

MACROPRUDENTIAL RISK SCANNER

2021 - Fourth Quarter

Number VII, April 2022



Publisher:

The Croatian Financial Services Supervisory Agency

Franje Račkoga 6

10000 Zagreb

www.hanfa.hr

Telephone: +385 1 6173 200

Fax: +385 1 4811 406

ISSN 2671-2067

Those using data from this publication are requested to cite the source.

Contents

- Contents 3
- 1. Introduction..... 4
- 2. Macroeconomic and financial environment risks..... 6
 - 2.1 Macroeconomic environment..... 6
 - 2.2 Financial environment 10
- 3. Financial services sector risks 14
 - 3.1 Short-term risks..... 14
 - 3.2 Long-term risks..... 17
- Box 1 Do domestic institutional investors display procyclical investment behaviour? 20
- Box 2 The impact of the Ukraine crisis on the operation of the financial services sector..... 27
- Box 3 LEI - 20 characters which reduce risks to financial stability 31
- List of abbreviations..... 35

1. Introduction

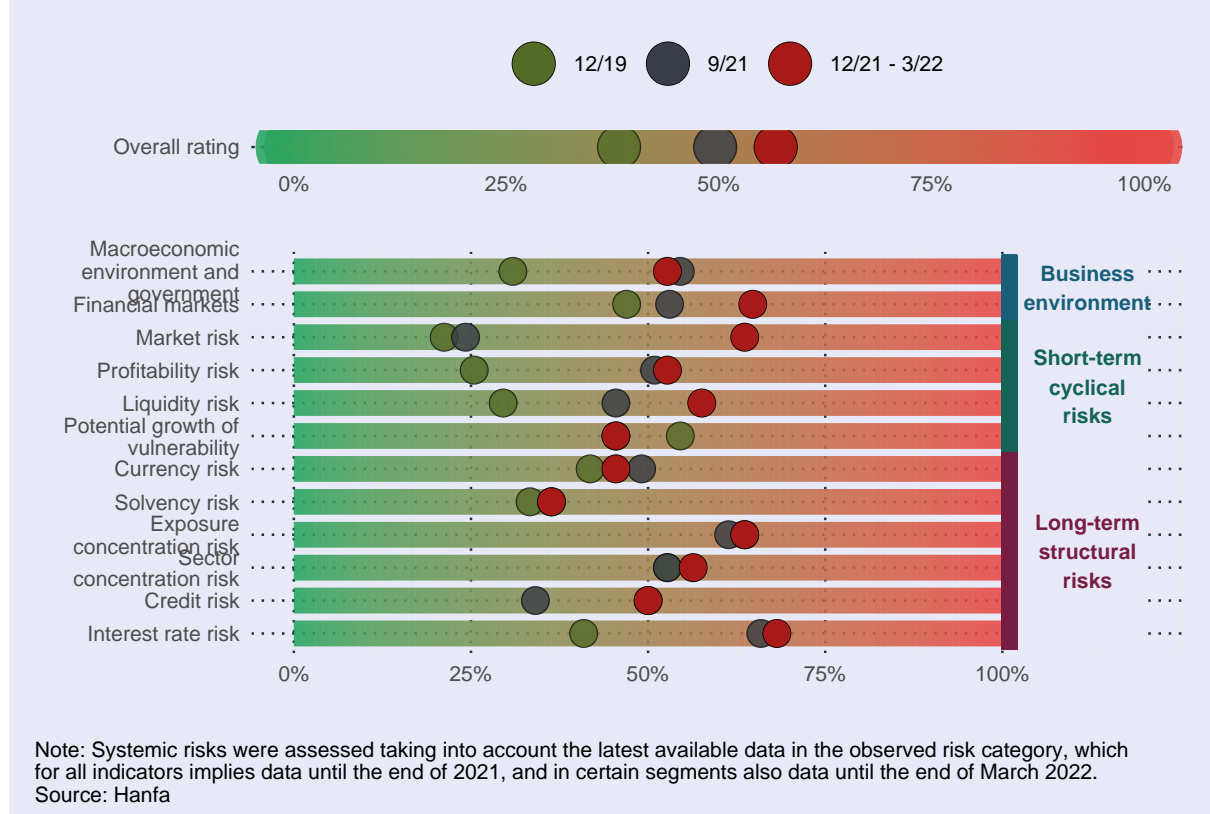
Together with the Croatian National Bank and the Ministry of Finance, the Croatian Financial Services Supervisory Agency (hereinafter: Hanfa) is responsible for the stability of the financial system in the Republic of Croatia, therefore promoting and preserving financial stability, in accordance with the Act on the Croatian Financial Services Supervisory Agency, is one of the basic goals of its work. A *stable financial system* implies the smooth functioning of all its segments (financial institutions, markets, services and infrastructure) in the process of resource allocation, risk assessment and management, and carrying out payments, as well as its resistance to sudden shocks.

Financial stability can be disrupted by the processes that arise and develop within the system, creating vulnerabilities that may materialize in the event of certain shocks in the form of disturbed liquidity and capital positions of financial institutions, disabling the smooth functioning of a part or the entire financial system. Such shocks can be external, i.e. transferred from the international environment, or idiosyncratic, i.e. generated by domestic macroeconomic and financial developments, economic policy or changes in the institutional environment. Therefore, any risk to which the system is exposed and which can have adverse effects on the functioning of the entire financial system or its part, thus causing a serious negative impact on the real economy, represents a *systemic risk*.

Over the past few years, global progress has been made in the area of understanding and consequently identification, evaluation and monitoring of systemic risks of the financial sector. However, in order to prevent the identified risks in time, and to mitigate the effect of their materialisation, it is necessary to develop an appropriate set of instruments and tools, i.e. policies aimed at preservation of the stability of the system as a whole, called *macroprudential policies*. Therefore, in the European Union (EU), bodies with macroprudential powers have been established at the national and international level after the global financial crisis, and frameworks for international cooperation have been developed along with macroprudential tools. Although in the initial phase of macroprudential capacity development, the focus was primarily on the banking sector, the growing share and importance of the non-banking part of the financial system creates structure changes and requires further development of the macroprudential framework, as well as the expansion to the financial services sector in order to adequately address systemic risk and prevent regulatory arbitrage. In addition, financial integration is constantly deepening, creating the need for a holistic approach, which the system views as an inseparable whole, the key part of which consists of monitoring and addressing vulnerabilities in a cross-sectoral, but also cross-border context.

The publication *Macroprudential risk scanner* therefore seeks to provide insight into the process of identifying, assessing and monitoring the evolution of systemic risks in the financial services sector under Hanfa's supervision, in order to timely take appropriate measures to prevent their materialisation and the impairment of the financial system stability. This contributes to better understanding of systemic risks, particularly in the vulnerability identification and risk spreading segment, encourages action planning and measures that provide adequate protection against the materialisation of such risks and contributes to greater confidence in the financial system and strengthening the system's resistance to shocks.

Figure 1 Systemic risk matrix - 4Q 2021



The new worsening of the epidemiological situation at the end of 2021 was not accompanied by a worsening of macroeconomic trends, but instead the economy recorded stable growth in that period, with the simultaneous acceleration in the growth of the general price level. Under the impact of rising global inflation rates, the beginning of 2022 was marked by tightening global monetary policy, spilling over to an increase in volatility in financial markets and partial price adjustments of financial instruments. The rise in geopolitical risks caused by the Ukraine crisis exacerbated the already expressed inflationary pressures and damaged investor sentiment. Consequently, the exposure of the financial services sector to market risk increased with a simultaneous slight increase in interest rate risk, given the significant increase in interest rates and returns, as well as the increase in probability of future materialisation of this risk. Although these developments had a negative impact on the returns of institutional investors' investment portfolios, and in certain segments caused mild liquidity pressures, the recent increase in systemic risks was nonetheless significantly less pronounced than at the beginning of the COVID-19 crisis and did not significantly threaten the stability of the financial services sector. Nevertheless, the existing globally high levels of valuation of financial assets, in particular stocks, increase the likelihood of future price adjustments in global financial markets.

2. Macroeconomic and financial environment risks

2.1 Macroeconomic environment

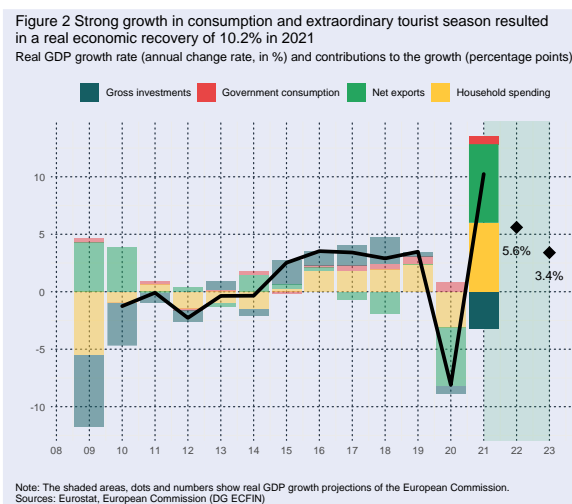
At the end of 2021, the exposure of the financial services sector to systemic risks slightly decreased primarily due to the strong recovery of the economy and its positive impact on the labour market and the improvement of relative fiscal indicators. A significant recovery and a more pronounced decline of vulnerability are hampered by an accelerated rise in prices, which reduces the purchasing power of households and consequently slows down consumption. An additional source of uncertainty and obstacles to the continuation of positive economic trends, in addition to still present epidemiological measures, is the escalation of geopolitical risks associated with the beginning of the war in Ukraine and sanctions imposed on Russia.

The last quarter of 2021 was marked by the re-escalation of the pandemic caused by the Omicron variant of the coronavirus. Despite the very high daily number of new cases, comparatively milder clinical pictures of the infected persons did not require additional restrictive epidemiological measures, which is why the new wave of the coronavirus pandemic did not significantly affect economic growth.

After the recorded two-digit economic growth rates in the second and third quarters, recovery continued in the last quarter of 2021, although in a somewhat slower manner. In the fourth quarter of 2021, gross domestic product was in real terms 9.7% higher than in the same quarter of 2020, mainly due to favourable net exports and increased personal consumption (Figure 2). At the level of the whole 2021, the real economic growth rate reached 10.2%. This completely offset the impact of the historically largest decrease of the gross domestic product of the

previous year and realised the scenario of V-recovery.

However, the escalation of the military conflict between Ukraine and Russia at the end of February 2022 (Figure 4), adversely affected the perception of recovery. Economic sanctions imposed by Western countries in response to the armed conflict will have repercussions on the European economy as well, primarily because of the expected increase in energy prices, but also because of the decrease in trade volume. Europe's dependence on imports of Russian energy products coupled with already high inflation pressures will inevitably affect consumer consumption and sentiment, which is already declining (Figure 3) and consequently a slowdown in economic growth. It is hard to predict the overall impact of these channels on European economies, but it is clear that it will depend on the duration of the conflict and the way in which it will end. Therefore, the current macroeconomic projections are exposed to strong negative risks.



Strong economic growth in 2021 kept the labour market conditions positive and consequently reduced vulnerabilities in that market. Despite the usual seasonal increase in unemployment at the end of the year¹, the administrative

unemployment rate was by 0.4 p.p. higher than at the end of September.

¹ With the end of the tourist season, during which a large number of seasonal workers are employed, there was a regular increase in unemployment. At the end of December 2021, the administrative

unemployment rate stood at 7.8% at the end of January 2022 and reached the pre-crisis level from the end of 2019 (Figure 5). Almost all economic activities recorded employment growth in 2021, which, in addition to partial labour shortages in certain segments, created pressure on nominal general increase in net salaries, which increased by 4.0% in 2021. This growth was also contributed by the tax changes from the beginning of 2021, which reduced the rates for income taxation. However, due to the acceleration of the growth of general price level, the average net salary decreased by 1.4% in real terms in 2021. This reduced the purchasing power of households, which, with expectations for further price increase at the beginning of 2022, was reflected in the slowdown of personal consumption (Figure 3).

Figure 3 Slowdown in household consumption in circumstances of accelerated price growth

Economic sentiment indicator and its components, 100 = long-term average indicator value

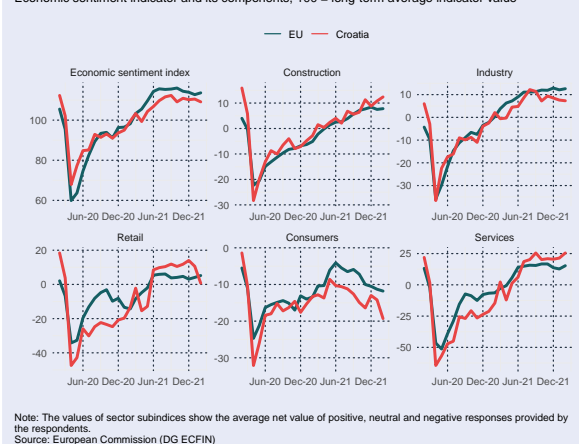
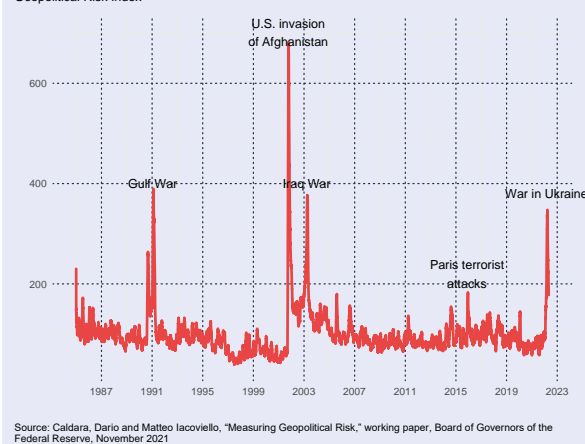


Figure 4 At the beginning of 2022, geopolitical tensions reached the highest level in the last 19 years

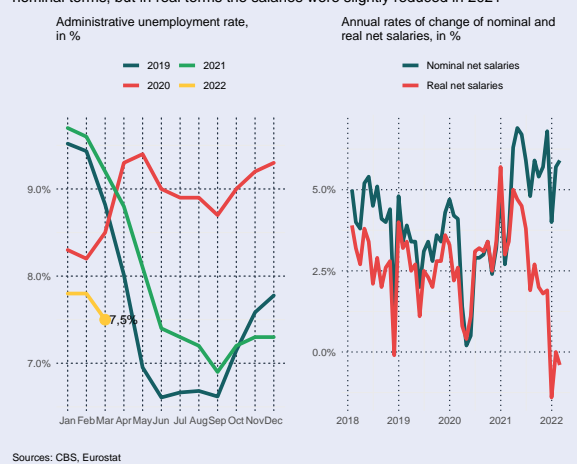
Geopolitical Risk Index



The accelerated rise of the general price level recorded in the previous period increases the

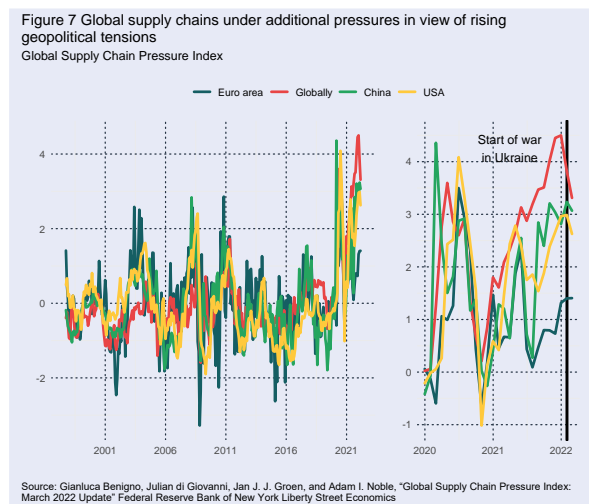
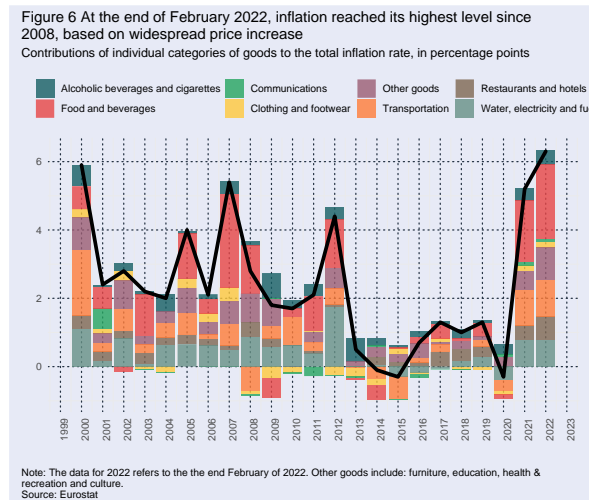
possibility of materialisation of systemic risks. At the end of February 2022, the annual rate of change in the consumer price index stood at 6.3%, the highest value recorded since October 2008. All components of the market basket influenced the increase in the inflation rate (Figure 6). The greatest contribution to the high inflation rate comes from the rise in the prices of goods belonging to the category of transport and food and beverages, as well as energy products, which were under additional pressure from the escalation of the conflict in Ukraine, with a tendency for further growth in the coming period. The still pronounced supply side distortions (Figure 7) and rising demand due to accelerated opening of the economy, strong growth in energy prices on world markets, but also the base effect caused by the "atypical" 2020 are the primary drivers of price growth both in Croatia and in the surrounding region. The disappearance of the baseline effect and the expected balancing of supply and demand are working towards a slowdown in price growth in the second half of 2022. According to the latest available [forecast of the European Commission](#) (from February 2022), the annual inflation rate in Croatia will reach 3.5% in 2022, while it will decrease to 1.6% in 2023.

Figure 5 Maintained employment led to an acceleration of salary growth in nominal terms, but in real terms the salaries were slightly reduced in 2021



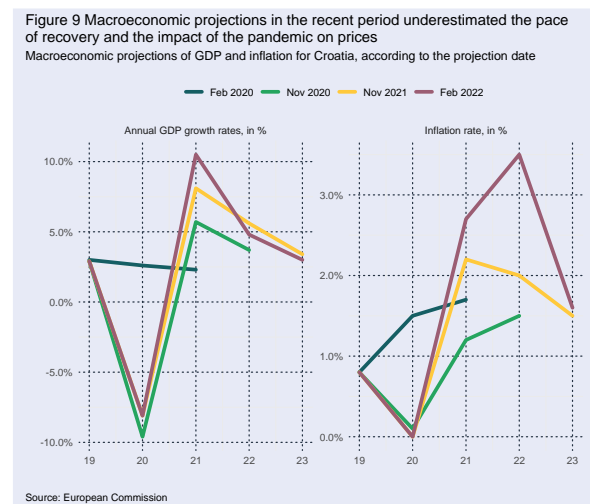
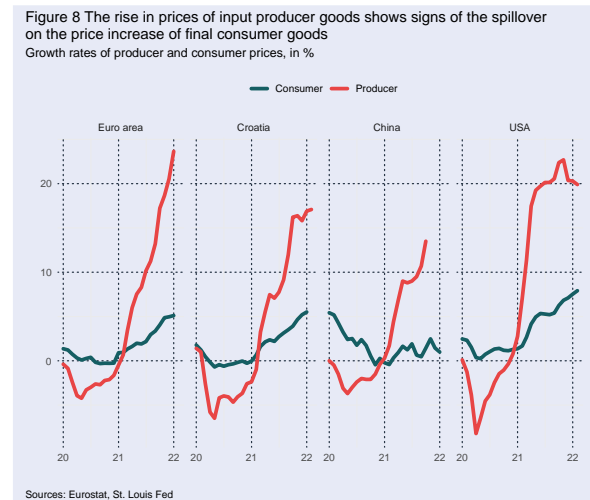
These projections are exposed to significant negative risks, which can act towards further acceleration of price growth. This primarily refers to the further escalation of geopolitical relations, which will create additional pressure on input

prices, primarily of energy and cereals, whose growth after the temporary absorption was shifted by producers to buyers through the increase in prices of final products (Figure 8). Demand side factors in the form of revised inflation expectations and a relatively strong labour market and labour shortages in certain segments of the economy, as reflected in the growth of nominal wages, could incite an inflationary spiral in 2022.



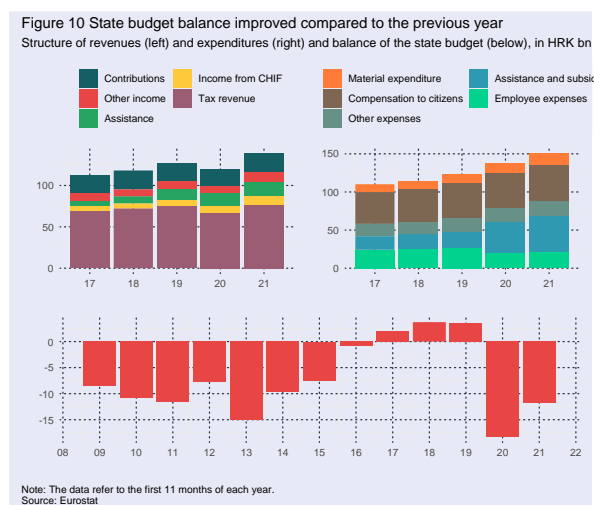
These developments led to significant revisions of macroeconomic expectations compared to those at the beginning of the pandemic, when macroeconomic forecasters repeatedly underestimated the pace of economic recovery, but also the effect that the pandemic and the aforementioned recovery may have on the prices of goods (Figure 9). Underestimating the dynamics of inflation in the coming period and the potentially delayed response of economic

policy makers can create a significant shock with negative consequences on market valuations and questionable efficiency in suppressing the awakened inflation. On the other hand, a premature or overly strong response by monetary authorities may compromise the vulnerable recovery of economies, which is burdened by the still present struggle with the pandemic, but also by the escalation of geopolitical risks.



Driven by the continued economic recovery and the reduced need for economic support measures following the COVID-19 crisis, the relative indicators of public finances improved in 2021. According to the Ministry of Finance, both revenues and expenditures increased in the first 11 months of 2021 compared to the same period in 2020, with the total balance reduced by HRK 6.5bn amounting to -2.7% of GDP (Figure 10). The largest contribution to the growth of

revenues is accounted for by the VAT tax income as the main budget filling channel, which, based on the recovery of personal consumption, but also the substantial price growth, was higher at the end of November than in the comparable period in 2019². At the same time, on the expenditure side, the greatest decrease was recorded with regard to subsidies due to a significant reduction in the amount of support measures for the preservation of jobs aimed at business activities affected by the COVID-19 pandemic³.



In view of the economic recovery, public debt as a percentage of GDP decreased by 3.7 p.p. at the end of the third quarter compared to the previous quarter and remained at 82.4%. In 2021, the Ministry of Finance issued 3 bonds having a cumulative value of HRK 9bn and EUR 2bn with an average interest rate of 1.08%, which were used to refinance the maturity of bonds with a slightly lower nominal principal value⁴ with an average interest rate of 5.01%. This effectively increased public debt by slightly less than EUR 1bn. However, at the same time, the annual cost of financing this part of debt was reduced by two thirds. Therefore, the improvement of the

relative debt indicator is entirely due to the growth of domestic product, while in absolute terms public debt at the end of September was by 1.0% higher than in June 2021. Improvements in public finance indicators were reflected in the improvement of Croatia's credit rating, [raised by Fitch to BBB in mid-November with a positive outlook](#), while S&P confirmed BBB- investment rating in March 2022, despite an uncertain geopolitical situation.

In addition to the already mentioned consumer and producer prices, the increase in residential real estate prices that started in 2017 continued throughout the entire pandemic period⁵, further emphasizing cyclical systemic risks in the system. Due to the long-term environment of low interest rates, real estate has become a relatively more attractive way of investing than standard forms of savings and/or investment. Given the rising inflation rates, it can be expected that the attractiveness of real estate investment will not decrease. In addition, an important determinant of price dynamics on demand side is foreign demand, which will probably increase with Croatia's entry into the euro area, while at the same time domestic demand is supported by the existing financing conditions, state subsidies and the absence of direct tax burden on real estate. On the other hand, pressure on the price increase also comes from the supply side as input prices for materials, land and labour rise, especially considering the post-earthquake reconstruction process. Consequently, at the end of the third quarter of 2021, residential real estate prices were by 9.0% higher than in the same period of the previous year, with all categories of real estate irrespective of location and age recording growth⁶.

² VAT income increased by HRK 9.0bn in the first 11 months of 2021 in relation to the same period of 2020, i.e. by HRK 2.2bn in relation to the same period in 2019.

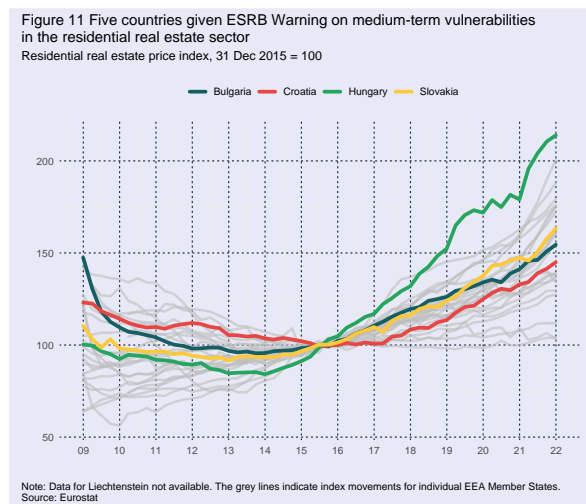
³ At the end of November, subsidies were by HRK 2.3bn less than in the same period in 2020.

⁴ The nominal value of the principal of due bonds was \$1.5bn, HRK 9bn and HRK 0.5bn.

⁵ The house price index increased by 13.2% between the end of 2019 and the third quarter of 2021.

⁶ In the third quarter of 2021, residential real estate prices in Zagreb increased by 9.6%, in the Adriatic region by 8.9% and in other regions by 8.2% on an annual level. During the same period, new residential buildings recorded an increase by 8.5% and existing ones by 9.2% on an annual level.

In this regard, the European Systemic Risk Board issued a [Warning on medium-term vulnerabilities in the residential real-estate sector in Croatia](#) late last year following a regular analysis of the housing market in European countries. The warning assessed that the identified medium-term weaknesses in the residential real-estate sector in Croatia could be a source of systemic risk and affect financial stability, which is why further development and implementation of macroprudential and other measures to mitigate these risks are expected.



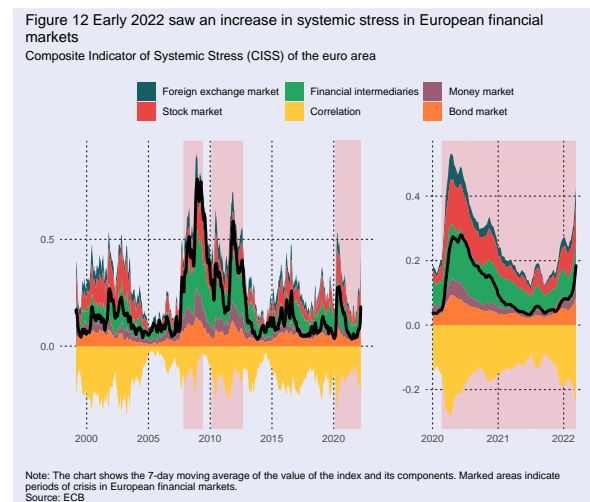
2.2 Financial environment

Growing macroeconomic uncertainties and the intensification of geopolitical tensions in February marked the beginning of 2022 and consequently raised systemic risks in financial markets to a higher level (Figure 12). The announcements of a remarkable reversal in the monetary policy of leading central banks are anticipated through the growth of volatility and returns (Figure 15), as well as occasional price adjustments in certain market segments (Figure 17). The adjustments were particularly pronounced in segments whose valuations significantly depend on the movement of discount interest rates, i.e. in the segment of risky debt securities and equity securities whose valuations are based on future expected cash flows (the so-called growth companies).

⁷ See the statement at the following [link](#).

⁸ Unlike in 2021, when the target dynamics amounted to EUR 20bn per month, for 2022 net purchases are planned in the amount of

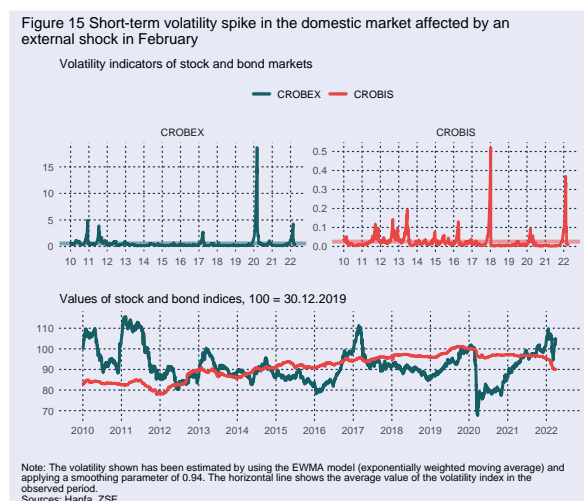
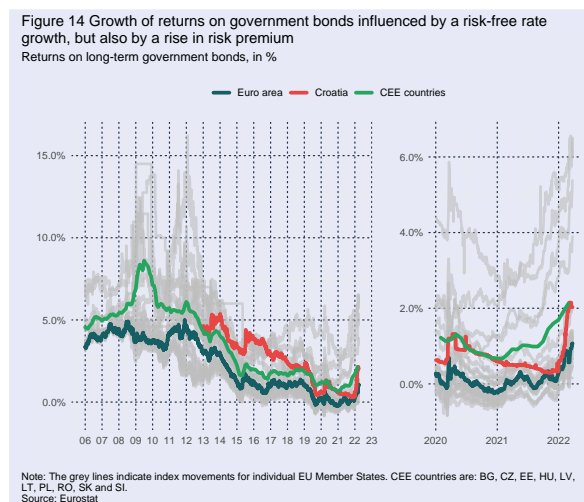
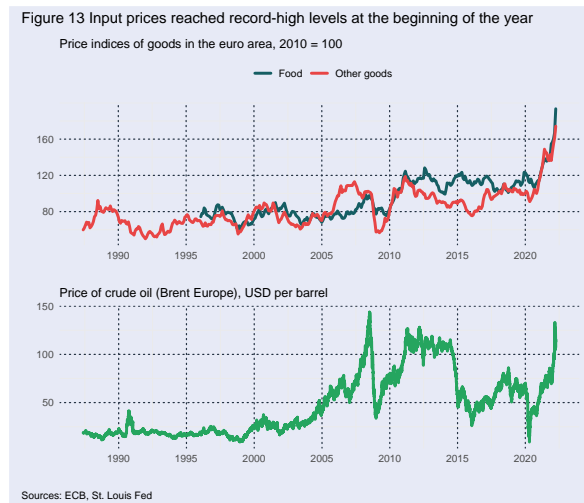
Global inflationary trends (Figure 13) created pressure on the profitability of companies, which therefore began to shift the rise in input prices in the second half of 2021 to consumers (Figure 8). As a result, in early 2022, the inflation indicators reached the levels last time recorded several decades ago, significantly aggravating the views of monetary policy makers.



At its last session in March 2022, the Fed increased the range of reference interest rate by 25 b.p. to 0.25% – 0.50%. It also announced it would further raise it by 25 b.p. at all six meetings this year, as well as additional three increases in 2023, when the reference interest rate should reach 2.8%. In March, the ECB also responded to increased pressures and published new guidelines on the dynamics of securities purchases⁷. At the end of March, net purchases as part of the intervention purchase of government bonds due to the pandemic (Pandemic Emergency Purchase Programme - PEPP) will be discontinued, while monthly net purchases as part of the Asset Purchase programme (APP) will be slightly higher than last year's⁸. At the same time, the ECB did not change reference interest rates on the basis of the assessment that the sources of current inflation growth are mostly on the supply side and the fact that the euro area economy is affected by sanctions imposed on Russia and

EUR 40bn in April, EUR 30bn in May and EUR 20bn in June, and for the third quarter it will depend on recent circumstances.

rising energy prices, which is slowing down the expected growth of the economy in 2022.

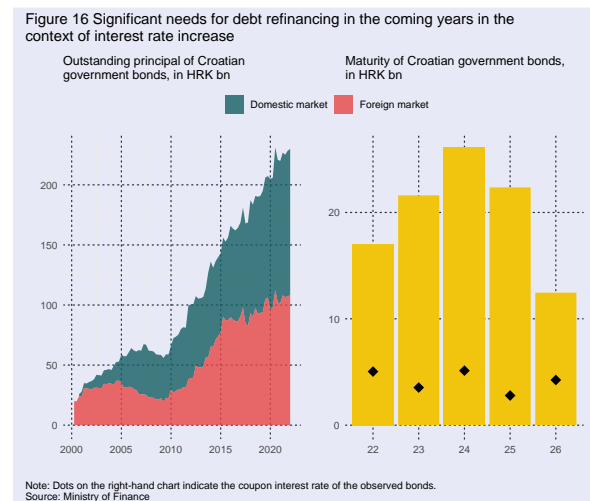


The expected monetary tightening in March 2022 was incorporated by markets into the required returns at the beginning of the year, so in addition to an increase in the risk-free part of

returns, the global risk premium increased, which increased systemic stress on bond markets.

The escalation of the situation in Eastern Europe further shook the confidence of investors and led to the escape to assets of highest quality perceived as more secure. In February and March, the returns on top-quality government bonds separated from other bonds. Returns on long-term Croatian government bonds reached a level of 2.03% at the end of March, which was by 1.7 p.p. higher than the value recorded at the end of last year (Figure 14).

The rise in risk-free interest rates and growing uncertainty reduce the present value of future cash flows, which is reflected in the upward trend in volatility in the domestic capital market (Figure 15). Consequently, the value of the CROBIS bond index at the end of March 2022 was 5.9% lower than at the end of 2021, while the value of the CROBEX stock index in the same period grew slightly by 0.9%. Reduced valuations also had a negative impact on the returns of domestic funds, which started the year in the negative after good results in 2021 (more information in Chapter 3 Financial services sector risks).



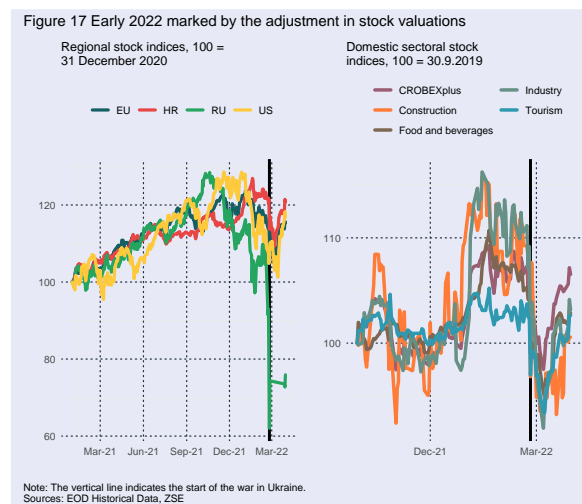
The continuation of the observed trends in the coming period will primarily depend on general conditions in financial markets, but also on the sustainability of fiscal indicators and the credit rating of countries. The upgrade of Croatia's credit rating at the end of last year to BBB with a positive outlook by the Fitch agency, and

confirmation of its investment rating by S&P agency in mid-March this year had a positive effect on the perception of the security of the government sector and in part facilitates future borrowing in the current circumstances. During 2022, HRK 16.9bn of bonds will mature, and in the next three years the need for financing will be even greater⁹ (Figure 16).

In a probable scenario of interest rate increase, the perception of the credit risk of Croatian government bonds by investors will largely determine the costs of refinancing of the existing issues, given the dominant share of government bonds in the investment structure of the financial services sector, and indirectly the profitability of the financial services sector. The long-term impact of interest rate growth on the profitability of the financial services sector, assuming an unchanged credit rating, will depend on the relation between short-term decrease in the value of existing bond investments and higher interest income from new bond investments. Although domestic institutional investors did not display procyclical behaviour in recent periods through a significant increase in exposure to credit and interest rate risk in their bond portfolios in search of higher yields, in the current circumstances of pronounced uncertainty they are exposed to high short-term risks (for more information on risk management in bond portfolios of domestic institutional investors, see [Box 1 Do domestic institutional investors display procyclical investment behaviour?](#)).

Price adjustments on European stock markets recorded at the beginning of 2022, which did not bypass the domestic market either (Figure 17), are the result of several factors: inflationary pressures on corporate sector profitability indicators, growth of risk premium due to a rise in

macroeconomic uncertainties in the still vulnerable “post-COVID” economic recovery and at times very high valuations. Positive price trends in stock markets continued during the last quarter of 2021, although this growth was somewhat milder than in the previous period¹⁰. This trend sharply reversed in January and February 2022, when the average adjustment in European markets stood at -1.5% compared to the end of 2021.



Amid the conditions of accelerating consumer price growth, markets are continuously revising their inflationary expectations, which, in addition to rising geopolitical tensions over the situation in Ukraine, negatively affects investor sentiment and increases market volatility (Figure 17). In addition to the escalation of geopolitical tensions, the investor sentiment on the European market was partly influenced by the spillover of volatility from the American stock market caused by the tightening of FED's monetary policy direction and business results relatively poorer than expected in part of the corporate sector¹¹.

Although the domestic stock market did not go through record-high valuation in the previous period, global market corrections and the deterioration of market sentiment (Figure 18)

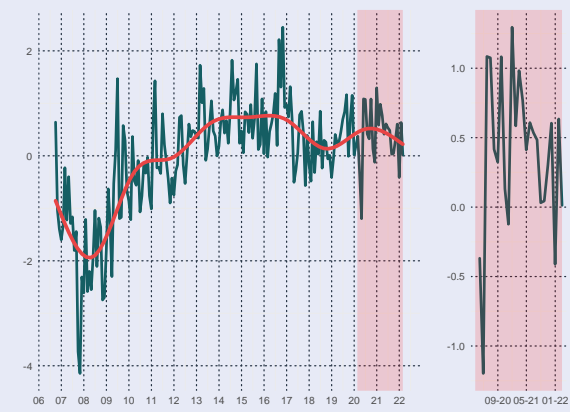
⁹ 30% of the total debt is due by the end of 2021.

¹⁰ At the end of the year, the average quarterly change rate of the leading stock indices of European countries stood at 3.5%, while in the third quarter it was slightly higher (4.0%).

¹¹ The S&P 500 index decreased by 8.2% in the first two months of 2022 compared to the end of the previous year.

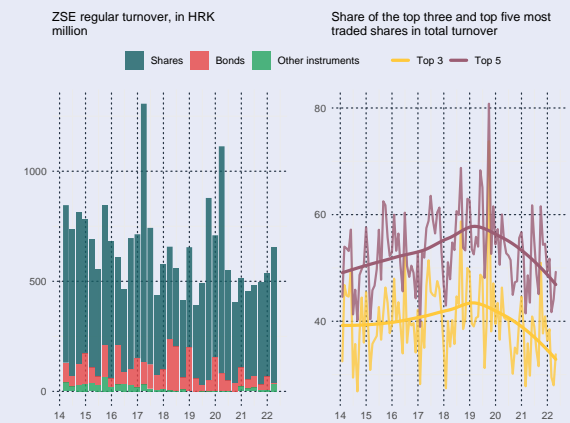
were reflected in the prices on the domestic capital market, so that some sectors, whose operations relied relatively more on imports of materials, such as construction, in February lost up to 10% of value from the end of January 2022.

Figure 18 Worsening investor sentiment amid higher geopolitical risks
Investor sentiment index in the domestic capital market



Note: The highlighted area indicates the crisis period that started on 20 February 2020.
Sources: Bloomberg, Google, Hanfa, ZSE

Figure 19 Increase in domestic market activities with a slight decrease in trade concentration



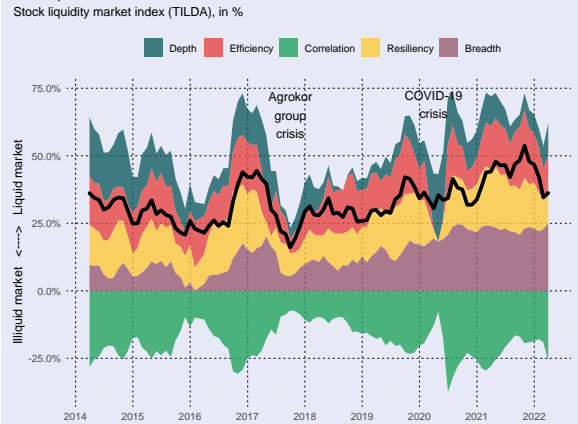
Sources: ZSE, Hanfa

The still relatively high concentration of trading on the domestic market, accompanied by a turnover recovery, continued to decrease in the last quarter of 2021 and early 2022, suggesting that part of the investor's funds was redirected to certain less liquid shares (Figure 19).

At the same time, the liquidity of the domestic stock market decreased slightly, primarily due to

the deterioration of the efficiency indicator, i.e. slightly higher implicit and explicit transaction costs due to increased market uncertainty and a slightly reduced resistance indicator showing price robustness in relation to sudden disruptions, which worsened due to higher volatility at the end of February (Figure 20). Market breadth indicators measuring the impact of the transaction volume on price stability and market depth measuring the trading activity are retained at the existing levels (for more information on the construction of the stock liquidity market index, see [Box 1 Measuring capital market liquidity](#) in the publication Macroprudential risk scanner, No 6). Challenging macroeconomic and financial circumstances with an increased level of systemic risk might continue in the coming period. Although the domestic capital market does not show signs of overestimation and is only marginally exposed to the economies that were subject to sanctions at the end of February, its high integration into international capital flows with detected significant structural vulnerabilities (relatively low liquidity and high trade concentration)¹² expose it to potential additional distortions and corrections.

Figure 20 Liquidity of the domestic stock market under mild pressure from recent developments
Stock liquidity market index (TILDA), in %



Sources: Hanfa and ZSE

¹² At the end of December, almost half of the shares listed on the Zagreb Stock Exchange were traded less than 10 days a month,

while the turnover of the first five shares accounted for 49.3% of the total turnover on the ZSE in December 2021.

3. Financial services sector risks

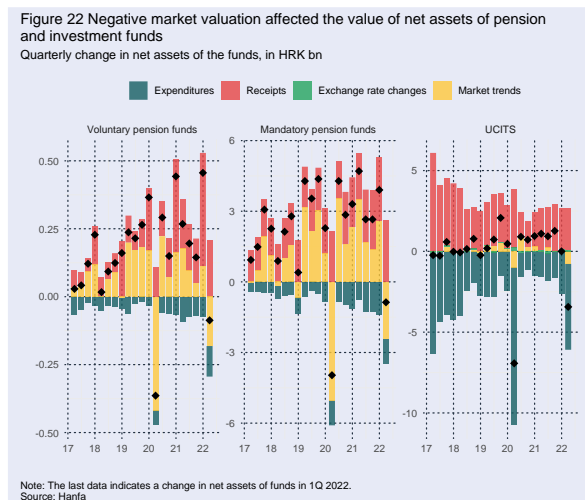
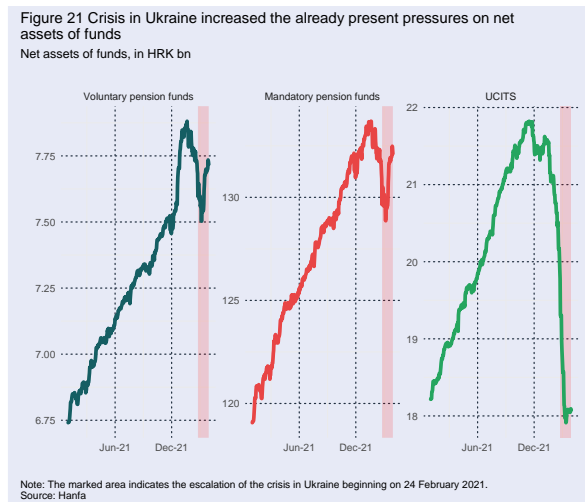
3.1 Short-term risks

The last quarter of 2021 was marked by the continuation of economic recovery with the inflation rate jumping to historically high levels, which, along with an increase in geopolitical risks at the beginning of 2022, increased the short-term vulnerabilities of the financial services sector. Thus, in early 2022, the increase and partial materialisation of interest rate risk and market risk reversed the trend of reducing short-term systemic risks from the previous year. This has a negative impact on the profitability of all segments of the financial services sector, with a slight increase in liquidity risk for investment funds.

The tightening of monetary policies and the associated growth of interest rates are tested by an increased and, in certain segments, very high valuation in global financial markets with an indirect adverse impact on the entire financial services sector (for more information on trends in financial markets, see Chapter [2.2 Financial environment](#)). Although the dynamics of interest rate increase in the following year is still uncertain, markets continuously incorporate various scenarios in their expectations depending on the announcements of central banks, leading to an increase in volatility in financial markets and, in certain segments, price adjustments.

The growth of market volatility in February 2022 was further influenced by the rise in geopolitical risk and the imposition of economic sanctions on Russia, which resulted in adjustments to the price of securities. The S&P 500 index decreased by 8.2% in the first two months of 2022, while the value of the domestic CROBEX index decreased by 3.8%. This affected the value of investments made by the domestic financial services sector, so that the assets of pension funds at the end of

March amounted to HRK 139.8bn, a decrease of 0.7% compared to the end of 2021 (Figure 21). The negative impact of market trends on the value of net assets of pension funds partly mitigated inflows of new funds amounting to HRK 2.8bn (Figure 22).

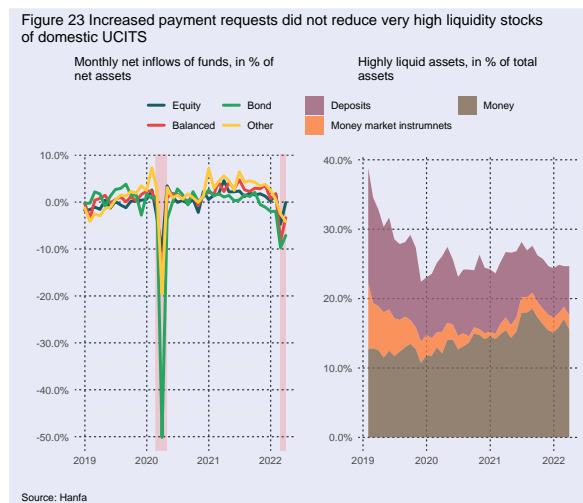


On the other hand, at the beginning of 2022, investment UCITS had twice the pressure on assets regarding negative market trends, but also increased disbursements. Therefore, their net assets at the end of March were 16.0% lower than at the end of 2021, and amounted to HRK 18.1bn. During this period, all types of funds recorded a decrease in net assets, and the largest decrease in absolute and relative terms was recorded by bond funds (funds largest in size), with net assets amounting to 18.6%, i.e.

HRK 2.8bn less at the end of March compared to the end of 2021.

The liquidity of the financial services sector during the first quarter of 2022 remained at very high levels despite increased pressures on the disbursement of money from investment funds.

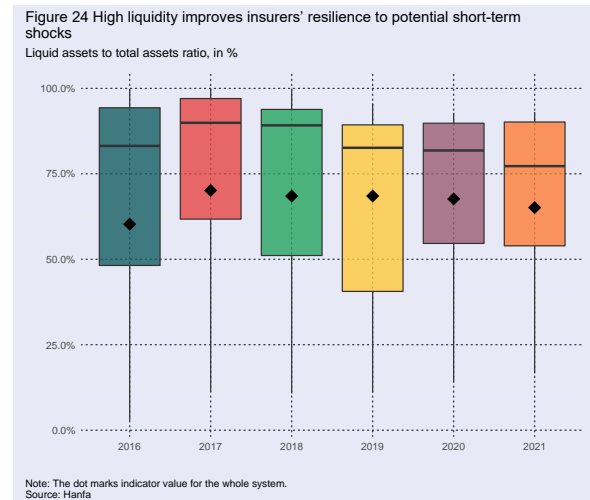
Market uncertainties rose significantly in February with the beginning of the occupation of Ukraine, which led to an increase in investors' risk aversion and probably their liquidity needs. This created pressures on disbursements from UCITS, but to a much lesser extent than in March 2020 (Figure 22). Net outflows were, same as then, dominant in bond funds, which, among other things, was influenced by increased volatility associated with uncertainties in connection with changes in bond returns.



Although sudden pressures on the disbursement of units may undermine the stable liquidity position of investment funds and, through mutual market exposures, may also be transferred to the rest of the system, the limited nature of the recent shock and high liquidity supply of funds¹³ (Figure 23) did not result in the materialisation of such a scenario. Therefore, at the same time, insurance companies did not record significant changes in liquidity indicators and they remained at very high levels (the median value of the share of liquid assets in the

¹³ The share of high-quality assets of investment funds that included money, deposits and money market

total assets of insurance companies stood at 77.2%, Figure 24).



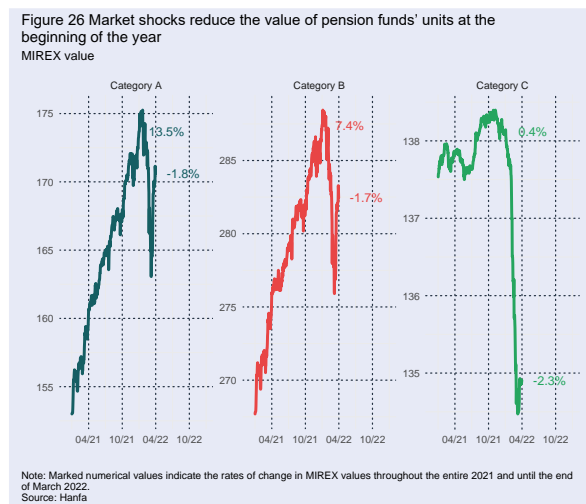
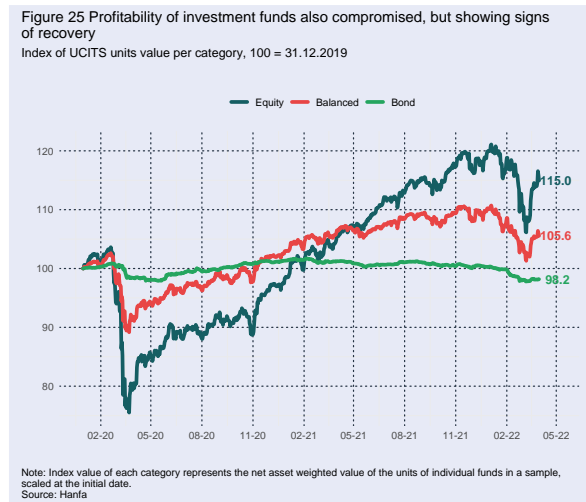
The profitability risk of the financial services sector remained at a slightly higher level. Due to their exposure to market risk and interest rate risk, insurance companies and investment funds are slightly more exposed to profitability risk compared to other parts of the financial services sector.

Having compensated for the value lost at the beginning of the pandemic by the end of 2020, most investment funds continued to generate positive returns in 2021, on the basis of market trends (Figure 25). Annual returns of equity, balanced and other funds amounted to 12.4%, 5.4% and 4.4%, respectively. Bond funds, the largest in size, concluded last year with negative returns of -1.3%, given the increasing pressure on bond valuations in the context of the expected change in monetary policy direction.

The reversal of market sentiment and the increase in uncertainty at the beginning of 2022 had an additional negative impact on the returns of UCITS, which were two to three percentage points lower in all categories at the end of March than at the end of the previous year. Despite the indications of recovery of UCITS' returns in March 2022 on the basis of a partial recovery of market valuation, the profitability risk remains pronounced in view of relatively (too) optimistic

instruments made up 24.7% at the end of March 2022.

stock valuations, especially in circumstances of marked uncertainty and instability that may not be short-term.



The returns of pension funds were similar to those of investment funds (Figure 26). After the high positive returns achieved by almost all mandatory pension funds in 2021, with the exception of conservative C categories whose returns stagnated¹⁴, the year 2022 saw their decline due to global market corrections caused by the escalation of the war in Ukraine and the gradual normalisation of monetary policies. By the end of March, all categories recorded negative returns averaging -1.9%¹⁵. Since stock

markets already started to recover from losses in March, it can be expected that these short-term market turbulences that usually occur in view of investors' rapid market reactions to changes in macroeconomic, market and political circumstances will mainly be absorbed later this year. However, the increase in the general price level, which intensified as the secondary macroeconomic impact of the war in Ukraine, will keep the real returns of domestic funds low or negative in 2022.

The recovery of economic activity in 2021 was reflected in the growth of written premiums (Figure 27) and consequently in profitability in the non-life insurance segment. Lower costs of claims payment also contributed to the growth of insurance profitability (Figure 28)¹⁶, so the return on non-life insurance assets in 2021 amounted to 3.7%. At the same time, the profitability of life insurance business continued to decrease due to a drop in income from premium, so the return on average assets at the end of 2021 amounted to 0.5%, which is half the long-term average profitability¹⁷.

The first months of 2022 saw the growth of premium in non-life and life insurance, which will partially alleviate investment losses that materialised at the beginning of the year. Given the tightening monetary policies and the expected further increase in interest rates during 2022, the value of the companies' existing investments could be further reduced. However, the increase in interest rates will also have an effect on the decrease in the value of technical provisions, so that the final net impact will primarily depend on the maturity mismatch of individual companies' assets and liabilities.

The profitability of leasing companies also recovered during 2021, given the overall

¹⁴ At the end of December 2021, category A mandatory pension funds recorded annual returns of 13.5%, category B funds recorded returns of 7.4% and category C returns of 0.4% on an annual basis.

¹⁵ Category A -1.8 %, category B -1.7 % and category C -2.3 %.

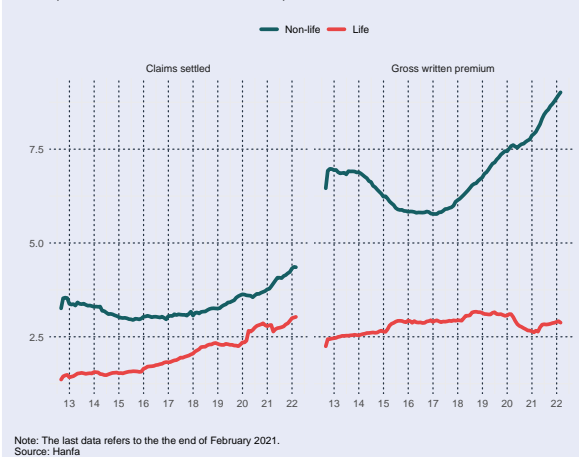
¹⁶ At the end of 2021, combined ratio stood at 89.2% and was 6.5 p.p. lower than in September, and this decrease was mainly due to

a decrease in the loss ratio (which decreased by 5.5 p.p.) and, to a lesser degree, a decrease in the expense ratio (which fell by 1.0 p.p.).

¹⁷ The average multi-year return on average assets of non-life insurance from 2013 to 2021 stood at 1.0%.

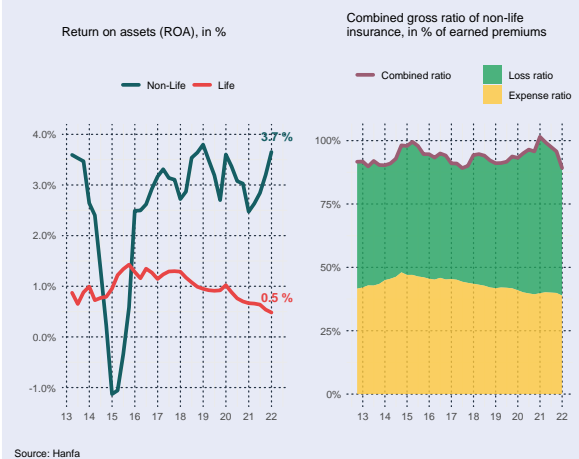
economic growth and the consequent decrease of credit risk in the corporate sector. The average return on assets of leasing companies at the end of 2021 stood at 2.1% and was by 1.0 p.p. higher than in 2020, but it was still below the level of the pre-pandemic 2019 (by 0.8 p.p.). Further growth of profitability will largely depend on the dynamics of macroeconomic trends and the potential effect of interest rate increase on the prices of leasing contracts.

Figure 27 The growth of gross written premium of non-life insurance accelerated in 2021. Annual performance indicators of insurance companies, in HRK bn



Note: The last data refers to the end of February 2021. Source: Hanfa

Figure 28 The recovery of profitability of non-life insurance can also be seen in the decrease of the combined ratio



Source: Hanfa

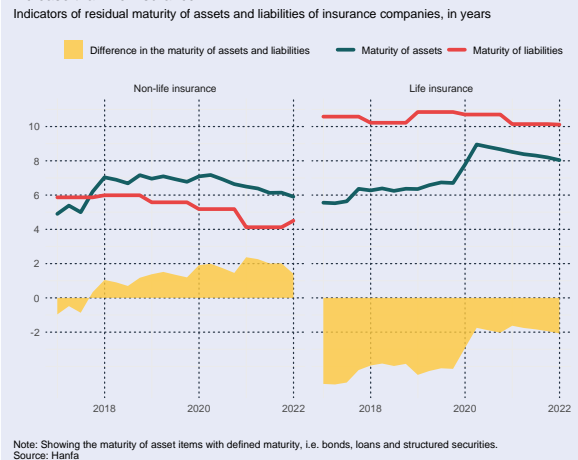
3.2 Long-term risks

Exposure to long-term systemic risks did not change significantly and remained at a slightly elevated level. The increased concentration of

investment in government bonds in the context of an increasing interest rate risk in the circumstances of increasing global inflationary pressures is the most prominent structural systemic risk facing the financial services sector at the beginning of 2022.

Although markets had anticipated the expected rise in reference interest rates due to inflationary pressures through the growth of the required returns, unexpected circumstances of war in Europe further fuelled the growth of risk premiums, in particular in EU countries with lower credit ratings. While this will affect the funds industry primarily through a consequential decline in the value of existing bond investments, the aggregate impact of higher interest rates on the insurance sector will depend on the maturity adjustment of companies' balance sheet¹⁸ and, due to a longer maturity of assets than liabilities of non-life insurance, they might be under higher pressure (Figure 29).

Figure 29 Non-life insurance possibly under higher pressure from interest rate increase than life insurance



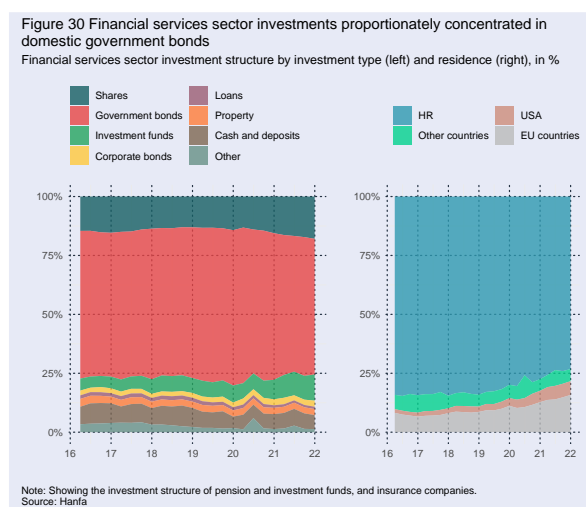
Note: Showing the maturity of asset items with defined maturity, i.e. bonds, loans and structured securities. Source: Hanfa

The financial services sector is structurally burdened by the still high concentration of assets within the sector itself and exposures of the sector to individual issuers, so this risk remained at an elevated level at the end of 2021.

At the end of 2021, Croatian government bonds accounted for a high 57.0% of total investments in the financial services sector. The multi-year

¹⁸ More information on the channels of inflation impact on insurance companies can be found in EIOPA's *Financial Stability Report* published in December 2021 and available via this [link](#).

trend of diversifying investments by increasing stock investments continued in 2021 (an increase of 2.4 p.p.), with the bulk of the funds channelled into stocks of European companies (Figure 30). It is likely that the trend of slight diversification of investments through an increase in strategic allocation of assets to foreign stocks will continue in the coming period, especially with the introduction of the euro. This increases the exposure of the sector to market risks, but through the positive effects of diversification it stabilises their returns and reduces the significance of potential idiosyncratic shocks.



The growth in foreign investments keeps the exposure of the financial services sector to the currency risk at moderate levels.

Foreign exchange markets reacted strongly to the beginning of the Ukraine crisis by increasing fluctuations in the exchange rates of the world's major currencies. Given Europe's significant pre-crisis trade ties with Russia, following the worsening of relations and the imposition of sanctions, some investors diverted their investments into a potentially safer U.S. dollar, so from the beginning of the crisis to the end of March the dollar appreciated 2.1% against the euro. Appreciation pressures are likely in the coming period, especially in the context of the growth of FED's reference interest rates, with ECB's negative reference interest rates remaining the same (for more information, see Chapter [2.2 Financial environment](#)). The

EUR/HRK exchange rate did not remain untouched by global trends, so the central bank intervened twice in March with the aim of maintaining the stability of the exchange rate of kuna to euro. However, considering Croatia's expected accession to the euro area at the beginning of next year, the likelihood of significant fluctuations in the exchange rate of kuna to euro is low, although indirect volatility towards the U.S. dollar is increasing. In the previous period, the average open net currency position of investment and pension funds did not change significantly and at the end of December 2021 stood at 29.4% for investment funds and 34.3% for pension funds. The completion of the euro adoption process will remove a significant portion of the currency risk from the funds' portfolio, so that the open net position of funds, assuming an unchanged portfolio structure, could amount to only 10.2% of the net assets of investment funds, i.e. 13.3% of the net assets of pension funds.

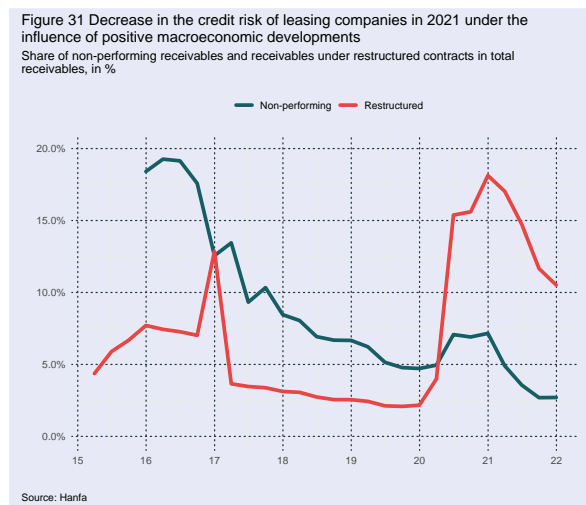
Credit risk to which the financial services sector is exposed significantly decreased in 2021, and it is currently the mildest of all long-term structural risks.

The faster-than-expected recovery of economic activity, as well as generous fiscal support and other measures for the preservation of the economy are the main reasons why the pessimistic projections of credit risk from the beginning of the pandemic did not materialise, and these were the most conservative in the context of leasing companies. The negative impact of the pandemic on the leasing sector operations was first postponed by support measures, and later largely annulled due to macroeconomic trends that were better than expected. At the end of last year, the share of non-performing placements in total placements of leasing companies was only 2.7% (Figure 31).

The crisis in Ukraine will not directly affect the rise in credit risk to which the financial services sector is exposed given the marginal presence of investments and exposures to Ukraine and

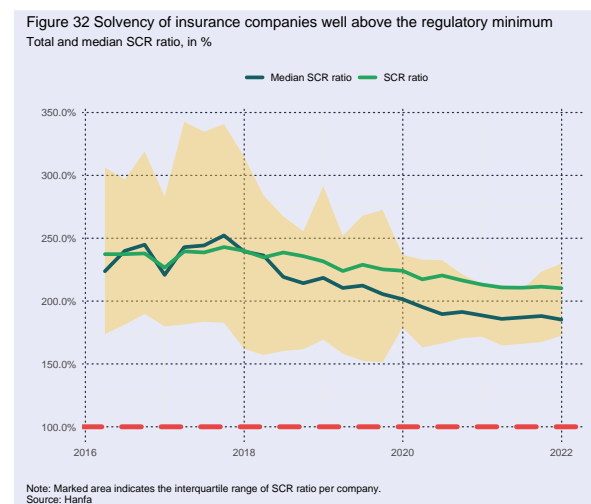
Russia. However, the secondary impacts of geopolitical instability in terms of rising energy prices, as well as interest rates, in view of the rise in risk premium, could considerably burden corporate sector operations, hinder debt servicing and reduce its solvency (for more information on the assessment of the significance and expected channels of impact of the crisis in Ukraine on the business operations of entities and financial stability, see [Box 2 The impact of the Ukraine crisis on the operation of the financial services sector](#)).

ratio stood at 185.3% at the end of 2021 (Figure 32), which remains significantly above the regulatory limit. High capital stocks of the domestic insurance sector are particularly important in view of the upcoming structural changes expected at the beginning of next year: introduction of the new international accounting standard¹⁹ and introduction of the euro which will, among other things, require an adjustment of the methodological approach to SCR calculation. Market exercises that Hanfa conducted with insurance companies have shown that the adoption of the euro will lower the solvency ratio of insurance companies. However, companies expected to be significantly affected by the transition to the euro have already defined a plan of measures to improve the solvency position during 2022.



Satisfactory capitalisation of the financial services sector was preserved during 2021.

Although insurance companies recorded a decrease in the median SCR ratio by 10.0 p.p. since the beginning of the COVID-19 crisis, this



¹⁹ For more information about the introduction of the new accounting standard, see [Box 2 The new IFRS 17 - Insurance contracts](#) in the publication [Macroprudential risk scanner, No 6](#)

Box 1 Do domestic institutional investors display procyclical investment behaviour?

Potential procyclical investment behaviour of domestic institutional investors is reflected in their search for short-term higher yields through focusing on riskier investments, which in the long run exposes them to higher credit risk and interest rate risk. In the 2014–2022 period, the total return on bond investments of domestic funds and insurance undertakings fell due to historically low, negative risk-free interest rates and lower credit risk of domestic sovereign bonds. The decomposition of the change in this return into risk-free, interest rate and credit component, where market changes that affect them are eliminated, has shown that the exposure of the domestic financial services sector to cyclic risks did not increase significantly during that period, except for a slight rise in the interest rate risk. However, in spite of the fact that institutional investors did not increase their exposure to cyclic risks actively, these risks have stayed high due to very high valuations under the circumstances of extreme uncertainty.

1 Procyclical investment behaviour of institutional investors through their search for yield

The general price of money, reflected in interest rate movements, has been following a downward trend with certain fluctuations ever since the beginning of the 1980s. Annual returns on US bonds reached 1.5% in 2021, significantly less compared to the long-term average since the 1980s, that stood at 4.8% (Figure 1). This trend has intensified in the last two years since the outbreak of the pandemic, influenced by expansive monetary policies of central banks in spite of short-term pressures on the risk premium growth at the very beginning of the coronavirus crisis. A similar trend has been recorded over the last several years by returns on long-term government bonds of the

Republic of Croatia, that ended the year 2021 at the level reaching only 0.3% (Figure 2).

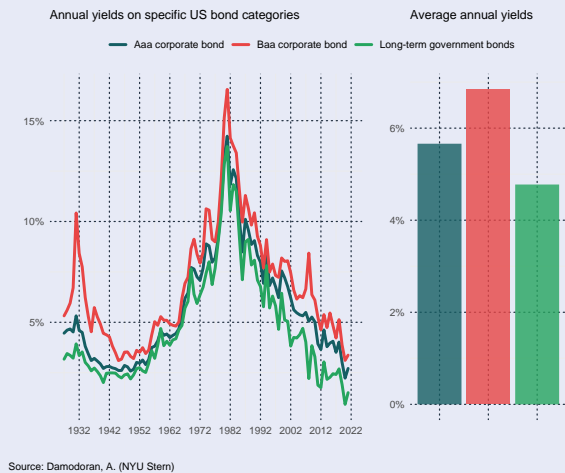
Low interest rates that keep declining pose a challenge to the financial sector as regards the generation of desired returns and fulfilment of investment goals. This challenge is particularly faced by institutional investors such as pension funds, investment funds and insurance undertakings, that allocate a significant part of their investments to debt securities due to the nature of their business operations, but also due to legal regulations. Even though it has been generating historical competitive returns, the domestic financial services sector has not remained intact by such circumstances in the recent period, with approximately 63% of its assets having been invested in debt securities at end-2021 (Figure 3).

Low returns²⁰ reduce the profitability and solvency of financial institutions, which leads to an underestimation of systemic liquidity risk and rising level of indebtedness accompanied by reduced debt sustainability. This finally results in weakened resilience of the financial system to disturbances. At the same time, the system transforms at a faster pace, which implies the growing importance of financial innovations and non-banking institutions, as well as the generation of new risks. As regards financial institutions' investment policies, passive investment strategies, containing lower implicit costs and reducing the deviation of the fund's results from those of their competition, are becoming more and more popular; however, such strategies may contribute to systemic risk spillovers through spillover and contagion channels in crisis periods. On the other hand, low returns direct institutional investors towards riskier investments, encouraging potential procyclical investment behaviour of investors in

¹For more information, see [ESRB Report](#).

their search for yield, which has been confirmed by numerous empirical studies²¹.

Figure 1 Bond yields in 2021 reached the lowest levels in the last 100 years



Search for yield manifests itself in three channels:

- 1) maintaining the existing portfolio structure accompanied by the extension of bond investment maturities,
- 2) increasing credit risk through investments in securities of lower credit quality, and
- 3) changing portfolio structure in the context of a reduced proportion of bond investments and relative increase in exposure to riskier financial asset classes, such as equity securities and investment fund units.

Although institutional investors' search for yield may increase nominal returns (direct – price channel) in the short run, among other things, through a rise in expected net inflows in the forthcoming period (indirect – dynamic channel)²², negative consequences are mostly manifested in tightening general financing conditions in the long run. Such tightening might occur in the forthcoming period (for more information, see Chapter [2. Macroeconomic and financial environment risks](#)). It is therefore extremely important to carry out a timely

²¹For more information, see Choi and Kronlund (2018), Barbu, Fricke and Moench (2020), Lu et. al. (2019), and Odzagli and Wang (2019).

²²For more information on the dynamic channel, see Lewellen and Lewellen (2022), and Bellando, Capota and Galanti (2019).

assessment of institutional investors' procyclical investment behaviour and of its potential impact on the financial stability.

Figure 2 Increased pressure on yields generated by investors' expectations Returns on long-term government bonds

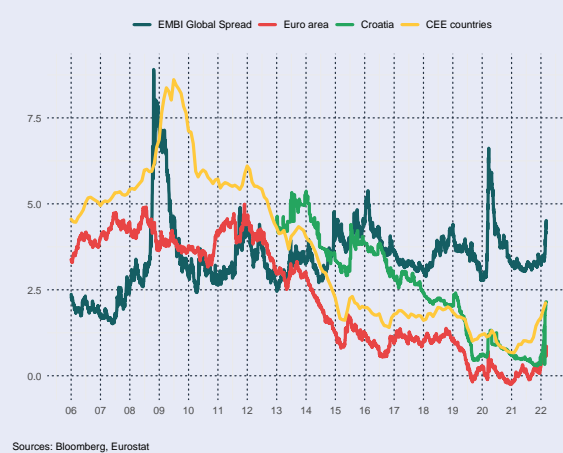
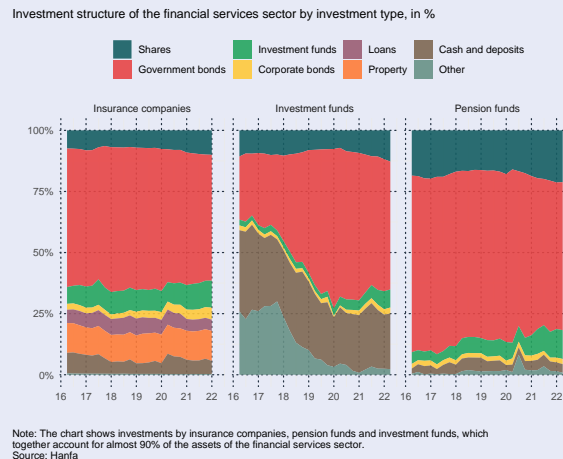


Figure 3 Dominant share of government bonds in the financial services sector investments



2 Yield to maturity as a risk measure of the bond component of institutional investors' portfolios

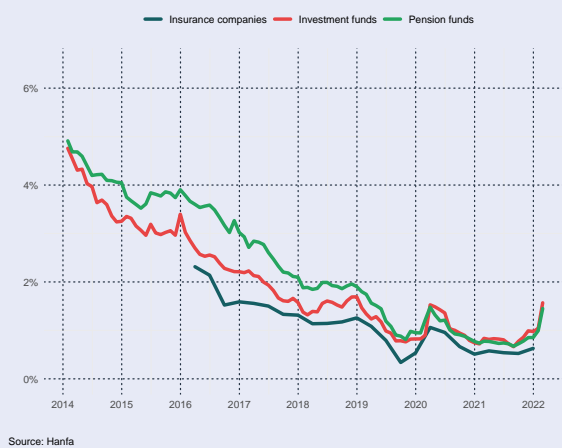
A bond's yield to maturity is a very important market indicator providing insight into general financing conditions, i.e. interest rate level, but also the perception of the riskiness of bond issuers. Furthermore, the yield curve slope which rises with the maturity of investments²³ provides an important insight into market expectations

²³A yield curve depicts the term structure of interest rates by plotting yields of bonds having different maturity dates and identical characteristics.

relating to future interest rate movements, i.e. economic activity. A flat or, under extreme conditions, inverted yield curve is therefore often a strong indicator of the upcoming recession.

A bond's yield to maturity at a certain point of time is the implicit value of the discount rate used for discounting the bond's future cash flows²⁴ until its maturity to the current market price of that bond. This enables a comparison and aggregation of different debt securities, as well as an insight into trends in general market conditions.

Figure 4 Declining yields also evident in the financial services sector portfolios
Yield to maturity of the bond component of specific sectors' portfolios, in %



The total yield to maturity can be decomposed into individual components (Figure 5)²⁵:

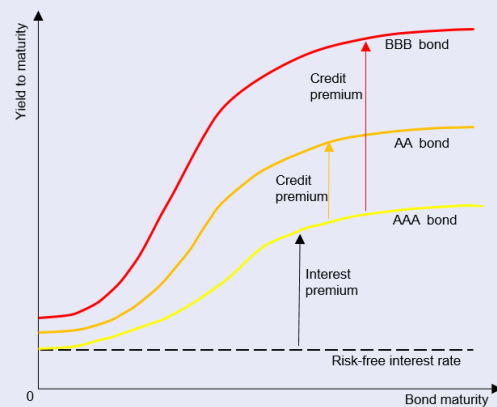
1) **risk-free component**, which shows the level of interest rate on the (perceivedly) risk-free financial assets class, and mostly equals the yield on the three-month AAA-rated euro area sovereign bond (e.g. yields on short-term German bonds),

2) **interest premium**, which reflects investors' preferences as regards maturity²⁶ and their expectations with respect to macroeconomic and financial trends, and equals the difference in yields of the bond observed against the AAA-

rated bond having the same maturity date and previously defined risk-free interest rate, and

3) **credit risk premium**, which reflects the compensation factor for the possibility of materialisation of the issuer's credit risk, i.e. the inability to settle coupon payments and principal, and equals the difference between the total implicit yield and risk-free interest rate increased by the credit risk premium.

Figure 5 Schematic overview of individual yield components



Note: AA and BBB refer to standard credit quality grades.
Source: Hanfa

The assessment of these yield-to-maturity components provides a useful tool for monitoring current market movements, but also the level of interest rate risk and credit risk assumed in institutional investors' portfolios.

3 Interest rate risk and credit risk pertaining to the financial services sector

In line with global developments, a declining trend in yield to maturity has recently also been evident in bond portfolios of domestic institutional investors (Figure 4). At end-2021, implicit yields to maturity of bonds in pension and investment²⁷ funds' portfolios were by as much as 4 percentage points lower than at the beginning of 2014, recording historically low levels of about 0.86%.

²⁴The remaining coupon payments and the principal

²⁵Barbu, Fricke and Moench methodology (2020)

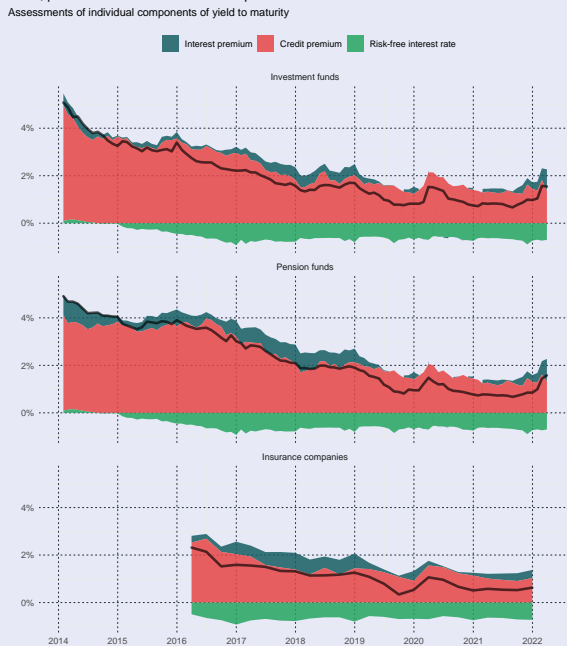
²⁶Relative preference of current capital inflows in relation to those in the future

²⁷Considering their importance (as at 30 September 2021, UCITS accounted for 96.21% of domestic investment funds' total net assets) and data availability, the analysis of investment funds will focus primarily on UCITS.

Since the outbreak of the global financial crisis, central banks have mostly pursued extremely expansionary monetary policies in their attempt to encourage a stronger economic growth in the circumstances of secular stagnation. Risk-free interest rates have therefore reduced significantly in this period, and were even negative in the period from 2015 to the beginning of 2022.

Such global circumstances have also had an impact on the domestic market, causing a continuous decline in the risk-free component of the yield on bond portfolios of funds and insurance undertakings. At the beginning of 2014, this component stood at 0.09%, but it dived into the negative area already in early 2015, and stood there even in late 2021, when it reached -0.73% (Figure 6).

Figure 6 Credit premium is the most significant component of the yield to maturity of investment funds, pension funds and insurance companies



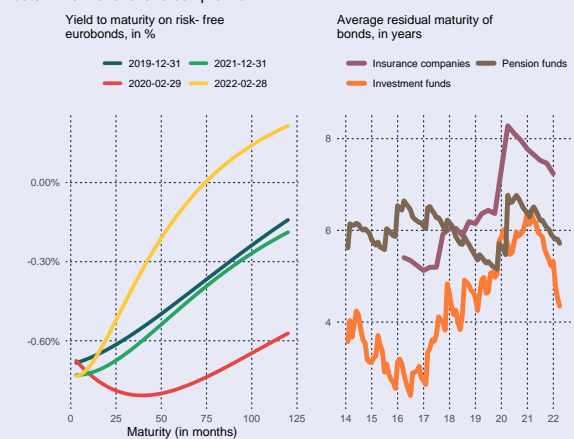
Note: The black line shows the weighted yield to maturity on the bond portfolio of investment and pension funds. The figure shows monthly data for investment and pension funds and quarterly data for insurance companies. Source: Hanfa, Bloomberg

At the same time, a rise in the level of the interest premium of domestic institutional investors' bond investments occurred along with a decline in risk-free interest rates, increasing at end-2021 almost twice (0.67%) compared to the average recorded in the preceding eight-year period (an average of 0.31% in the 2014-2021 period). This was due to an extension of the average maturity

of bond investments of domestic funds and insurance undertakings in their search for higher yields, considering the fact that term premium grows with a higher level of taken interest rate risk caused by longer maturities. In line with long-term investment strategies of pension funds and insurance undertakings, their interest premium is relatively higher compared to the interest premium of investment funds' portfolios.

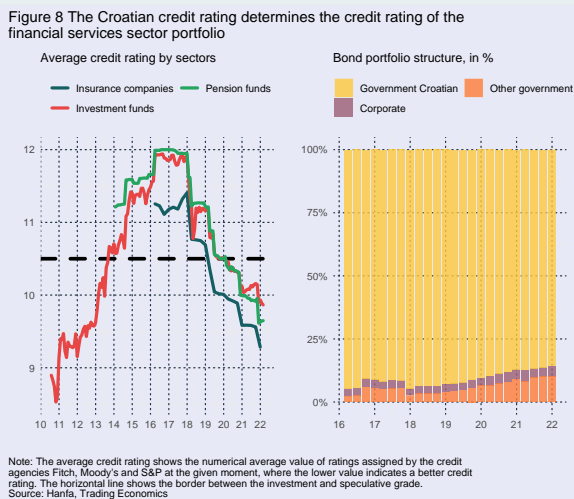
The transition of the interest premium into the negative area is a rare occurrence, which reflects the inversion of the risk free yield curve, i.e. its decline occurring with longer maturities. This reflects pessimistic investors' medium-term and long-term macroeconomic expectations, as a result of which they tend to make safer investments, such as those into high-quality sovereign bonds, making a flight to safety and reducing their long-term yields. This trend was evident in domestic investment and pension funds' portfolios at the beginning of the global pandemic, when the negative interest premium partially mitigated the rise in total yields. However, following the stabilisation of financial market conditions, the premium recovered very soon (Figure 7). Escalating geopolitical tensions in early 2022 and uncertainties regarding their impact on the global economy led to a growth in the interest premium caused by investors' flight to safety and risk-free interest rate based on the expected increase in reference interest rates in the rest of the year.

Figure 7 The shape of the yield curve and the maturity of the bond portfolio determine the level of credit premium



Source: Eurostat, Hanfa

The most significant and the most variable component of the required yield to maturity of the financial services sector is credit risk premium. It reflects the credit quality of debt instruments contained in institutional investors' portfolios, as well as trends in market perception of the credit risk pertaining to individual bonds.



The credit risk premium of domestic institutional investors' bond portfolios stood at an average of 2.21% in the observed period; however, it recorded a significant declining trend, reaching 1.26% at end-2021. This was the result of a decrease in the relative level of public debt and fiscal deficit, which had an impact on the credit rating of sovereign bonds, that account for more than 85% of their bond portfolio (Figure 8). Due to the very high level of exposure to government bonds, the profitability of the financial services sector is therefore closely associated with trends in fiscal policy and market perception of the credit risk pertaining to government bonds²⁸. The high level of uncertainty currently present on financial markets, under conditions of increased indebtedness related to the fiscal response to the coronavirus crisis, lay an additional emphasis on this channel of potential materialisation of interest rate risk and credit rate risk in business operations of the financial

services sector (for more information, see Chapter 3. [Financial services sector risks](#)).

4 Do domestic institutional investors display procyclical investment behaviour?

At first sight, movements in the implicit yield on bond investments and its individual components imply a significant decline in credit risk exposure, accompanied by relatively stable exposure to the interest rate risk of the financial services sector. Taking account of the cyclic nature of the systemic risk or its accumulation in the prosperity stage of the cycle, it is necessary to distinguish between the impact of general macroeconomic and financial trends from the impact of the active reallocation of institutional investors' portfolio on implicit yield movements. This enables ex ante detection of systemic risk growth within the system and timely action taken to increase the resilience of the system to potential disturbances and shocks and aimed at reducing the consequences of the materialisation of systemic risks in the crisis stage of the cycle.

Potential procyclical investment behaviour of domestic institutional investors is reflected in their search for short-term higher yields through shifting their portfolios towards riskier investments, which in the long run exposes them to higher credit risk and interest rate risk. Search for yield may also result in undesirable concentration of investments in riskier assets, due to which any price corrections, along with possible liquidity interruptions, can cause severe disturbances, in particular if they spill over to the rest of the financial system through interconnection channels. In this way, apparently limited idiosyncratic shocks may become systemic shocks through spillover and contagion effects, exerting serious negative effects on the financial system.

The assessment of the procyclical investment behaviour of institutional investors was made on

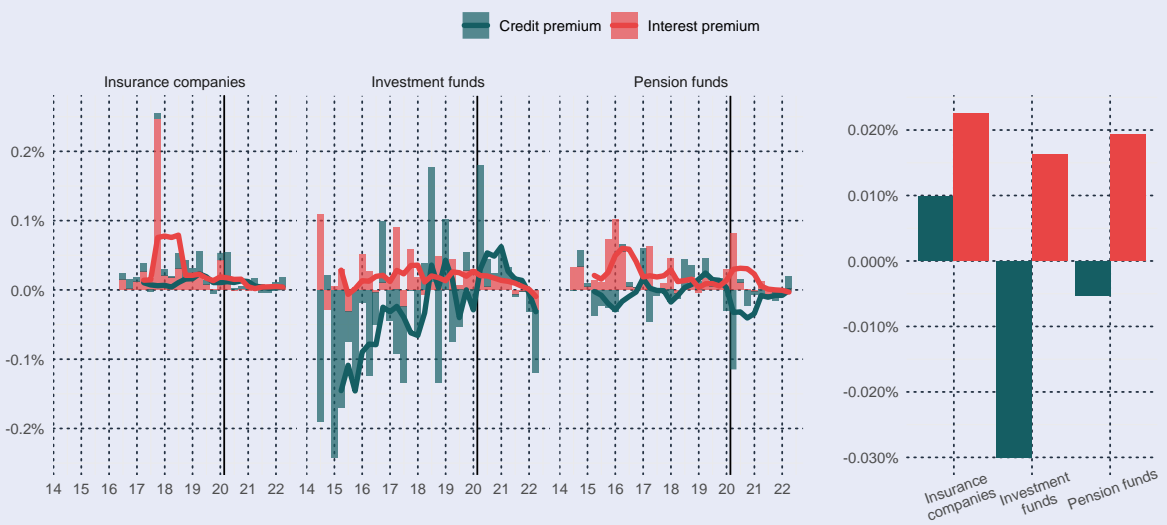
²⁸ For more information on risks arising from the interconnection of the financial services sector and the public sector, see Box 2 in Macroprudential Risk Scanner No 3.

the basis of the approach developed by Barbu, Fricke and Moench (2020). According to this approach, the active change in the yield in the observed period equals the difference between the current yield level and the level of yield that would be generated by the portfolio from the previous period if changes in its structure (active reallocation) had not occurred.

$$\Delta y_t = \sum_{i=1}^M w_t^i * y_t^i - \sum_{j=1}^N w_{t-1}^j * y_t^j,$$

where $i = 1, \dots, M$ is the bond i contained at the moment t in the company's portfolio, $j = 1, \dots, N$ is the bond j contained at the moment $t - 1$ in the company's portfolio, w_t^i is the share of the bond i in the company's portfolio at the moment t , and y_t^i is its yield to maturity at the moment t .

Figure 9 Institutional investors actively increased their exposure to interest rate risk, but not to credit risk
Active change in the level of interest rate risk and credit risk in bond portfolio, in percentage points (left); average quarterly change in risk exposures in the observed period (right)



Note: The vertical lines indicate the beginning of the coronavirus crisis at the end of February 2020. The chart bars indicate the active change in the exposure to the credit risk and interest rate risk, while the lines indicate the moving average of the active change in the exposure over the last year.
Source: Hanfa

As expected, the most active sector as regards active management of bond investment risks is the investment fund sector (Figure 9), as investment funds are faced with dynamic payments and disbursements of funds on an ongoing basis and therefore have somewhat shorter-term investment profiles than pension funds and insurance companies. UCITS' investment profile also requires proactive portfolio management, aimed at generating competitive yields higher than management fees, which would, at the same time, attract new inflows of funds. On the other hand, pension funds and insurance companies, particularly in the field of life insurance, have somewhat longer investment horizons and face a relatively lower need for portfolio reallocation, which is evident

from their bond portfolio management in the observed period. Investment funds' credit premium recorded a sharp rise at the beginning of the coronavirus crisis, primarily due to liquidity pressures that called for the sale of relatively more liquid bonds of a higher credit quality, which led to an implicit growth in their credit premium in the first quarter of 2020. The activity in all the three sectors has been notably reduced since the onset of the coronavirus crisis, given the high uncertainties on global financial markets.

In the observed period, the reallocation was primarily carried out through greater exposure to interest rate risk, considering the extension of investment maturities (Figure 7). As a consequence, in the period from 2014 to the end

of 2021, interest rate risk premium was actively increased by approximately 2 basis points quarterly on average (Figure 9). On the other hand, there was no evidence of any significant search for yield through increased exposure to credit risk. Credit risk exposure was actively reduced since 2014 at the level of all investment funds (by 2.8 basis points quarterly on average), while only a smaller portion of UCITS recorded a more active rise in credit risk exposure several quarters before the coronavirus crisis. At the same time, pension funds' credit risk exposure recorded a modest fall, while only insurance companies slightly increased their exposure to this risk (by 1 basis point quarterly on average), albeit with a marginal impact on the overall riskiness of their bond portfolio.

5 Implications for financial stability in the circumstances of definite growth in interest rates

The analysis of the active management of credit risk and interest rate risk carried out in the financial services sector does not point to any systemically significant procyclical investment behaviour of funds and insurance companies and consequent rise in exposure to other risks. In other words, the 2014-2022 period saw no systemically important search for yield of the financial services sector, despite profitability pressures in the form of declining bond investment yields. This does not preclude the possibility that certain entities responded to the challenging low-yield environment by increasing the riskiness of their bond investments or increasing their exposure to equity securities and, consequently, market risk of stock price corrections.

However, in spite of the fact that institutional investors did not increase their exposure to cyclic risks actively, these risks have stayed high due to

continued, very high valuations under the circumstances of extreme uncertainty (for more information, see Chapter [2. Macroeconomic and financial environment risks](#)).

Such cyclic systemic risks are additionally pronounced in the context of striking structural vulnerabilities of the sector (for more information, see Chapter [3. Financial services sector risks](#)), primarily reflected in the high concentration of sovereign bond investments. Their value in the upcoming period will depend significantly on changes in monetary conditions, but also on possible additional pressures on fiscal fundamentals.

References

- Bellando, R., Capota, L. D., & Galanti, S. (2020). The impact of return shocks on mutual funds' flows: an empirical study of French bond mutual funds. Preliminary draft dated Jan, 10, 2020
- Barbu, A, Fricke, C and Moench, E, 2020, 'Procyclical asset management and bond risk premia', Research Papers in Economics
- Lewellen, J., & Lewellen, K. (2018). Institutional investors and corporate governance: The incentive to increase value. Unpublished working paper, Dartmouth College
- Lu, Lina and Pritsker, Matthew G. and Zlate, Andrei and Anadu, Kenechukwu and Bohn, James, Reach for Yield by U.S. Public Pension Funds (June, 2019). FRB Boston Risk and Policy Analysis Unit Paper No. RPA 19-2
- Ozdogli, Ali K. and Wang, Zixuan (Kevin), Interest Rates and Insurance Company Investment Behavior (March 31, 2019)

Box 2 The impact of the Ukraine crisis on the operation of the financial services sector

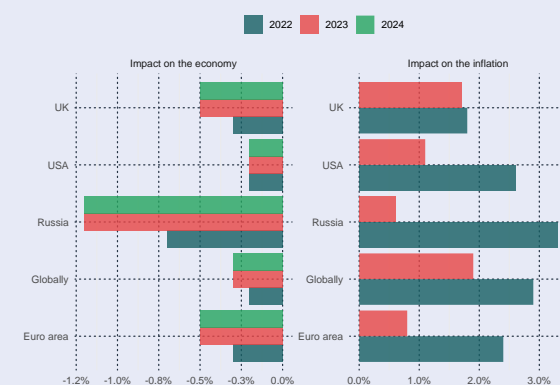
The overall consequences of the Ukraine crisis on the operation of the domestic financial services sector by far surpass direct and indirect exposures of domestic financial institutions to the Ukrainian and Russian economy in general, as well as to sanctioned entities specifically. Therefore, Hanfa has carried out a survey among companies operating in the financial services sector on potential channels for the spillover of risks related to the crisis in Ukraine on the domestic financial system. The results of the survey suggest that the domestic financial services sector expects the Ukraine crisis and the following sanctions to have a negative impact on the Croatian economy; however, it does not perceive the financial stability as jeopardised. The results also imply that financial institutions in general rightly detect systemic risks and assess possible consequences of the crisis in Ukraine they could face. Still, some companies underestimate the effect of possible additional market shocks which may occur should the crisis take an unexpected turn.

In spite of the several-month long deterioration in geopolitical relations, the pace and scope of the escalation of the Ukraine crisis at the end of February 2022 took by surprise not only numerous investors, but also economic policy makers. This led to a sharp rise in systemic stress on financial markets and an increase in short-term systemic risks in the financial services sector (for more information, see [Chapter 2 Macroeconomic and financial environment risks](#) and [Chapter 3 Financial services sector risks](#)). The subsequent economic measures taken by countries led by the USA, United Kingdom and EU Member States further raised uncertainty and potential economic costs caused by the crisis.

In years to come, the Ukraine crisis will exert the expected limiting impact on the recovery of the global economy from the coronavirus crisis, while euro area countries will face relatively higher costs due to their interconnectedness

with the Ukraine and Russian economies. While the brunt of the adverse impact on the global economy is expected to be felt in the upcoming years, the conflict in Ukraine will produce a powerful effect on the prices of raw materials as early as in 2022, as Russia and Ukraine are globally significant exporters of raw materials, primarily energy products, cereals and certain precious metals. The impact on final consumer goods prices will therefore be substantial, particularly under the circumstances of the already existing general price growth.

Figure 1 The Ukraine crisis will have a several-year limiting impact on the economy, while the existing price shocks will further intensify
The impact of the crisis in Ukraine on macroeconomic indicators, the change compared to the initial scenario, in p.p.



Sources: Statista estimates, Financial Times, Oxford Economics, NIESR

Figure 2 The survey covered 72 supervised entities in 7 industries managing the financial assets amounting to 54.3% of the GDP
Financial assets under management, in HRK bn



Note: The numbers relate to the number of entities which participated in the survey by individual industries. As regards pension and investment funds, the results were collected at the level of fund management companies. Source: Hanfa

The direct exposure of the domestic financial services sector to Russia shortly prior to the escalation of the crisis was marginal and totalled only HRK 564m or 0.2% of financial services sector assets at end-2021. This exposure was

reduced to only HRK 22m or 0.01% of total financial services sector assets already in the first week of the crisis through active deleveraging and reduction in market exposure value, but also through changes in the ownership structure of certain entities²⁹.

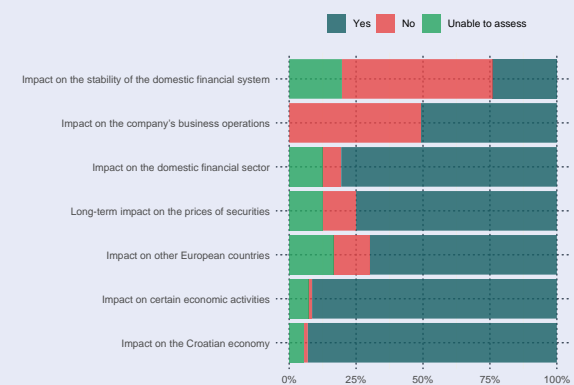
Even though the direct exposure of the financial services sector to sanctioned entities and to the Ukrainian economy is marginal, the global character of the Ukraine crisis, which has a negative effect on macroeconomic developments and financial valuations, exposes the financial service sector to a series of systemic risks through indirect risk spillover channels. Some systemic risks have already materialised, exerting an adverse impact on the profitability of institutional investors (for more information, see Chapter 3 [Financial services sector risks](#)), but not jeopardising the stability of the system.

Given the fact that the crisis is still ongoing and its outcome is highly uncertain, the timely identification and addressing of systemic risks require adequate recognition of all the channels of the crisis' impact on the operation of the domestic financial services sector. In addition to the top-down recognition of systemic risks by regulators, the bottom-up recognition of systemic risks by individual companies is equally important, for the purpose of reducing their vulnerabilities and detected risks in a timely manner.

At the end of February, Hanfa therefore carried out a survey among companies comprising the financial services sector, asking for feedback on indirect impacts of the crisis and potential risks of their spillover on the operation of the companies. The survey covered 72 companies from 7 different industries actively operating in late February and managing financial assets totalling HRK 234.1bn (Figure 2). Survey

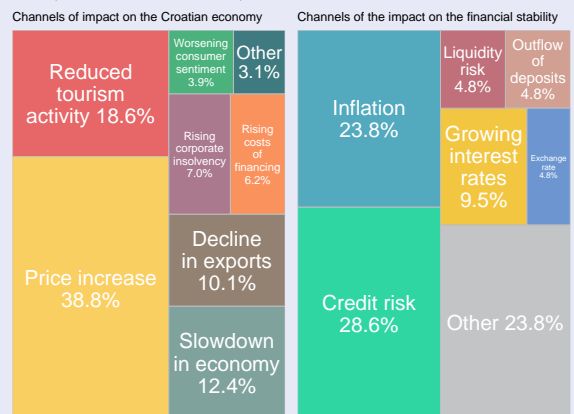
questions were of an open-ended type, i.e. they offered no pre-defined responses, which additionally highlights the process of the detection of key risks and channels of their spillover on the operation of the financial services sector by individual entities.

Figure 3 The Ukraine crisis has a negative impact on the economic activity and market valuations, with a limited effect on the financial stability
Responses provided by supervised entities, in % of total responses



Source: Hanfa, supervised entities

Figure 4 The increase in the general level of prices is the most apparent channel of the impact which sanctions exert on the Croatian economy and on the stability of the domestic financial system



Source: Hanfa, supervised entities

The results of the survey suggest that financial institutions and companies in the financial services sector expect the Ukraine crisis and the following sanctions to have a negative impact on numerous EU economies in general, but also on the Croatian economy specifically. However, at the same time they do not perceive the financial stability as jeopardised (Figure 3). As many as 93% of the companies assume that the crisis in

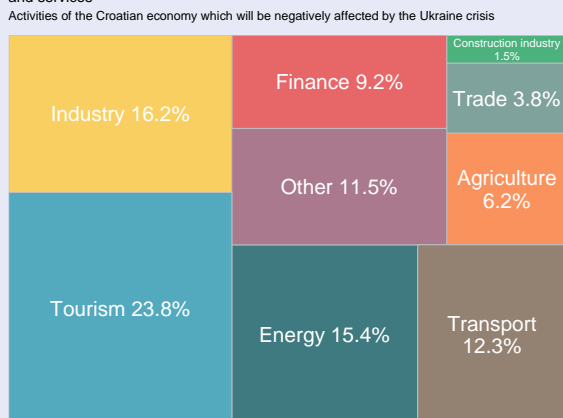
at the beginning of March and passed into the ownership of Hrvatska poštanska banka d.d.

²⁹ The most important change in the ownership structure was that of Sberbank d.d., which at end-2021 accounted for 91% of the exposure to Russian entities through cash at bank and deposits held by supervised entities with that bank, which was rehabilitated

Ukraine will have an adverse effect on the Croatian economy, primarily in the form of further price increase and reduction in tourism activity and export of goods (Figure 4), while only 24% of them believe that recent events may jeopardise the financial stability.

In their opinion, the most affected areas are tourism activity, followed by the industry, energy and transport sectors, whose operation will be relatively severely hit by growing raw material prices (Figure 5). The gravest threat to the stability of the financial system is posed by growing inflation, potential materialisation of credit risk and the expected rise in interest rates (Figure 4). These risks were high even before the Ukraine crisis, and have additionally increased due to recent developments.

Figure 5 Supervised entities presume the Ukraine crisis will have a stronger negative impact on economic activities relying on the external exchange of goods and services

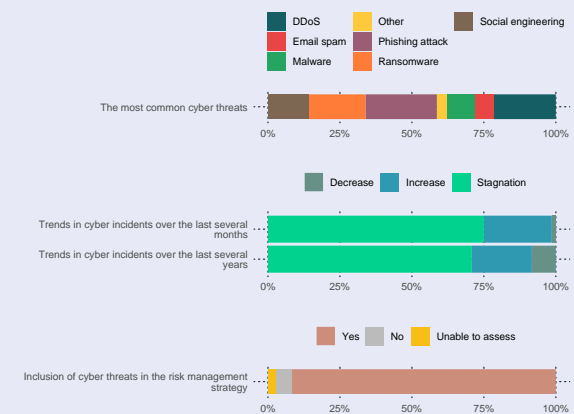


Source: Hanfa, supervised entities

Given the growing significance of cybersecurity for the operation of the financial system, as well as a potential rise in the number of cyber incidents in the context of increased geopolitical tensions, the survey also included questions relating to potential cyber risks. The companies were asked to assess the trend in the number of recent incidents, including the most common types of incidents, and their cyber risk management strategies. Even though the majority of the entities has not recorded any rise in the frequency of cyber incidents recently, as many as 92% of them have included cyber threats in their risk management strategies, which additionally highlights the relevance of

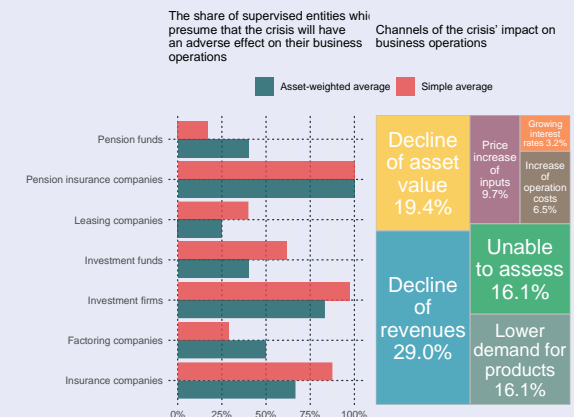
this risk category, which is developing rapidly and emerging in numerous variants.

Figure 6 The diverse nature of incidents hinders the defence against cyber attacks; however, supervised entities manage these risks successfully



Source: Hanfa, supervised entities

Figure 7 Supervised entities perceive the negative effect of the crisis in Ukraine primarily through reduced asset value and declining income



Source: Hanfa, supervised entities

As many as half of the companies assumed that the crisis would have a negative impact on their operation, supporting the assumption that they are very well aware of the effects which the crisis may have on their business operations. Even though the responses reveal certain heterogeneity in expected impacts on the companies' business operations (predictably, considering the diverse nature of their operation), it can be noticed that entities which are relatively more exposed to the risk of inflation and growing interest rates, such as insurance companies and pension insurance companies, detect negative consequences of the Ukraine crisis in most of their responses. On the other hand, entities which are relatively more exposed to market risks, such as pension funds

and investment funds, presume that markets have already incorporated negative effects of the crisis in their valuations, and expect the crisis to have a negative impact on their business operations only to a smaller extent. Entities such as leasing companies and factoring companies mostly face credit risk in line with the nature of their business, and do not expect any significant adverse consequences of the crisis on their operation as they cooperate with predominantly domestic business entities.

Finally, the results of the survey suggest that financial institutions and companies operating in the financial services sector generally do not underestimate the impacts of the crisis in Ukraine they could face. However, a number of the companies at the same time potentially underestimate the effect of possible market shocks which may occur should the crisis take an unexpected turn.

Box 3 LEI - 20 characters which reduce risks to financial stability

A comprehensive implementation of the LEI system would greatly facilitate the identification of direct and indirect mutual exposures of financial institutions at the global level, thus contributing to a better understanding of the possibility of financial contagion and finally mitigating risks to the stability of the financial system. The development of a comprehensive regulatory framework at the EU-level will help boost the process of accepting the LEI, but also promote the understanding of benefits provided by the introduction of unique and unambiguous identifiers of financial market participants.

1 International unique identifier of entities participating in financial transactions

Several recent financial crises that have marked the global economy have highlighted the need to identify, monitor and manage risks in a more adequate manner for the purpose of preserving financial stability in the event of systemic risks. The 2008 Great Financial Crisis showed how a lack of such management may cause major shocks to the global economy. Growing globalisation is best reflected in a rapid increase in cross-border activity carried out over the last decade and a sharp rise in interconnectedness of entities operating on the financial market.³⁰ This brought into focus the idea of unique and unambiguous identification of all entities participating in financial transactions in order to facilitate the determination of net exposures.

In 2012, the Financial Stability Board (hereinafter: FSB) put forward a proposal for the introduction of a unique international financial corporation identifier. The introduction process was initiated by the adoption of a document laying down the

framework for setting up the required infrastructure and comprising 35 recommendations for the development and implementation of the Global Legal Entity Identifier System (hereinafter: LEI system³¹), whose governance structure is divided into three components (Figure 1).

The proposed legal entity identifier (hereinafter: LEI) is a 20-character alphanumeric code which identifies legal entities in a unique and unambiguous manner. The first four characters identify the institution which has issued the LEI, while the fifth and sixth characters are set to zero (thus saving a place for any future additional partitioning). The following 12 characters are unique to each entity, while two last characters are check digits.

2 The benefits of the LEI system and its implications for the financial stability

The existing systems for the identification of parties to financial transactions have mostly been of a partial nature as they have focused on a part of the financial market only, due to which they have been relatively mutually unrelated.³² Even though such practice favours the development of business models based on data provision, it results in the segmenting of information, thus reducing the overall efficiency of the system and hampering risk monitoring for both private and public sector.

On the other hand, the LEI system is global and comprehensive in nature, and identifies financial market participants in an unambiguous manner. The benefits of using this identification system

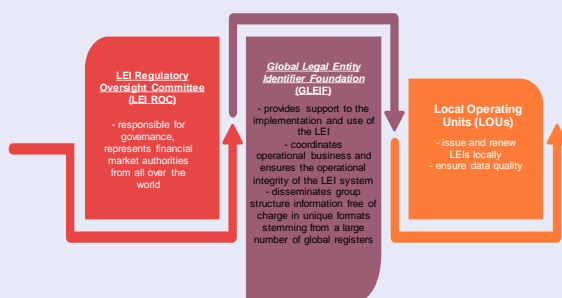
³⁰ The argument that the interconnectedness of financial corporations should be analysed in more detail was supported by the 2008 failure of the Lehman Brothers bank, which had over 7,000 branches in over 40 countries all over the world.

³¹ A Global Legal Entity Identifier for Financial Markets, FSB, 8.6.2012, [link](#)

³² The examples of such systems are SWIFT (Society for Worldwide Interbank Financial Telecommunication), CUSIP (Committee on Uniform Securities Identification Procedures) or D-U-N-S (Data Universal Numbering System), and exposure and ownership structure mapping tools offered by platforms such as Bloomberg or Thomson Reuters.

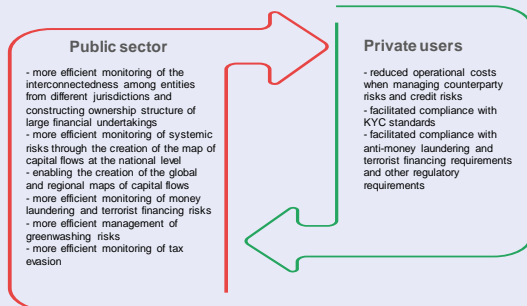
are reflected in the reduction in operational costs due to increased effectiveness in monitoring and managing counterparty risk and credit risk (Figure 2). Other advantages include easier compliance with anti-money laundering and terrorist financing requirements and other legal provisions. The system could also strengthen attempts of the public and private sector to avoid greenwashing practices, i.e. false claims of environmental, social and governance (ESG) compliance.

Figure 1 The three-tier governance structure of the LEI system



Sources: FSB, Hanfa

Figure 2 Benefits for the public sector and private users



Sources: ESRB, Hanfa

In addition to private users, the LEI system could be beneficial to the entire financial system as it facilitates the management of systemic risks through the analysis and monitoring of a widespread network of mutually related entities. The monitoring of their interconnectedness through their assets and liabilities is especially important in the context of contagion risk, which is particularly high in crisis periods and may jeopardise the stability of the system if not addressed in a timely manner. Given the existence of unique national identifiers in the majority of developed jurisdictions, the most

significant benefit of the LEI system arises from its global character.

3 Recommendation of the European Systemic Risk Board (ESRB) on the use of the Legal Entity Identifier (LEI)

In November 2020, the ESRB issued the [Recommendation on identifying legal entities \(ESRB/2020/12\)](#) by LEIs (hereinafter: Recommendation) for the purpose of:

- 1) ensuring that all legal entities established in the Union that are involved in financial transactions obtain and maintain an LEI;
- 2) ensuring the systematic and comprehensive use of the LEI for identification of entities in the reporting of financial information; and
- 3) promoting the awareness and use of the LEI by the general public and facilitating the general public's access to company information through the use of the LEI.

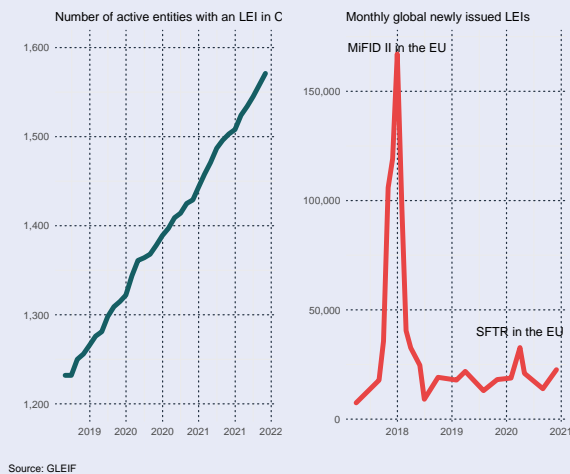
In line with these objectives, the European Commission was recommended to incorporate into the EU legislative framework the use of the LEI through mandatory identification of entities in the reporting of financial information, including in any public disclosure of data. In addition, national competent authorities were recommended to try to promote the use of the identifier until its incorporation into the EU legislation in all the above-mentioned situations.

Therefore, Hanfa took steps in order to encourage entities operating in the financial services sector to obtain and use the LEI. Moreover, the LEI will be included as one of the identifiers in all upcoming supervisory reports, including in amendments to the existing ones, and it will be used for the identification of entities operating in the financial services sector in all public registers available on Hanfa's website.

4 Outlook of the LEI system – the LEI as the identifier of the global economy?

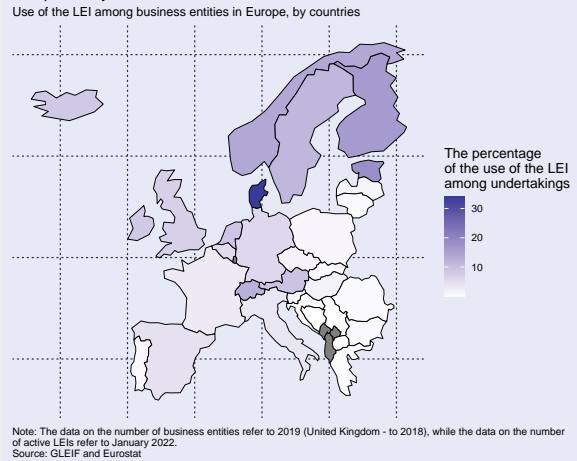
Further implementation of the LEI system may significantly contribute to the understanding, analysis and prevention of potential risk spillover between the banking sector and financial services sector. The strengthening of legislation through the implementation of MiFID II³³ and SFTR³⁴ in 2018 stimulated global financial market participants to implement the LEI (Figure 3). Following the implementation of these regulations, the number of active entities with an LEI in Croatia has been growing steadily, which implies that legal requirements play an important role in decision-making as regards the use of the LEI.

Figure 3 Growing number of legal entities using the LEI



A lack of interest in and awareness of the possibilities and advantages of the LEI outside the financial sector leads to difficulties in its acceptance and, in the end, its implementation. Even though the base of legal persons using this identifier has been expanding continuously, the majority of corporate entities in many European countries, in particular the CEE countries, still fail to use the LEI, which prevents the exploitation of the full potential of the system (Figure 4).

Figure 4 The general level of use of the LEI is still low due to a lack of its acceptance by the non-finance sector



Note: The data on the number of business entities refer to 2019 (United Kingdom - to 2018), while the data on the number of active LEIs refer to January 2022. Source: GLEIF and Eurostat

In spite of considerable challenges, the identification requirement relating to legal entities participating in financial transactions at the EU-level should enter into force in 2023, thus additionally accelerating the existing processes and stimulating further adoption of the LEI. The adoption of legal regulations will have to be followed by an adjustment period, in which legal entities will adapt to the new reporting method, which will in the long run be beneficial to regulators, supervised entities, and, finally, the entire economy. The objective of synchronised activities carried out by the regulator and industry regarding the full implementation of the LEI is to build a more stable and resilient financial system, whose quality and data availability will facilitate macroprudential action. A fully implemented LEI system would thus ensure a truly holistic approach to the detection of systemic risks pertaining to the financial system, which is becoming more global in nature on a daily basis.

References

ESRB (2021) *Occasional Paper Series: The benefits of the Legal Entity Identifier for monitoring systemic risk*

ESRB (2020) *Recommendation on identifying legal entities*, ESRB/2020/12

³³ Markets in financial instruments directive II (MiFID II), [link](#)

³⁴ Securities financing transactions regulation (SFTR) [link](#)

-
- Federal Reserve Board (2011) *Legal Entity Identifier: What Else Do You Need to Know?*
- FSB (2012) *A Global Legal Entity Identifier for Financial Markets*
- FSB (2019) *Thematic Review on Implementation of the Legal Entity Identifier*
- Ka Kei Chan and Alistair Milne (2013) *The Global Legal Entity Identifier System: Will It Deliver?*
- McKinsey & Company (2017), *The Legal Entity Identifier: The Value of the Unique Counterparty ID*
- Office of Financial Research (2017) *Collective Action: Toward Solving a Vexing Problem to Build a Global Infrastructure for Financial Information*
- Stephen Cecchetti, Kim Schoenholtz (2017) *Managing risk and complexity: Legal entity identifier*, VoxEU

List of abbreviations

bn – billion

b.p. - basis point

CBS – Croatian Bureau of Statistics

CEE – Central and Eastern Europe

CHIF – Croatian Health Insurance Fund

CISS - Composite Indicator of Systemic Stress

ECB – European Central Bank

EGP – European Economic Area

EIOPA – European Insurance and Occupational Pensions Authority

ESMA – European Securities and Markets Authority

ESRB – European Systemic Risk Board

EU – European Union

EUR – euro

FED - Federal Reserves

GDP – gross domestic product

Hanfa – Croatian Financial Services Supervisory Agency

HRK – Croatian kuna

m – million

PEPP - Pandemic Emergency Purchase Programme

pp – percentage point

SCR – Solvency Capital Requirement

TILDA - stock liquidity market index

UCITS – undertakings for collective investment in transferable securities

VAT – value-added tax

ZSE – Zagreb Stock Exchange

Country codes: AT – Austria; BE – Belgium; BG – Bulgaria; CY – Cyprus; CH – Switzerland; CZ – Czech Republic; DE – Germany; DK – Denmark; EE – Estonia; EL – Greece; ES – Spain; FR – France; GB – Great Britain; HR – Croatia; HU – Hungary; IE – Ireland; IT – Italy; LT – Lithuania; LU – Luxembourg; LV – Latvia; MK – North Macedonia; MT – Malta; NL – Netherlands; NO – Norway; PT – Portugal; PL – Poland; RO – Romania; USA – United States of America; SE – Sweden; SI – Slovenia; SK – Slovakia; UK – United Kingdom

