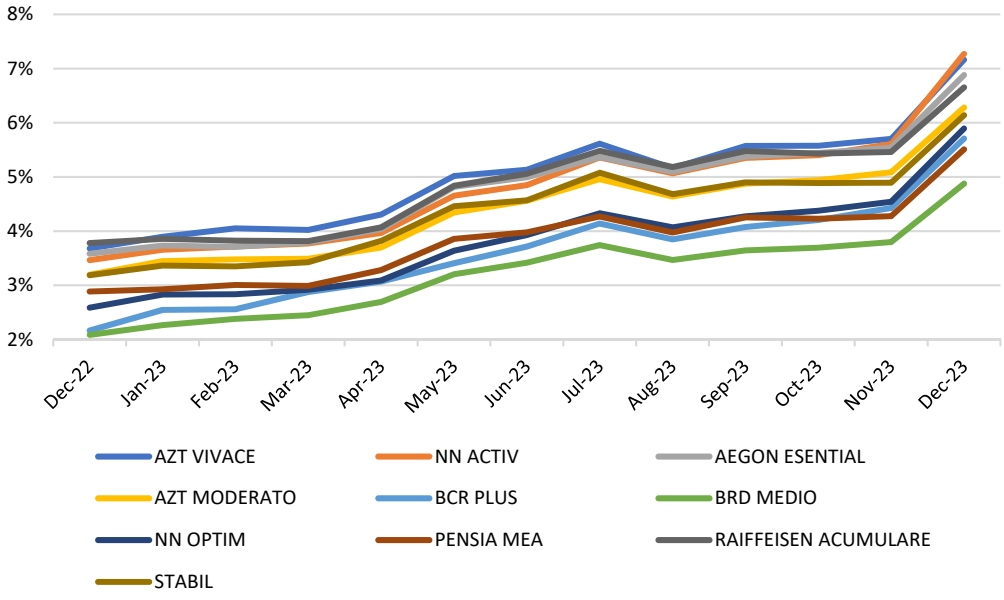
Figure 79 Evolution of the Net Assets Value of Pillar II Pension Funds (RON)



Source: ASF processing

The rate of return of voluntary pension funds is the annualised rate of the product of daily returns, measured over a 60-month period.

Figure 80 Evolution of annualised rates of return of voluntary pension funds



Source: ASF processing

Similar to the results observed in Pillar II, all voluntary pension funds recorded increases in annualised rates of return at the end of December 2023 compared to the same period of the previous year.

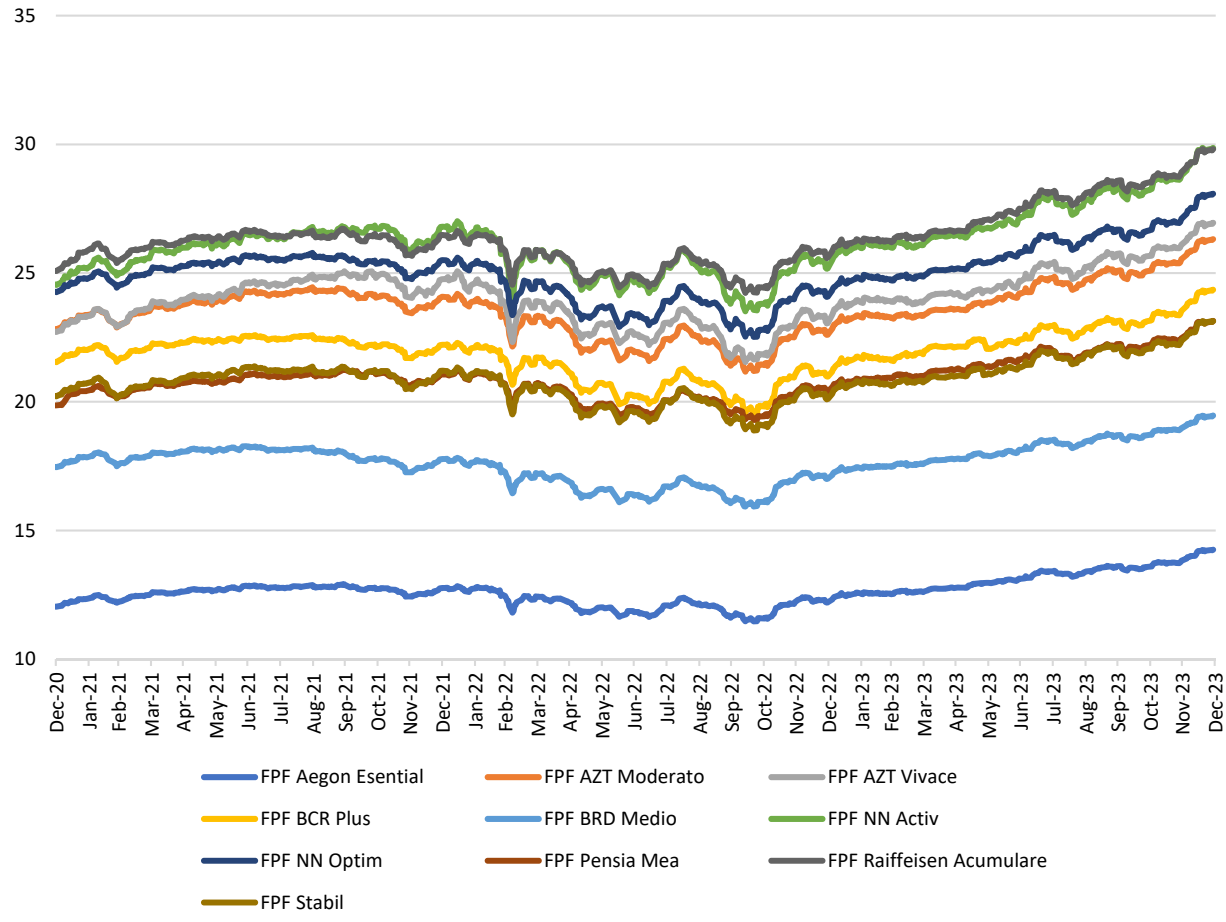
Table 35 Annualised return of NAV in Pillar III from inception to end December 2023 (calculated according to the inception date of each voluntary pension fund)

FPF Aegon Esential	FPF AZT Moderato	FPF AZT Vivace	FPF BCR Plus	FPF BRD Medio	FPF NN Activ	FPF NN Optim	FPF Pensia Mea	FPF Raiffeisen Acumulare	FPF Stabil
4,40%	6,02%	6,22%	5,52%	4,70%	6,82%	6,52%	5,19%	7,34%	5,87%

Source: ASF processing

Due to the similar investment structure, the evolution of the returns of the fund units of the Pillar III voluntary pension funds follows the same trend as for the Pillar II funds, except that some funds were launched more recently and therefore their long-term performance history is different. In the short term, however, the trend in returns is similar across the whole private pension fund market.

Figure 81 Evolution of the Net Assets Value of Pillar III Pension Funds



Source: ASF processing

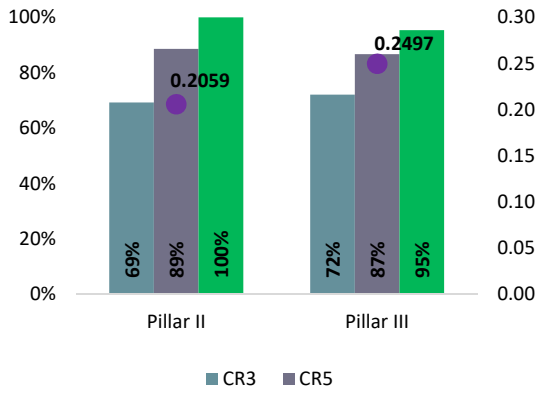
5.4. Risks and vulnerabilities in the private pension market

Private pension fund investments are based on the principle of prudent management so as to ensure the security, diversification, quality, liquidity, and profitability of private pension fund assets, and the legal framework requires maximum limits in fund portfolios by both asset class and individual holdings to allow for risk diversification and to avoid concentration on a single issuer. Currently, the investment portfolios of private pension funds comprise a mix of financial assets such as equities, corporate bonds, municipal bonds, bonds issued by foreign non-government entities, government bonds, investments in mutual funds, bank deposits, commodity and precious metal funds, derivatives, etc. Managers are also required to comply with the investment policy authorised by ASF.

Given the mandatory nature of the privately managed pension scheme in Romania, several mechanisms have been legally established to protect participants, including the minimum rate of return for each risk category of private pension funds. If a fund regularly achieves rates of return below the minimum rate, special supervisory measures are triggered to redress the situation. In the context of a limited number of privately managed pension funds and the existing protection mechanisms, a similar approach has been observed from managers with regard to strategic allocation of the investment portfolio, characterised by a moderate exposure to risk, and at the same time, a preference for securities issued by the Romanian State.

The privately managed pension market is highly concentrated, with the top three pension funds accounting for 69% of assets at the end of December 2023. The degree of concentration in voluntary pension funds
is similar, with the top three funds accounting for 72% of assets. The main indicators used by the Competition Council highlight the high degree of concentration, which can be explained by the market structure, the small number of private pension funds, and the random allocation mechanism in Pillar II, whereby most new entrants are distributed in equal shares to all managers of privately managed pension funds.

Figure 82 Concentration ratio of private pension funds (by total assets at end of December 2023), calculated on the basis of indicators used by the Competition Council[35]



Source: ASF processing

[35] CR3, CR5, and CR7 represent the market share of the top three, five, and five private pension funds, respectively in each pillar, while HHI represents the Herfindhal-Hirschman Index, calculated as the sum of the squares of the market shares of the pension funds in each pillar; the higher the HHI, the higher the degree of concentration.

The contributions of participants in private pension funds are transferred directly to the account of the pension fund registered with the depository bank, which is authorised, regulated, supervised, and controlled by the National Bank of Romania. Depositaries are jointly and severally responsible, together with private pension fund administrators, for the safekeeping of private pension fund assets, for verifying compliance with legal requirements relating to asset transactions and the daily calculation of the unit value of net assets, and for notifying ASF of any irregularities or errors found. At the end of December 2023, asset custody services were offered by three credit institutions authorised by the National Bank of Romania (NBR): BRD-GSG, which has the highest asset share of approximately 82.04%, Raiffeisen, 13.64%, and BCR, 4.32%.

Table 36 Market share of private pension fund depositaries as at 31 December 2023

Depositary	Value of assets in custody	% of total assets
BRD - GROUPE SOCIETE GENERALE SA	107.868.399.442	82,04%
RAIFFEISEN BANK SA	17.936.963.671	13,64%
BANCA COMERCIALĂ ROMÂNĂ SA	5.677.308.069	4,32%
Total	131.482.671.182	100,00%

Source: ASF processing

The market for private pension fund depositary services is highly concentrated, and the complexity and importance of depositary mechanisms for the proper functioning of these markets make the risk of substitution high for the entity with the largest market share in this segment, namely BRD - Groupe Societe Generale. It is subject to prudential supervision by the National Bank of Romania and is already included in the category of other systemically important institutions in Romania (an additional capital buffer is being imposed on it as a result of its inclusion in this category based on the score calculated according to the methodology harmonised with the European Banking Authority guidelines).

Private pension funds must opt for a risk category, expressed in terms of investment policy, when they are set up, in the prospectus, in which they must remain classified: low risk, medium risk, and high risk. In general, a low-risk category implies a risk-averse investment policy with lower exposures to equities and other more volatile instruments. In this case, the expected returns are also lower and are correlated with the level of risk taken. On the other end of the spectrum, a higher risk category implies a greater appetite for equities or other investments that can offer higher returns. Under Pillar II, all pension funds are in the medium risk category, with the exception of FPAP Aripi (managed by Generali Societate de Administrare a Fondurilor de Pensii Private SA), which is in the high-risk category. Under Pillar III there are 8 voluntary pension funds in the medium risk category and two in the high-risk category (NN Activ managed by NN Asigurări de Viață SA and AZT Vivace managed by ALLIANZ-ȚIRIAC PENSII PRIVATE Societate de administrare a fondurilor de pensii private SA).

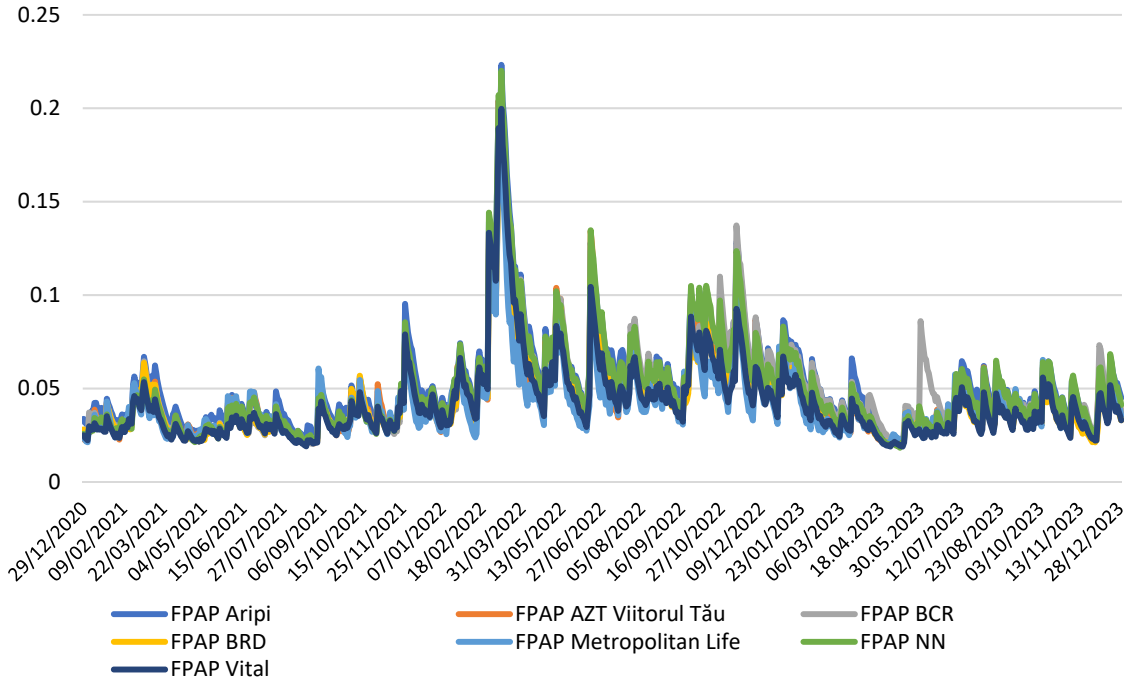
Market risk is the risk of loss resulting from adverse movements in interest rates, exchange rates, or market prices in general. It is generally managed by managers through diversification, but also by monitoring the price volatility of the main financial instruments while actively managing short-term portfolios. We assess that market risk is maintained at a medium to high level, due to expectations of persistently high interest rates and inflation, in a context of continued global uncertainties amplified by intensifying geopolitical pressures following the outbreak of a new armed conflict in the Middle East.

In a long - term, the real economy may be negatively affected, with financial markets eventually reflecting the vulnerabilities created and naturally adjusting their risk premia associated with expectations of returns.

At the end of December 2023, private pension funds invested most of their assets in local currency-denominated financial instruments (88.9%), followed by euro-denominated financial instruments (10.3%), and US dollar-denominated financial instruments (0.8%). Given the limited exposure to foreign currency denominated financial instruments, currency risk was at a low level, with a number of managers using derivatives for protection and to preserve the value of their euro or US dollar denominated holdings.

In 2023, the volatility of the unit value of private pension funds' net assets remained at a lower level compared to 2022, when there were more shocks, as the pension system was influenced by the tensions in the European financial markets.

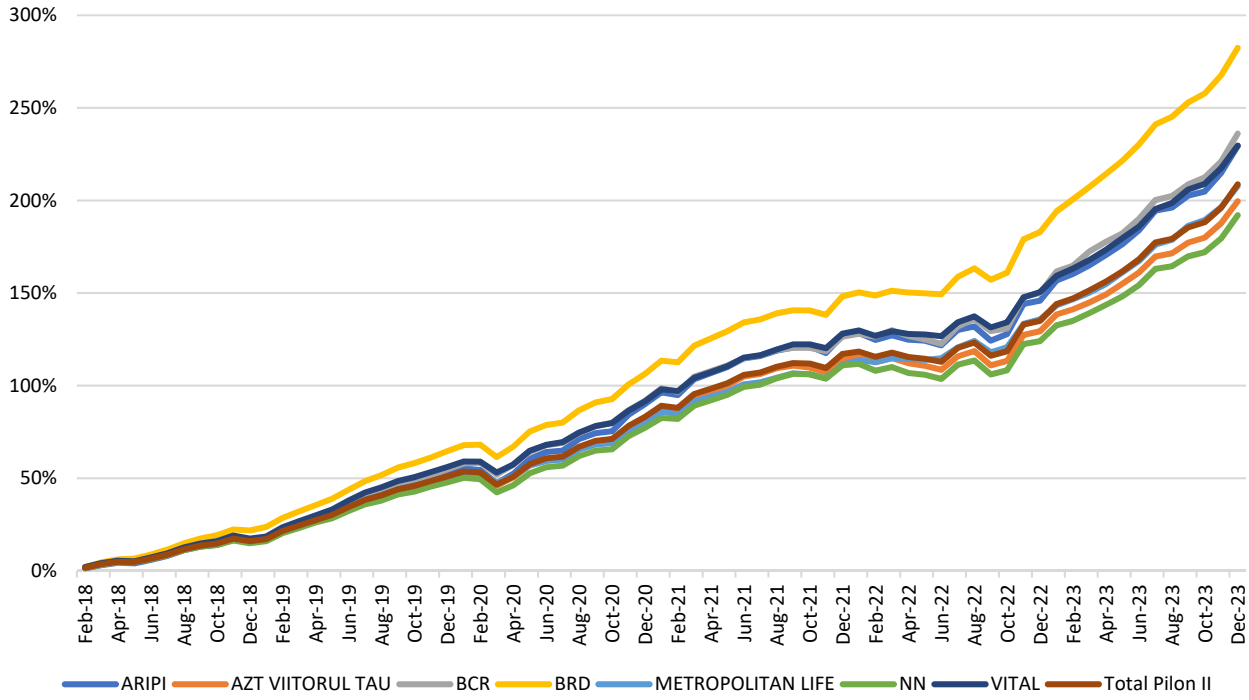
Figure 83 Evolution of daily annualised volatility of Pillar II pension funds - GARCH (1.1)



Source: ASF calculations (Garch model)

The value of total assets related to privately managed pension funds (Pillar II) increased by more than 208% from the beginning of 2018 to the end of 2023, with the private pension system still accumulating and payouts at a low level. The largest increases in assets we can observe are in the cases of FPAP BRD and FPAP BCR. The periods of volatility in the financial market are also reflected in the short term in the assets of private pension funds, which may record episodes of decline, depending on the macro-financial context. However, pension fund assets have grown rapidly after temporary periods of decline.

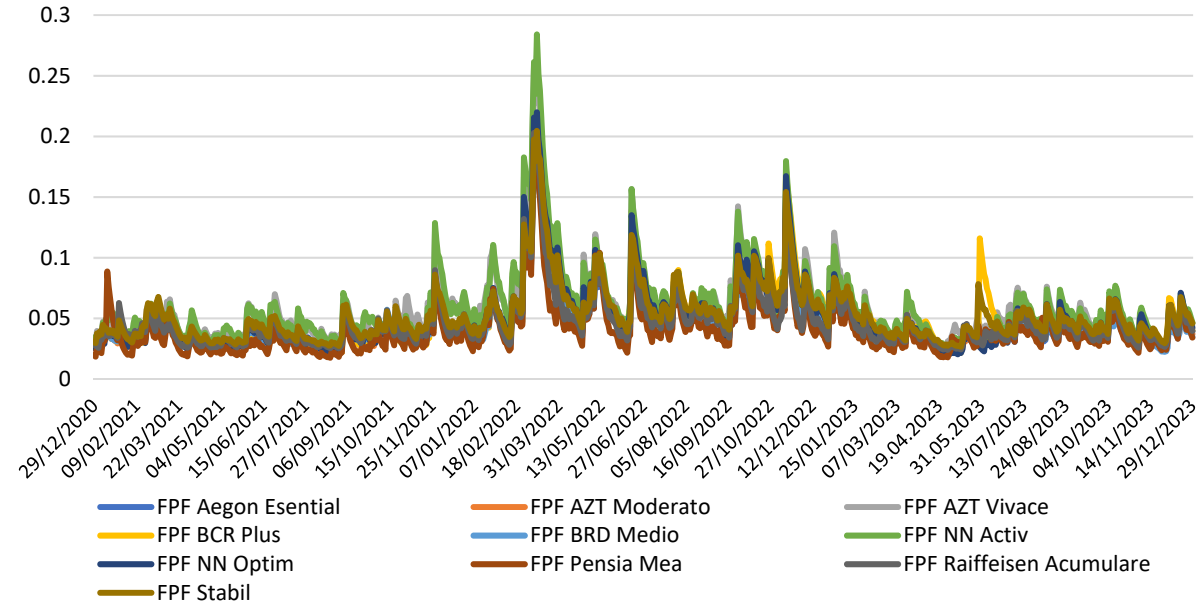
Figure 84 Evolution of total assets of privately managed pension funds (Jan. 2018=100%)



Source: ASF processing

The annualised volatility of Pillar III fund units follows the same trend as for Pillar II.

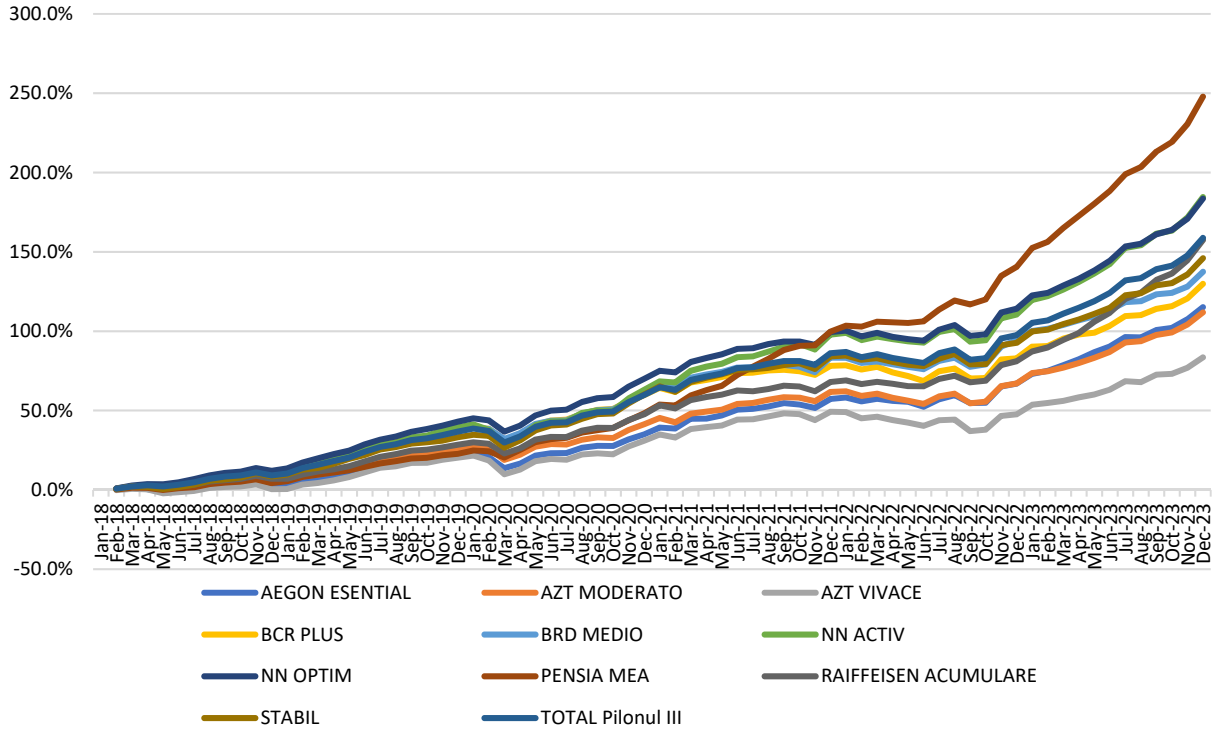
Figure 85 Evolution of daily annualised volatility of Pillar III pension funds - GARCH (1.1)



Source: ASF calculations (Garch model)

Voluntary pension funds have also seen major increases in assets from January 2018 to the end of 2023 of over 158%.

Figure 86 Evolution of total assets of voluntary pension funds (Jan. 2018 =100%)



Source: ASF processing

Given the uncertainty of the macro-financial outlook and the likelihood of materializing risks, including systemic risks, we believe that private pension fund assets may fluctuate in the coming period, which will be directly influenced by the mark-to-market mechanism. By their nature, private pension funds are long-term investors who do not engage in speculative behaviour but rather in holding instruments to maturity and periodically receiving their entitlements (coupons, dividends, etc.).

Credit risk remains low due to the high-quality requirements of the issuers of fixed income instruments held by the funds, the vast majority of which are government bonds and bonds issued by international financial institutions.

Liquidity risk is at a low level, with 1.14% of private pension fund assets held in current accounts and short-term deposits, down from 4% at the end of 2022. From a liquidity point of view, the private pension scheme is currently resilient to any claims on its assets due to the fact that it is in the accumulation period (funds receive monthly contributions) and outflows from the scheme (due to death, disability, retirement, or transfer) are low.

On Pillar II, during 2023, payments of net personal assets amounting to about RON 919 million were made to 54,518 participants or beneficiaries. Of the total amount of payments made, 52.6% are related to the opening of pension rights, 15.5% follow the death of the participant, and 31.9% as a result of invalidity. The level of payments made represented 0.73% of total assets at the end of the month of December 2023. In Pillar III, net personal asset payments of approximately RON 113 million were made to 11,210 participants

or beneficiaries. Of the total amount of payments made, 86.5% are related to the opening of pension entitlement, 5.4% to the death of the participant and 8.1% to disability.

In order to cover the guaranteed minimum amount, the managers of privately managed pension funds are obliged to set up a technical provision from their own funds in accordance with the provisions of Rule No. 13/2012 on the actuarial calculation of the technical provision for privately managed pension funds. The technical provision is set up to cover the risks related to the mandatory minimum investment guarantee established by Law No. 411/2004 and is used if the value of a participant's personal assets falls below the value of the contributions paid to the participant over the entire active period, less transfer penalties and legal fees. The Private Pension System Rights Guarantee Fund is also another safety lever of the private pension system. We thus assess that the solvency risk of private pension funds is at a low level.

Operational risk is at a low level, with pension fund managers continuously monitoring and evaluating operational processes to mitigate this risk. In this respect, ASF Rule No. 6/2015 on the management of operational risks generated by IT systems used by entities regulated, authorised/approved and/or supervised by ASF is applied. To date, no cyber attacks on the pension fund industry have been reported.

The structure of the Romanian private pension system provides for several mechanisms to protect the rights of participants, including: segregation of assets between administrators and funds, additional checks and validations by depositories, technical provisions set up by administrators, increased reporting requirements and transparency, and the Private Pension System Rights Guarantee Fund (FGDSPP). This market structure, together with the state of its evolution, which is still in a period of accumulation, means that the stability of the FGDSPP remains at low risk

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6. Sustainable finance

The European Central Bank conducted its second climate risk stress test, which complemented the ECB's Banking Supervision Climate Stress Test on risks to banks by expanding its scope to also look at firms and households. The exercise therefore aimed to test the resilience of firms, households, and banks in three transition scenarios: accelerated transition, late-push transition, and delayed transition.

The results of the climate risk stress test show that delaying the transition and taking no action at all is more costly in the long run compared to a faster transition, which, although it would initially involve higher investment and energy costs, in the medium term the financial risks would decrease, with investments in renewable energy paying for themselves more quickly and ultimately reducing energy costs.

In the context of the growing interest in the transition to a sustainable economy, monitoring and combating greenwashing have become major concerns for policymakers around the world.

The name of an investment fund can be a source of environmental misinformation if it does not reflect the actual sustainability profile of the fund. So, looking at EU investment funds, ESMA has examined the basis for these concerns and found that funds are increasingly using ESG and sustainability language in their names and that investors consistently prefer funds with ESG language in their names.

Therefore, as the popularity of ESG investments grows, so do the risks of environmental misinformation. In addition to losses to individual investors, environmental misinformation can have profound consequences for the confidence of the wider investment community in the effectiveness of sustainability disclosure regimes, with negative knock-on effects on the financing needed for the transition to a more sustainable economy.

Given the continued rapid development of the sustainable debt market, ESMA has analysed the existence of a price benefit for sustainable debt. The results of the analysis do not confirm the existence of the so-called greenium, often attributed to the willingness of investors to forgo returns in exchange for the sustainability element of the financial product they invest in, sustainable bonds. The results are encouraging from financial stability perspective, as price divergences between sustainable and conventional debt instruments appear to stem from the same fundamental risk factors, e.g., the creditworthiness of an issuer, and are not driven solely by the ESG status of the bonds. Thus, it was found that ESG bond issuers have historically benefited from price premiums depending on issuer characteristics and that the public sustainability commitments of issuers do not influence the price of bonds issued by them.

In terms of climate change impacts, there has been a global increase in the frequency and severity of natural disasters in recent years. The impact of such developments is significant for insurance companiesdue to the increase over time in the value of claims paid for weather/climate related natural catastrophe events.

During the first nine months of 2023, at least seven natural catastrophes occurred in Europe, with individual insured losses per event exceeding the EUR 1 billion threshold, according to information published by Munich Re. However, despite facing a number of natural catastrophes each year, most of which are weather-related: severe storms, hail, floods, droughts, and vegetation fires, the deficit in natural disaster insurance protection in Europe is extremely high (83%). Only 17% of the economic damage caused by

natural catastrophe events was insured, according to information published by Gallagher Re. This indicates a significant exposure of the population and companies to the materialisation of these categories of risks.

As for Romania, the World Bank confirms in its Climate and Development Country Report its vulnerability to natural disasters caused by climate change. Floods and droughts are the main categories of natural disasters identified by the WB to which the country is exposed, potentially generating significant macro-financial risks.

Given the low level of insurance coverage in Romania, there is also a need to increase public awareness of the risks arising from climate change and the potential losses caused by it. Catastrophe insurance is the key tool to mitigate losses from extreme climate-related events, providing financing to households and businesses in the event of these risks materialising. Therefore, increasing insurance coverage would limit household and business losses and contribute positively to the country's economic development.

6.1. Climate risk stress test

The European Central Bank (ECB) has published the results of its second economy-wide climate risk stress test[36]. The climate stress test follows on from the results of the first stress test published in September 2021. It complements the climate stress test for ECB banking supervision, which analysed risks for individual banks in July 2022, with a broader scope and looking at firms, households, and the banking sector. The results show that the best way to achieve a net-zero economy for firms, households, and banks in the euro area is to accelerate the green transition at a faster pace than under current policies. Moreover, delaying the transition and inaction altogether leads to even higher costs and risks in the long run. While involving less investment overall, failure to meet emission reduction targets exacerbates the impact of physical risk on the economy and the financial sector.

The stress test examines the resilience of firms, households, and banks under three transition scenarios, which differ in timing:

1. an *accelerated transition*, frontloading green policies and investments, leading to a reduction of emissions by 2030, in line with the Paris Agreement targets;
2. a *late-push transition*, which continues on the current path but does not accelerate until 2026 (and is still intense enough to achieve Paris-aligned emission reductions by 2030);
3. a *delayed transition*, which also only starts in 2026, but which is not dynamic enough to reach the Paris Agreement targets by 2030.

[36] https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op328~2c44ee718e.en.pdf?7793485730460e4e0b4e170237eb7429

The scenarios designed for this exercise differ in terms of timing and ambition for emission reductions by 2030 and combine the transition trajectories of the Network for Greening the Financial System (NGFS) with the latest macroeconomic projections and energy developments. The accelerated transition scenario assumes an immediate start of the transition, which is consistent with the optimal trajectory of the net-zero NGFS by 2050. Under the late-push transition scenario, current macroeconomic and geopolitical conditions would lead to a transition boost that would only start after 2025, but would be sufficiently intense to lead to emission reductions comparable to the accelerated transition scenario. The Delayed Transition scenario assumes a delayed transition timetable and more lenient policy action which would not be dynamic enough to achieve emission reductions similar to the other scenarios by 2030.

The results show that firms and households clearly benefit from a faster transition. Although a faster transition initially implies higher investments and higher energy costs, the financial risks decrease significantly in the medium term. Both profits and purchasing power are less negatively affected as investments in renewable energy pay for themselves earlier and ultimately reduce energy costs. An accelerated transition would benefit businesses, households, and the financial system compared to a late-push transition scenario. Credit risk increases in all scenarios, especially in the late-push transition scenario. While the fast-push transition would lead to higher costs for households and businesses in the short term due to rapid and severe increases in energy prices, it would reduce financial risks in the medium term due to faster reductions in energy expenditure. Banks are exposed to the highest credit risk if the transition needs to be rushed at a later stage and quicker, higher-cost investments are needed. In the case of late-push transition, banks can expect credit risk to increase by more than 100% by 2030 compared to 2022, while in the case of accelerated transition, the increase is only 60%.

The accelerated and delayed transition scenarios would lead to similar levels of risk in 2030. Still, it would imply substantially different long-term implications for both transition risks and physical risks. Under the accelerated transition scenario, the risk exposure of companies and households would start to decline in the second half of the decade. After significant progress in the transition, the delayed transition scenario, it would continue to increase until 2030 and possibly beyond, due to continued increases in energy prices and reductions in renewable energy capacity. In addition, higher temperature increases are expected to lead to an increase in the frequency and severity of natural disasters in the long term. Thus, assuming that global efforts would be in line with the assumptions underlying the NGFS framework, in the event of a delayed transition, firms and households could be more vulnerable to physical risks as well as potentially to the cumulative effects of transition and physical risks combined.

The impact of the transition would be highly heterogeneous across economic sectors, with the greatest risk of expected losses if the transition were to take place late and suddenly. Companies in the mining, manufacturing, and utilities industries would be among the most severely affected by transition risk and would therefore have the greatest impact on their balance sheets and consequently on their financial risk.

Because of their heavy reliance on brown energy sources, these energy-sensitive sectors will bear the greatest costs in the form of higher energy costs and the need for major investments in carbon reduction activities and renewable energy. The transition risk would disproportionately affect vulnerable firms within the sectors, particularly in a late-push transition scenario. This further illustrates the benefits of an early start to the transition to mitigate costs and financial risks.

Although the field of climate stress testing is still in its infancy, the findings of exercises conducted by other jurisdictions align with the results of this stress test.

The Financial Stability Board and NGFS member institutions have already completed 35 climate scenario exercises; these vary widely in terms of methodology, level of granularity, in-scope jurisdictions, horizon, and climate risks covered. Particularly in the case of abrupt transition scenarios, other exercises have similarly found that climate risks would be concentrated within sectors, resulting in secondary risk (Financial Stability Board, 2022).

Other exercises focusing on the impact of transition risks on financial institutions in Italy, the Netherlands, France, and Canada found impacts for credit risks that are of a similar order of magnitude to this exercise and more pronounced in energy-intensive sectors such as the oil sector.

6.2. Combating greenwashing. ESMA analysis of practices in the investment fund industry

ESMA's Sustainable Finance Risk Review, through its article The financial impact of greenwashing controversies[37], highlights the importance of monitoring and addressing this issue. The transition to a low-carbon economy requires confidence in the commitment and ability of companies to adapt their business operations to contribute to climate goals. However, greenwashing risks undermining this confidence, damaging consumer and investor confidence.

This article explores the role that ESG controversies can play in supporting these efforts. While greenwashing controversies do not provide accurate information on the extent or frequency of greenwashing events, they are important from an investor protection point of view, as it reflects public perception of greenwashing, which can lead to reputational problems for the firms involved.

The number of greenwashing controversies involving large European firms increased between 2020 and 2021 and tended to be concentrated within a few firms in a few main sectors, including the financial sector. Given that perceptions can, to some extent, drive investment decisions, the relationship between greenwashing controversies and key financial indicators such as share returns and company performance ratings was also studied, and no causal relationship was identified.

[37] https://www.esma.europa.eu/sites/default/files/2023-12/ESMA50-524821-3072_TRV_Article_The_financial_impact_of_greenwashing_controversies.pdf

The results suggest that allegations of greenwashing have not had a clear financial impact on firms and highlight the absence of an effective market-based mechanism to help prevent potential greenwashing behaviour. This underlines the importance of clear policy guidance from regulators and efforts by supervisors to ensure the credibility of sustainability claims.

The corporate sector has a key role to play in supporting the transition to a low-carbon economy, including by adapting its activities so that they are compatible with the Paris Agreement's goals of keeping the global average temperature rise this century to well below 2°C above pre-industrial levels. At the same time, investors are increasingly concerned about climate change and social issues, such as rising levels of inequality, increasing pressure on companies to realise their environmental and social impacts.

As a result, companies are increasingly committed to improving their social and environmental performance, for example, by committing to reduce greenhouse gas emissions or implementing social safeguards in their supply chains. Corporate communication related to sustainability can take various forms, including the publication of non-financial statements or, in the financial sector, the inclusion of ESG-related terms in financial product names. Meanwhile, public concern is growing about companies engaging in selective disclosure while possibly omitting their true ESG performance. This is leading consumers, investors, and regulators/supervisors to take an increasing interest in understanding whether companies' sustainability commitments, goals, and claims are reflected in their actions.

The absence of an effective, market-based mechanism to help prevent environmental misinformation behaviour was noted. This underlines the importance of clear policy guidance from regulators and efforts by supervisors to ensure the credibility of sustainability claims.

Although only one possible source of information exists, resources open to the general public, such as reports, (social) media platforms, and public investigations, can provide an indication of the prevalence of greenwashing concerns. Indeed, information shared by the media can play a decisive role in reducing information asymmetry and making new information available to a wider public. Controversies arising from media attention can thus serve as a useful signal of wider public attention. Reflecting the potential influence that controversies can exert on allocations of investors, some industry bodies have recently called for controversial data to be brought within the scope of EU regulations to increase transparency

RepRisk data, which analyses a wide range of news sources in 23 languages on a daily basis, was used to identify ESG-related incidents or controversies that may have a negative reputational or financial impact on a company. These incidents are correlated with 28 ESG issues, including "incidents of misleading communication", which closely mirror existing definitions of greenwashing[38]. In the first phase, granular data was collected on 933 incidents of misleading communication between 1 January 2020 and 31 December 2021 involving European companies in the STOXX Europe 600 index (as of July 2022). RepRisk provides additional details on the sector in which the company operates, the severity of the incident and the extent of the environment, as well as a detailed description of the incident, and a link to the original source[39].

Recent evidence shows that the number of misleading communication incidents has increased in the EU since 2012 across all sectors. However, misleading communication is not synonymous with greenwashing. Therefore, as a second step, it is necessary to identify which misleading communication incidents specifically relate to potential greenwashing practices by companies (for example, a company accused of misleading consumers by advertising its herbal product as "steak" qualifies as a misleading communication incident, but is not greenwashing).

Two methods were considered: (1) identifying, through a text-based search, all incidents containing the word "greenwashing" in their title or description. However, this approach is based on RepRisk's definition of greenwashing, which is limited to incidents related to environmental issues. It also introduces a dependency on the style of wording of specific media, leading to variability in the identification of greenwashing incidents that cannot be controlled; (2) manual labelling of incidents that are aligned with the ESA high-level common understanding of greenwashing (ESMA, 2023). This definition is not specifically limited to environmental issues but also covers social and broader sustainability and impact claims. It also provides for a broader scope, including the absence of intentionality and the possibility that incidents may occur at different stages of the product or service life cycle (e.g., manufacturing, delivery, etc.). Although this method of identification also involves a certain degree of subjectivity, it allows the extent of perceived potential greenwashing to be assessed according to the common understanding of the ESA.

Between January 1 2020 and December 31 2021, 191 companies (i.e., 32% of STOXX Europe 600 constituents) were involved in a total of 933 misleading communication incidents. 70% of these incidents relate to greenwashing, but the proportion of incidents identified as greenwashing controversies varies

[38] RepRisk defines incidents of misleading communication as situations "where a company manipulates the truth to present itself in a positive light but contradicts this image through its actions or misleads consumers about its products and services".

[39] RepRisk defines severity as "a function of three dimensions: first, what are the consequences of the risk incident (e.g., in terms of health and safety: no other consequences, injury, death); second, what is the magnitude of the impact (e.g., one person, a group of people, a large number of people); and third, was the risk incident caused by an accident, negligently or intentionally, or even systematically. There are three levels of severity: low severity, medium severity, and high severity." The reach of information sources is defined as "influence based on readership/circulation as well as its importance in a given country, according to RepRisk's own rating. All sources are pre-classified according to reach: limited reach, medium reach, and high reach. Limited reach sources would include local media, smaller NGOs, local government bodies, and social media. Medium reach sources include most national and regional media, international NGOs and national and international state government bodies. High coverage sources are the only truly global media.

greatly depending on the method of identification. While the word "greenwashing" appears in 257 misleading communication incidents (28%), the manual approach leads to the identification of 630 greenwashing controversies (68%). This difference mainly stems from the fact that the manual approach encompasses all misleading sustainability claims (i.e., not only environmental claims but also misleading social or impact claims) and highlights the importance of convergence in terms of definitions and scope of greenwashing practice for surveillance monitoring purposes. However, it also stresses the need for careful evaluation of data and the importance of adopting reliable assessment methods when using controversial ESG reports.

A classification of greenwashing controversies according to the main sector in which companies operate showed a significant concentration in the oil and gas sector, followed by the financial sector and the food and drink sector.

Reputational problems caused by allegations of greenwashing can damage a firm's credibility and trigger additional risks to its financial position. Reputational and litigation risks can exist in their own right, but they can also reinforce each other.

Greenwashing controversies are not synonymous with greenwashing events. The absence of a universal definition introduces an additional degree of subjectivity. This matters when it comes to public perception of greenwashing behaviour and can dilute the financial impact of greenwashing controversies. To explore these questions, an event study was conducted to assess whether the observed stock market returns of companies involved in greenwashing controversies deviate from expected returns. This study was also complemented with a multivariate time series analysis to investigate whether greenwashing controversies help explain stock returns. Finally, a cross-sectional regression was performed to test the relationship between greenwashing controversies and firm valuation.

While stock prices generally rose over the sample period, they fell sharply around the COVID-19-induced market turmoil in early 2020 before turning positive across all sectors.

The breakdown by sector further highlights the divergence in the timing and extent of this recovery, for example, firms operating in the oil and gas sector experienced a steeper initial decline than those in other sectors.

Next, the value relevance of greenwashing controversies was assessed using a cross-sectional regression analysis, using the price/earnings per share (PE) ratio as the dependent variable, which averaged from 1 January 2020 to 31 December 2021. Holding all other conditions equal, if greenwashing controversies were evaluated as a potential risk factor, a firm heavily involved in greenwashing controversies should display a lower PE ratio relative to other firms with similar characteristics. There is no clear correlation between the number of controversies and PE ratios.

Overall, the resulting findings suggest that investors and markets did not pay much attention to greenwashing controversies in 2020 and 2021. While there is anecdotal evidence that in specific cases, markets reacted to financial news flow related to greenwashing, this does not appear to have been the case in most instances. However, the subjective dimension of ESG controversies and a divergent understanding of what constitutes greenwashing mean that these findings should be interpreted with caution.

The increasing coverage of greenwashing in the media raises further questions about the potential financial impact on businesses. This is important from an investor protection perspective and is in line with ESMA's strategic priority to address the potential risks that greenwashing poses to markets and investors. Overall, the results of the analysis show that greenwashing controversies did not have a clear and systematic negative financial impact on firms in 2020 and 2021, suggesting that investors and markets did not pay much attention to greenwashing controversies. However, the subjective dimension of ESG controversies and the absence of a common definition for greenwashing imply that these results should be interpreted with caution. The increasing level of public scrutiny of sustainability claims also highlights that investor and market reactions to greenwashing controversies may change in the future. The findings highlight the absence of an effective market-based mechanism to help prevent potential greenwashing behaviour. This underlines the importance of clear policy guidance from regulators and efforts by supervisory authorities to ensure the credibility of sustainability claims.

Tackling greenwashing is one of the key priorities of ESMA's strategy on sustainable finance and, in this respect, its assessment of how investment funds identify themselves (by name or through their documents) is an important first step in detecting and monitoring potential greenwashing practices.

Finance plays a key role in supporting the transition to a more sustainable economy. To achieve this, investors need to have confidence that the sustainable financial products on offer are accurately described. With this in mind, identifying and monitoring the phenomenon of environmental misinformation has become a major concern for policymakers around the world.

The European Securities and Markets Authority (ESMA), the EU securities and financial markets regulator, has published an article[40] analysing the use of language related to environmental, social, and governance (ESG) factors in EU investment fund names and documentation. In this study[41], ESMA shows that the proportion of EU UCITS investment funds that have in their names ESG words increased from less than 3% in 2013 to 14% in 2023. The article also highlights that fund managers prefer to use generic language ("ESG", "sustainable") instead of specific words. This can make it more difficult for investors to check whether the fund's portfolio is consistent with its name.

The name of a fund can be a source of environmental misinformation if the name does not reflect the actual sustainability profile of the fund. ESMA has therefore used a dataset containing the historical names of over 36,000 EU-domiciled single investment funds with approximately EUR 16 trillion of assets under management from mid-2013 to mid-2023. ESMA's analysis shows that more and more funds are including ESG terms in their names and that, of these, funds prefer to include fewer specific words (general ESG words). In addition, since mid-2017, many investment funds have changed their names to include ESG words. At the same time, there is evidence of a consistently high investor appetite for investment funds that have an ESG-related term in their name, compared to funds that do not have any ESG-related words in their name.

[40] ESMA, ESG names and claims in the EU fund industry, 2 October 2023, https://www.esma.europa.eu/sites/default/files/2023-10/ESMA50-524821 2931_ESG_names_and_claims_in_the_EU_fund_industry.pdf

[41] ESMA also used natural language processing techniques to examine the use of ESG-related language in over 100,000 fund documents. Funds with ESG words in their names, as well as funds that present

As funds can also signal their ESG objectives and goals through documentation, ESMA's analysis also investigates the funds' regulatory (KIID/KID and investment strategy) and marketing information. To this end, ESMA has built a dataset of over 100,000 documents available at the end of 2022, covering over 18,000 funds.

The study shows that funds with ESG-related language in their investment strategy and KIID/KID (Key Investor Information Document/Key Information Document) provide more detailed ESG information (using additional words to those included in the name) than other funds. In addition, the proportion of ESG words found in different types of documents is consistent with the type of SFDR disclosure (e.g. Article 8 funds use more ESG words than Article 6 funds, but fewer than Article 9 funds). Furthermore, funds sold to retail investors are associated with more extensive ESG language in the KIID/KID compared to funds sold to institutional investors, but this effect does not exist for investment strategies or marketing materials. Thus, funds targeting retail investors appear to make additional ESG statements in documents produced to improve retail investors' understanding of the fund. However, the same funds do not make particular efforts to documents that are not standardised and regulated. This suggests that fund managers are adapting their communication strategies according to the types of readers expected, highlighting the importance of ensuring consistency between different types of documents. It also highlights the importance of monitoring this type of communication channel from an investor protection perspective.

ESMA's findings support recent regulatory efforts - both in the EU and abroad - on disclosure requirements for investment funds. For example, the evolution of ESG language in fund names demonstrates the usefulness of ESMA's recent public consultation on guidelines to ensure that fund names accurately reflect their portfolio from an ESG perspective. [42]

Moreover, NLP (natural language processing) based assessment of the ESG language used in various fund documents demonstrates the benefits of standardised information - in the form of templates - gradually becoming widely available, for example, through SFDR.

As for the issuance of sustainable financial instruments, they have soared in recent years, benefiting from a growing investor appetite for financial products with a sustainability element.

Another ESMA paper (The European sustainable debt market - do issuers benefit from an ESG pricing effect?, 6 October 2023[43]) extended the analytical work to all types of environmental, social, and governance (ESG) bonds and identified a set of key factors that could cause the so-called "greenium", which is often attributed to investors' willingness to forgo returns in exchange for the sustainability element of the financial product they invest in. This directly contributes to understanding investors' preferences for sustainable finance, helps to investigate any price distortions between comparable debt instruments that could impact market stability should they be revealed, and ultimately contributes to ESMA's strategic priority of monitoring ESG market developments and assessing new financial instruments. In terms of findings, the analytical results published by ESMA cannot confirm the existence of a systematic and

[42] Information under Article 9 of the Sustainable Finance Disclosure Regulation (SFDR), tend to use relatively more ESG words in their documentation.

[43] https://www.esma.europa.eu/sites/default/files/2023-10/ESMA50-524821-2938_The_European_sustainable_debt_market_-_does_issuers_benefit_from_an_ESG_pricing_effect_0.pdf

consistent price advantage for any category of ESG bonds. In addition, it was found that ESG bond issuers have historically benefited from price premiums depending on the characteristics of the issuer and that public sustainability commitments by issuers do not influence the price of their bonds.

In this article, ESMA examines whether investors prefer sustainable debt instruments, but also whether they are willing to give up yields in the process and thus contribute to a "greenium". The United Nations Development Programme (2021) defines greenium as "the pricing of benefits based on the logic that investors are willing to overpay or accept lower returns in exchange for sustainable impact". Concretely, this means that sustainable debt instruments are priced inside their yield curve, i.e., they offer lower returns at equal or higher prices, unlike their conventional counterparts, provided all other characteristics of the instrument and the issuer are (nearly) equal (Climate Bonds Initiative, 2021).

While investor preferences may justify price differences due to individual financial and non-financial aspects, the systematic existence of a greenium may give rise to several concerns. First, from a regulatory and supervisory perspective, a systematic mispricing of sustainable debt may signal market price distortions, particularly if the sustainability aspect driving the pricing premium turns out to be inaccurate. This could raise financial stability concerns in the form of high price volatility or a rapid decline in liquidity for sustainable debt instruments. It may also raise investor protection concerns, for example, if investors feel misled about the sustainable performance of a sustainable debt instrument. This problem can be further compounded by a disclosure insufficient or unclear on the specific sustainability characteristics of the instrument. Second, the incentives for issuers to increase their sustainability spending and profile can be strengthened by using alternative mechanisms, including the development of comprehensive and long-term entity-wide strategies to holistically transform business processes.

This analysis focuses on the financial stability aspect and informs regulatory and supervisory work by assessing potential price distortions in the environmental, social, and governance (ESG) debt market and thus investigating the possibility of the "greenium" phenomenon triggering financial stability problems. In this way, potential financial stability problems can be identified at an early stage and contribute to ESMA's strategic priority of monitoring key market developments in the area of sustainable finance.

The rapid growth of sustainable debt instruments in the market has led to the development of a broad set of types of sustainability bonds, which can be broadly divided into two categories: proceed[44] bonds (UoP - use of proceed bonds) and sustainability-linked[45] bonds (SLB - sustainability-linked bonds).

[44] UoP bonds have proceeds earmarked for a specific sustainability project or activity, with the aim of obtaining funding for a predetermined sustainability purpose. Although there are no formal labels, such as those required by law, these bonds are usually distinguished by the sustainability of the project being funded and are usually divided into green bonds (for those whose proceeds are earmarked for an environmental purpose, such as reducing CO2 emissions or restoring biodiversity), social bonds (for social purposes, such as healthcare or social housing), and sustainability bonds, which contain both environmental benefits and social elements. However, with increasing efforts to better understand different aspects of sustainability, the availability of UoP bonds with a specific thematic focus has increased, from blue bonds to transition bonds or *rhino* bonds.

[45] SLB bonds are future-oriented, entity-focused instruments, i.e., designed to support the sustainable transformation of an entity. Unlike UoP bonds, the proceeds are earmarked for general corporate purposes or refinancing activities, but the issuer commits to a specific and defined sustainability outcome in the future, usually expressed in the form of company-wide key performance indicators (KPIs) and measured against sustainability performance targets (SPTs). SLBs also contain penalty mechanisms, usually in the form of a coupon increase, if sustainability targets are not met. SLBs are a relatively new form of sustainable debt, first issued in 2019, and saw a surge in the market in 2020 as they provided an attractive sustainable financing option, particularly for issuers

Table 37 Categories of proceed bonds (UoP)

Type of bonds	Description
Green bonds	Bonds where the proceeds or an equivalent amount will be used exclusively to finance or refinance, in whole or in part, new and/or existing eligible environmental projects, e.g., projects related to biodiversity restoration, pollution prevention and control, and energy efficiency.
Social bonds	Bonds whose proceeds or an equivalent amount will be used exclusively for the financing area or refinancing, in whole or in part, of new and/or existing eligible social projects, for example, projects related to affordable basic infrastructure, access to essential services, affordable housing, job creation, socio-economic promotion and empowerment, food security.
Sustainable bonds	Bonds where the proceeds or an equivalent amount will be used exclusively to finance or refinance a combination of environmental and social projects.
Climate bonds	Securing funding for climate change solutions, e.g. mitigation or adaptation projects, including renewable energy plants or climate change mitigation programmes. Not all climate bonds need to be UoP bonds, but most are.
Blue bonds	Securing funding for ocean-related assets and projects, e.g. marine conservation and restoration and water-related infrastructure.
Rhino bonds	Fundraising for wildlife conservation, including endangered species such as the black rhino.

Note: Overview of the different uses of procedural obligations and their objectives. Several of these categories can also be applied in sustainability bond issues, albeit with different bond structures. Source: Climate Bonds Initiative, ICMA, United Nations Global Compact, Green Finance Institute, ESMA

In recent years, the market for sustainable debt issued by the EEA has grown at a rapid and continuous pace. Outstanding ESG bonds reached EUR 1.7 trillion in H1 2023, an increase of 28% year-on-year and 663% compared to H1 2018, with green bonds dominating the market (63%).

Therefore, ESMA analysed the existence of a price benefit for sustainable debt by constructing a unique dataset of outstanding ESG and conventional bonds of EEA issuers based on data extracted from Refinitiv

that do not qualify for UoP bonds. However, they are also subject to increasing scrutiny, particularly in terms of the effectiveness of the penalty mechanism and the meaningfulness of the issuer's sustainability commitment.

Eikon and by performing regression analyses for several models and sample specifications, but the results do not confirm the systematic existence of a greenium for either category of sustainable bonds.

However, it was noted that ESG bond issuers have benefited from yield discounts in the past due to their characteristics, and various possible reasons for this observation were considered, ranging from first-to-market advantage to increased levels of greenwashing concerns. It was also found that this trend is not continuing today. In addition, public ESG commitments by issuers have no effect on bond prices in general.

The results are encouraging from a financial stability perspective, as price divergences between sustainable and conventional debt instruments appear to stem from the same fundamental risk factors, e.g., the creditworthiness of an issuer, and are not solely determined by the ESG status of the bonds. However, given the considerable need to support the transition to a more sustainable economy, the results also indicate a limited market appetite to forgo higher yields in support of this objective. This opens up new research possibilities to investigate, for example, under what conditions investors might be more willing to opt for sustainable investment vehicles and forgo returns, or to assess the margin of foregone returns that investors would be willing to accept to support the sustainable transition.

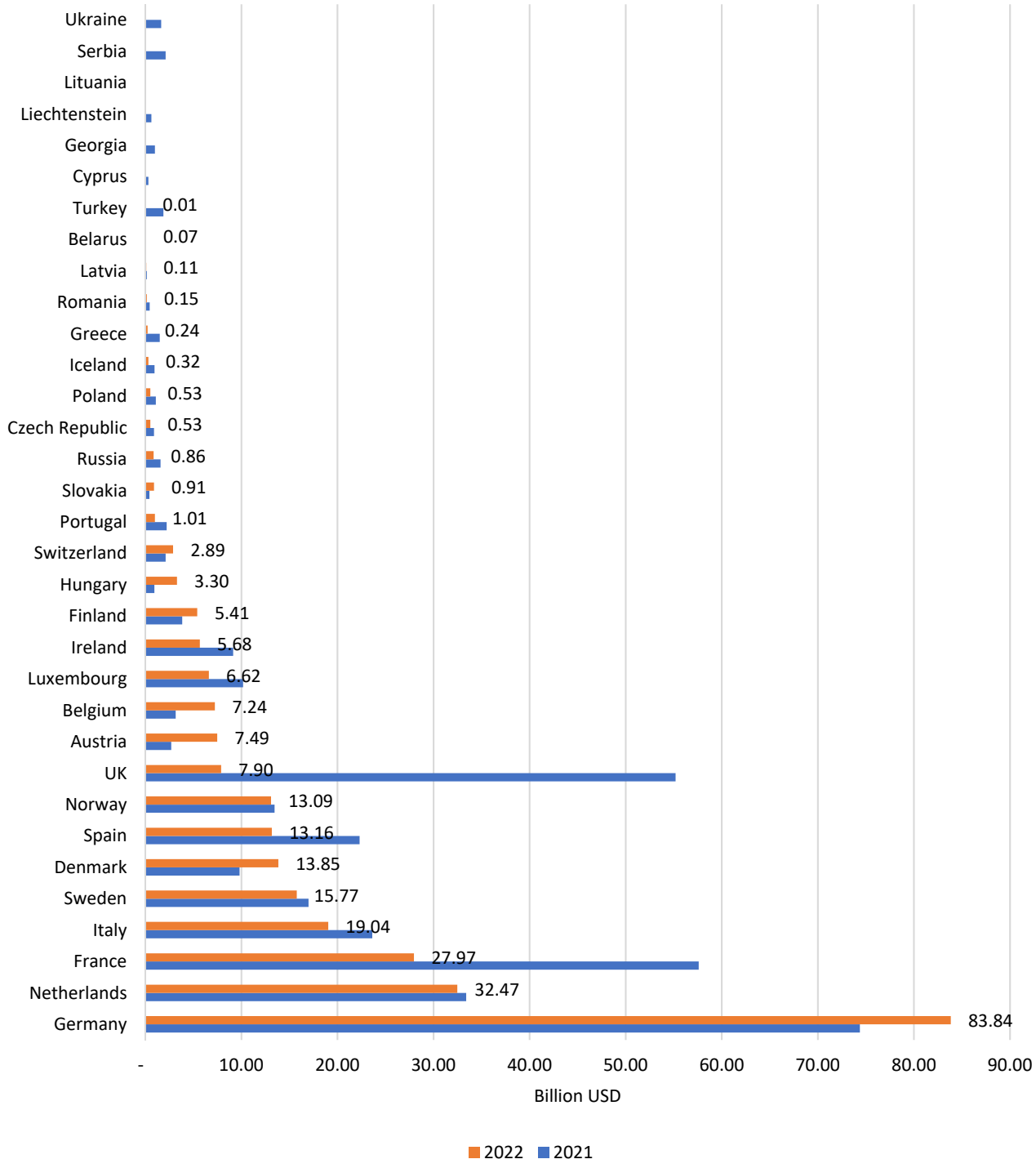
However, given that the market for sustainable debt continues to evolve steadily, and that ESMA's analysis refers to a specific sample of outstanding bonds, these results should not be interpreted as a blanket rejection of the possibility of price advantages related to sustainable debt instruments.

6.3. Green debt (green bond issues)

According to data published by the IMF, the value of green bond issuance in Romania stood at USD 0.15 billion in 2022, down from USD 0.45 billion in 2021. The downward trend is similar to that identified in most of the European countries analysed. However, the lower value recorded in Romania compared to the other countries where green bonds were issued during the period analysed stands out. In 2022, only in Latvia (USD 0.11 billion), Belarus (USD 0.07 billion), and Turkey (USD 0.01 billion) was the amount of issuance lower than in Romania.

Of the 33 countries analysed, only nine showed positive dynamics in terms of green bond issuance in 2022 compared to 2021. The largest increase in absolute terms was in Germany, where USD 83.8 billion worth of green bonds were issued, about USD 9.5 billion more than in 2021. The period under review also saw a positive development in Hungary, where issuance increased from USD 0.94 billion (2021) to USD 3.3 billion (2022).

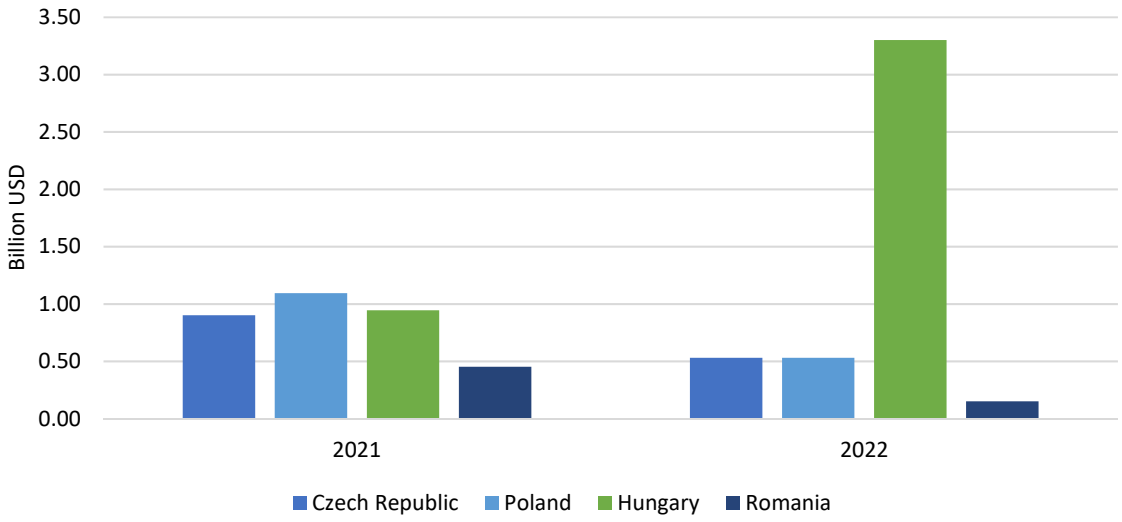
Figure 87 Value of green bond issuance in European countries



Source: IMF, Refinitiv, ASF processing

Green bond issuance in Romania is well below the level of the countries analysed in the region (Czech Republic, Poland: USD 0.53 billion, and Hungary).

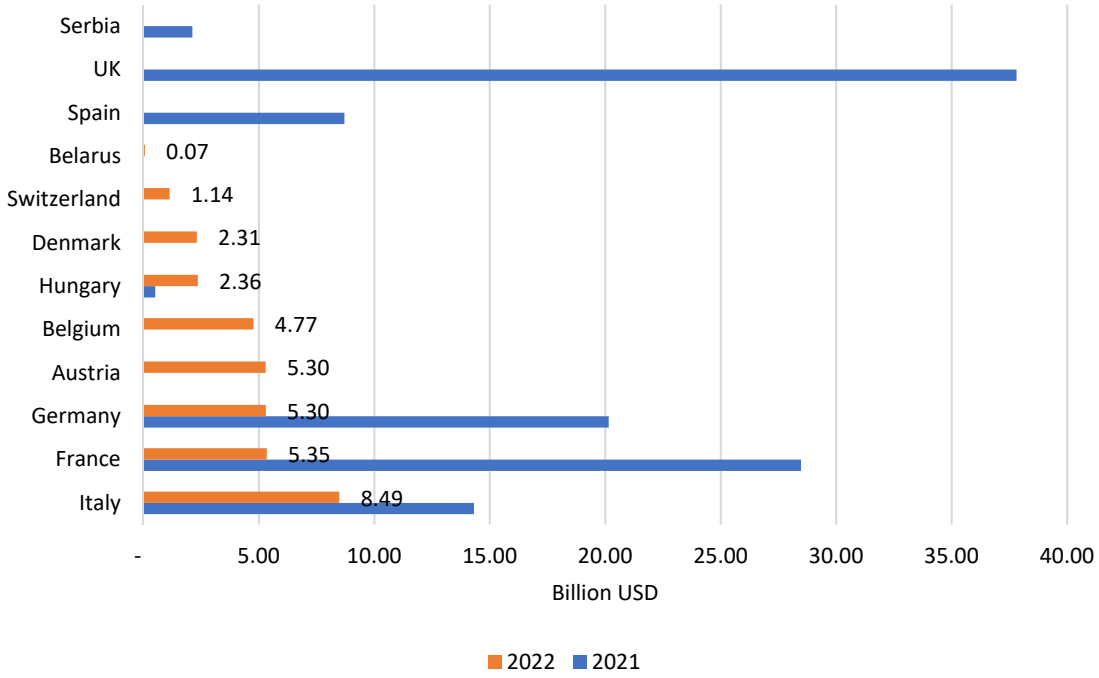
Figure 88 Value of green bond issuance in Romania and countries in the region



Source: IMF, Refinitiv, ASF processing

According to data published by the IMF, 9 countries in Europe issued green sovereign bonds in 2022, compared to 7 countries in 2021. However, the total value of green sovereign bonds issued in 2022 (USD 35.1 billion) is well below the level recorded in 2021 (USD 112.1 billion). Italy issued the highest value of green sovereign bonds in 2022, while the previous year was dominated from this perspective by the value of bonds issued by the UK.

Figure 89 Green sovereign bond issuance



Source: IMF, Refinitiv, ASF processing

6.4. Sustainability reporting (NFRD-EU/95/2014)

Directive (EU) 2022/2464[46] on sustainability reporting by companies, known as "CSRD"[47] arose in the context of the need to increase the importance to be attached to corporate social responsibility, also highlighted in European Commission reports. These have provided detailed evidence that many companies are not reporting meaningfully on all major sustainability issues, including climate, greenhouse gas emissions, and factors affecting biodiversity.

The CRSD expands on the "non-financial" reporting obligations already existing in legislation under Directive 2014/95/EU ("NFRD" - "Non-Financial Reporting Directive"). The main objective of the CRDS is to revise the European requirements on non-financial reporting, following the shortcomings identified by the EC services in the area of non-financial reporting, in particular in terms of comparability/standardisation, quantity, quality, and relevance of the information reported by companies.

As a time horizon, Member States must ensure that the laws, regulations and administrative provisions necessary to comply with the new provisions enter into force by July 6 2024.

The CRSD Directive brings a number of changes and developments that contribute to improved sustainability reporting. The main new features are the following:

- gradually extending the scope of reporting entities, so that from 1 January 2026 listed SMEs will also be covered;
- introduction of the "dual materiality" approach, in the sense that reporting will not only refer to information "to the extent necessary to understand the development, performance and position of the company", but also to information necessary to understand the impact of companies' activities on environmental, social and personnel issues, respect for human rights, anti-corruption and anti-bribery;
- increased standardisation of reporting, with a positive impact on the comparability and analysis of the information presented, which will be achieved through the use of mandatory reporting standards adopted in the form of European regulations;
- increase confidence in the sustainability information reported by companies by introducing a sustainability reporting assurance obligation (to be carried out by statutory auditors).

At the national level, the CSRD Directive is currently being transposed.

Second, it applies to a 'large enterprise', which is either an EU company or an EU subsidiary of a non-EU company. 'Large enterprise' is a term defined in the Accounting Directive and means an entity that exceeds at least two of the following criteria:

- net turnover greater than EUR 40 million;
- total assets greater than EUR 20 million;
- 250 employees on average during the financial year.

[46] of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU

[47] eng. "Corporate Sustainability Reporting Directive

As a third category, the CSRD applies to insurance companies and credit institutions, regardless of their legal form.

There are also exemptions from the application of the CSRD. In particular, a subsidiary will be exempt if the parent company includes the subsidiary in its report that complies with the CSRD. As mentioned above, listed micro-enterprises and unlisted SMEs do not fall within the scope, but may apply the provisions on a voluntary basis.

Companies will use the new sustainability reporting standards to disclose information within the directors' report, thereby providing report users with an integrated picture of their impact and performance on environmental, social, human rights, and governance (ESG) factors.

To make their sustainability information more searchable by users and more readable by computers, companies will be required to prepare their financial statements and directors' reports in a single XHTML format and tag sustainability information, according to a digital taxonomy.

Audit committees will have increased responsibilities under the new Directive. In addition to monitoring the sustainability reporting process and making recommendations to ensure the integrity of the sustainability information provided by the company, they will have to:

- monitor the effectiveness of the company's internal quality control and risk management systems and internal audit functions;
- monitor the annual and consolidated sustainability reporting on sustainability;
- inform the company's administrative or supervisory bodies on the outcome of the sustainability reporting;
- review and monitor the independence of statutory auditors or audit firms.

As part of the European Commission's Action Plan for Financing Sustainable Growth, Regulation (EU) 2020/852 establishing an EU classification system for environmentally sustainable economic activities (EU Taxonomy) entered into force in 2020. The EU Taxonomy is a key tool of the European Union to redirect capital flows to sustainable investments and create transparency in the market. It encourages greater channelling of investment by companies, investors, and policymakers where it is most needed for sustainable development. The EU Taxonomy Regulation will therefore play an important role in boosting sustainable investment and implementing the European Green Deal.

Under the EU Taxonomy, issuers admitted to trading on the regulated market are required to disclose how and to what extent their activities are classified as sustainable, as defined in the EU Taxonomy Regulation. The Taxonomy Regulation sets six environmental objectives:

- Climate change mitigation
- Adapting to climate change
- Sustainable use and protection of water and marine resources
- Transition to a circular economy
- Pollution prevention and control
- Protection and restoration of biodiversity and ecosystems

In June 2021, the Commission formally adopted the Climate Change Delegated Regulation, which sets out criteria for activities that make a substantial contribution to climate change mitigation and adaptation, the first two of the six environmental objectives.

The non-financial statement will include, depending on the area of activity, the information required by Article 8 of Regulation (EU) 2020/852[48], as well as the information required by Commission Regulation (EU) 2021/2178 of July 6 2021 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by specifying the content and manner of presentation of the information to be provided by undertakings subject to Article 19a or 29a of Directive 2013/34/EU in relation to environmentally sustainable economic activities and by specifying the methodology for complying with this obligation to provide information.

In this regard, according to Article 8 para. (2) of Regulation (EU) 2020/852, in particular, the issuers concerned, which are non-financial undertakings within the meaning of that Regulation, shall provide the following information:

- the proportion of their turnover derived from products or services associated with economic activities that qualify as environmentally sustainable pursuant to Articles 3 and 9; and
- the proportion of their capital expenditure and the proportion of their operating expenditure related to assets or processes associated with economic activities that qualify as environmentally sustainable pursuant to Articles 3 and 9.

At the same time, the provisions of Commission Regulation (EU) 2022/1214 of March 9 2022 amending Delegated Regulation (EU) 2021/2139 as regards economic activities in certain energy sectors and Delegated Regulation (EU) 2021/2178 as the publication of specific information on those economic activities will be taken into account, depending on the area of activity.

In 2022 the full reporting requirements of the EU taxonomy were applicable for the first time. This means that in the coming years, as part of its specific supervisory activities, ASF will assess how many of the activities carried out by companies are not only eligible from a taxonomy point of view but also aligned with the taxonomy. In this respect, it is expected that there will be significantly lower levels of alignment than of eligibility.

In addition, the Commission has adopted the Complementary Delegated Act introducing specific reporting requirements for companies related to their activities in the gas and nuclear energy sectors, and a second Delegated Act related to the other four environmental objectives is expected to be adopted in 2022.

In view of this, the supervisory work on issuer reporting will need to be restructured in light of the new sustainability requirements, including the ESMA requirements imposed by GLESI[49].

[48] of the European Parliament and of the Council of 18 June 2020 establishing a framework to facilitate sustainable investment and amending Regulation (EU) 2019/2.088, published in the Official Journal of the European Union, L series, No 198 of 22.06.2020

[49] Guidelines on Enforcement on Sustainability Information - a set of guidelines issued by ESMA, similar to the guidelines for financial reporting compliance with the IFRS reporting framework

6.4.1. Integrating sustainability aspects into the supervision of collective investment undertakings

ASF continued in the second half of 2023 with both actions related to the integration of sustainability risks into the risk oversight process at the level of supervised entities and actions to monitor and supervise the transparency of sustainability-related information in pre-contractual disclosures, websites and periodic reports.

At the level of supervised entities, the application of the provisions of the SFDR (EU Regulation 2019/2088 on sustainability reporting in the financial services sector) and the Taxonomy (EU Regulation 2020/852 establishing a framework to facilitate sustainable investment and amending Regulation EU 2019/2088) has created challenges for both financial market participants and the Financial Supervisory Authority, as investors begin to consider financial products that incorporate environmental, social, and governance (ESG) factors.

In addition, the obligation to integrate sustainability risks into the procedures and processes developed for the purpose of risk management at the level of the funds under management, as well as those envisaged under the overall governance structure provided for in Regulation (EU) 2021/1255 (amending Delegated Regulation (EU) No 231/2013 as regards sustainability risks and sustainability factors to be taken into account by alternative investment fund managers) and Directive (EU) 2021/1270 (amending Directive 2010/43/EU on sustainability risks and sustainability factors to be taken into account for undertakings for collective investment in transferable securities (UCITS)), entered into force on 1 August 2022.

In this regard, ASF has taken the necessary steps to develop new processes for identifying, assessing, and monitoring ESG risk factors that may affect the business and performance of supervised entities, in order to enhance risk-based supervision and promote investor protection.

With the development of the EU legal framework on sustainability and the entry into force of the EU Regulation 2019/2088 on transparency for financial market participants (SFDR) and the EU Regulation 2020/852 on taxonomy (TR), ASF has intensified its supervisory actions in compliance with transparency requirements for financial market participants. In the case of undertakings for collective investment in transferable securities (UCITS), alternative investment funds (AIFs) and their managers the SFDR aims to increase transparency on ESG impacts and risks by establishing transparency requirements both in pre-contractual disclosures (prospectuses) and in periodic reports.

Transparency requirements relate to the integration of sustainability risks and the inclusion of descriptions of:

- how sustainability risks are integrated into their investment decisions, and
- negative effects of investment decisions on sustainability factors, as per Art. 6 of theSFDR.

Where a financial product promotes, inter alia, environmental or social features or a combination of these features, provided that the investee companies follow good governance practices, the information to be disclosed under Article 6 includes information on how these features are met - Article 8 of the SFDR.

The results of the supervisory activities carried out in this respect in the second half of 2023 reveal that all investment funds operating in the local market have the transparency requirements set out in Art. 6 of the SFDR included in the pre-contractual documents.

With regard to the transparency of the promotion of environmental or social features and sustainable investments in the periodic reports, ASF envisages carrying out verification activities on how the environmental or social features - for Art. 8 funds of the SFDR - and the level of the overall sustainability-related effect for each financial product have been achieved through the relevant sustainability indicators, if ASF will authorise and supervise Art. 9 funds of the SFDR.

On the Romanian capital market, there are seven investment funds that promote ESG (Environmental, Social and Governance) characteristics and are set up in compliance with the provisions of Article 8 of Regulation (EU) 2088/2019 - OTP Innovation open-ended investment fund, managed by OTP Asset Management Romania S.A.I. S.A., and BRD Global open-ended investment fund, managed by SAI BRD Asset Management S.A.I. S.A. The BRD Global Open-ended Investment Fund was authorized as a fund promoting environmental features in July 2023, by Authorization No. 89/03.07.2023, while the OTP Innovation Open-ended Investment Fund is the first Art. 8 SFDR fund authorized on the Romanian capital market in early 2022, by Authorization No. 31/11.02.2022. In the second half of 2022, ASF authorised the modification of two funds managed by SAI Raiffeisen Asset Management SA (Raiffeisen Sustainable Equity and Raiffeisen Sustainable Mix) into Feeder funds, which invest at least 85% of their assets in Master funds, managed by Raiffeisen Kapitalanlage Gesellschaft m.b.H and set up in compliance with the provisions of Art. 8 of the SFDR.

It should also be noted that a total of 11,803 investors (11,671 individuals and 132 legal entities) hold fund units in these UCITS set up in accordance with Article 8 of the SFDR.

With the growing demand for financial products incorporating environmental, social, and governance (ESG) factors, a significant number of such funds are being authorised.

As part of the authorisation process for financial products incorporating environmental, social, and governance (ESG) factors, ASF has developed a series of analyses and verifications of the pre-contractual information submitted for authorisation and has considered the following:

- Regarding the transparency of the promotion of environmental or social features in the pre-contractual information, the prospectus submitted to ASF for authorisation must include information on how the environmental and social features are complied with, as well as the results of the assessment of the likely effect of sustainability risks on fund returns - Art. 6 para. (1), letter(b) of SFDR.
- On the integration of sustainability risks in investment decisions, according to Art. 8 para. (1), letter (a), in conjunction with Art. 6 para. (1) letter (a) of the SFDR, ASF has verified that the prospectus mentions a number of instruments used by the fund to mitigate sustainability risks.
- With regard to the consideration of the main negative effects on sustainability factors, at the entity and financial product level, according to Art. 4 and 7, respectively of the SFDR, the prospectus submitted for authorisation must contain a statement on the consideration of the negative effects of investment decisions on sustainability factors.

- The prospectus must contain an Annex on the provision of pre-contractual information related to sustainability, drawn up pursuant to Art. 14 of EU Regulation 2022/1288, which corresponds in format to Annex II of the same Regulation. At the same time, ASF has verified that a prominent statement is inserted in the main body of the prospectus that information on the environmental or social characteristics, as specified in Article 14(2) of EU Regulation 2022/1288, is available in the annex to the documents or information concerned.

  With regard to the content elements developed by the trustee in the Annex on the provision of pre-contractual information related to sustainability, ASF considered the following elements:

- Under the Section on Planned Asset Allocation for this financial product - the information presented is correlated with the information provided under other relevant sections of the prospectus submitted for authorisation.

- Under the Section related to Sustainability Indicators used to measure the achievement of environmental or social characteristics promoted by the fund - the existence of elements related to the alignment to environmental and social characteristics of the assets in the portfolio, through the use of ESG scores from rating providers together with a system of limits applicable to ESG scores, ultimately determining which investments are ESG, depending on the particularities set out in the fund's pre-contractual information.

- In the Issuer Information Screening Section - the existence of benchmarks in the prospectus formalising how the fund's investments are screened for issuer evaluation and ESG scoring after the exclusion stage has been completed on the basis of the core business.

6.4.2. Project "Sustainable Finance - Strengthening Supervisory Capacity", financed by funds from the European Commission's Directorate-General for Structural Reform (DG REFORM)

During H2 2023, activities continued under the "Sustainable Finance - Strengthening Supervisory Capacity" Project, an important tool in the context of ASF's commitment to support the development of sustainable finance in the local market.

The project "Sustainable Finance - Strengthening Supervisory Capacity" is funded by the European Commission's Directorate-General for Structural Reform (DG REFORM) and Romania participates in it together with the authorities of Croatia, Malta, and Poland.

The main objective of the project is to develop the capacity of authorities and supervised entities to implement the sustainable finance framework, in particular with regard to the transparency requirements and reporting obligations of financial market participants in the area of sustainable finance.

At the level of the Financial Instruments and Investments Sector, the project aims to strengthen the implementation of the EU regulatory framework for sustainable finance, in particular by improving methodologies and tools for the supervision of reporting and transparency requirements applicable to undertakings for collective investment in transferable securities (UCITS), alternative investment funds (AIFs), and their managers, financial investment firms, and issuers. Thus, the project will strengthen the Authority's work on several levels. First , by reinforcing the supervisory measures on transparency requirements imposed on supervised companies, ASF will act to maintain investor confidence in ESG investments and reduce the phenomenon of environmental disinformation - "greenwashing".

Alternatively, the integration of sustainable financing principles into day-to-day supervisory activities is intended to facilitate the early identification of sustainability-relevant risks and enhance the resilience of the capital market, while supporting supervised entities' efforts to implement their own sustainability risk management policies in line with the new requirements.

6.4.3. Common Supervisory Action on sustainability risks and disclosures)

During the second half of 2023, ASF initiated the Common Supervisory Action on sustainability risks and disclosures.

The exercise runs from Q3 2023 to Q4 2024 and aims to assess how supervised entities:

(1) integrates sustainability risks into the risk management framework at the level of the managed funds - as per Regulation 2021/1255 for AIFs and Directive 2021/1270 for UCITS;

(2) addresses the phenomenon of "greenwashing" and

(3) comply with the transparency requirements imposed by Regulations 2019/2088 (SFDR) and 2020/852 (Taxonomy).

The main objective of the exercise is to achieve greater convergence at the European level in relation to the oversight of sustainability risk integration and compliance with sustainability-related transparency requirements at the level of investment funds, through coordinated action by National Competent Authorities (NCAs) on risks arising from incorrect or misleading reporting, non-compliance with the reporting templates set out in the SFDR, as well as any other type of issue at the entity or financial product level that could lead to greenwashing.

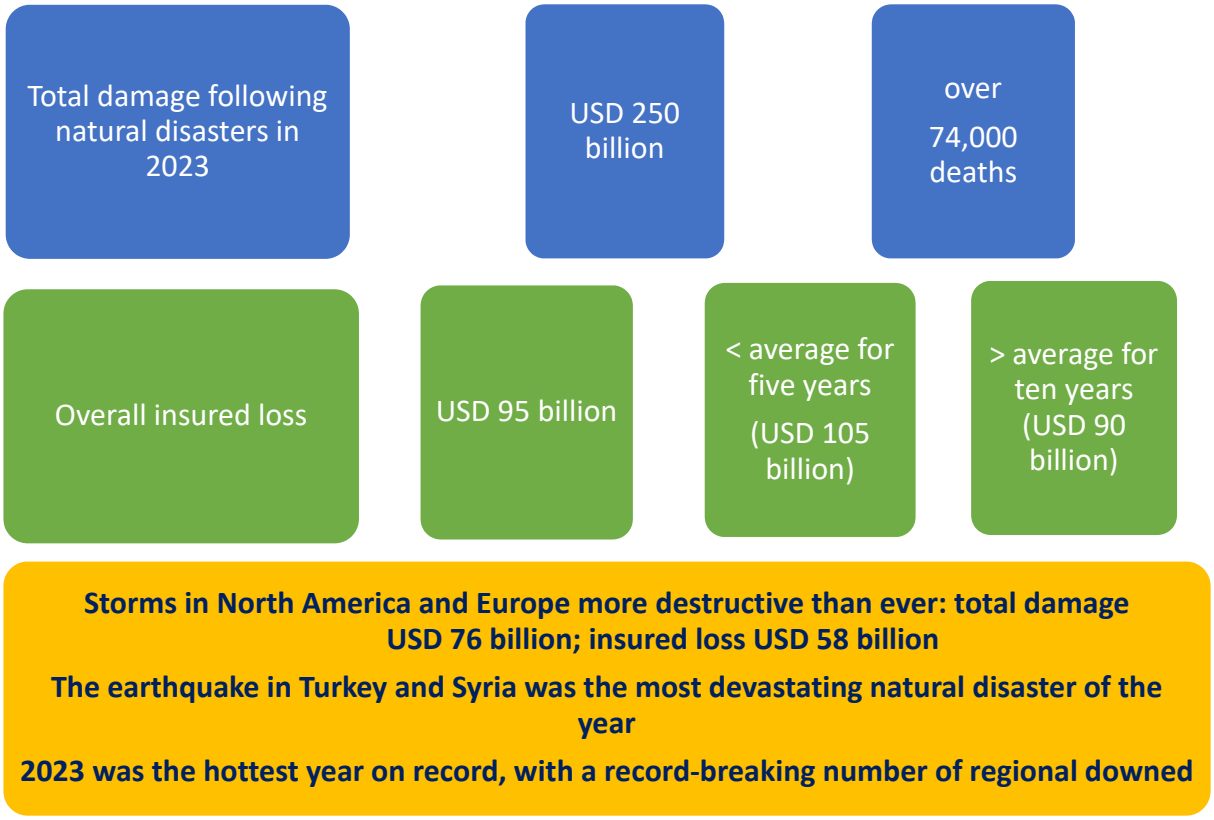
Thus, ASF selected a relevant sample for the proposed exercise, according to the materiality thresholds established in ESMA's IMSC and IMSC OWG, and addresses and questionnaires were sent to the supervised entities. During 2024, ASF is expected to centralise and analyse the responses received and report to ESMA on the most important local market findings in relation to the integration of sustainability risks and compliance with sustainability-related transparency requirements at the level of investment funds.

6.5. Losses from natural disasters at global level

Globally, according to information published by Munich Re, 2023 saw new records of negative impacts from natural disasters.

Total damages from natural disasters were around USD 250 billion globally, similar to the level in 2022, of which 38% is insured damage. Thus, according to Munich Re data, insured losses in 2023 totalled USD 95 billion, below the 2022 value (USD 125 billion) but above the long-term average (USD 90 billion, the average for the last ten years).

Figure 90 Year 2023 - main statistics on natural disasters



Source: Munich Re, ASF processing

It can therefore be seen that, although the total amount of losses is similar to the previous year (USD 250 billion), the amounts insured in 2023 are below those insured in 2022.

In terms of negative records, 2023 saw the largest losses from severe regional storms in the U.S. or Europe. In North America, assets destroyed by storms totalled USD 66 billion, of which USD 50 billion was insured, while in Europe, losses were about USD 10 billion, of which USD 8 billion was insured.

One of the dark statistics is the number of deaths caused by natural disasters, which stands at 74,000, well above the annual average of the last five years (10,000). 85% of the deaths were due to geophysical disasters. However, 76% of the overall losses were weather-related, and only 24% had geophysical causes.

According to Munich Re, the series of earthquakes in southeastern Turkey and Syria in February 2023 were both the most destructive natural disasters of the year and the costliest, with total losses of approximately 50 billion, but insured claims amounted to only USD 5.5 billion.

Europe

According to information published by Munich Re, losses from natural disasters in Europe amounted to USD 83 billion, largely due to the earthquake in Turkey, while insured losses amounted to approximately USD 19 billion, representing only 23% of the total loss amount.

Storms in the Alpine and Mediterranean regions contributed to storm losses.

In July and August, hail caused billions of dollars in losses in northern Italy and several other regions. These were the result of prevailing high temperatures and the risk of severe storms due to increased evaporation.

Heavy rains in countries along the Adriatic coast caused widespread flooding in May and August. The beginning of September was characterised by severe flooding, especially in Greece, and then intensified across the Mediterranean with a cyclone named Storm Daniel.

Losses from these events in Europe amounted to USD 17 billion, of which only USD 2 billion was insured.

In December, significant rainfall caused heavy flooding in many parts of northern Germany.

6.6. Romania's insurance protection deficit in the event of natural disasters

EIOPA's Natural Catastrophe Insurance Protection Gap Report (October 2023) captures the level of the protection gap in Member States as well as by category of natural catastrophe.

The 2023 edition is an update to the previous edition of the insurance penetration estimates, covering Germany, where there has been an improvement in the flood protection gap, Ireland, with a change in the coastal flood insurance protection gap score, and Slovenia, providing a new insurance penetration estimate, that has changed the protection gap scores.

The EIOPA results show that the lowest protection deficit is in the case of storms. With all countries having an indicator equal to or less than 2, storm is a well-insured natural disaster in countries where the risk is high.

Coastal flooding is a hazard that may be more relevant to climate change. Currently, one country, the Netherlands, shows a protection deficit (score >=3), while Germany has a score of 2.5, placing it in the category of countries requiring monitoring in this respect.

Wildfires are also strongly influenced by climate change. Currently, two countries, Portugal and Greece, have a protection deficit in terms of this risk (score >=3) and three countries, Austria, Croatia, and Cyprus, require monitoring (score = 2.5).

For floods, two countries have a protection deficit, Slovenia and Croatia. Eight countries should be closely monitored, the Netherlands, Italy, Germany, Romania, Slovakia, Bulgaria, Poland, and Austria.

Earthquake is the hazard where the protection gap score is the highest for both Greece and Italy (score = 4 - very high protection gap). Three other countries also have a current protection gap, Romania, Slovenia, and Bulgaria (score >= 3). In addition, three countries should be monitored, Cyprus, Croatia, and Portugal (score = 2.5).

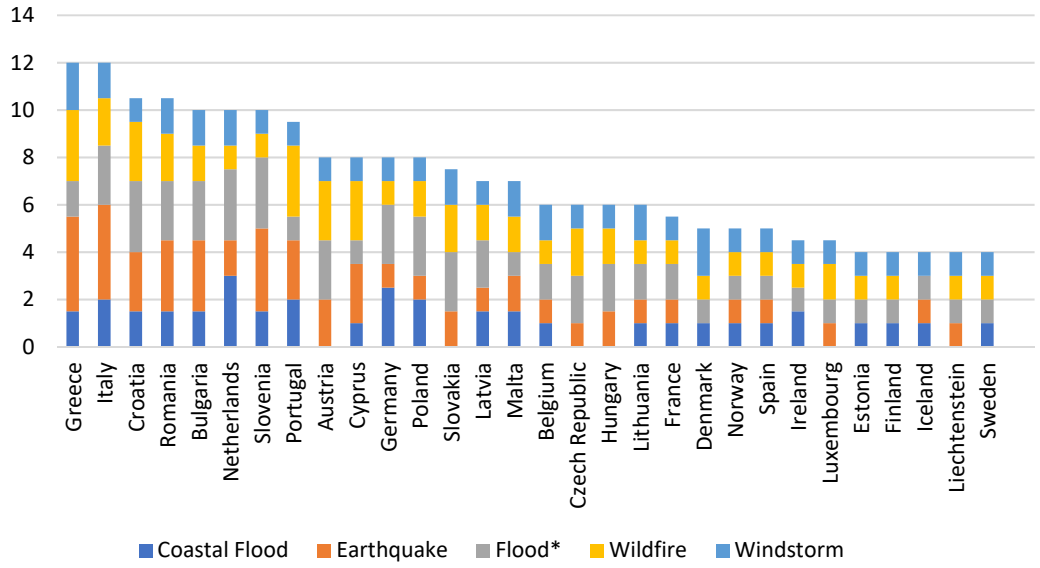
Therefore, EIOPA's results on the insurance protection gap for Romania show that the country is exposed to earthquake risk (score 3) and flood risk (2.5) due to the lack of sufficient insurance coverage.

Figure 91 EIOPA Insurance Protection Gap Dashboard results by type of natural disaster and countries with the largest gap

Storms	Smallest protection gap; risk is well insured
Coastal flooding	The Netherlands: protection gap Germany: requires monitoring
Natural fires	Portugal, Greece: protection gap Austria, Croatia, Cyprus require monitoring
Flooding	Slovenia, Croatia: protection gap The Netherlands, Italy, Germany, Romania, Slovakia, Bulgaria, Poland, Austria require monitoring
Earthquake	Greece, Italy: very high protection deficit Romania, Slovenia, Bulgaria: high protection deficit Cyprus, Croatia, Portugal need monitoring

Source: EIOPA results, European Disaster Insurance Protection Gap Dashboard, October 2023

Figure 92 Aggregate values of the current protection gap score for the five categories of natural disasters for each country



Source: EIOPA, European Disaster Insurance Protection Gap Dashboard, October 2023; scores can range from 0 to 4; (score = 0, when there is no protection gap; score = 1 low protection gap; score = 2 medium protection gap; score = 3 high protection gap and score = 4 very high protection gap);

6.7. Private pension fund investments in Romanian ESG-rated shares

Improving sustainability factors in the private pension sector is a major concern, and as a consequence, improvements in legal provisions are underway. In the private pension market, according to information provided by managers, ESG criteria are included in the investment policy of pension funds without affecting the objective of achieving an adequate risk-return profile. Therefore, the governing bodies of private pension funds consider ESG criteria together with other financial factors that may contribute to the achievement of participants' retirement objectives.

In addition, given the systemic nature of global environmental challenges, private pension managers promote a forward-looking and systemic approach to environmental sustainability that addresses growing negative trends (such as climate change, biodiversity loss, global overconsumption of resources, food shortages, ozone depletion, ocean acidification, deterioration of the freshwater system, and land use change) as well as the emergence of new threats. As a consequence, a particularly important step is to provide financial products that promote both environmental and social features.

In terms of alignment and compliance with ESG criteria, the ten managers in the Romanian private pension market ensure transparency and public communication on sustainability factors by publishing information on policies developed internally or at group level in relation to the integration of sustainability risks into their investment decision-making processes, in line with the provisions of Article 3 of EU Regulation 2088/2019. In addition, all managers have published on their websites information on how their remuneration policies are compatible with the integration of sustainability risks, in line with the provisions of Article 5 of the EU Regulation 2088/2019. Private pension fund managers have also published on their websites a statement taking into account the main negative impacts of investment decisions on sustainability factors, in accordance with the provisions of Art. 4 para. (1) of E.U. Regulation 2088/2019. With regard to the transparency obligations specified in Article 6 of EU Regulation 2088/2019, this information is included in the pre-contractual documents, which, in the case of private pension funds, are the pension scheme prospectus and the investment policy statement (IPS).

In practice, in order to ensure transparency and public communication on sustainability factors, private pension fund managers inform participants and all stakeholders by publishing information on the pension fund's investment policies in relation to long-term sustainability, including ESG criteria and other non-financial factors, on their own website. In addition, with regard to the integration of ESG factors, while for the E (Environmental) and S (Social) components best practice standards in the regulatory sector are currently being developed, in the G (Governance) area much progress has been made and major steps have been taken in this direction, with the result that pension fund managers have a duty to represent the long-term financial interests of participants.

Moreover, private pension fund managers have demonstrated a sustainable approach to their activities by acting responsibly, in the sense that they have promoted and placed particular emphasis on defending principles of good corporate governance. This has been achieved by ensuring professional management by the investment teams, who have always sought to combine the identification of the best opportunities for participants to earn with the application of a prudent and sustainable investment strategy based on best risk management practices. At the same time, in order to ensure proper implementation of the set objectives, the governing bodies and fund managers consider developing appropriate stress tests to test

investment strategies, taking into account both financial and ESG factors. In this respect, the scope and complexity of the stress tests have been subject to the principle of proportionality.

In terms of regular reporting, most of the managers include in the semi-annual Risk Report information on compliance with the provisions of EU Regulation 2088/2019 on aligning existing policies with the new legislative requirements on ESG risks. In this respect, for some managers, a number of changes have been made to the reporting system of risk exposures and risk management processes by adding sustainability risks as well as providing details on the frequency of operational risk reviews. Accordingly, the teams analysed sustainability (or sustainability-related) risks based on the internally developed ESG scorecard, through which the sustainability criteria for the portfolio asset classes (equities, corporate bonds, and mutual funds) were studied.

There have also been entities that have considered covering all risks in the risk management process and have included ESG risks in their internal reviews. As such, sustainability risk assessment was also included in the reviews carried out for issuer endorsement/review where information was available. Among the main activities carried out in the area of risk management, the review and improvement of the framework for assessing and monitoring reputational risk at the level of the issuers in the portfolio was also identified through the use of ESG rating information available on commercial platforms dedicated to this type of assessment. At the same time, the non-compliance risk mapping process carried out was assessed, and the non-compliance with legal provisions on sustainability risks. Also, at the level of some entities, a number of changes in internal procedures for introducing ESG risks have taken place, thus, on the one hand, a weekly report on ESG risk has been introduced, on the other hand, policies have been harmonised with the new legislative requirements, and in the case of the risk profile it has been updated in compliance with the legislative requirements on ESG risk. In addition, in the case of an entity aiming to meet the requirements of European regulations, the commitment to sustainability has been further strengthened through the establishment of a Group-wide Responsible Investment Committee, which operates under a dedicated guide.

We note that the objective of such a guide is to guide the management framework for integrating ESG factors into the investment decision-making process, promoting a sustainable business model and a positive impact. Thus, entities as long-term institutional investors and asset owners have a fiduciary duty to their stakeholders and are required to act accordingly by monitoring companies in their managed portfolios, as well as establishing an ongoing dialogue on financial and non-financial areas, including ESG issues, to identify best practices in governance, business ethics, social cohesion, and environmental protection.

In view of the above, we will now list the main measures implemented by private pension managers with regard to ESG risk integration:

- Most managers include in the Half-Yearly Risk Report submitted to the Financial Supervisory Authority information on compliance with the provisions of EU Regulation 088/2019 on aligning existing policies with new legislative requirements on ESG risks, although there is no legislative provision for managers to include ESG risks in the Half-Yearly Risk Report;
- Changes to the risk exposure reporting system and risk management processes by adding sustainability risks as well as providing details on the frequency of operational risk reviews. Accordingly, a number of

entities analyse sustainability risks on the basis of an internally developed ESG scorecard, through which sustainability criteria for portfolio asset classes (equities, corporate bonds, and mutual funds) are studied;

- Covering all risks in its risk management process, which means that it has included ESG risks in its internal checks. As such, the sustainability risk assessment was included in the analyses carried out for the approval/review of issuers, for issuers that had this information available;
- Reviewing and improving the risk assessment and monitoring framework for portfolio issuers by using ESG rating information available on a commercial platform dedicated to this type of assessment.

The privately managed pension system in the non-bank financial markets plays an important role in achieving sustainable development goals, playing a particularly important role in encouraging investment in projects that are sustainable from both an environmental and a social perspective.

Finally, together with these guidelines, the Financial Supervisory Authority considers it particularly important to take into account the "Supervisory Principles for Private Pensions" - IOPS and the best practice paper on investment governance of pension funds published by the OECD and IOPS in order to align with the provisions of Regulation 2088/2019.

In the context of the European prioritisation of sustainability, the Bucharest Stock Exchange has published a section dedicated to the ESG scores[50], independently calculated for 2021 by the company Sustainalytics, a global provider of ESG ratings and analysis. At the time of this report, the section contained ESG scores calculated for 21 listed companies, of which 20 are equity issuers and one is a bond issuer. Five indicators were calculated for each of these companies and are described below.

[50] https://bvbresearch.ro/ReportDashboard/ESGScores

Table 38 Description of the indicators used for ESG scores

ESG Risk Score	This indicator measures the extent of ESG risks not managed by the company. A lower score indicates a more limited extent of unmanaged ESG risks.
ESG Risk Ranking Score	This metric shows the ranking of the company at the sub-industry level at which it is classified according to the Sustainalytics methodology. A higher ranking means better ESG performance compared to similar companies in the area covered by Sustainalytics.
Exposure	This indicator assesses the company's exposure to various material ESG risks. The Exposure Score indicator calculated by Sustainalytics takes into account not only the specifics of the sub-industry in which the company operates but also individual company characteristics such as the business model. A higher score indicates a higher exposure of the company to material ESG risks.
Management	The Management Score indicator assesses the extent to which identified ESG risks are managed by company management, based on publicly available programs, practices, and policies. A higher score indicates better management performance in managing identified ESG risks.
Momentum	This parameter indicates the evolution of the ESG Risk Rating parameter compared to the previous period analysed. A negative score represents an improvement in the level of unmanaged ESG risks. Momentum Score is not available if the issuer has been included in the project in the last year or if it has changed since the previous year.

Source: BVB Research Hub, Sustainalytics, ASF processing

Table 39 Overview of the companies evaluated and their ESG scores

Company Name	ESG Risk Score	ESG Risk Ranking Score	*Top*	Exposure	Management	Momentum
Issuers of shares						
Alro Slatina	29.4	10/36 top 26%	26%	53.4	49.4	-5.7
Antibiotice Iași	24.5	22/473 top 5%	5%	48.5	53.3	-0.9
Aquila	22.4	51/95 top 54%	54%	33.3	37.2	n/a
Banca Transilvania	17	28/376 top 8%	8%	36.8	56.4	n/a
BRD GSG	15.4	23/409 top 6%	6%	41.3	66.8	-3.8

Burs de Valori București	23.1	34/49 top 69%	69%	31.6	28.4	6.1
Electromagnetica	18.1	105/139 top 76%	76%	23.3	23	0.3
Farmaceutica Remedia	16.7	15/46 top 32%	32%	23	28.9	-1.6
Impact	18.7	25/87 top 29%	29%	29.4	39.3	-2.7
Norofert	35.8	17/56 top 30%	30%	59.3	44.2	n/a
Nuclearelectrica	23	38/302 top 13%	13%	56.7	63.9	3.6
OMV Petrom	22.5	3/55 top 5%	5%	68.2	78.6	n/a
One United Properties	18.4	92/284 top 33%	33%	34.1	47.5	-1.6
Romcarbon	17.6	28/63 top 44%	44%	29.6	44.6	-5
Rompetrol Well Services	19.2	7/84 top 8%	8%	40	57.8	-22.6
SNTGN Transgaz	27.3	27/112 top 24%	24%	44.2	43.5	-11.7
Societatea Energetică Electrica	29.9	84/302 top 28%	28%	54.8	48.9	-3
Sphera Group	18.7	3/125 top 3%	3%	39.4	55.2	-10.7
Teraplast	22.7	36/143 top 25%	25%	40.4	46.6	0.7
Transport Trade Services	24.8	59/95 top 62%	62%	35.3	33.8	-3.5
Emitenți de obligațiuni						
Autonom services	13.5	7/71 top 9%	9%	26	51.6	n/a

Source: BVB Research Hub, Sustainalytics, ASF processing

At the end of December 2023, private pension funds had investments worth RON 17.07 billion in 14 ESG-scoring equity issuers, representing 55.5% of total equity investments and 13% of total assets. At the same time, private pension funds held in aggregate between 0.6% and 27.4% of the shares issued by ESG-scoring companies in their portfolios

Table 40 Investments of private pension funds in Romanian issuers with ESG score

Issuer	Value in portfolios of private pension funds as at 31.12.2023	Percentage held by pension funds of total shares issuer
Alro SA	96,946,778	8.8%
Antibiotice SA	5,226,087	0.6%
Aquila Part Prod Com SA	258,912,189	23.5%
Banca Transilvania SA	5,302,450,728	27.4%
BRD - Groupe Societe Generale SA	2,283,741,000	18.3%
Bursa de Valori Bucuresti SA	113,990,430	21.6%
Electrica SA	919,037,565	23.1%
Nuclearelectrica SA	1,384,515,908	9.3%
OMV Petrom SA	5,092,103,079	14.2%
One United Properties SA	72,332,276	1.9%
Sphera Franchise Group SA	121,870,531	12.2%
Teraplast SA	263,343,897	23.5%
Transgaz SA	764,451,248	21.5%
Transport Trade Services SA	393,856,209	24.3%
Total shares with ESG score	17,072,777,924	
Total assets of private pension funds	30,736,025,312	
Total assets of private pension funds	131,482,671,182	

Source: BVB Research Hub, Sustainalytics, ASF, ASF processing .

Annex 1 - Calculation methodology for CoVaR, Delta CoVaR and Marginal Expected Loss (MES) indicators

The CoVaR and Delta CoVaR measures come from investigations by Adrian and Brunnermeier (2016)[51] and are based on value-at-risk for an institution Xi and a specified quantile α.

As specified by Adrian and Brunnermeier (2016) we start by estimating the VaR, CoVaR, and ΔCoVaR measures. The VaR specification measures the maximum loss for a financial institution given an exogenously fixed probability †%.

Let $\{X1,t, X2,t\}$: t = 1,2, … , T the yields for financial institutions 1 and 2 $VaR^1_{\alpha,t}$ for financial institution 1 is calculated by the form:

$$Pr\left(X_{1,t} \leq VaR^1_{\alpha,t}\right) = \alpha\%$$

The CoVaR will be the value-at-risk for a financial institution determined by a specific event of another financial institution. The CoVaR statistic for financial institution 1, determined by the unfavourable dynamic specific to institution 2, is formally expressed as:

The CoVaR will be the value-at-risk for a financial institution determined by a specific event of another financial institution. The CoVaR statistic for financial institution 1, determined by the unfavourable dynamic specific to institution 2, is formally expressed as:

$$Pr\left(X_{1,t} \leq CoVarR^{1|2}_{\alpha,\beta,t} | X_{2,t} \leq VaR^2_{\beta,t}\right) = \alpha\%$$

Where:

$$Pr\left(X_{2,t} \leq VaR^2_{\beta,t}\right) = \beta\%$$

For the quantile β specific $X_{2,t}$

Acharya et al. (2017) demonstrate that it is possible to isolate the systemic risk contribution of a given institution using marginal expected shortfall (MES). The mathematical form of the model is:

$$MES^B_{5\%} = \frac{1}{number\ of\ days} \sum_{\{\text{t: quantile 5\% of the system}\}} R^b_t$$

Further evaluating the methods proposed by Acharya et al. (2017)[52] we notice a more refined definition of the model. The authors define MES as the short-term loss for a firm influenced by the market recording a loss in excess of its value-at-risk for †%.

Let $r_{i,t}$ be the daily logarithmic return for the firm and $r_{m,t}$ be the daily return of the specific market index on which the firm operates. Under these conditions the MES becomes:

[51] Acharya, V. V.; Pedersen, L. H.; Philippon, T.; Richardson, M. Measuring systemic risk. The Review of Financial Studies 2017, 30(1), 2-47

[52] For a comprehensive discussion of the construction of the measures see Adrian T.; Brunnermeier M.K. CoVaR. American Economic Review 2016, 106(7), 1705-1741.

$$MES_{i,t} = E_t(r_{i,t+1}|r_{m,t+1} < q_{\alpha,t}(r_{t+1}) = C)$$

$$MES_{i,t} = E_t(r_{i,t+1}|r_{m,t+1} < C)$$

Where C is a constant for what we want to consider "tail risk".

Let also *Expected shortfall* (ES) for a market be the expected loss at the index level conditional on this loss being greater than threshold C.

$$ES_t = E_t(r_{t+1}|r_{t+1} < C)$$

When all the firms analysed are part of a specific market, it is easy to see that the MES for a firm is the derivative of the ES market value by market capitalisation, which explains the term "marginal" in the title of the measure. It is useful to specify that in this case, the MES value for a firm can be interpreted as its share in the total systemic risk of the market[53] .

[53] See Idier et al. (2013) How Useful is the Marginal Expected Shortfall for the Measurement of Systemic Exposure? A practical assessment, European Central Bank Working Papers Series, no. 1546/May 2013

Annex 2 - Calculation methodology for rational speculative bubble testing

In a series of papers with great influence on academic research, Phillips, Wu, and Yu (2011)[54] and Phillips, Shi, and Yu (2015)[55] developed modelling frameworks for testing the existence of speculative bubbles. Building on these contributions, the most relevant testing procedures - SADF (sup augmented Dickey-Fuller) and the generalized version of the test (GSADF) - have been used in a battery of empirical studies in which the explosive nature of the data is interpreted as the presence of a speculative bubble. The scope of this research has covered the full spectrum of financial markets, from investigations of equity markets (Nguyen and Waters, 2022) to studies of currency dynamics (Hu and Oxley, 2017).

The Generalized Sup ADF (GSADF) test is a statistical test used to detect the presence of a unit root in a time series. This property indicates the presence of a trend that cannot be explained by the current stochastic process. The GSADF test is an extension of the traditional Augmented Dickey-Fuller (ADF) test, which is used to test for a unit root in a univariate time series. If a financial time series exhibits a unit root, it means that the mean and variance of the series will change over time and is considered non-stationary. In other words, there is a trend that cannot be explained on the basis of the stochastic process. In the context of speculative bubbles, this could indicate that the current price of an asset is determined by certain trading patterns (speculative or perception-induced in nature) rather than elements of the fundamental value of the asset

The GSADF test for explosiveness applied to $\{y_t\}_{t=0}^{T}$ series is derived from the ADF statistic for a θ shape parameter:

$$y_t = c + \theta y_{t-1} + \sum_{i=1}^{k} \lambda_i \Delta y_{t-1} + \varepsilon_t \qquad (1)$$

Where: Δ represents the first difference operator, and $\varepsilon_t \sim (0, \sigma^2)$. The objective is to test the null hypothesis of u $H_1: \theta = 1$ versus the explosive alte $H_1: \theta > 1.$

Phillips, Shi, and Yu (2015) define the SADF statistic as the sup-ADF statistic that derives from the recursive estimation of the empirical regression in Equation 1. Considering a subsample bounded by $r1$ and $r2$, the test formalization is given bv:

$$SADF(r_0) \equiv sup\{ADF_{r_1=0}^{r_2}\}$$

The GSADF test is based on the same logic as above, but uses more subsamples in the regression processing of Equation 1. The sta $GSADF(r_0) \equiv sup\{ADF_{r_1}^{r_2}\}$

[54] Phillips, P. C., Wu, Y., & Yu, J. (2011). Explosive Behavior in the 1990s NASDAQ: When Did Exuberance Escalate Asset Values? International Economic Review, 52(1), 201-226.

[55] Phillips, P. C., Shi, S. and Yu, J. (2015) Testing for Multiple Bubbles: Historical Episodes of Exuberance and Collapse in the S&P 500. International Economic Review, 56, 1043-1078.

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