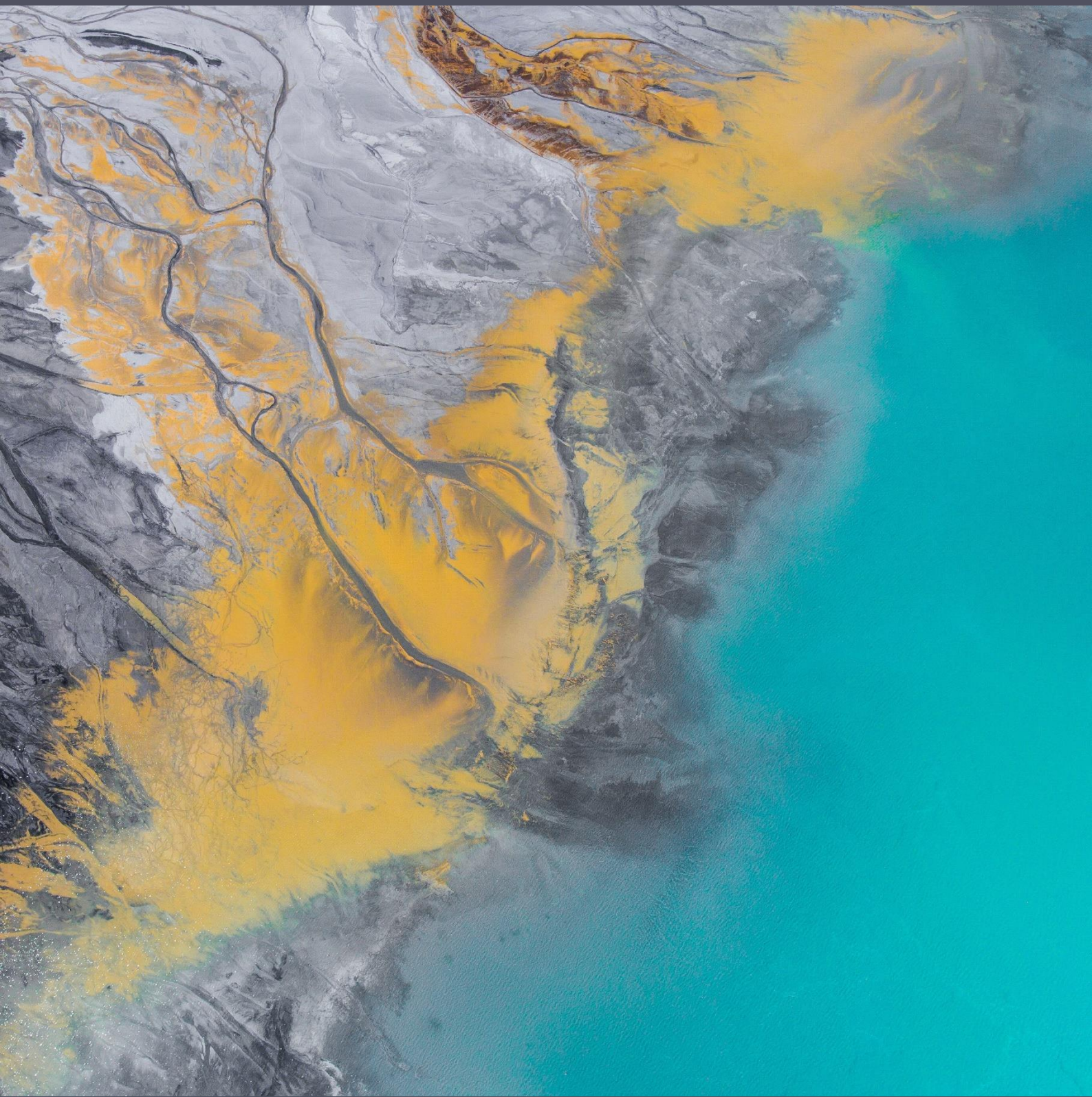
MACROPRUDENTIAL RISK SCANNER

2020 - First Half

Number IV, August 2020



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ISSN 2806-7142

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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, an appropriate set of instruments and tools, i.e. policies aimed at ensuring the stability of the system as a whole, called *macroprudential policies*, had to be developed. Therefore, in the European Union (EU), bodies with macro-prudential 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 macro-prudential 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 structural 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.

2. Macroeconomic overview

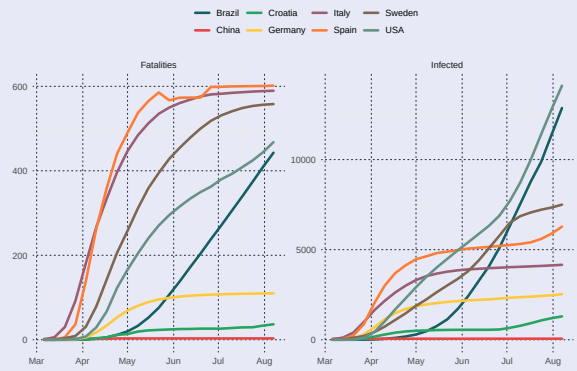
How a (local) health problem turned into a global economic crisis

At the end of 2019, media and professional space was dominated by fears and projections about the slowdown of global economic activity driven primarily by negative secular trends, rising geopolitical tensions and the continued worsening of trade relations between major economies. In such an economic environment in the European Union, the challenge of climate change was the focus of economic policy makers who also directed their efforts towards bringing Brexit to an end by agreement. These circumstances marked Croatia's takeover of the Presidency of the Council of the EU at the beginning of 2020. At the same time, in China, increasing attention was focused on a health problem, the spread of the coronavirus causing COVID-19 disease.

Over the following weeks, the virus was detected in an increasing number of countries, mostly Asian, and did not attracted much attention from global economic and health policy makers. That changed somewhat at the end of February, when first deaths in Northern Italy were recorded. In a short period of just a few weeks, the spread of the coronavirus took global dimensions, with a growing number of countries recording exponential rise in new cases of infection (Figure 1). On March 11, the World Health Organization declared a global pandemic, and the coronavirus grew from a potential threat into a crisis of an unthinkable scale.

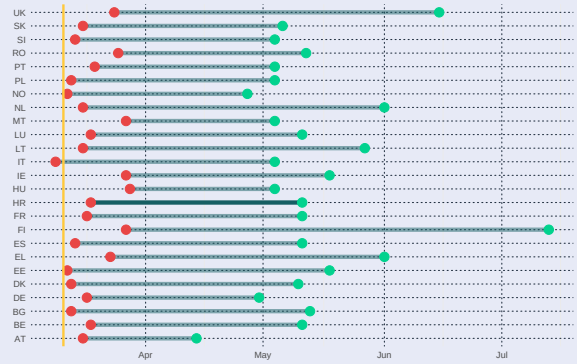
After the escalation of the epidemiological situation in Northern Italy and the consequent introduction of epidemiological measures in the form of restrictions on movement, other EU countries also reacted very quickly. By the end of March, most countries were in a state of partial or total movement restriction (lockdown), given that due to the rapid development of the situation and the exponential nature of the spread of the virus, there was a threat of the entire health care system collapsing due to limited resources (Figure 2). These measures had a strong horizontal impact and created a bilateral economic shock - of supply and demand - which resulted in a complete or partial limitation of the operations of certain activities.

Figure 1 Health crisis becomes global in March
Number of cases per 1m inhabitants



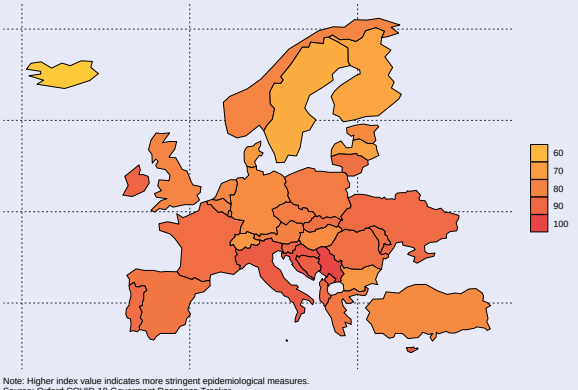
Source: John Hopkins CSSE

Figure 2 Most EU countries adopted epidemiological measures in the short term
Period of restricted movement (lockdown) from the introduction of measures until their (announced) relaxation



Note: Vertical line indicates March 11, when the WHO declared a global pandemic.
Source: Aura Vision

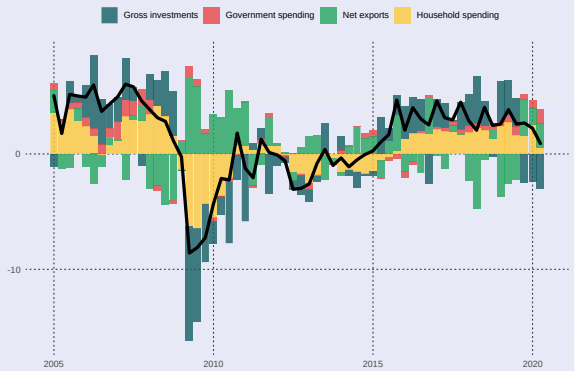
Figure 3 Croatia implements very stringent epidemiological measures
Maximum value of epidemiological measures stringency index, January – May 2020



Note: Higher index value indicates more stringent epidemiological measures.
Source: Oxford COVID-19 Goverment Response Tracker

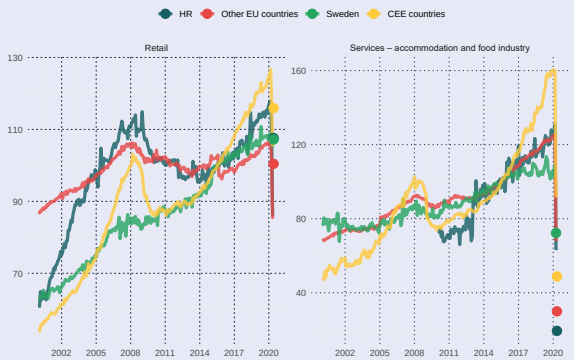
Croatia was among the EU countries that implemented very strict epidemiological measures (Figure 3). A relatively rapid national reaction and the strength and comprehensiveness of movement restricting measures prevented the exponential progression of the epidemic and thus contributed to a more successful further development of the health situation. At the end of May 2020, there were 2246 cases of infection in Croatia, accounting for 0.06% of the total population, which made Croatia relatively successful in terms of viral control at that time. This allowed for a relatively earlier relaxation of measures and the gradual opening of the economy, which started on 4 May 2020.

Figure 4 Gross domestic product in the 1st quarter grew by 0.4% at an annual level
Real growth of GDP (annual rate change, in %) and contributions to growth (percentage points)



Source: Eurostat

Figure 5 Strong contraction of turnover in retail and service activities
Turnover index, 2015=100



Note: CEE countries are: BG, CZ, EE, HU, LV, LT, PL, RO, SI and SK. Points indicate last available indicator values.
Source: Eurostat

Although the control of the first wave of epidemic in Croatia was relatively successful, many uncertainties about the virus, with its global impact that is not subsiding, will have far-reaching economic consequences. It is therefore to be expected that the upcoming global economic crisis caused by coronavirus will have an extremely negative impact on all economic agents (more about the impact of the crisis on the stability of the financial services sector in *Box 1 - Simulation of the effects of coronavirus crisis on the stability of the financial services sector*).

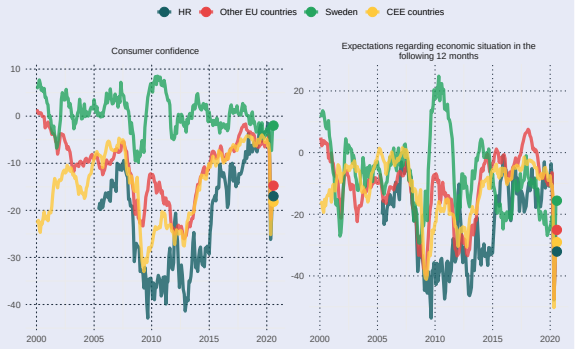
Although the lockdown in Croatia formally started on March 18, the slowdown of the economy can already be seen in the figures for the first quarter of 2020. The annual growth of real gross domestic product in the first three months of 2020 was only 0.4%, a slowdown of 2 percentage points compared to the fourth quarter of 2019, when the economy increased by 2.4% on an annual basis (Figure 4). Stagnation of economic activity is mainly due to a slowdown in household consumption, whose contribution to overall growth decreased by the above-mentioned two percentage points compared to the end of 2019. Due to the closing of borders in March, foreign trade in goods and services declined sharply in the first quarter of 2020, by 10.6% compared to the same period of the previous year. The contraction of the exchange of services was more pronounced, with imports dropping almost double the decrease in exports.[1] The contribution of net exports of goods was also positive in the first quarter, as the difficulties in the exchange of goods in the new circumstances resulted in a 1.6% decrease in imports of goods, while at the same time exports decreased by 0.3%. Despite an increase of 3.1% on an annual level, gross investments in fixed capital at the beginning of 2020 recorded the fourth consecutive quarter of deceleration and, amid extremely high uncertainties, their further slowdown in the rest of the year is certain. A positive contribution to investment, but also to consumption, can result from the countercyclical

[1] Export of services was by three percentage points lower than in the first quarter of 2019, while import was by 5.8 percentage points lower.

activities of the public sector in the form of acceleration of public spending and investments. Public spending grew in the first quarter of 2020, when it increased by 4.8%, and is expected to grow later this year.

Figure 6 Complete recovery of consumer confidence takes time

Indicators of consumers' confidence and expectations, difference between positive and negative survey responses



Note: CEE countries are: BG, CZ, EE, HU, LV, LT, PL, RO and SK. Points indicate last available indicator values.
Source: Eurostat

Figure 7 The crisis reversed the trend of seasonal decrease in the unemployment rate on the labour market

Registered unemployment rate, in % of working population

Source: CBS

High-frequency data indicate that the extent of coronavirus crisis is comparable to the previous major financial crisis, with a high potential to be even greater, at least in the short run. For example, short-term indicators of the business environment point to a strong contraction of turnover in shops and services, where contraction in the case of Croatia is relatively pronounced relative to comparable countries due to strict epidemiological measures (Figure 5). However, a sharp drop in turnover was also observed in countries that had much more relaxed approach to the pandemic, such as Sweden. Although the behaviour of citizens in various European countries is not fully comparable, especially in the North-South divide, this implies that the rapid recovery of the economy after the crisis (so-called V recovery) is unlikely and will primarily depend on the sentiment, expectations and habits of consumers. Given the historical evolution of these indicators showing that recovery is slow and often a long process, it can be expected that, after the initial contraction of consumer sentiment (Figure 6), the return to pre-crisis levels will be a lengthy process.

The level of disposable income, which will primarily be determined by trends in the labour market, will influence the propensity to consume much more than behavioural characteristics of consumers. The coronavirus crisis reversed the trend of seasonal decrease in the unemployment rate, so at the end of June the registered unemployment rate in Croatia was 9.1% (Figure 7). Thus, the number of unemployed persons at the end of June was by almost 19 thousand higher than at the end of 2019, amounting to 150.6 thousand. Given that in the same period of previous years the number of unemployed persons on the domestic labour market was on average reduced by 48 thousand, the effect of coronavirus crisis on the domestic labour market in the first half of 2020 is reflected in the loss of about 66 thousand jobs.

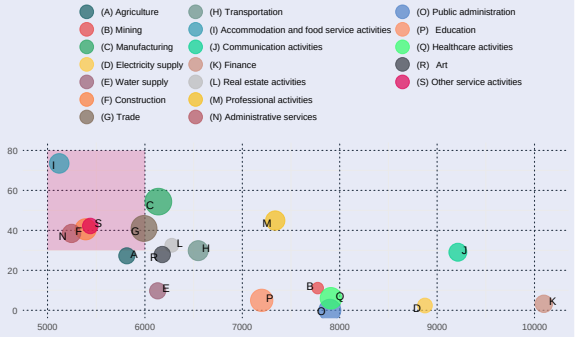
The impact on the labour market would have been even more pronounced had the government not adopted measures to preserve jobs by which employers who meet the defined conditions are paid financial support[2] for employees. In April, the number of beneficiaries of this measure amounted to 577 thousand, accounting for approximately 38% of the total number of persons employed, while in May the number of beneficiaries decreased by almost 92 thousand as a result of the relaxation of epidemiological measures. This measure helped

[2] The aid amounted to HRK 3,250 in March, while in April, May and June it amounted to HRK 4,000, with the conditions for applying being more strict in June (more information on the CES website): https://mjera-orm.hzz.hr/korisnicka-pitanja/nova-mjera-ocuvanje-radnih-mjesta-lipanj-2020-pitanja-i-smjernice/).

stabilise the labour market in the short run by ensuring a certain level of revenue for more than half a million employees during the lockdown period, but the real consequences of the crisis for the labour market will only become clear with the abolition of the job safeguarding aid.

Figure 8 Workers in service activities (I, N and S) significantly hit by the crisis

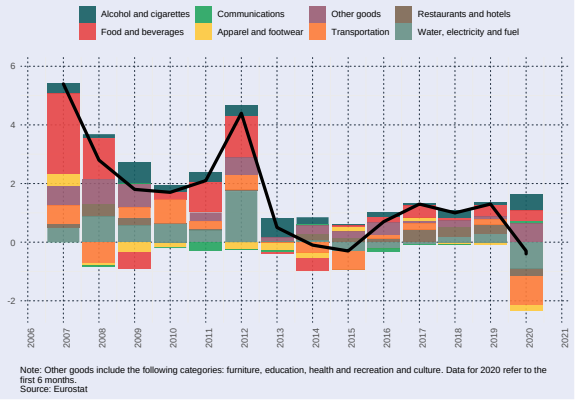
Average net salary, March 2020 (x axis), received aid to preserve jobs, in % of the total number of workers in the sector for March, April and May 2020 (y axis) and the number of workers in the sector, March 2020 (circle size)



Note: Showing one-letter indications of activities according to the 2007 National Classification of Activities (NKD).
Source: CBS, CES

Figure 9 Deflation pressures prevail in the short term

Contributions of individual goods categories to the total inflation rate, in percentage points



Note: Other goods include the following categories: furniture, education, health and recreation and culture. Data for 2020 refer to the first 6 months.
Source: Eurostat

It is certain, however, that an increase in unemployment will have a more intense impact on the younger population, which are typically more often employed under fixed-term contracts and as seasonal workers, particularly those working in services and tourism. In terms of the share in total aid for the preservation of jobs, the processing industry and trade are particularly endangered (Figure 8), since they rely heavily on cross-border trade, which decreased due to border closure. Employees working in the accommodation and food preparation (I), construction (F) and administrative (N) and other services (s) are in extremely difficult situation, especially if the low level of salaries in these sectors is taken into account, which is why the absorption potential for preserving the standard of living in a possibly longer period of suppressed business activities of these employees is limited.

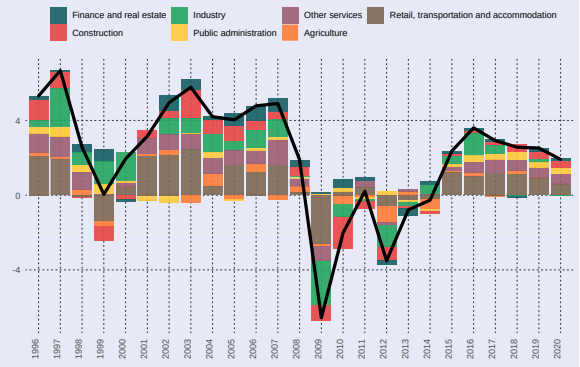
The post-financial crisis period was characterised by suppressed inflation despite the relaxation of the main central bank's monetary policies and quantitative discounts placing large amounts of money into the economy. The reasons behind this were twofold. On one hand, the general price level was kept low by the process of globalisation and optimisation of company production processes. On the other hand, the absence of a more pronounced price increase in the form of inflation is the consequence of money allocation not for consumption, but for financial markets, primarily stocks and real estate, which potentially led to the creation of price balloons on these markets. The new crisis caused by the coronavirus brought with it a new cycle of monetary and quantitative relaxation with the aim of stabilising financial markets and maintaining financing costs at low levels (see Chapter 3.3 Market risks).

In the medium term, the general level of prices could rise as the price of production processes could be expected to increase due to higher administrative costs as a result of health and environmental protection measures. In addition, new supply chains, which proved to be cost-efficient in good times but very vulnerable in the crisis period, will contain more implicit costs. However, deflationary pressures prevail in the short term, primarily due to a decline in economic activity and rising unemployment, but also due to a decrease in energy prices in conditions of globally limited production activities. Thus, as early as June, the rate of change in the price level was negative, amounting to -0,4% on an annual basis (Figure 9). Although food prices rose due to increased demand and difficult cross-border transport, the decline in prices of energy products and transport has more than compensated for this increase.

Impact of coronavirus crisis on economic activities until the end of the year

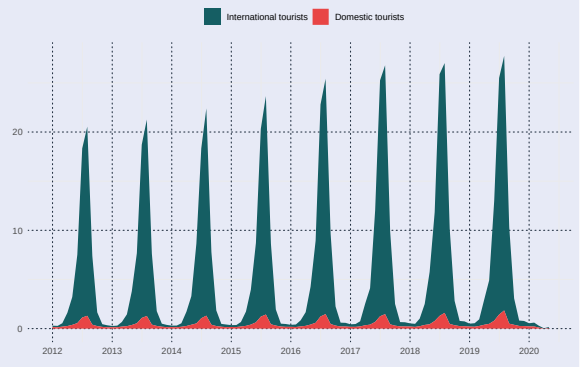
There are three key factors that will determine the extent of the crisis and the speed of recovery of the entire economy: (i) the *structure of the economy* on which the ability to carry out remote work respecting the social distance depends, particularly affecting labour intensive sectors such as tourism and services; (ii) the *structure of the corporate sector* in view of the significant vulnerability of highly indebted enterprises and small and medium-sized enterprises with limited access to funding sources; (iii) the *effectiveness of fiscal stimulus* in safeguarding employment.

Figure 10 Added value increase is mostly generated by retail and service activities
Contributions of individual activities to the real growth of gross added value, in percentage points



Note: Data for 2020 refer to the 1st quarter.
Source: Eurostat

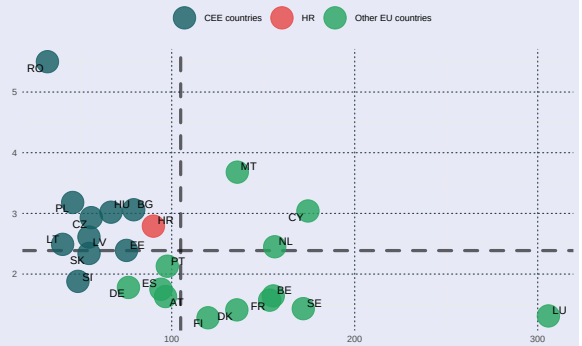
Figure 11 Domestic tourism primarily depends on arrivals and purchasing power of international tourists
Number of overnight stays by tourists by residency, in millions



Source: Eurostat

The structure of the gross value added of the domestic economy shows that economic growth is mainly generated by service activities mainly linked to tourist activity, and they are the most endangered in the current circumstances (Figure 10). Relying on monocultural growth is a significant structural weakness considering the epidemiological limitation of physical contact, which will reduce the absorption capacity of tourist destinations. Another important limiting factor in tourism is the psychological impact of the epidemic, since a certain number of guests can be expected to give up travel because of fear of a potential infection or obligation to self-isolate when returning from the holidays. The decrease in the volume of travel will also be affected by the deterioration of the consumers' economic situation in the form of rising unemployment and reduced income. Finally, a factor that will certainly have a significant impact on the tourist activity is the openness of borders and cross-border freedom of movement of the population, especially when taking into account the share of foreign guests in total overnight stays of between 92% and 93% depending on the observed year (Figure 11). A higher purchasing power of foreign tourists should be added to this, so it is certain that the result of tourism, and consequently the overall domestic economic activity in 2020, will significantly depend on the (non-)arrival of foreign tourists.

Figure 12 Operations of non-financial companies will be under debt repayment pressure
Unconsolidated debt of non-financial companies, in % of GDP at the end of March 2020 (x axis), interest rate on loans to non-financial companies, in % - May 2020 (y axis)



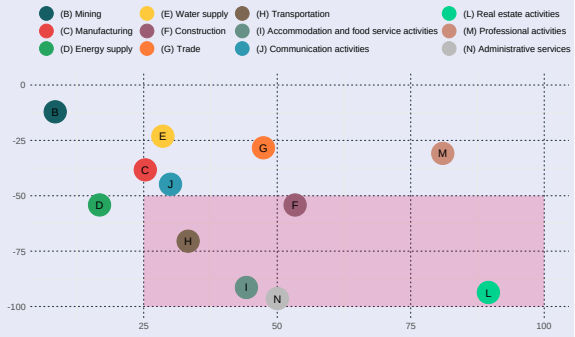
Note: Showing interest rates on balances of long-term bank loans to non-financial companies. Lines indicate average sample values.
Source: ECB

The epidemiological measures introduced in March partially or totally froze business activities and reduced corporate revenues, while at the same time financial liabilities continued to mature. The CNB and Hanfa reacted swiftly by issuing recommendations to credit institutions and leasing companies to facilitate the payment of existing liabilities for non-financial companies through moratoriums and delays of forced

collection of receivables[3] (more information in Chapter 4 Measures aimed at safeguarding financial stability). In addition to these measures, the Ministry of Finance secured HRK 15bn for cheaper loans to entrepreneurs through HBOR and HAMAG BICRO programmes[4]. The objective of these measures is to ensure sufficient company liquidity and to facilitate the payment of financial obligations. It should be noted that they are of a short-term nature so far, and it is certain that the consequences of coronavirus crisis will have a longer-term impact on the operations of non-financial companies, especially in certain activities. In such circumstances, companies whose operations are already under increased pressure of repaying debt will be particularly endangered, although at aggregate level the companies sector is relatively less indebted in relation to the European average, but comparatively more burdened by the cost of interest (Figure 12).[5] Therefore, additional corporate borrowing is likely, and the availability and cost of financing will significantly affect the recovery of this sector.

Figure 13 Companies in service (H, I and N) and real-estate activities (F and L) particularly at risk

Share of micro-companies and SMEs in the added value of the activity per costs of production factors, in % - 2017 (x axis) and the annual rate of change in the amount in fiscal receipts, in % - April 2020 (y axis)



Note: Showing one-letter indications of activities according to the 2007 National Classification of Activities (NKD).
Source: CBS, Eurostat, Tax Administration

Small and medium-sized enterprises with limited access to capital markets and cross-border financing are particularly vulnerable, and they are most prevalent precisely in the activities that are most affected by the coronavirus crisis (Figure 13). An alternative possibility of financing medium-sized and small enterprises through traditional bank loans is provided by the specialized Progress Market of the Zagreb Stock Exchange, which was registered at the beginning of 2019, as a multilateral trading facility for the realisation of SME investment plans through raising of the new capital or the facilitation of easier transfer of ownership[6]. Although interest margins on loans to the real sector have converged in previous years towards rates observed in comparable countries in Central and Eastern Europe, with the coronavirus crisis they have increased significantly[7], despite historically high levels of excess liquidity in the system, which at the end of April 2020 amounted to HRK 49bn or 12% of GDP (Figure 14). Although the increase of the interest margin is understandable in circumstances of historically high level of uncertainty that makes it difficult to assess the creditworthiness of clients, without timely dynamisation of the credit market, significant disturbances may appear in the financial position and solvency of non-financial companies with an inevitable materialisation of credit risk in the financial system, which can have a negative impact on the ability of financial intermediation of the system and ultimately prolong-term economic recovery.

Finally, the efficiency of government measures to help the economy will have a crucial impact on

[3] More information on Hanfa's recommendations to leasing companies is available on Hanfa website: https://www.hanfa.hr/vijesti/hanfa-izdala-dodatne-preporuke-leasing-društvima-u-cilju-olakšanja-otplate-leasinga/.

[4] More information available at the following address: https://ec.europa.eu/info/sites/info/files/2020-european-semester-convergence-programme-croatia_hr.pdf.

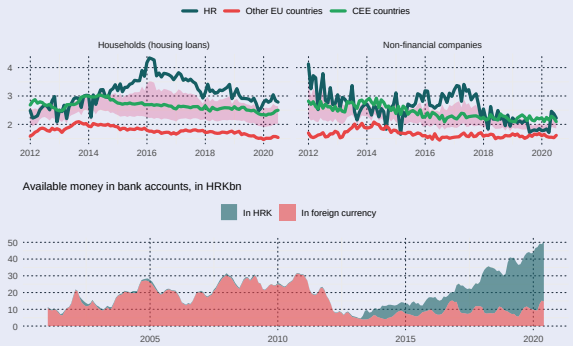
[5] At the end of 2019, the non-consolidated debt of domestic companies amounted to 87.6% of the gross domestic product, and at the end of March 2020 it was financed at an average interest rate of 2.85%, which is by 0.4 percentage points above the EU average.

[6] More information available at the official website of the market: https://progress.market/home.

[7] At the end of April 2020, the interest margins on loans to non-financial companies amounted to 2,5%, an increase of 0,7 percentage points compared to the end of 2019.

economic recovery.[8] The domestic fiscal measures adopted to support the economy at the end of May amounted to HRK 30 billion, or 7.5% of GDP (Figure 15), half of which relates to measures to ensure liquidity and guarantee more favourable loans to entrepreneurs through HBOR and HAMAG BICRO programmes. A third of total funds refer to a direct fiscal impulse which includes the write-off of a part of taxes and contributions and support measures for the preservation of jobs, while the remaining sixth of the total amount refers to the postponement of payment of taxes and contributions. Although quantitatively modest in relation to Western countries, the efficiency of fiscal impulses, in addition to the size of the measures adopted, will be equally affected by its adequacy in the segment of sectoral distribution and temporal application. However, irrespective of their design, these measures will have a significant impact on the level of public debt. Although fiscal consolidation resulted in its significant reduction in previous years[9], the domestic fiscal position is comparatively worse in relation to comparable Central and Eastern European countries, but also compared to the position of public finances just before the outbreak of the 2008/2009 global financial crisis (Figure 16).

Figure 14 Financing conditions relatively high despite generous liquidity in the system
Interest margins on bank loans to non-financial companies and households sectors, in %



Note: CEE countries are: BG, CZ, EE, HU, LV, LT, PL, RO, SI and SK. The marked area in the above graphic shows the interquartile range for a sample of EU countries.
Sources: ECB, CNB

Figure 15 Domestic fiscal response to the crisis more modest relative to Western countries
Size of fiscal response to COVID-19 crisis, in % of 2019 GDP

Note: Showing only quantifiable measures.
Source: CBS, Ministry of Finance, Bruegel

The snowball risk remains pronounced since the growth rate of the economy in the recent period only slightly exceeded the cost of debt servicing[10], which prevented a more pronounced reduction in the level of debt on the wave of cyclical movements without significant changes in the structure of public finances. At the same time, the possibility for a further increase in revenues through higher taxes, which are already at a comparatively high level, is limited (Figure 16). Therefore, it is inevitable that there will be new debts to finance current liabilities and stimulate the economy, which will put the sustainability of public finances under considerable pressure in the coming period. Still relatively favourable financing conditions should count as a mitigating factor, given the expansionary programmes of central banks through which significant funds were placed into the system in order to depreciate shocks on financial markets. The agreement on the recovery plan and Multiannual Financial Framework for the period 2021-2027 will greatly contribute to the facilitation of fiscal positions of EU Member States. Within the framework of this agreement, a new recovery instrument (Next Generation EU - NGEU) worth EUR 750bn was created, which, with funds raised on financial markets, will increase the financial power of the

[8] More information available at the following address: https://www.koronavirus.hr/en.

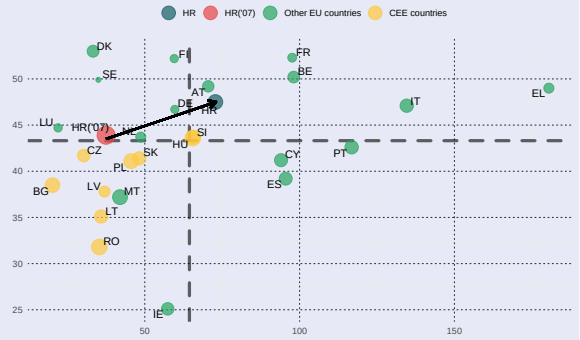
[9] In the period from the end of 2015, public debt measured by the share in GDP decreased by 11 percentage points to 73.2% of GDP at the end of 2019.

[10] The cost of debt servicing in 2019 was 2.2% of GDP and the real rate of economic growth was 2.9%.

EU budget from 2021 to 2024 through a combination of grants and loans.[11]

Figure 16 General government's fiscal space relatively small

Consolidated public debt, in % of GDP (x axis), revenue of general government, in % of GDP (y axis) and implicit interest rate (circle size), in % - 2019



Note: Circle size indicates the amount of general government's interest expenses in % of GDP in 2019. Lines in the chart indicate average values.
Sourcer: Eurostat

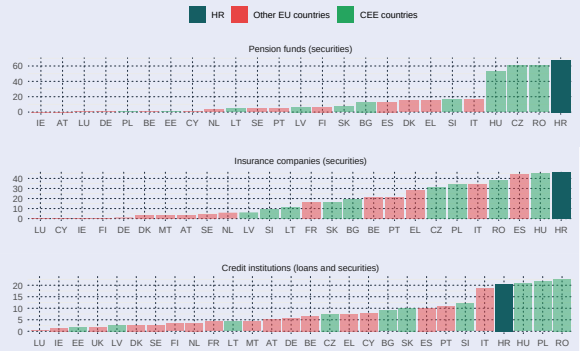
Figure 17 Higher indebtedness makes public finance vulnerable to changes in financing conditions

Interest expense growth in scenarios of interest rate increase by 1, 2 or 3 percentage points, in % of GDP

Source: Hanfa

Figure 18 Domestic financial system highly exposed to domestic government

Proportion of general government exposure, in % of total sector's assets (2019)



Note: Pension systems in EU countries are not necessarily comparable given the specificities of local regulations and system characteristics, therefore, they should be interpreted with caution.
Source: ECB (Quarterly Sector Accounts) and Hanfa

It is crucial to the options and conditions of financing that the current investment rating of the country is retained (more in Chapter 3.2 Market risks) as well as perceptions and risk appetite of investors in global financial markets.

The public sector will have to rely more on cross-border financing, since the domestic financial sector is highly exposed to the government, making room for increasing this exposure and absorbing higher amounts of new debt limited (Figure 18). The price of borrowing by the government, and indirectly by other domestic sectors, is thus additionally exposed to the risk of a sudden change in the risk premium and foreign investors sentiment, who, unlike domestic investors whose investment structure is largely regulated by law, have a much wider range of investment opportunities (Figure 17).

Instead of conclusion - structural changes on the horizon

An extreme event of global scale such as the crisis caused by coronavirus will result in structural changes in many spheres of modern society, including economic systems. Some of the changes have already started to take place, e.g. education has become digital overnight, offices have been replaced with living rooms, and conference rooms have been replaced with virtual zoom rooms.

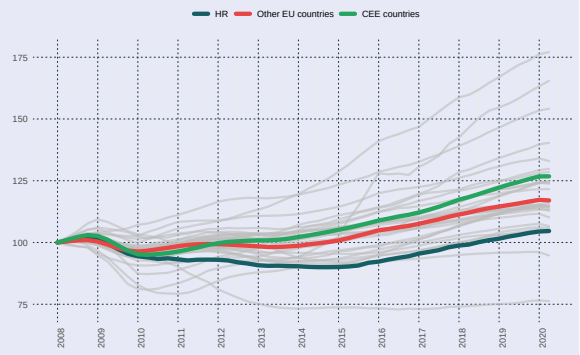
Never before did an event have such a rapid and uniform impact on all countries of the world, thus demonstrating the extent of global interconnection, but also the vulnerabilities arising from globalisation and globally diversified supply chains. The crisis strengthened already existing de-globalisation trends and trade tensions, and brought back the idea of self-sufficiency to mainstream discourse. Although it has shaken the geopolitical relations and political stability of the EU, the crisis has also shown greater determination and harmonisation among economic policy makers in action with a view to stabilising the health and economic situation than during the outbreak of the global financial crisis. However, despite the

[11] More information in the statement by the European Council available at: https://www.consilium.europa.eu/media/45109/210720-euco-final-conclusions-en.pdf.

unprecedented fiscal stimuli and monetary injections, this crisis, just like all the previous ones, will bring to the forefront the current structural vulnerabilities of economies whose addressing will determine the pace of recovery.

According to the recent report of the European Commission within the framework of the 2020 European Semester[12], in Croatia, reform priorities in the field of sustainability of public finances are highlighted, with the emphasis on the launch of the reform of the budgetary framework, financial sustainability of the public sector and raising the transparency of local self-government bodies, as well as greater reliance on direct taxation. One of the more prominent challenges is access to corporate finance especially in the context of a comparatively poorly developed domestic capital market. Corporate financing through the capital market is still under development. What could positively contribute to its dynamisation are recent amendments to the Mandatory Pension Funds Act, which could increase interest and liquidity in this market, and the establishment of the Progress Market of the Zagreb Stock Exchange through a less restrictive legal framework in order to facilitate access to capital needed for growth and development.

Figure 19 Catching up with comparable countries requires structural changes
Real gross domestic product index, 31.12.2017 = 100

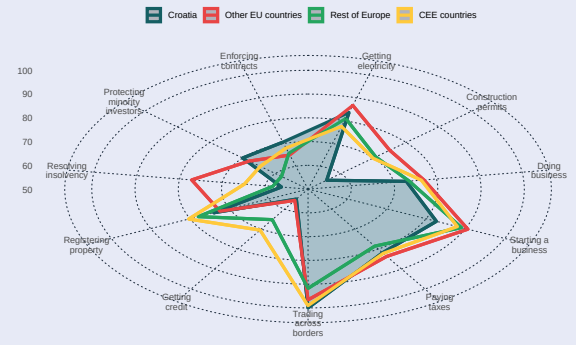


Note: CEE countries are: BG, CZ, EE, HU, LV, LT, PL, RO, SI and SK. Lines marked in grey show indicator movements for individual EU countries.
Source: Eurostat

Relaxed financing conditions on international financial markets will ease the burden of new borrowing, which will, with a rational allocation of resources from the EU funds intended for recovery from coronavirus crisis, create a space for structural reforms necessary to catch up with comparable countries in Central and Eastern Europe. The size of the domestic economy only exceeded the 2007 level in 2019, while the CEE countries reached that level as early as in 2012. (Figure 19).

Convergence will be enhanced by improving the business environment, particularly in the areas of access to credit, resolving insolvency and obtaining building permits (Figure 20), which would spur foreign investment and innovation. To maintain competitiveness in the coming period, it will be necessary to improve digital capacities which are currently at levels below the EU average (Figure 21). Improving and greater relying on digital resources would reduce barriers to access to information and knowledge and raise the digital potential of society. A more pronounced improvement in digital capacity that can be achieved in the medium term (Figure 21) has a strong potential to foster social mobility, geographic decentralisation, innovation, competitiveness raising and ultimately more sustainable economic growth.

Figure 20 Significant room for improvement of business environment
Rating by individual categories of doing business indicators, 2019



Note: CEE countries are: BG, CZ, EE, HU, LV, LT, PL, RO, SI and SK. Rating indicates a relative standing of a country in the sample of 190 world countries, with a higher value indicating better business practices.
Source: World Bank (Doing business)

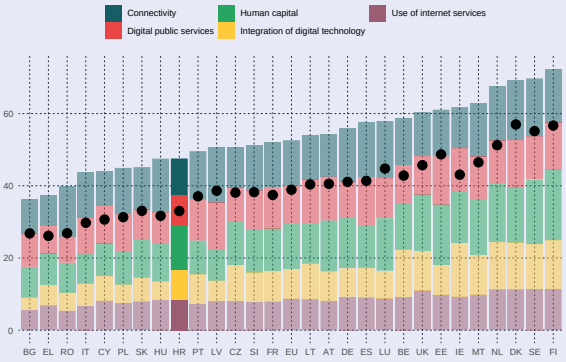
Despite a number of unknown facts regarding the coronavirus crisis, it is certain that will result with higher debts for the majority of economic agents. The overall level of the economy debt will also be affected by the earthquake in

[12] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020SC0510&from=EN

Zagreb, whose cost of reconstruction is preliminarily estimated at approximately HRK 100 billion[13], which represents a quarter of the total gross value added of the economy in 2019. As much as 42% of the total amount refers to the complete reconstruction of hospitals and educational institutions, the financing of which will be ensured entirely by the public sector, as well as financial assistance for the reconstruction of private property. High level of debt makes the economy vulnerable to sudden changes in financing conditions that are particularly pronounced in times of high uncertainty.

The forthcoming period will provide insight into the willingness of all segments of the economy to structural adjustment in exceptional circumstances and provide a test of willingness for a relatively larger and longer-term global challenge posed by climate change.

Figure 21 Increase in the level of digitalisation was additionally reinforced by recent events
Digital Economy and Society Index, 2015 and 2020



Note: Dots indicate the composite indicator level in 2015. Showing the contribution of individual components in the overall DESI indicator.
Source: European Commission (Digital Economy and Society Index)

[13] More details on the preliminary cost assessment are available on the website of the Ministry of Construction and Physical Planning: https://mgipu.gov.hr/about-the-ministry-139/scope-of-the-ministry/construction-142/reconstruction-of-earthquake-damaged-buildings-in-the-city-of-zagreb-and-its-surroundings/10757

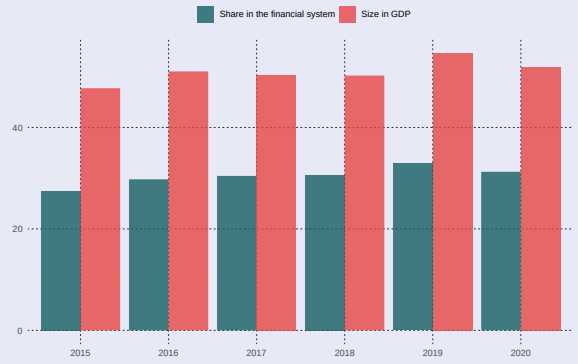
3. Overview of risks in the financial services sector

3.1 Principal trends

Continuous growth in the size and importance of the financial services sector in the domestic financial system was temporarily halted at the beginning of 2020. This was a result, to a lesser extent, of negative market trends, while the reduction of financial services sector assets was significantly influenced by investor perception and sentiment.

In the first quarter of 2020, the size of the financial services sector decreased by HRK11.5bn, reaching HRK 204bn at the end of March, i.e. 50.8% of the gross domestic product (Figure 22). This decrease, together with the simultaneous increase in credit institutions' lending, resulted in a reduction of the sector's share in the financial system by 1.8 percentage points, which stood at 30.8% at the end of March 2020.

Figure 22 The financial services sector slightly decreased in the 1st quarter 2020
Size of the financial services sector, in %



Note: Data for 2020 refer to the end of March.
Source: Hanfa, CNB and CBS

The growth of the financial services sector in 2019 (13.5%) was the result of positive trends in international stock markets, the increase in Croatian government bond prices due to entering the investment credit class, as well as the continuous inflow of money into pension funds, as well as positive trends in the insurance and leasing market (more information about these trends can be found in the publication Macroprudential Risk Scanner, No 3[14]). Positive macroeconomic and financial trends continued in early 2020 despite growing concerns about the development of the health crisis caused by coronavirus in the Far East countries, primarily China. Investor sentiment deteriorated slightly in late January, when China introduced quarantine in Wuhan province and in early February, when the spread of the virus to other countries accelerated.

Figure 23 Assets under management of funds determined a decrease in the sector size
Contributions of individual industries to the annual rate of change of the financial service sector, percentage points

Note: Data for 2020 indicate the rate of change of sector size at the end of March in relation to the end of 2019.
Source: Hanfa

Growing concerns and a worsening investor sentiment culminated on February 20, when Italy saw a sharp rise in fatalities. Markets reacted promptly, which had a strong impact on capital flows and consequently on the prices of all classes of financial assets, both on foreign and domestic financial markets (more information in Chapter 3.3 Market risks). As a result, the financial services sector's assets at the end of March 2020 were 6.3% lower than at the end of 2019. This decrease is mainly due to a decline in net assets of investment funds, as investors reacted to negative market trends and high

[14] https://www.hanfa.hr/media/5332/macroprudential-risk-scanner-2019_3.pdf

uncertainty associated with the pandemic by significant outflows from funds. At the same time, the decrease in net assets of pension funds was significantly lower due to stable and foreseeable net outflows (Figure 23).

Equity, balanced and bond funds, which accounted for 92% of the total net assets of UCITS funds at the end of May 2020, recorded comparable net asset reduction rates of 29%, 22% and 33% respectively, in the first quarter relative to the end of 2019. (Figure 24). Although their relative size is comparable, these trends result from different causes. Reductions in net assets of equity funds are for the most part the result of negative market trends, i.e. price contraction in stock markets. At the same time, the decline in net assets of bond funds was primarily a result of net outflows, which may be associated with a greater conservatism and risk aversion of investors in these funds, who had a "panicked" response to the escalation of the pandemic by withdrawing money from the funds and partially spilling them into safer bank deposits (Figure 25). The decrease in net assets of balanced funds was equally influenced by market trends and investor decisions. Price recovery on stock markets in April and May, with positive net payments in view of lower prices, compensated for the decline in net assets of equity and balanced funds, while net assets of bond funds stagnated.

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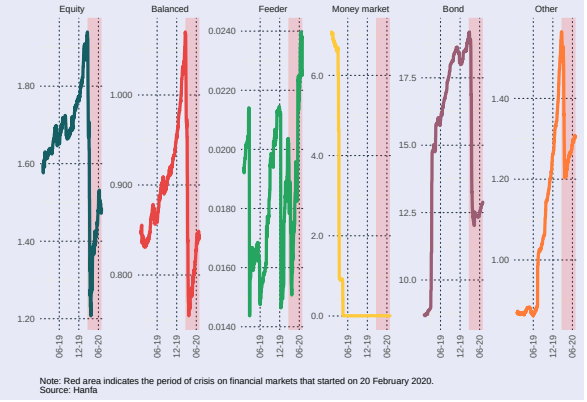
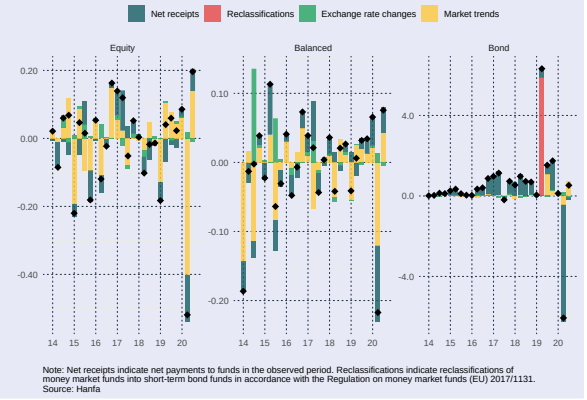
Figure 24 The crisis had a strong impact on net assets of investment funds
in HRKbn



Note: Red area indicates the period of crisis on financial markets that started on 20 February 2020.
Source: Hanfa

Figure 25 Decrease in net assets of UCITS under the impact of payment of funds
Quarterly change in net assets of investment funds, in HRKbn



Note: Net receipts indicate net payments to funds in the observed period. Reclassifications indicate reclassifications of money market funds into short-term bond funds in accordance with the Regulation on money market funds (EU) 2017/1131.
Source: Hanfa

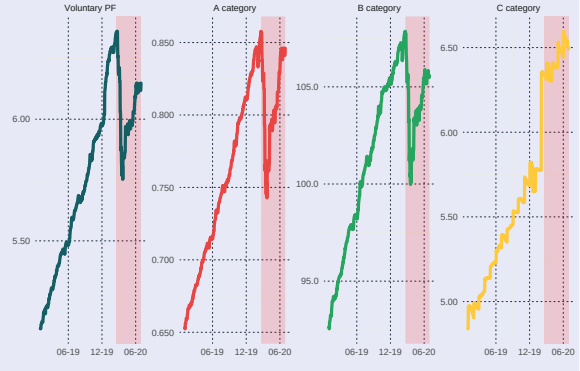
Negative market trends in the first quarter of 2020 reduced the net assets of pension funds by 3.6% compared to the end of 2019. Positive and stable net inflows depreciated a part of market price adjustments (Figures 26 and 27). This reduction was largely compensated for in the second quarter (4% growth compared to the end of March) under the influence of partial price recovery on stock and bond markets and the continuation of net inflows of funds. The risk profile of a pension fund category determined the magnitude of the reaction of assets to the

initial shock in the financial markets. Given the comparatively higher investment risks, the asset value of category A pension funds recorded the sharpest decline, while category C funds' assets remained almost unchanged (Figure 27). These disruptions clearly demonstrated the difference in the investment risk profiles of A, B and C categories of mandatory pension funds, which is consequently reflected in their long-term returns, primarily influenced by market trends (see Chapter 3.5 above). Profitability and capitalisation of financial service providers). Although projection of trends in periods of high uncertainty is extremely unreliable, it can be assumed that financial markets absorbed most of the shock caused by the pandemic, and the prices of asset classes were adjusted accordingly. Therefore, even in the event of further deterioration of the health situation, and consequently of macroeconomic outlook, a relatively weaker market reaction than at the beginning of the year is likely.

Figure 26 Market trends determined the movements of net assets of pension funds in 2020
Quarterly change in net assets of pension funds, in HRKbn

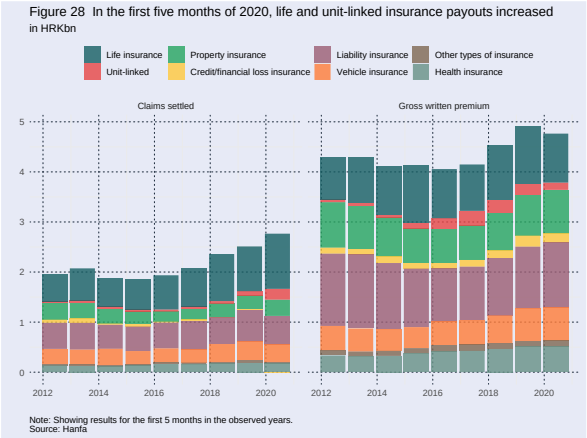
Source: Hanfa

Figure 27 Net assets of pension funds partly recovered
in HRKbn

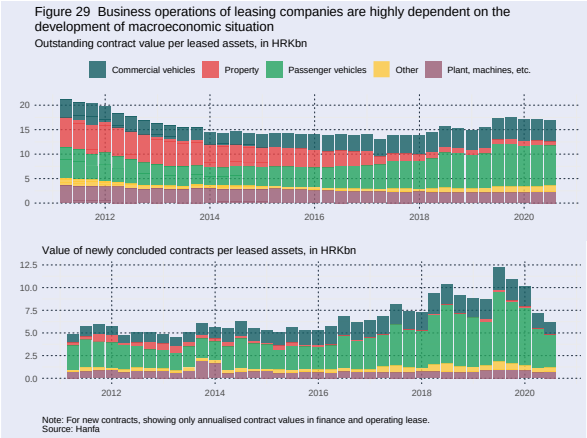


Note: Marked area indicates the period of crisis on financial markets that started on 20 February 2020.
Source: Hanfa

While the escalation of the pandemic spilled over to financial markets almost without delay and reduced the value of funds' assets, the insurance and leasing segment can expect the consequences of coronavirus crisis with a certain time lag, which will significantly depend on the development of the macroeconomic situation. It is certain that, at least temporarily, the conclusion of new contracts will be slowed down and that the insurance segment will see an increase in the payment of claims by individual classes of insurance, especially given the recent earthquake, with a potential increase in the number of early terminations of life insurance contracts in the context of increased uncertainties and reduced household income. In the first five months of this year, a slight acceleration of the increase in claims settled in life and unit-linked insurance was observed in relation to the same period of the previous year, where a part of the increase was related to the maturity of the portfolio and part to early surrender, while at the same time the amount of gross premium written decreased, after a period of continuous growth in which these classes of insurance were a relatively competitive form of long-term savings (Figure 28). The settlement of claims in the asset insurance segment, primarily linked to settled earthquake insurance claims, also increased, while claims in other classes of insurance slowed down in 2020, which can be linked to reduced economic activity and mobility of citizens. However, these trends, together with adverse market effects on the value of assets, should not jeopardise the solvency of insurance companies with regard to high capital buffers, in particular at market-wide level. Occasional liquidity pressures, especially on certain companies, may be more pronounced. However, systemic disturbances are not expected in view of the relatively good maturity adjustment of assets and liabilities, as well as the liquidity of assets, in particular with the increase in secondary liquidity of government bonds due to central bank auction repurchase.



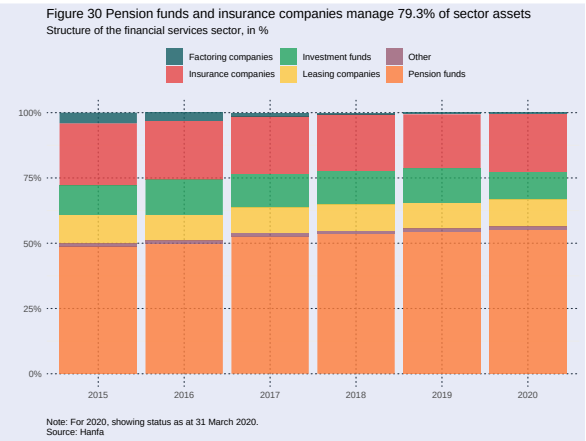
Leasing companies have demonstrated a stable growth over the past few years, which mainly relied on the financing of passenger and commercial vehicles, as demand for these services grew in line with the economic recovery and growth of tourism activity, especially in the car rental segment (Figure 29). Since the transport sector is one of the most affected by the coronavirus crisis (see Chapter 2 Macroeconomic overview), the contraction of the newly concluded contracts is quite certain. Therefore, business operations of leasing companies will be under pressure from lower income in the short run with regard to the approval of moratoriums on leasing contracts (see Chapter 4 Measures adopted to preserve financial stability) and stagnation of new jobs, while in the medium term the costs of value adjustments can be expected to rise due to an increase in non-performing placements.



These impacts of the coronavirus crisis on intermediaries of the financial services sector and funds until the end of the year should neither be systemic in nature nor of the same intensity as the initial shock in March, since numerous measures of fiscal, monetary and prudential character have been adopted since then, which increased the liquidity of the system, facilitated the operation of financial institutions, but also servicing of financial service users liabilities (more information in Chapter 4 Measures aimed at safeguarding financial stability).

3.2 Structural characteristics and risks

The initial mid-March systemic shock had a negative impact on the assets of the financial services sector and consequently on the cross-sectoral concentration that further increased in the first quarter of 2020. The share of pension funds in the total assets of the financial services sector increased by two percentage points in relation to the end of 2019, so at the end of March, pension funds managed a total of HRK 115.7bn, i.e. 56.6% of the sector's total assets.[15] The same share increase was recorded by insurance companies, which accounted for 22.7% of the total financial services sector at the end of March (Figure 30).

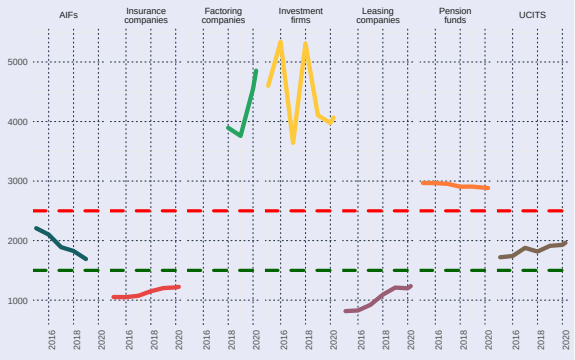


[15] 28.8% of GDP

In the coming period, the concentration of the sector is expected to continue, given the legally conditioned stability of net inflows of pension funds even if the average amount of payments per insured person is reduced due to worsening conditions in the labour market. The size of pension funds' assets exceeding HRK 100bn brings diversification benefits, particularly with the recent legal relaxation and expansion of investment opportunities, which consequently reduces the volatility of its value. However, a high concentration of the system can amplify risks that initially do not have systemic effects through spillover channels and contagion, and ultimately result in impaired stability of the financial system. Although still in the area of high concentration, the intra-sector concentration of pension funds continued to decrease in the first quarter of 2020 (Figure 31).

Figure 31 High concentration present in some, relatively smaller industries

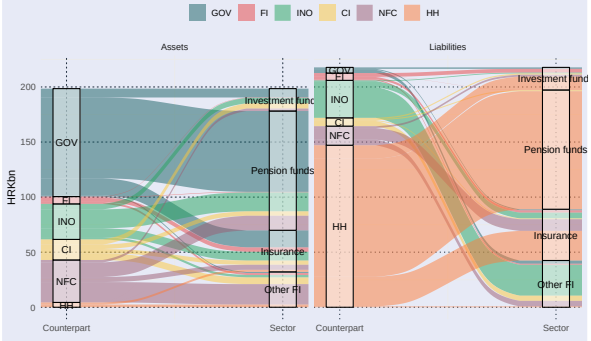
Herfindahl-Hirschman Index (HHI)



Note: According to the classification of the US Department of Justice, markets with index value up to 1500 are considered as competitive, while those with index value above 2500 are considered as highly concentrated.
Source: Hanfa

Figure 32 Trends in population and government sectors will mostly influence financial services

Interconnection of financial services sector and other sectors of the economy, as at 31 March 2020



Note: Abbreviations stand for: GOV – government, FI – financial services sector, INO – foreign sector, CI – credit institutions, NFC – non- financial companies, HH – households.
Sources: CNB, Hanfa

Apart from pension funds, investment firms and factoring companies are also in the high concentration zone, but these are relatively small segments of the financial services sector[16] and their systemic impact is limited. On the other hand, UCITS, leasing and insurance companies are located in the area of moderate and low concentration, but with a stable multi-year growth trend. It is very certain that these trends will continue, because crisis periods that test business models of individual companies often further accelerate the process of market consolidation.

Propagation and amplification of disturbances in the financial system significantly depend on the interconnection of parts of the system and the economy in general. At the end of 2019, some segments of the financial services sector were not significantly directly linked. However, their indirect connection was significant through a high level of exposure to the government, as investments in government bonds are the predominant investment class of the financial services sector (Figures 32 and 33). Under conditions of strong contraction of economic activity and double impact on the state budget through the revenue and expenditure side, the deterioration of the general government's financial position (more information in Chapter 2 Macroeconomic environment) exposes the financial services sector to potential losses in the event of an increase in the risk premium.

Liabilities of the financial services sector are concentrated on households which, apart from being the only shareholder in pension funds, are also the largest shareholder in investment funds and the most represented users of insurance services (Figure 32). Therefore, on the sector-wide basis, changes in investor sentiment and possible irrational behaviour that may result in a sudden withdrawal of funds and the materialisation of liquidity risks may ultimately

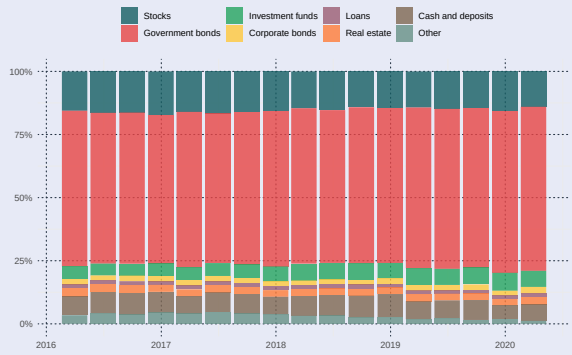
[16] At the end of March 2020 they accounted for only 0.6% of the total financial services sector.

further undermine the financial position of the financial services users themselves[17].

The structural weakness of the financial services sector is also reflected in the concentration of investments in (domestic) sovereign debt securities, which, at the end of March 2020, accounted for two thirds of the sector's total investments (Figure 33). Although perceived as a less risky form of investment than shares and corporate bonds, which has historically generated comparatively high returns, a high concentration of investments in government bonds makes the sector vulnerable to sudden changes in investor sentiment in financial markets and a consequent price adjustment. In addition, the implicit secondary liquidity of these investments is questionable, particularly during crisis periods, which was evident during March when the central bank directly repurchased government bonds thus preventing their significant price decrease and stabilizing the domestic bond market. For the same reason, the Stability Fund[18] was established with the potential to purchase government bonds in the amount of HRK 500m, thus creating an additional liquidity absorber of the bond market.

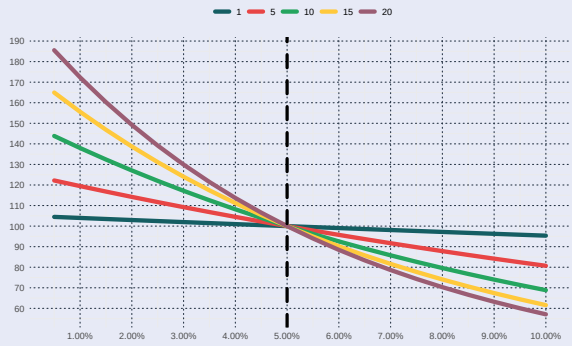
Periods of stress, such as the recent one caused by the coronavirus pandemic, are characterized by a high level of uncertainty, which can lead to a significant increase in demanded returns, i.e. a decrease in the price of debt instruments. In such circumstances, sectors and companies whose portfolios are characterised by a longer maturity would be proportionately more affected (Figure 34). Due to the nature of the business and the need to harmonise the maturity of assets and liabilities, these are primarily insurance companies in the life insurance segment and pension funds (Figure 35). However, exposure to interest rate risk increased for both investment funds and insurance companies of non-life segment in the recent period, since these companies significantly increased the maturity of their bond investments in search for adequate returns in the today's environment of low yields.

Figure 33 Pronounced concentration of investments in government bonds
Investment structure of the financial services sector by investment type



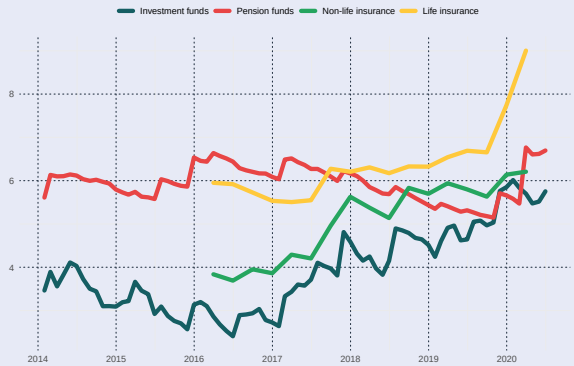
Note: Showing investments of insurance companies, pension funds and investment funds that jointly hold almost 90% of assets in the financial services market.
Source: Hanfa

Figure 34 Bonds with longer maturity show a stronger reaction to changes in financing conditions
Showing relation between bond price (y axis) and market yield to maturity (x axis)



Note: Showing bonds with principal amount 100 and 5% coupon paid semi-annually.
Source: Hanfa

Figure 35 Higher maturity makes entities vulnerable to changes in market sentiment
Average residual maturity of bonds in portfolio, in years



Source: Hanfa

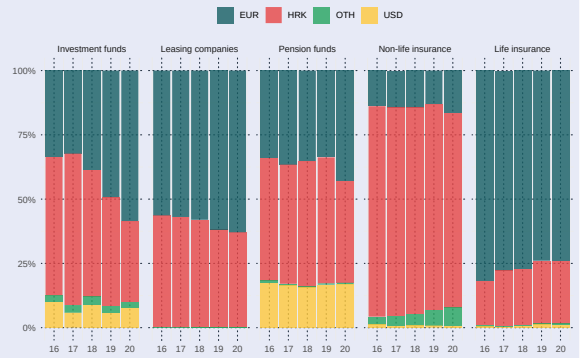
Given the high euroisation rate of the domestic economy, the exposure of the financial services sector to the currency risk that would have a negative impact on the profitability of companies in the event of a more pronounced appreciation of the domestic currency (Figure

[17] The effects on a household microlevel are dispersed where the net effect on a particular household can be positive or negative.

[18] https://www.hanfa.hr/media/5332/macroprudential-risk-scanner-2019_3.pdf

36) is also increased. At the end of March and the beginning of April, depreciation pressures prevailed on the market, but foreign currency interventions by the central bank, as well as realization of a currency swap with the European Central Bank, prevented significant oscillations in the exchange rate of kuna to euro (more information in Chapter 3.3 Market risks).

Figure 36 Certain sectors exposed to foreign currencies through high proportion of assets in EUR



Source: Hanfa

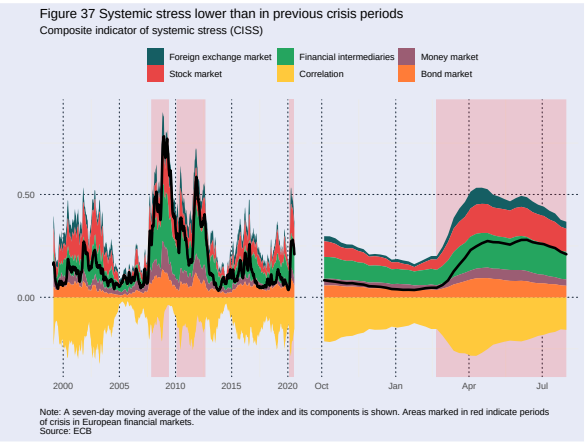
As a result, currency risk in the previous quarter did not materialise, but some segments of the financial services sector, especially funds, still have relatively high, although within legal limits, currency mismatch of assets and liabilities (open currency position). Since most foreign currency assets are euro-denominated, the implementation of the euro adoption process will eliminate most of the exposure to the currency risk of the domestic financial services sector.

3.3 Market risks

In the previous issue of this publication (Macroprudential risk scanner, No. 3) the growing concerns about market risks were highlighted, emphasising the increase in global economic uncertainty associated with the strengthening of protectionism and trade tensions, as well as investors' growing fears about the continued expansion of stock financial markets, which, supported by the accommodative monetary policies of the central banks, recorded historically the longest expansion period and record high valuation. These trends indicated an increase in the chances for recession and possible price correction in the medium term. Some of these expectations materialised during the first half of 2020, in view of the recorded sharp price corrections on world markets, unprecedented monetary measures with the aim of stabilising markets, which eventually resulted in partial and sometimes full recovery.

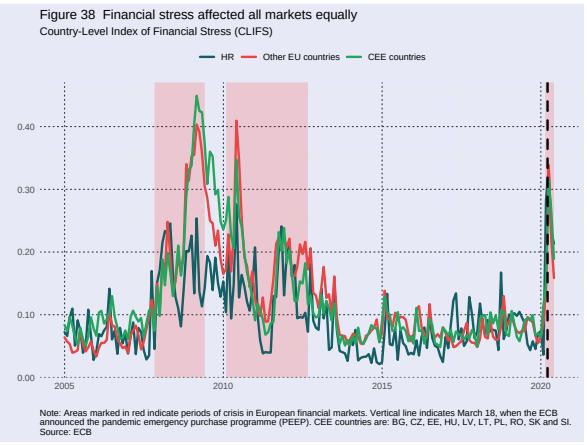
The beginning of 2020 was marked by growing concerns among economic analysts about the development of the health situation in China, but financial markets were relatively stable and recorded historically low levels of stress (Figure 37). The unexpectedly strong and rapid deterioration of the health situation in Italy and the rest of Europe was a trigger for the development of the health crisis into a systemic disorder that shifted to global financial markets.

Figure 37 Systemic stress lower than in previous crisis periods



Note: A seven-day moving average of the value of the index and its components is shown. Areas marked in red indicate periods of crisis in European financial markets.
Source: ECB

Figure 38 Financial stress affected all markets equally

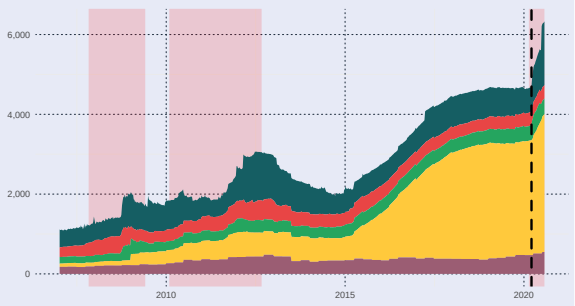


Note: Areas marked in red indicate periods of crisis in European financial markets. Vertical line indicates March 18, when the ECB announced the pandemic emergency purchase programme (PEEP). CEE countries are: BG, CZ, EE, HU, LV, LT, PL, RO, SK and SI.
Source: ECB

Despite the comparatively better health situation in Croatia in relation to other European countries, the stress observed in the domestic financial markets in March 2020 was comparable to the stress observed in other EU countries,

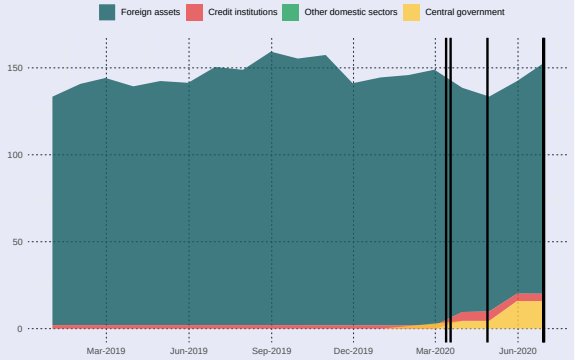
which was not the case in the 2008 global financial crisis and the 2011 European debt crisis when domestic stress levels were nevertheless comparatively lower than the rest of the EU (Figure 38).

Figure 39 Swift and strong reaction of euro area central banks
Total assets of the Eurosystem central banks, in EUR bn



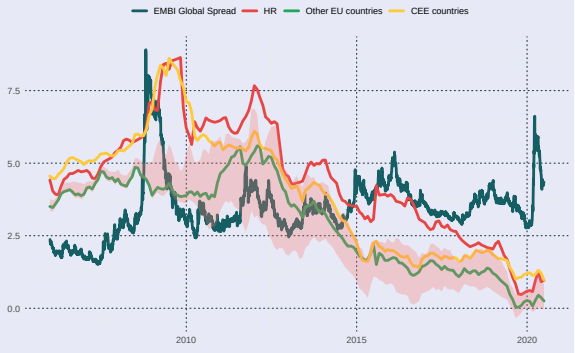
Note: Areas marked in red indicate periods of crisis in European financial markets. Vertical line indicates March 18, when the ECB announced the pandemic emergency purchase programme (PEEP).
Source: ECB

Figure 40 Central bank's interventions to help stabilise the bond market
Assets of the Croatian National Bank, in HRK bn



Note: Vertical lines indicate the dates when the CNB purchased Croatian government bonds.
Source: CNB

Figure 41 Yields on government bonds slightly diverged at the beginning of the crisis
Yields to maturity on long-term government bonds, in %



Note: The area marked in red shows the interquartile range of yields of EU countries. CEE countries are: BG, CZ, EE, HU, LV, LT, PL, RO, SI and SK.
Source: Eurostat

Unlike during the previous two crises, central banks were much quicker in recognizing the necessity of a timely response and they reacted strongly to stabilise capital markets, but also to provide the necessary liquidity to the economies affected by the strongest post-war shock of supply and demand. On 18 March, the European Central Bank introduced the Pandemic Emergency Purchase Programme (PEPP) with the aim of preserving low funding costs during the crisis period and facilitating lending that would allow access to finance for the real sector, announcing the purchase of sovereign and corporate bonds of issuers from the euro area (Figure 39). The initial programme size was EUR 750bn (6.3% of the euro area GDP) with the foreseen duration until the end of 2020, but it was increased to EUR 1,350bn (11.3% of the euro area GDP) in June 2020, with an estimated duration until June 2021.

The actions from central banks in March stabilised financial markets and kept interest rates at low levels, which was reflected in a partial reduction of the risk premium for developing markets[19] (Figure 41). The success of the longer-term objective of monetary authorities, ensuring the availability of financing for the non-financial companies and households sector, will greatly depend on the credit and investment policies of financial institutions. The evolution and depth of the 2020 economic crisis in 2020 will greatly depend on the success of this objective, because although an agreement on the allocation of funds from the European recovery fund under the EU's multiannual budget was reached, the payment of resources from the fund is very likely to start only at the beginning of next year.

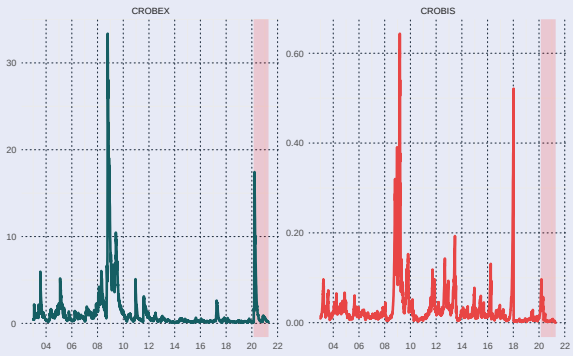
In mid-March 2020, the disorder shifted to the domestic bond market, which was partially due to reordered significant withdrawals of investors in bond UCITS (see Chapter 3.1 Principal trends). Therefore, the reduced liquidity in the secondary bond market had a negative impact on bond prices. The domestic bond market was stabilized

[19] EMBI Global Spread is a measure of return performance on international government and corporate bonds issued in developing countries.

by the purchase of securities of the Republic of Croatia by the CNB. In five auctions, the CNB purchased a total of HRK 17.9bn, i.e. 4.4% of GDP (Figure 40). This generated a demand for securities of the Republic of Croatia and halted the growth of returns on government bonds at the level of 0.91% at the end of May 2020, which is the average level of returns in comparable CEE countries (Figure 41).

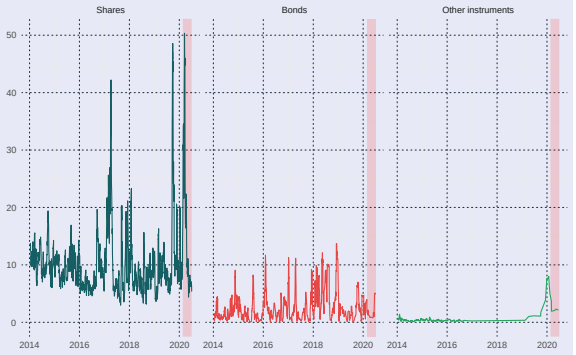
The movement of returns on government bonds in the coming period will greatly depend on the development of the macroeconomic situation and the consequent fiscal position of the general government in view of the expected drop in tax revenues due to a reduced tax base, while increasing expenditures due to the adoption of measures supporting the economy and the preservation of employment. Therefore, new debts of general government in the financial markets are certain. What is positive in this case is that interest rates in international markets are still relatively low, but there is a risk of changing the country's risk perception by investors and credit agencies, which will depend on macroeconomic trends and imbalances, especially in the public finance segment, in comparison with other (comparable) countries. The potential loss of the investment rating, given to Croatia in 2019, would reduce the pool of potential institutional investors and consequently have a negative impact on bond prices. Given the structural characteristics of the domestic financial services sector, which is characterised by a significant exposure to sovereign bonds and the risks arising from this interconnection (more in Box 2. Risks arising from the interconnection between the financial services sector and the public sector in the publication Macroprudential risk scanner No. 3), trends in this market will have a major impact on the business operations of the financial services sector.

Figure 42 Sharp rise of volatility on the stock market in March
Estimated volatility of leading domestic stock and bond indices



Note: Showing volatility estimated by way of the exponentially weighted moving average model (EWMA) with smoothing parameter of 0.94.
Sources: ZSE, Hanfa

Figure 43 After a sharp rise in March, turnover on the domestic capital market decreased
Turnover on the ZSE regular market, in HRK bn



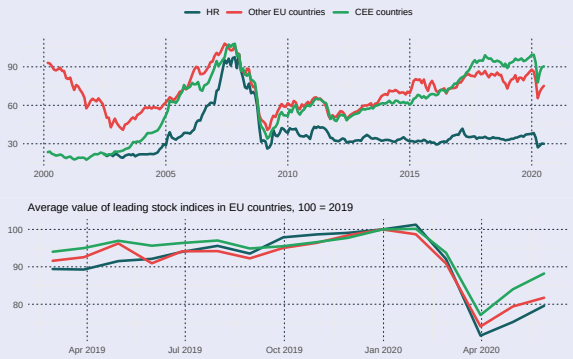
Note: The area marked in red indicates the period of crisis in financial markets that started on 20 February 2020. Showing the moving seven-day average of turnover on the market.
Source: ZSE

A strong increase in volatility and turnover on the domestic stock market occurred in mid-March 2020, due to the expected deterioration of the macroeconomic situation in view of the imposed emergency closing of the economy and the resulting difficult assessment of the financial stability of companies in the new circumstances (Figures 42 and 43). Due to significant price volatility on the market, and with the aim of protecting investors, on March 12, Hanfa issued a decision on the temporary suspension of trading on the Zagreb Stock Exchange.[20] This stress episode on the domestic stock market was relatively mild compared to the crisis episode at the end of 2008, when the shock followed a relatively long period of a strong price increase. The stock prices in the period preceding the coronavirus crisis only began to show signs of more robust growth in 2019. At the same time, stock markets in other EU countries, and particularly in comparable CEE countries,

20 https://www.hanfa.hr/vijesti/hanfa-donijela-rješenje-o-privremenoj-obustavi-trgovanja-na-zagrebačkoj-burzi/

recorded a multi-year growth trend that started immediately after the end of the euro area debt crisis in 2012. (Figure 44). Despite these, even divergent trends in previous years, the domestic stock market recorded a relatively stronger correction relative to comparable markets of about twenty percentage points in March 2020.

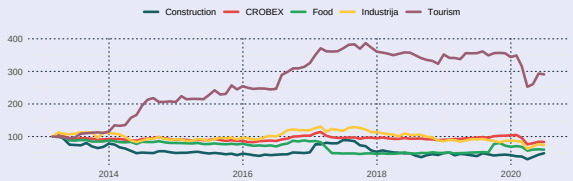
Figure 44 EU stock market partly recovered after the initial contraction
Average value of leading stock indices in EU countries, 100 = 2007



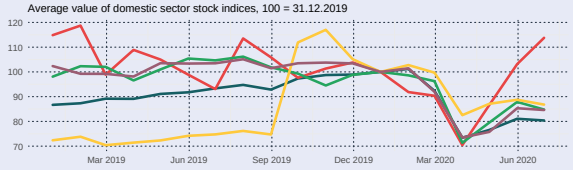
Average value of leading stock indices in EU countries, 100 = 2019

Note: CEE countries are: BG, CZ, EE, HU, LV, LT, PL, RO, SI and SK.
Source: Bloomberg

Figure 45 Divergence of stock prices of certain industries in 2Q 2020
Average value of domestic sector stock indices, 100 = 28.3.2013



Average value of domestic sector stock indices, 100 = 31.12.2019

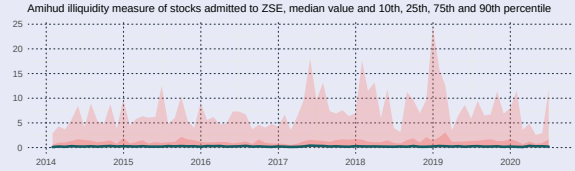


Source: ZSE

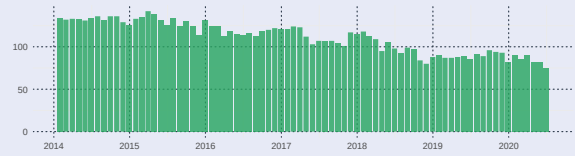
A slight recovery of eight percentage points was achieved in April and May. Although the value of most stocks decreased, a stratification of prices per industrial sectors can be noticed (Figure 45). Stocks in the food industry recorded a relatively minor correction, since in the lockdown period this industry recorded a relatively minor shock compared to other industries with a stock value decreasing on average from 20% to 30%.

Stratification was evident during the recovery in April and May, when prices in construction industry fully recovered from the initial shock (in part related to the expected process of reconstruction of buildings after the earthquake in Zagreb), while on the other hand, the price recovery of tourism stocks was significantly slower in view of their direct pandemic impact and uncertainty regarding the results of the tourist season (more information in Chapter 2 Macroeconomic overview).

Figure 46 Stock market liquidity stable in 2020, however, trading becomes more and more concentrated
Amihud illiquidity measure of stocks admitted to ZSE, median value and 10th, 25th, 75th and 90th percentile

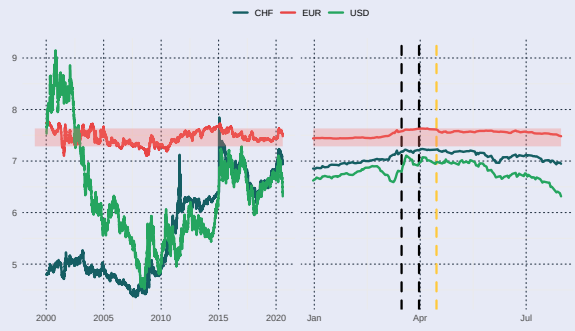


Number of stocks that recorded 10 or more trading days in the observed month



Note: Amihud illiquidity measure shown indicates average stock price change per HRK 1000 traded, therefore, higher value indicates higher value of stock illiquidity.
Source: Hanfa

Figure 47 Depreciation of the exchange rate of kuna to euro within the limits of historical oscillations
Ratio of individual currencies unit value to Croatian kuna, in HRK



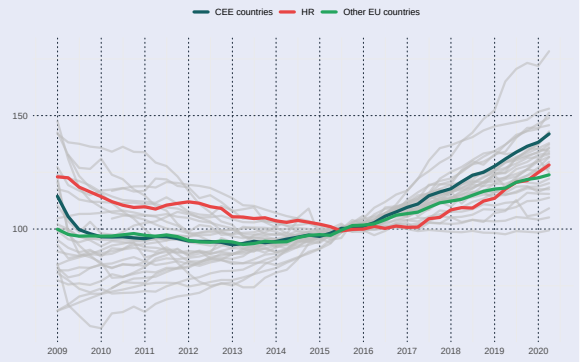
Note: Area marked in red indicates the interval between the 10th and 90th percentile of the exchange rate value HRK/EUR. Black vertical lines indicate the CNB foreign currency interventions, while yellow line indicates the date when the currency swap with the ECB was agreed.
Source: ECB

Depreciation pressures dominated the domestic foreign exchange market in March. This was primarily the result of the behaviour of some investors who reacted to initial shock by liquidating domestic currency positions and exchanging them for euro-denominated positions, perceived as more stable.

Due to the importance of preserving the stability of the exchange rate for safeguarding the stability of the entire financial system, the CNB held two foreign currency interventions in March 2020, by which it released EUR 1bn. Depreciation pressures weakened after April 15, when the CNB and the ECB agreed on a currency swap in the amount of EUR 2bn to be made available to the CNB, if necessary, by the end of 2020. Consequently, the exchange rate of kuna to euro was kept within the range in which it moved over

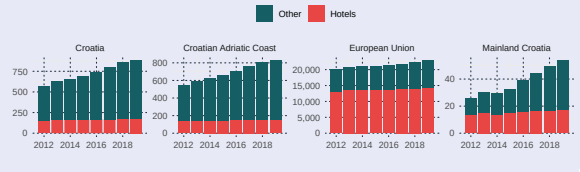
the past two decades, but at a relatively higher level than the long-term average (Figure 47). This prevented significant systemic disturbances given the relatively high exposure of the financial sector, as well as the overall economy, to currency risk. With a high level of euroisation of the economy and the international reserves in the amount of 30% of GDP, Croatia's accession to the European Exchange Rate Mechanism II, which implies maintaining the stability of the exchange rate, leads to an expectation that any future disturbances in the foreign exchange financial market will be buffered.

Figure 48 After the strong multi-year growth, a reversal in the real-estate market is possible
Real-estate price index, 31.12.2015 = 100

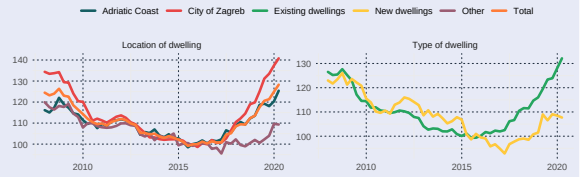


Note: Grey lines show the indicator movement for individual EU countries
Source: Eurostat

Figure 49 Growth of real estate prices uneven and partly connected with tourist activities
Number of beds in tourist accommodation establishments, in 000



House price indices, per location and property type, indices 2015 = 100



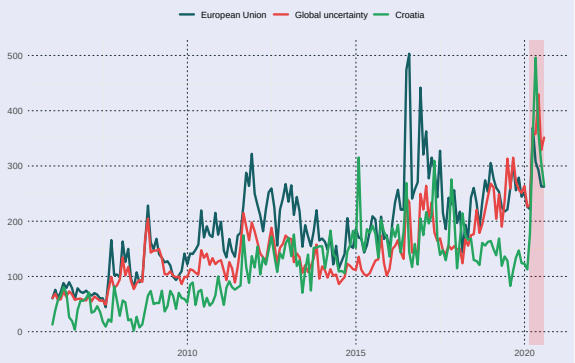
Source: CBS, Eurostat

Developments in the real estate market have the potential to develop into a systemic disturbance given the pronounced procyclicality of this market and the high share of real estate investments in total investments of all domestic sectors, including the financial sector (more info in Box 1. Financial services market as the source of systemic risks in the publication Macroprudential Risk Scanner, No 2[21]). The robust price increase in the period from the end of 2016 to the end of 2019 (by 24 percentage points - Figure 48) was supported by economic recovery and a state programme for subsidising housing loans. However, it was highly heterogeneous region-wise (Figure 49) and the growth was dominantly concentrated in certain regions (the Adriatic Coast and Zagreb) in which accommodation service expanded, especially daily-accommodation services, whose growth is based on expanded digital distribution possibilities(Figure 49). Given that the accommodation services sector was severely negatively affected by the coronavirus crisis (see Chapter 2 Macroeconomic overview), future trends in the currently deadened real estate market will largely depend on the development of the epidemiological situation and associated tourist arrivals, and ultimately on the liquidity and debt of property owners. The real estate market in Zagreb will also be impacted by the recent earthquake that could affect customers' preferences in the forthcoming period in the form of a shift of focus from apartments in the city centre to new buildings and houses with a garden.

In addition to the housing market, the commercial real estate market could also come under pressure given the likely drop in rent income as a result of lockdown and termination of some businesses. Further reduction of income, especially in commercial real estate market, can be expected due to adjustment of business operations of some companies to distance work and optimisation of operating processes which will ultimately require less workers and smaller office spaces, while for the hospitality segment of a real estate market, further development of the epidemiological situation in the country will be crucial.

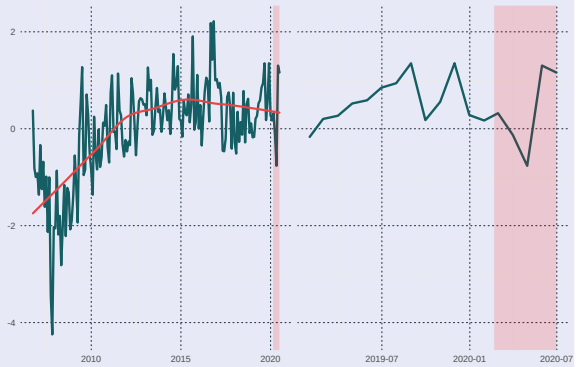
21 https://www.hanfa.hr/media/4505/macroprudential-risk-scanner-2019_2.pdf

Figure 50 Economic uncertainty at historically high levels
Index of economic uncertainty generated by economic policies



Note: EU indicator shows average indicator value for IT, DE, FR and UK.
Source: Economic policy uncertainty

Figure 51 Uncertainty related to the health crisis temporarily disrupted the investor sentiment
Investor sentiment index



Note: Area marked in red indicates the period of crisis in financial markets that started on 20 February 2020.
Source: Hanfa

Investments in real estate generated comparatively much higher returns than investments in financial assets, which is why, especially in a multi-year environment of low returns, some institutional investors increased their direct or indirect exposure to this market. However, even in times of a sharper drop in returns, there should be no systemic effect, even though some sectors and entities, particularly certain insurance companies, are still relatively more exposed to developments in the real estate market.

Following the initial disorder caused by the spread of the pandemic on financial markets, in the second quarter of 2020, markets recovered partially or even fully, deviating from pessimistic macroeconomic forecasts. These divergent trends add to the historically high level of uncertainty in the current circumstances (Figure 50). The investor sentiment index[22] also fell during March and April 2020 reflecting the strong deterioration in expectations of domestic investors (Figure 51). However, the reduction of stress in the financial markets that followed in May and June resulted in market stabilisation and a subsequent recovery of investor sentiment. Given the extremely high level of uncertainty, it is to be expected that volatility in the financial markets will continue to be increased for the rest of the year, as investors are not able to have consistent expectations, but instead they are corrected with any new information from the health, macroeconomic and geopolitical spheres.

3.4 Profitability and capitalisation of financial services providers

The profitability of the financial services sector in recent years has been influenced by long-term low interest rates, which has intensified the search for higher returns. Escalation of the global health crisis and consequential corrections to market prices focused the attention on maintaining and preserving existing returns. Although the profitability of almost all financial service providers, apart from the funds, remained relatively stable during the first quarter of 2020, it will depend greatly on the further development of the health situation and on the strength and duration of the coronavirus crisis. It is therefore likely that keeping the current levels of profitability indicators in the coming period will be challenging.

The decrease in unit prices and negative returns from the beginning of the health crisis[23] to the end of June 2020 were recorded for all categories of funds (Figure 52). Given the structure of investments and materialised market risks primarily in the form of significant stock price adjustments, the returns of equity funds fell

[22] More about the methodology for calculating investor sentiment index and the index itself in Box 1. Sentiment index for Croatia: are domestic investors irrational? in the publication Macroprudential risk scanner, No 3

[23] 20 February 2020 is considered to be the beginning of the health crisis, when the coronavirus crisis in Europe worsened.

the most during that period (-13.7%), thus completely eliminating the growth in returns achieved last year. However, taking into account relatively high returns in 2019, the annual returns analysis, compared to June 2019, reveals that negative returns in the one-year period were achieved only by equity (-5.2%) and money market funds (-0.7%), whereby this one-year correction for equity funds is still lower than the one recorded in 2018, caused by negative trends in international capital markets and the Agrokor Group crisis. Although the returns of all other categories of funds have decreased both since the beginning of the year and since the beginning of the health crisis, the returns of balanced, bond and other funds have increased slightly on an annual basis, by 0.2%, 0.4% and 0.9% respectively. Therefore, the profitability of investment funds is still not significantly jeopardised under the current circumstances.

Figure 52 Decrease in the returns of UCITS since the beginning of the health crisis
Returns of UCITS, in %

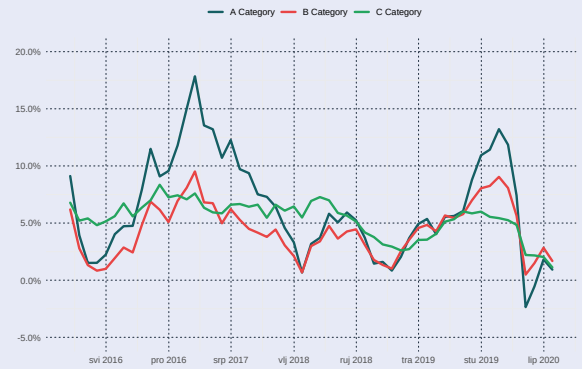
Note: Annual returns, returns from the beginning of the year and returns from the beginning of the crisis are calculated as change in unit price for 30.6.2020 relative to 30.6.2019, 31.12.2019 and 20.2.2020, when the coronavirus crisis in Europe worsened.
Source: Hanfa

Figure 53 Average returns of bond funds are higher than interest rate on time deposits
Annual returns of bond funds and credit institutions' interest rates on time deposits, in %

Source: CNB and Hanfa

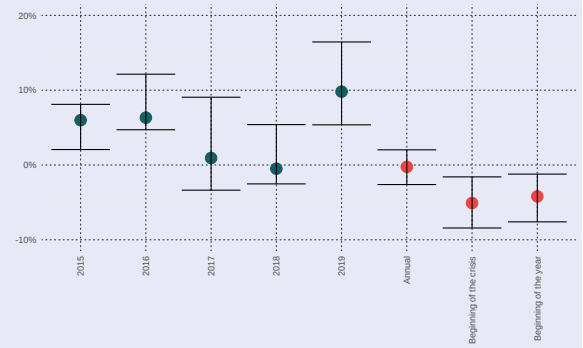
On the domestic market, investing in investment funds is considered an alternative to savings, so in good times savings are reallocated from bank deposits to investment funds, especially in bond funds, given the pronounced conservatism of domestic retail investors, while in crisis periods the direction is reversed. This, among other things, contributed to a significant decline in net assets of bond funds in March 2020. However, despite the recorded decline in the assets of the funds during the first quarter of 2020, the average annual returns of bond funds in the period from 2014 remained higher than the interest rate on fixed-term deposits, which partially compensates for the relatively higher volatility of the returns on investments bond (Figure 53).

Figure 54 Although reduced, the profitability of mandatory pension funds is still stable
Annual returns of MIREX indices



Source: Hanfa

Figure 55 Reduced profitability of voluntary pension funds
Returns of voluntary pension funds, in %



Note: Dots indicate average annual returns, while horizontal lines indicate lowest and highest returns. Annual returns, returns from the beginning of the year and returns from the beginning of the crisis are calculated as change in unit price for 30.6.2020 relative to 30.6.2019, 31.12.2019 and 20.2.2020, when the coronavirus crisis in Europe worsened.
Source: Hanfa

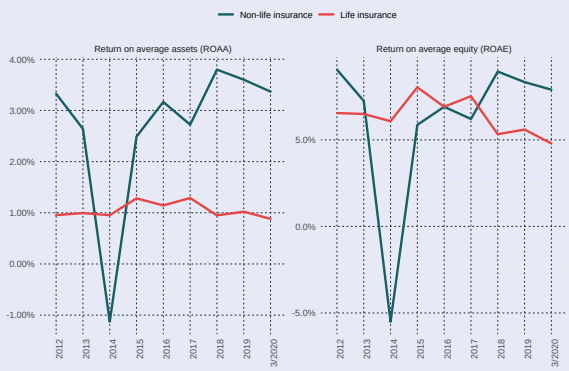
Market instabilities caused by the coronavirus crisis did not significantly undermine the profitability indicators of pension funds since their primary objective is to ensure the safety of the investment of members' assets while ensuring positive long-term returns. It is reflected in their investment strategies and a high concentration of relatively safe forms of assets. Turbulence on stock and bond markets during March led to a decrease in the unit prices of all categories of mandatory pension funds,

with the highest correction recorded in the Mirex A index[24] which decreased by 10.5% at the end of March compared to the end of 2019, while in the same three-month period Mirex B and Mirex C indices decreased by 5.0% and 1.2%, respectively.

Although this decrease was significant, in the second quarter, due to partial price recovery in stock and bond markets, the unit prices of mandatory pension funds of all categories increased, so that positive returns of 0.9%, 1.7% and 1.1% for mandatory pension funds of categories A, B and C were nevertheless recorded on an annual basis at the end of June 2020 (Figure 54). Unlike mandatory pension funds, voluntary pension funds recorded a negative annual return (-0.3%) at the end of June, while the unit price was 5.1% lower than in the period just before the crisis (Figure 55).

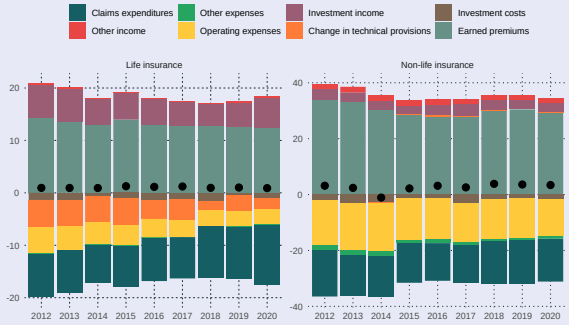
The profitability of the insurance sector in the first quarter of 2020 was relatively unaffected by negative market trends (Figure 56), but the impact of the pandemic due to the nature of business operations of insurance companies will be visible after a while, depending on the intensity and duration of the crisis. The slowdown of economic activities and the reduction in clients' income will affect the profitability of insurers primarily through a reduction in premiums, due to a potential increase of requests for early termination of contracts and particularly through a drop in the newly concluded life insurance premiums, which is already evident in the May data (Figure 37). In addition to the reduced clients' income, the decrease of the newly concluded life insurance premiums will be affected by the difficulties in the conclusion of the contracts in a context of restricted movement and the reduction of banking activities.

Figure 56 Profitability of insurance companies slightly decreased in 2020
Return on average assets (ROAA) and return on average equity (ROAE)



Source: Hanfa

Figure 57 Expected decrease in premiums will significantly affect the profitability of insurance companies
Contributions of individual categories to the return on average assets (ROAA) of insurance companies, percentage points



Note: Change in technical provisions includes change in mathematical provisions and other technical provisions, and change in special provision for life insurance where the policyholder bears the investment risk.
Source: Hanfa

A potential increase in claims due to the coronavirus crisis in certain lines of business of non-life insurance (e.g. credit and guarantee insurance, financial loss insurance) might be partly compensated by the decrease in claims in motor vehicle insurance. The increase in damage claims caused by the earthquake in Zagreb in March of this year should not significantly jeopardise the profitability of insurance companies, given the relatively small share of earthquake insurance premiums in the portfolio of non-life insurers[25] and adequate reinsurance programs of insurance companies. Following the continued decline in the profitability of insurers in the non-life insurance segment in 2019, generated by an increase in claims expenditures reflected and through an increase in the loss ratio (Figure 58)[26], the

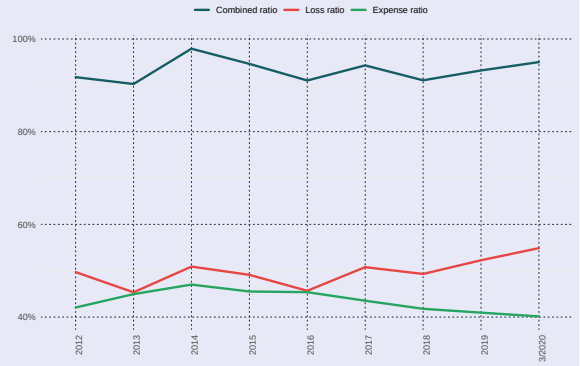
[24] Mirex indicates a relative business performance measure of mandatory pension funds, with Mirex A referring to A fund category. By analogy, Mirex B and C refer to B and C categories.

[25] The gross written premium of earthquake insurance and insurance of financial loss due to business discontinuation caused by the earthquake accounted for 1.5% of the total non-life insurance premium in May.

[26] The combined ratio is the sum of the loss ratio (the ratio of expenses related to claims and earned premiums for the relevant

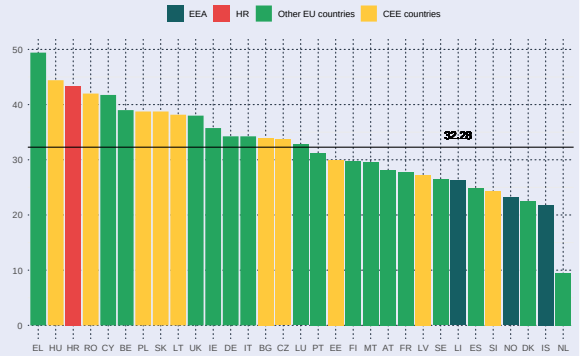
profitability of this segment decreased in the first quarter of 2020, as well. The increase in business efficiency evident in the reduction of the cost ratio partially depreciates the increase in claims expenditures, while the domestic segment of non-life insurance remains less cost-effective compared to the markets of other European countries (Figure 59).

Figure 58 Combined ratio slightly increased due to loss ratio
Gross ratio for non-life insurance, in %



Source: Hanfa

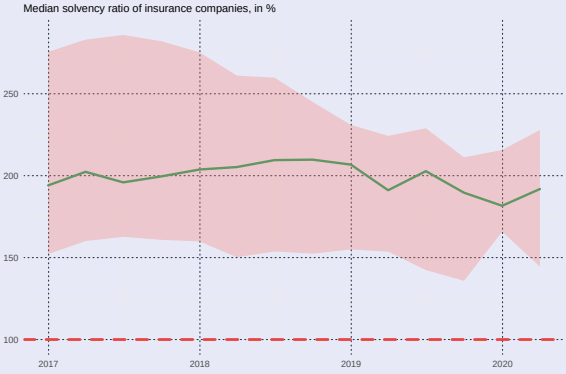
Figure 59 Expense ratio of domestic companies relatively high compared to other EU countries
Average expense ratio in the period 2017-2019, in %



Source: EIOPA

Generating adequate returns on insurance companies' investments, largely hindered by the prolonged period of low interest rates, will be further hampered under current circumstances, especially in the life insurance segment given its long-term obligations under high-guarantee policies concluded in the past. Negative trends in the first quarter of 2020 did not significantly affect the level of capitalisation of the insurance sector (Figure 60), primarily because of the conservative investment structure characterised by a dominant investment in domestic debt securities. Even after completing the implementation of transitional measures for the calculation of capital requirements for concentration risk and the spread risk related to government bonds issued in foreign currency (increasing the risk weight for the calculation of capital requirements from 50% in the annual calculation to 100% in the calculation of capital requirements for the first quarter of 2020), the level of capitalisation remained relatively stable with the sector's median ratio well above the regulatory minimum[27]. Although the insolvency positions of insurers are likely to deteriorate in the coming months, the high level of capitalisation of the sector is sufficient to depreciate future negative developments.

Figure 60 Solvency of insurance companies well above the regulatory minimum
Median solvency ratio of insurance companies, in %



Note: Marked area indicates interquartile range of solvency ratio by companies, while the horizontal line indicates the regulatory minimum.
Source: Hanfa

At the end of the first quarter of 2020, leasing companies recorded a lower level of profitability (Figure 61) than at the end of 2019. This is the direct consequence of the depreciation of the exchange rate of kuna to euro (Figure 47) and realised losses from exchange rate differences in relation to comparatively higher exposure of liabilities to foreign currency (subject to a

period) and the expense ratio (the ratio of all operating expenses and earned premiums for the relevant period).

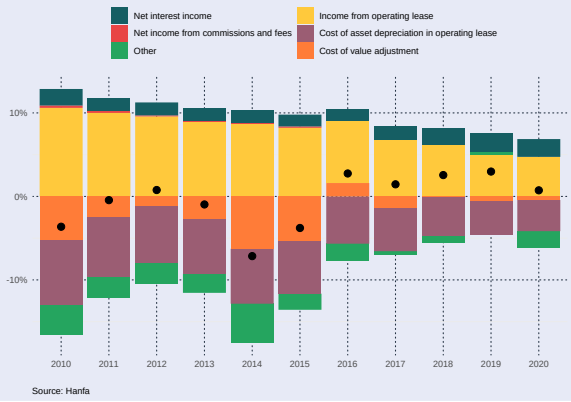
[27] Solvency II regulatory framework defines two levels of required capital: Minimum Capital Requirement (MCR) representing the minimum allowed capital level and Solvency Capital Requirement (SCR) representing the level of capital that enables an insurance or reinsurance undertaking to absorb almost all adverse events and solvent business operations considering the underwriting risk. An insurance company is obliged to have eligible own funds covering the Solvency Capital Requirement and Minimum Capital Requirement, i.e. maintain the ratio of eligible own funds to SCR and MCR above 100%.

relatively high share of liabilities to foreign credit institutions) than of assets[28]. Preserving the pre-crisis profitability of leasing companies will be very challenging for the rest of the year. Leasing companies generate the largest share of their profits from operating leasing income, which is likely to be significantly reduced in the rest of the year in view of the slowdown of the economy. A decrease in the number and value of new leasing contracts became evident as early as the end of the first quarter of 2020[29]. Reduced tourist activity will have a negative impact on the operations of car rental companies, which finance vehicles mostly through leasing, and passenger carriers are also under significant pressure, so revenue from collecting annuities/instalments is reduced. In order to facilitate the servicing of obligations to lessees that are significantly affected by the coronavirus crisis, Hanfa issued recommendations to leasing companies at the end of March and mid-May to grant a moratorium on instalments/annuities. According to these recommendations, leasing companies will not take enforcement measures against lessees whose operations had already been or will be affected by the crisis[30] (see Chapter 4 Measures adopted to preserve financial stability). At the same time, leasing companies will not be required to make value adjustments of receivables under contracts concluded with one part of the lessees until the end of March 2021. In addition to already implemented channels of reduced new business deals and repayment of existing contracts, the profitability of leasing companies could come under additional pressure in the event of the return of leased assets (mostly vehicles).

For other financial service providers, i.e. investment firms and investment or pension fund management companies, profitability indicators were stable at the end of 2019 (Figure 62).

Figure 61 Profitability of leasing companies decreased in 1Q 2020

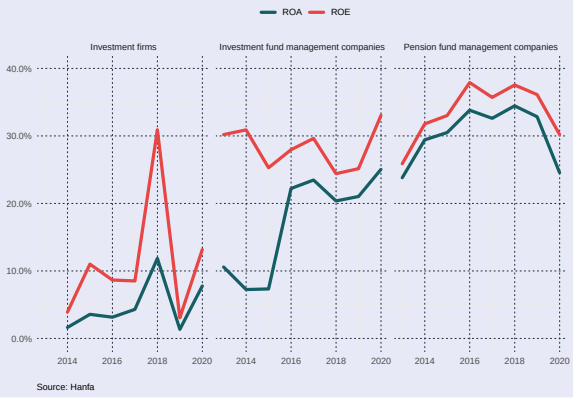
Contributions of individual categories to the return on assets (ROA) of leasing companies, percentage points



Source: Hanfa

Figure 62 Profitability of other financial institutions was stable during 2019

Return on assets (ROA) and return on equity (ROE), in %



Source: Hanfa

In 2019, investment fund management companies recorded an increase in pre-tax profits (by 15% compared to 2018) due to higher income from management fees, which in addition to the recorded decrease in assets and capital further improved profitability indicators. Investment firms also recorded an increase in profitability, while at the same time the profitability indicators of pension fund management companies, albeit slightly reduced by the increased other costs from fund management, remained relatively stable at the end of 2019. Given the dynamic period in which

[28] At the end of 2019, 76% of the liabilities and capital were in EUR or tied to EUR in relation to 61% of the assets.

[29] During the first quarter of 2020, as much as 16% less new contracts related to financial and operating lease were concluded compared to the first quarter of 2019, while the value of these contracts was 17% lower in relation to those concluded during the same period of the previous year.

[30] The measures relate to customers who have duly settled their obligations and who have been identified, on the basis of clearly defined criteria, as not being able to continue to pay their obligations and who have not paid three annuities/instalments for three consecutive months starting in April 2020.

the net assets of UCITS strongly decreased (more information in Chapter 3.1 Principal trends), the profitability of investment fund management companies during this year will primarily depend on the value of the assets under management, for which the stabilisation of macroeconomic conditions and possible recovery of investor sentiment will be crucial. These factors, in addition to the aforementioned asset value, will determine the volume of investment activities, and thus the profitability of investment firms (more information in Chapter 3.3 Market risks).

3.5 Liquidity risk

The importance of the on-going monitoring and assessment of investment funds' liquidity risk has been best illustrated by recent events, when the growing uncertainty about the effect of the crisis caused by the coronavirus on the overall economic system led to increased caution on the part of conservative investors. Domestic investment fund investors reacted strongly to the external shock caused by the unfavourable development of the epidemiological situation, withdrawing HRK 7bn, or 30.5% of the UCITS net value as at 10 March, in the period from 11 March, when the World Health Organisation declared a global pandemic, to the end of March (Figures 24, 25 and 26).

The strongest effect of the investors' withdrawal, both in absolute and in relative terms, was recorded by bond funds, and, to a lesser extent, by equity and balanced funds (Figure 64). This way, relatively conservative UCITS investors, primarily retail investors, created temporary pressure on the domestic bond market. However, the pressure was reduced by the central bank's intervention, which soon stabilised the market (more information in Chapter 3.3 Market risks).

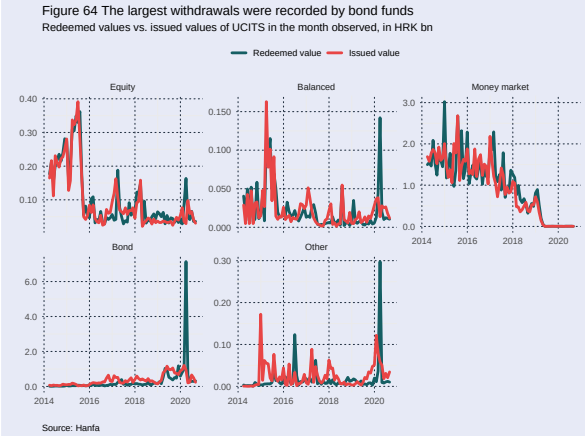
Following the systemically important episode of withdrawals at the beginning of the first wave of the epidemic, the situation stabilised in the second quarter, with the recovery recorded during May and June due to new entries, but also due to favourable market trends that had a positive impact on the value of assets in which funds invest. In this respect, it should be pointed out that the initial high level of liquidity along with the timely intervention by the central bank was a key prerequisite for the quick stabilisation and restoration of investor confidence. In recent years, the importance and significance of monitoring and action aimed at limiting liquidity risk and relating leverage has been in the focus of international regulators[31], intending to prevent this risk from taking on a systemic nature. Therefore, they have made plans for 2020 to carry out stress testing for the EU fund industry as regards disturbances in the corporate bond and real estate market. Even though domestic investment funds are not significantly exposed to these markets, Hanfa monitors liquidity indicators for this segment of the financial system on an on-going basis.

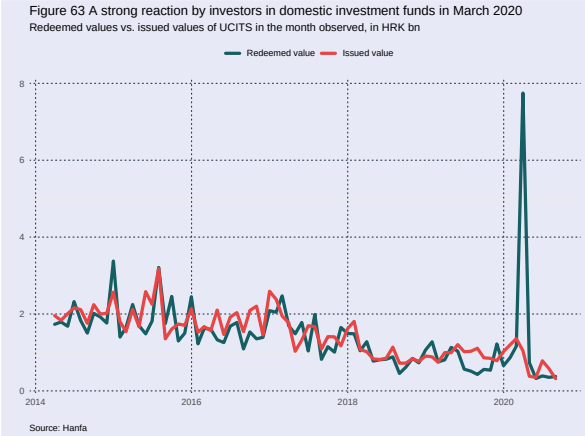
Although the insurance sector liquidity has remained at satisfactory levels over recent years (Figure 65), with the median share of liquid assets in total assets of insurance companies even having risen slightly in the first quarter of 2020 (from 75.3% at end-2019 to 76.9% in the first quarter of 2020), the high level of dispersion of liquidity indicator distribution by individual companies suggests that the liquidity of certain companies might be jeopardised due to negative developments caused by the coronavirus crisis.

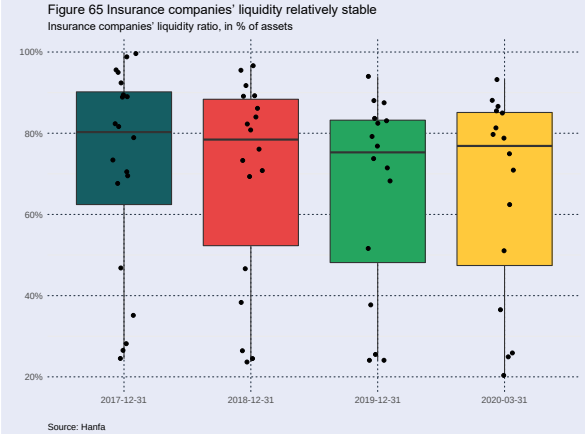
The expected reduction in revenue inflows caused by a decrease in new business and a potential increase in the number of cases of early termination of the contract and in liabilities relating to certain business lines will build up pressure on the liquidity of the entire insurance

[31]See Recommendation of the European Systemic Risk Board on liquidity and leverage risks in investment funds, available at: https://www.esrb.europa.eu/pub/pdf/recommendations/esrb.recommendation180214_ESRB_2017_6.en.pdf

sector. If unstable market conditions result in a significant decline in the value of insurers' investments, accompanied by a decrease in their marketability, insurance companies might suffer additional losses provided they have to sell their illiquid investments in order to meet their obligations to their clients in a timely manner.

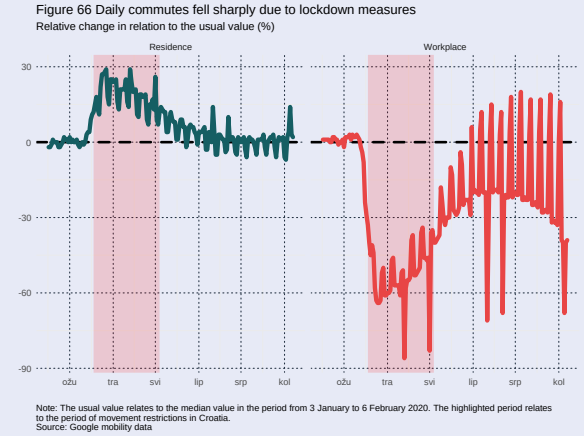






3.6 Operational risks

Lockdown measures implemented in mid-March 2020 led to a structural change in the manner in which companies, including financial institutions, operate on a daily basis. Businesses that depend on the interaction with clients were forced to close, while other businesses had to adjust their operation to the new circumstances. The introduction of social distancing and mobility restriction measures reduced the number of employees travelling to their offices sharply, and the number grew slightly only after the relaxation of the lockdown measures in May (Figure 66).



Financial services belong to the activities that were allowed to continue with their operation, provided they had adjusted their business processes in an adequate manner. In order to ensure business continuity, financial institutions needed to adjust their operating processes and adapt their approach to client interaction in a relatively short term. Hanfa, as a regulator, also adjusted its business operations to the new circumstances, taking a series of measures in order to enable all supervised entities to do this as well (more information on the measures taken in Chapter 4 Measures aimed at safeguarding financial stability, and on Hanfa website[32]). Joint efforts of the regulator, supervised entities, but also all other financial markets participants

[32] https://www.hanfa.hr/upozorenja-hanfe/covid-19/

ensured the smooth functioning of the financial system.

Replacing the office with the living room and moving business to the digital sphere helped preventing the spread of the coronavirus, exposing, however, financial institutions' operations to computer viruses and potential cyber-attacks. Nevertheless, in spite of the increasing digitalisation of processes and rising exposure to cyber risks, no systemic events that might threaten the operation of the financial system have been recorded in the last two quarters.

Although pushed into the background by recent developments, Brexit still remains a significant potential source of operational risk to the EU financial system, in particular in the event of no deal.

Digital infrastructures at system level proved robust to withstand external attacks, yet flexible enough and capable of preserving the orderly functioning of the system at a time of sudden and significant disturbances. This will only speed up further technological progress and digitalisation of the system, primarily as regards fintech services. The on-going development of technology is followed by growing operational risks through increased exposure to cyber risk, which makes it important to ensure that the benefits from technological progress outweigh the risks taken.

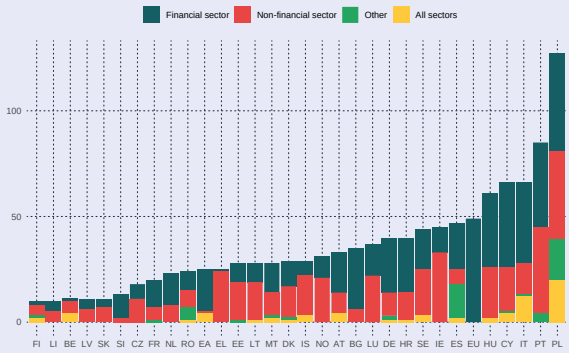
4. Measures aimed at safeguarding financial stability

The outbreak of the coronavirus and its rapid spread from China to the rest of the Asian continent, and subsequently to the rest of the world, placed particular emphasis both on the importance of economic policy makers and their coordinated action, and the significance of the cooperation with international authorities. The escalating pandemic in Europe made it evident that the effect of epidemiological measures implemented by governments and public institutions, that brought certain segments of the economy to a complete halt for the purpose of suppressing the virus, will reduce economic activity significantly. In order for the system to absorb these uncertainties as successfully as possible and in order to minimise the effects of the materialised systemic risk, governments and regulators adopted a series of measures. At the EU-level, at the beginning of the health crisis, the ESRB initiated the collection of data on measures taken by the EU 27 Member States, Iceland, Liechtenstein and Norway. Measures introduced by the European Supervisory Authorities, in particular EIOPA, that apply to the euro area and/or the entire EU were added subsequently.

The analysis of all the measures published so far[33] shows that half of them relate to the financial sector (Figure 67). Considering the great potential of the effect on the financial stability, both segments of the sector, credit institutions and financial services sector, are equally represented as regards the number of measures implemented. A further breakdown reveals that the largest number of measures taken in the financial services sector relate to those targeted at insurance companies, followed by measures related to trading in securities and market regulation[34] (Figure 68).

The measures mainly consist of those relating to deferred payment, fiscal measures significant for market stability and microprudential measures, which accounted to about two thirds of all the measures implemented (Figure 69). In addition to their primary goal relating to the safeguarding of the stability of business operations, the measures intended for supervised entities aimed at facilitating their operation as well, jeopardised by the potentially increased operational risk (see Chapter 3.6 Operational risks). Therefore, the majority of the microprudential measures were related to changes in reporting requirements (10% of all the measures). Measures relating to deferred payment and fiscal measures significant for market stability were dominated by direct aid measures, which also make up 10% of all the measures.

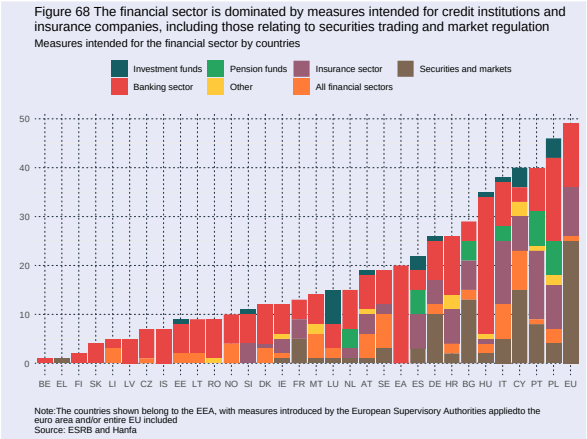
Figure 67 As regards the number of the measures, Croatia ranks above the EU median
Number of measures by the sector they were intended for



Note: The countries shown belong to the EEA, with measures introduced by the European Supervisory Authorities applied to the euro area and/or entire EU included
Source: ESRB and Hanfa

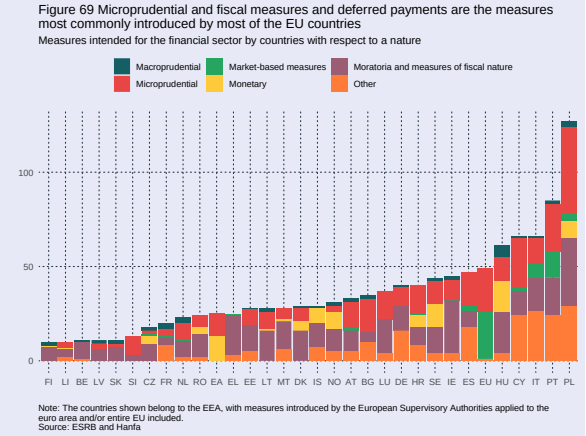
[33] The measures analysed were published on 30 June 2020. The majority of the measures have been publicly disclosed and are available at: https://www.esrb.europa.eu/home/search/coronavirus/countries/html/index.en.html

[34] A total of 17% of all the measures intended for the financial sector relate to the insurance companies, while 18% of them are related to securities and capital markets.



The breakdown by country shows that Poland and Portugal were the most active countries as regards the number of adopted and reported measures, while the least active were Finland and Liechtenstein. With 40 measures adopted, Croatia occupies the upper part of this list and belongs to the group of countries whose number of measures is above the median and average value for the EU.[35]

A more detailed analysis relating to insurance companies shows that national regulators took prompt actions by implementing adequate measures related to the insurance sector in response to the COVID 19 crisis, as some of these measures were implemented even before the strict epidemiological measures, as early as in the first half of March. The set of measures intended for the insurance sector has been updated on an on-going basis. In addition to measures relating to reporting requirements and dividend distribution, the insurance sector saw the adoption of other, microprudential measures, involving liquidity measures, certain requirements regarding the supervision of the companies, organisation of weekly teleconferences with insurance companies, etc. However, due to the uncertain environment, most of the measures have no clearly defined end date of their application, with only 16% of them having a precisely defined end-of-application date. Croatia is one of the nine EU Member States that have adopted measures relating to the relaxation of reporting requirements and to the dividend payment, ranking among the leading countries as regards the total number of the measures applied to that sector (Figure 70). In addition to meeting the primary goal of preserving the financial stability, the purpose of the measures was to facilitate and safeguard business operations, at the same time protecting the interests and rights of insurance services users and public interests.



Particular importance should be given to the measure banning insurance companies from paying dividends[36], adopted for the purpose of safeguarding the stability of business operations and providing additional liquidity support. At the end of May, the ESRB adopted the Recommendation on restriction of distributions during the COVID-19 pandemic[37], recommending insurance and reinsurance companies, investment firms, credit institutions and central counterparties to refrain from making a dividend payout or giving an irrevocable commitment to make a dividend payout, buy-backs of ordinary shares and

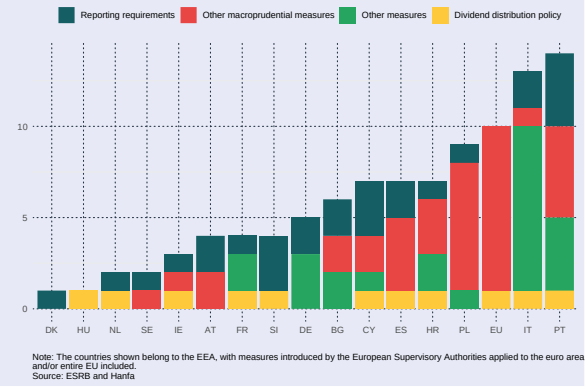
[35]The median is 29, and the average number of measures at EU-level is 36.

[36] https://www.hanfa.hr/news/hanfa-board-bans-insurance-companies-from-the-payment-of-dividend-and-ensures-the-earnings-are-retained-in-croatia/

[37] https://www.esrb.europa.eu/pub/pdf/recommendations/esrb.recommendation200608_on_monitoring_financial_implications_of_fiscal_support_measures_in_response_to_the_COVID-19_pandemic_3~c745d54b59.en.pdf

paying variable remuneration to a material risk taker at least until the beginning of 2021.

Figure 70 As regards the number of measures intended for the insurance sector, Croatia ranks among the leading European countries



Note: The countries shown belong to the EEA, with measures introduced by the European Supervisory Authorities applied to the euro area and/or entire EU included.
Source: ESRB and Hanfa

As in the insurance sector, most of the measures relating to investment and pension funds adopted at EU-level refer to the relaxation of reporting requirements (as much as 39% of all the measures intended for funds) and are applied to domestic funds, too. In addition to the changes in reporting requirements, national regulators also imposed other measures relating to securities, markets and infrastructure: public disclosures and temporary sale bans on securities markets in order to calm and stabilise the markets. As regards the number of measures relating to securities, markets and infrastructure, Croatia is at the EU-average level. In addition to tolerating reasoned and justified report publication delays, for the purpose of facilitating the new situation and reducing issuers' operating costs, Hanfa adopted a decision relieving them from the obligation to pay their fees for the entire 2020[38], thus saving them around HRK 4m. One of the most important measures and recommendations for taking actions aimed at mitigating negative effects on the stability of business operations and protecting lessees was Hanfa's recommendation for leasing companies not to take enforcement measures against lessees who had met their obligations properly so far, and to provide for the possibility to approve grace periods longer than three months[39]. Until 26 June 2020, leasing companies approved rescheduling regarding 78.1% of the contracts in respect of which the rescheduling had been requested (18.7% of active contracts), in the total value of HRK 5.45bn.

The exchange of experience among Member States and adoption of measures at the EU level have proven to be good practice, which has led to the extending and deepening of the existing cooperation and analysis. In this regard, the ESRB has published its Recommendation ESRB/2020/8[40], describing expected steps to be taken by national macroprudential authorities and other institutions in the following period aimed at reducing economic effects of the health crisis. The Recommendation is divided into two parts: Part A, prescribing a conceptual framework for monitoring financial stability implications of the measures by national macroprudential authorities; and Part B, laying down detailed templates for reporting to the ESRB on actions undertaken, with a special emphasis on cross-border and cross-sectoral implications. The final stage is supposed to include the preparation of an analytical framework and an analysis of the impact of the lifting of the measures on the stability of financial systems, in order for the analyses to be integrated in ESRB reports. Hanfa, as one of the

[38] https://www.hanfa.hr/news/at-an-extraordinary-meeting-hanfa-board-relieves-issuers-from-the-payment-of-fees-for-2020-and-bans-the-company-otp-osiguranje-dd-from-the-payment-of-dividend/

[39] https://www.hanfa.hr/vijesti/hanfa-izdala-dodatne-preporuke-leasing-dru%C5%A1tvima-u-cilju-olak%C5%A1anja-otplate-leasinga/

[40] The *Recommendation of the European Systemic Risk Board on monitoring the financial stability implications of debt moratoria, and public guarantee schemes and other measures of a fiscal nature taken to protect the real economy in response to the COVID-19 pandemic (ESRB/2020/*8) is available at: https://www.esrb.europa.eu/pub/pdf/recommendations/esrb.recommendation200608_on_monitoring_financial_implications_of_fiscal_support_measures_in_response_to_the_COVID-19_pandemic_3~c745d54b59.en.pdf?35a81a46f32f9b8d233f3c3d59812675.

macroprudential policy makers, is acting in accordance with the ESRB Recommendation, closely monitoring the implications of the measures on the stability of the financial system and cooperating with other regulatory authorities in the Republic of Croatia.

In addition to adopting measures within the framework of international cooperation, Hanfa will continue taking steps aimed at supporting the continuity of business operations on the financial services market, safeguarding and facilitating the functioning of the overall economy and protecting the interests of financial services users.

Box 1 Simulation of the effects of the coronavirus crisis on the stability of the financial services sector

Stress testing as a macroprudential tool of the regulator

Systemic risk is any risk the system is exposed to, that can exert a negative impact on the functioning of a part or of the entire financial system, producing at the same time a negative effect on the real economy. In its nature, it comprises the cyclical and the structural dimension. The analysis of the cyclical dimension of the systemic risk implies regular monitoring of indicators that may, when necessary, be sublimated into the risk dashboard, pointing to the current phase of the macroeconomic and financial cycle. The analysis of the structural dimension of the systemic risk focuses on indicators of structural characteristics of the system such as internal and external interconnection with other economic sectors or level of liquidity, profitability and solvency supplies that determine the ability of the system to absorb a systemic event. One of the tools often used for a detailed analysis of the structural dimension of the systemic risk is stress testing.

Stress testing comprises a wide set of analytical approaches, frameworks and models that provide to the regulator and general public an ex ante insight into the resilience of the system in the event that a rather unlikely, but possible scenario materialises. The timely detection of any weaknesses of the system is highly important for the purpose of effective implementation of the macroprudential policy, as it enables the regulator to reinforce, acting within its powers, those segments of the system that are deemed vulnerable, in order to address the risks before they materialise, but also to mitigate any negative consequences in the event of the materialisation of the systemic risk. Such an analysis is challenging to perform in real time due to the cyclical nature of the financial cycle, with the majority of economic operators seeming more stable in prosperous times than they really are at a moment. The gap between the perceived and real situation is also present in times of crisis, when the negative perception hinders and prolongs the recovery of the system. Stress testing is therefore an especially important communication tool of the regulator, which points to the actual state of the system outside the present context and expectations of economic agents.

Stress testing in circumstances associated with the coronavirus epidemic

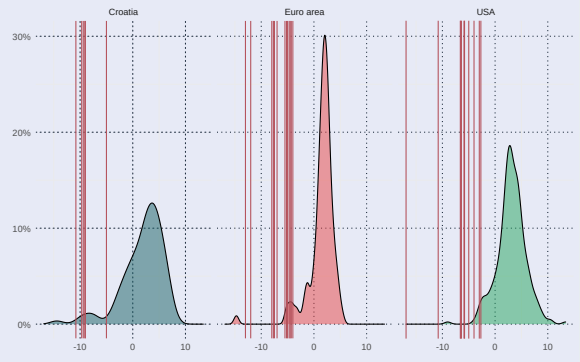
The coronavirus epidemic is an example of an external shock that comes suddenly, has a huge impact on the global economy and brings into question certain economic theories, the so-called black swan[41]. It is precisely due to its uniqueness and unpredictability, but also due to unprecedented reactions by economic policy makers that followed, that this shock has resulted in historically high levels of uncertainty that are also reflected in the macroeconomic outlook for the economic activity in the upcoming period (Figure 1). In line with this, the available US economic growth projections for 2020 range between -2.7% and -16.9%, while in the euro area they range from -4% to -19%. The economic growth projections for Croatia available at the moment range between -5% and -10.8% on an annual basis; however, domestic economy performance will depend not only on labour market and corporate sector

[41]The "Black Swan" theory was popularised after the global economic crisis by the American writer Nassim Nicholas Taleb in his book *The Black Swan*.

developments and effectiveness of state aid measures to support the economy (more information in Chapter 2 Macroeconomic overview), but also largely on the results achieved in the USA and euro area.

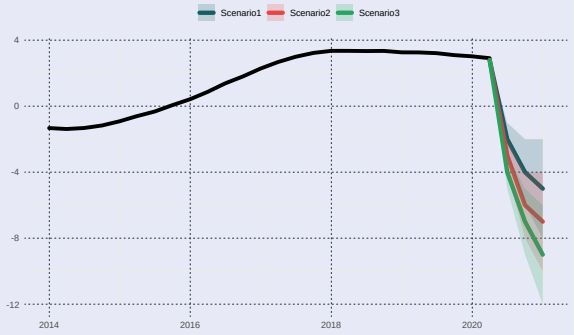
There are two main reasons leading to a broad range of macroeconomic projections for economic performance in 2020. The first factor relates to the presence of the threat that the coronavirus poses to health, considering that the development of the epidemic situation in the rest of the year will determine the pace and duration of the economic recovery. Most institutions therefore base their projections on several scenarios (Figure 2). The second unavoidable factor results from the methodological approach itself. Considering the unique nature of the coronavirus crisis, during which most of the global economy was initially brought to a halt for a certain period of time, and then partially re-launched thanks to economic support measures, classic models of and approaches to macroeconomic projections have been called into question. It is obvious that the economic activity rate for 2020 in Croatia and other countries will be positioned on the negative, left tail of the distribution graph, i.e. in the area of extreme events used for calibrating stress scenarios. Therefore, the methodological approach used for stress testing may in the current situation offer insight into macroeconomic trends and resulting effects on the financial services sector in the rest of the year.

Figure 1 The uncertainty is also reflected in macroeconomic outlooks
Distribution of real economic growth rates and publicly disclosed projections for 2020, in %



Note: Vertical lines represent publicly disclosed projections of the real economic growth rate in 2020.
Source: Eurostat, St. Louis FED, IMF, EC, Ministry of Finance of the Republic of Croatia, CNB, OECD, ECB, Moody's, Barclays, Erste Group

Figure 2 The projection of the effects of the current crisis implicitly contains a significant margin of error
Schematic overview of the reliability of the projection of the COVID-19 crisis impact on the economic growth, in %



Note: The movements of the GDP in different scenarios have been presented for illustrative purposes only.
Source: Hanfa

The household sector accounts for the largest part of the financial services sector (Figure 3 in Chapter 3.2 Structural characteristics and risks), which emphasises even more the significance of the consumer sentiment for the effective functioning of the sector. The regulator's timely and transparent communication relating to the resilience of the system is therefore highly important for the preservation of the financial stability, for the purpose of preventing any panic reactions in the case of the occurrence of additional disturbances on the markets.

The following text describes the conceptual and methodological framework of the simulation conducted relating to the impact that the coronavirus crisis could have on the financial services sector by the end of 2020. As regards the methodology, this simulation assumes the characteristics of stress testing, while considering the generation of scenarios it has characteristics relating to both stress simulation and macroeconomic projection, as it aims to provide realistic assumptions about the epidemiological situation until the end of the year and assess trends related to macroeconomic and financial indicators. The final scenarios result from the interaction between a broad set of variables and institutional sectors, with relatively more unfavourable results having often been chosen among a range of potential outcomes, considering that in the current extreme and uncertain conditions they can easily change from extreme and stress-related to becoming essentially the baseline projections.

Methodological approach and scenario description

The approach used in the simulation reflects the methodology used in the macroeconomic (the so-called top-down) stress testing, where macroeconomic scenarios are generated and calibrated on the basis of macroeconomic models and relations, which ensures the internal consistency of simulated scenarios, which then spill over, either directly or indirectly, to supervised entities. The exercise focuses on the system stability assessment and the results of simulation cannot therefore be transposed directly onto the assessment of the stability of individual entities, as this approach ignores certain idiosyncratic specificities of those entities.

Considering the historically high level of uncertainty, a relatively short six-month time horizon was chosen (end-2020), with the static balance sheet assumption (possible reactions by supervised entities to simulated macroeconomic and financial developments were ignored). The exercise was based on the latest data on companies' asset structure[42] and information on the epidemiological and economic situation available by the end of 2020. Three scenarios were simulated, differing depending on the economic recovery pace in the second half of the year. The simulation included the pension fund and investment fund sectors[43], as the largest sectors, and insurance companies, that jointly accounted for 87.7% of the entire financial services sector at the end of March 2020.

The methodological approach involves three key steps: 1) generation of a consistent macroeconomic scenario, 2) assessment of the impact of the scenario on financial markets developments and 3) spillover of the effects on individual balance sheets of entities in the financial services sector by using detailed data on exposures (Figure 3).

Figure 3 Schematic overview of the methodological framework

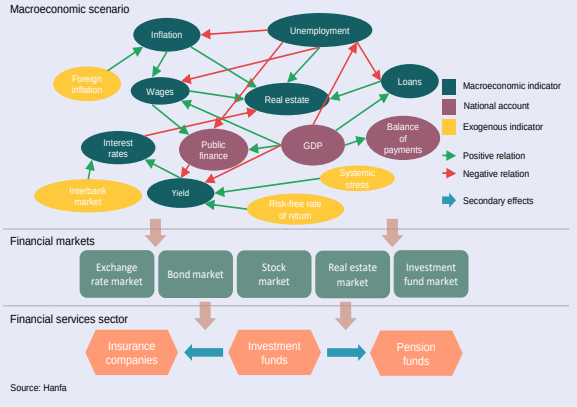
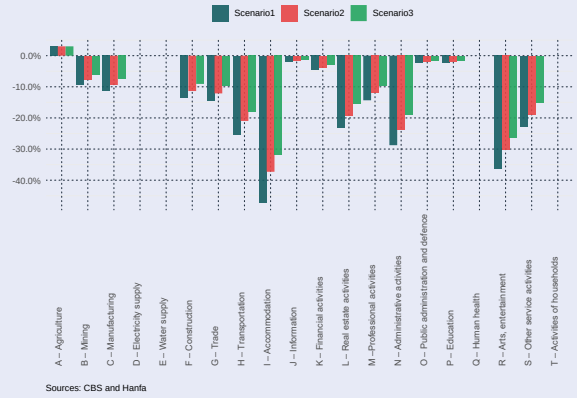


Figure 4 The coronavirus crisis has a disproportionate effect on certain sectors
The assessment of the annual rate of change in gross value added of certain sectorss in 2020



The calibration of the macroeconomic scenario relies on the combination of relations assessed in the model (assessed relations between macroeconomic variables are shown in Figure 3) and the expert assessment of the trends of certain indicators. The most important macroeconomic variable is gross domestic product, whose movements influence, directly or indirectly, other modules in the simulation. Movements in the Croatian gross domestic product in 2020 were assessed by means of the bottom-up approach, with the performance of the gross value added having been assessed by individual activities, having in mind the specificities of business operations of individual activities and secondary effects on other activities. In line with this, the largest value added

[42] The latest available data on insurance companies' investment structure relate to the end of March 2020, while the same data on pension and investment funds relate to the end of June 2020.

[43] The simulation did not include alternative investment funds (AIFs), having in mind lower availability of detailed data as regards their portfolio structure.

decrease was assessed to have occurred in accommodation, arts and entertainment services, followed by administrative services, transportation services and real estate activities (Figure 4). A growth in the value added in 2020 was recorded in the scenarios only by the agricultural activity, although a slowdown in the increase compared to previous years is expected to happen in this activity too, due to a reduced demand related to a decline in the tourist activity.

In the most conservative scenario (Scenario 1), that assumes the prolongation of certain epidemiological measures in the second half of the year, the nominal decline in the gross domestic products amounts to -14.9% on an annual basis. A slightly more favourable epidemiological situation is assumed in Scenarios 2 and 3, which results in a more moderate decline of the economic activity, reaching -12.5% and - 10.4% respectively (Table 1). The slowdown of the economy that resulted from a partial shutting down of the economy and restrictions on normal business activities has a negative impact on labour market developments, reflected in a rise in the unemployment rate and a decline in the average level of gross wages. A strong contraction in the import of goods and export of services also has an adverse effect on the international position of the economy, that records a deficit in current transactions in the balance of payments, which increases the depreciation pressure on the exchange rate. However, considering the actions taken by the Croatian National Bank so far and the fact that on 10 July Croatia joined the European Exchange Rate Mechanism II[44], that implies the maintenance of exchange-rate stability, all the three scenarios simulate a relatively mild exchange rate depreciation. Negative trends and worsening labour market conditions lead to a slight fall in prices in 2020.

General government balance has been hit twice due to a strong contraction in revenues following a decreasing economic activity and rising expenditures related to measures adopted for the purpose of supporting the economy and preserving the employment. As a consequence, the general government records a negative balance on an annual basis, ranging from -7.6% (Scenario 3) to -8.9% (Scenario 1) of the GDP, due to which the public debt rises to a level ranging between 89% and 95% of the GDP, depending on the scenario. Deteriorating public finances have a negative effect on the risk premium, reflected in the growth in the return on long-term government bonds. At the same time, Scenario 1 assumes a deterioration in the credit rating and the exit from the investment grade category, which reduces the range of potential investors.

A simulated rise in the risk premium increases the cost of borrowing of other sectors through a rise in short-term and long-term bank loan interest rates. This rise has been reduced due to a historically high bank liquidity level, that allows banks to continue granting loans. The pace of economic recovery will partly depend on loan market developments in the upcoming period and on the availability of financing for the households and non-financial corporations sectors. The availability of (loan) financing combined with the situation in the labour market, determine the trends in the real estate market, that has been recording a stagnation in demand for several months since the outbreak of the crisis. The subdued demand in the City of Zagreb is the result, among other things, of the devastating earthquake that hit the city in March. With continued reduction in demand and market segmentation in prospect, price corrections and a turn in current trends were simulated for the following period, with the intensity of the contraction depending on possible overestimation of the prices before the

[44]For more information, see the official website of the European Commission: https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.pr200710_1~88c0f764e7.en.html?utm_source=ecb_twitter&utm_medium=social&utm_campaign=20200710_PR_ECBCroatia

crisis. The details on the scenario narrative and expected macroeconomic developments can be found in Chapter 2 Macroeconomic overview.

In the second simulation phase, the defined macroeconomic scenarios spill over to disturbances on financial markets (Figure 3). The shock on the bond market reflected in the growth in yields/ fall in prices spills over to individual exposures of entities in the financial services sector in three steps: 1) for each bond valued on the mark-to-market basis the implicit yield to maturity is estimated taking into account its price, residual maturity and cash flows for the respective bond, 2) the implicit yields assessed are corrected linearly by the simulated increase in the yields according to the scenario observed[45], 3) on the basis of the simulated yield, residual maturity and cash flows for the respective bond, a new price is assessed. The shock on the stock market is also applied for individual exposures of entities, by selecting the return from the negative tail of the distribution graph from the historical distribution of monthly returns of the stock observed according to the Value-at-Risk approach. This approach enables consistent differentiation between relatively riskier stock portfolios of certain entities and more conservative ones on the basis of historical movements of stock prices. Therefore, for the same level of the shock selected in the observed scenario, comparatively riskier stocks will generate less favourable results relative to stocks that involve less risk. The calibration of shocks using the Value-at-Risk approach to monthly returns of unit prices was also used for investments in foreign investment funds. The prices of domestic investment fund units were estimated as an integral part of the simulation, whereby the assessed values of investment fund units in the second step spill over to the portfolios of other companies exposed to them (secondary effects). The value of the real estate portfolio of insurance companies was corrected in accordance with the macroeconomic scenario, with personal use real estate having been exempted from the simulation, and only the price of the investment part of the real estate exposure having been corrected. The value of the remaining assets, consisting primarily of cash and cash substitutes and deposits, remained unchanged in the simulation horizon. In case of pension funds, that are currently in the accumulation phase, characterised by the increase in the number of insured persons and positive net inflow of funds, the effect of labour market developments in 2020 was also taken into account. In the end, all exposures to foreign currencies were corrected directly or indirectly through a simulated exchange rate of the kuna against the euro.

Simulation results

By means of the financial channels described, simulation scenarios were translated into the value of total assets of individual segments of the financial services sector, whose decrease is proportional to the intensity of the shock simulated (Figure 6). In line with this, insurance companies' assets fell, depending on the scenario, by between -5.3% and -1.9% relative to the end of March 2020. The decrease in net assets of investment funds under the simulated conditions ranged between -3.5% and -1.2% compared with the end of June 2020. Pension funds' assets declined by -2.4% in Scenario 1, stagnated in Scenario 2 and even rose in Scenario 3, primarily due to the positive net inflow of funds that compensates for losses under simulated stress conditions in financial markets.

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[45]German and US government bonds were exempted from the set of bonds exposed to the shock, as an increase in the return of these bonds is not expected due to expansive actions taken by the central banks and their perception as the risk-free asset class.

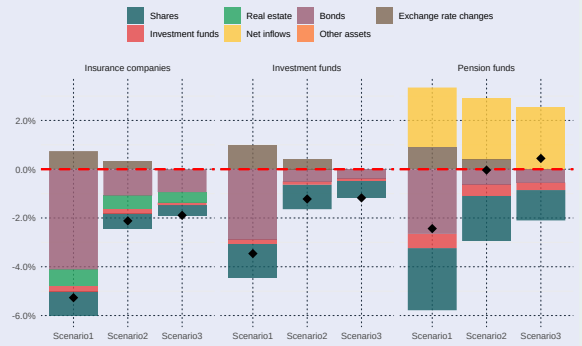
Table 1. Macroeconomic scenario
Overview of the assessed values of key macroeconomic variables and shocks used in financial markets

					2020		
Indicator	**2016**	**2017**	**2018**	**2019**	**Scenario1**	**Scenario2**	**Scenario3**
Gross domestic product (annual growth rate)	3.38	4.34	4.51	4.47	- 14.93	- 12.48	- 10.43
Unemployment rate	13.15	10.33	8.12	7.06	14.59	13.32	12.41
Gross wages (annual growth rate)	2.02	5.51	1.09	8.44	- 6.56	- 5.94	- 4.74
Current transactions (in % of the GDP)	2.11	3.51	1.84	2.76	- 4.54	- 2.15	0.10
Bank loans in real sector (annual growth rate)	- 4.00	-	2.00	4.00	2.41	3.14	4.16
Inflation (in %)	1.39	0.92	3.21	1.13	- 0.47	- 0.26	- 0.08
Real estate (growth rate)	0.79	7.64	4.69	10.00	- 11.02	- 8.77	- 6.78
General government balance (in % of the GDP)	- 1.11	0.80	0.26	0.34	- 8.87	- 8.15	- 7.56
Public debt level (in % of the GDP)	80.80	77.76	74.78	73.24	94.97	91.61	88.95
Government bond return (in %)	3.07	2.66	2.09	0.47	2.64	1.69	1.65
Short-term interest rates (in %)	6.70	6.08	5.77	5.30	5.68	5.34	5.33
Long-term interest rates (in %)	5.56	4.68	4.72	3.82	4.14	4.10	4.09
Stock market shock (VaR level)					97.5%	95.0%	90.0%
Investment fund market shock (VaR level)					97.5%	95.0%	90.0%
Relative depreciation of the kuna/euro exchange rate					1.60%	0.70%	0%

Note: VaR indicates Value-at-Risk, i.e. the level of shock selected from the historical distribution of the variable observed.
Source: Hanfa

Having in mind the predominance of bonds in investment portfolios of the entities, financial services sector assets were primarily affected, as expected, by developments on the bond market. This result places even more emphasis on risks arising from the strong interconnection of the financial services sector and the public sector, especially in the event of a loss of the investment grade credit rating, assumed in Scenario 1 (for more information, see Box 2 Risks arising from the interconnection of the financial services sector and the public sector in Macroprudential Risk Scanner No 3). In line with the level of exposure and intensity of the shock, stock market movements and changes in the prices of investment fund units exerted a relatively smaller impact on the decrease in the assets of the financial services sector. Developments in the commercial real estate market had a negative effect exclusively on the value of insurance companies' assets. A slight depreciation of the kuna against the euro under the simulated conditions had a positive impact on the asset value considering the rise in the value of assets expressed in the domestic currency.

Figure 5 Assets of sectors primarily under the influence of trends in the bond market
Decomposition of the relative change in assets of the sectors in different scenarios, in %



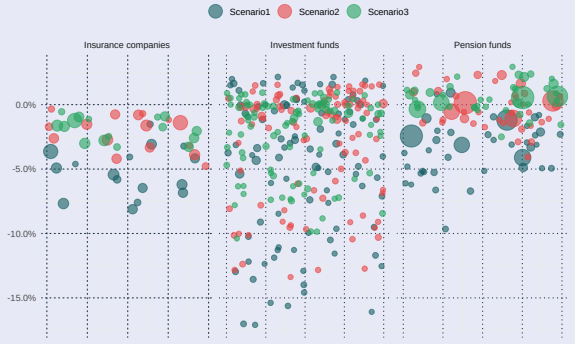
Note: Taking account of the availability of data, the change in assets at end-2020 in insurance companies relates to the end of March, while the same data on pension and investment funds relate to the end of June. Black squares represent the cumulative net change in assets of the sectors in the scenarios observed.
Source: Hanfa

The results at the level of individual companies reveal significant heterogeneity of the impacts of the simulation, that is most apparent in the investment funds sector. This fact is not surprising, considering that at the end of June 2020, there were 100 active UCITS with very different investment strategies and risk profiles (from money market to equity funds), which is reflected in their performance under stress conditions (Figure 7).

A detailed overview of individual results shows that the dispersion of disturbance impacts under stress conditions rises with the intensity of the assumed scenario (Figure 6), which reveals a clear differentiation in business models of the companies according to their stability. In other words, during stable (good) periods, the results of companies with different risk profiles show relative convergence, but increased risk taking due to financial disturbances leads to a higher

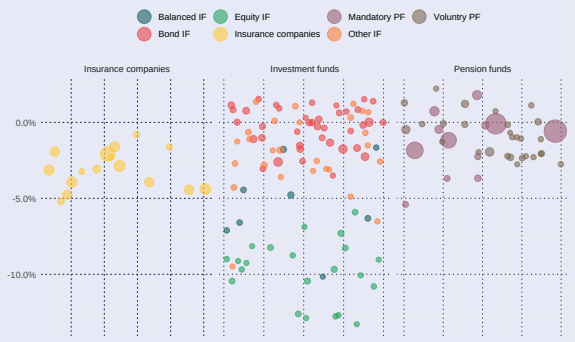
level of differentiation in their business performance. Stress test exercises therefore facilitate the detection of structural weaknesses, that are hard to recognise in stable circumstances.

Figure 6 Dispersion of the results by entities increases along with the intensity of the stress scenarios
Relative change in the value of assets of the companies depending on the scenario, in %



Note: The size of dots denotes the simulated size of the fund or insurance company at the end of 2020.
Source: Hanfa

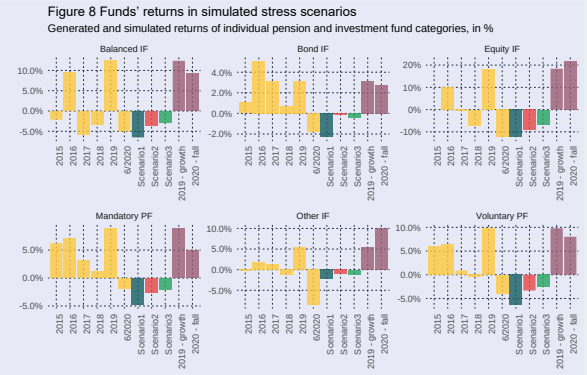
Figure 7 Strong divergence of the results within individual industries
Relative change in the value of assets of the companies depending on the scenario, in %



Note: The size of dots denotes the simulated size of the fund or insurance company at the end of 2020. The average value in simulated scenarios is shown.
Source: Hanfa

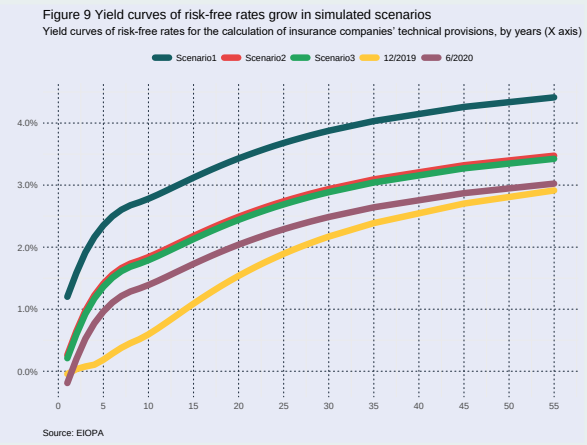
Simulated returns of pension and investment funds point to potential losses of unit holders in the event that the assumed scenarios materialise under stress conditions. Except for equity funds, all investment and pension fund categories recorded a smaller decrease in returns in absolute terms in 2020, after the losses generated in the first six months and the estimated average losses in the rest of the year were added up, in comparison with the growth recorded in 2019 (Figure 8). Relatively conservative bond funds recorded the slightest average fall in return (-1%) in 2020, with the return in the first six months reaching -1.8%. This fund category also experienced the strongest reaction by investors (their sudden withdrawal of funds), who withdrew HRK 7.1bn in March 2020, or 37.8% of the net value of bond UCITS recorded at the end of February (more information in Chapter 3.5 Liquidity risk). The simulation results imply that even in the scenario significantly less favourable than the one observed in March, this fund category recorded relatively modest return decline rates, comparable to positive returns generated in the previous years.

Figure 8 Funds' returns in simulated stress scenarios
Generated and simulated returns of individual pension and investment fund categories, in %



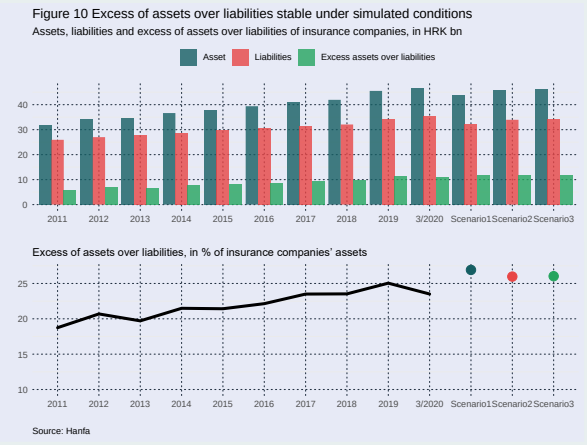
Note: The data for June 2020 show the return generated in the first half of the year, while the simulated return shows the return in the rest of 2020 depending on scenario assumptions. The data "2020 – fall" show the assessed average fall in returns in 2020, which includes the returns generated in the first six months and the average assessment in the second half of the year in the three stress scenarios.
Source: Hanfa

Figure 9 Yield curves of risk-free rates grow in simulated scenarios
Yield curves of risk-free rates for the calculation of insurance companies' technical provisions, by years (X axis)



Source: EIOPA

Figure 10 Excess of assets over liabilities stable under simulated conditions
Assets, liabilities and excess of assets over liabilities of insurance companies, in HRK bn



Source: Hanfa

Although insurance companies recorded a somewhat larger fall in assets than pension and investment funds in all the three scenarios, their

liabilities decreased proportionally as well, with the excess of assets over liabilities remaining stable above the level of 25% of total assets (Figure 10). In more concrete terms, due to simulated linear rise in the yield curve, technical provisions of insurance companies declined as the expected future cash flows were discounted by larger rates (Figure 9). Moreover, the decrease in the value of liabilities is even more evident than the decline in the value of assets due to a relatively longer maturity of their liabilities than that of assets. The year 2019 saw a similar effect in the opposite direction, when a negative shift of the yield curve led to a relative rise in insurance companies' liabilities in comparison with their assets, causing a slight deterioration of solvency indicators (find more details in Macroprudential Risk Scanner No 3). However, it is important to emphasise that the simulation presented took account of negative impacts in financial markets, but not of the specificities of insurance sector operations, that significantly affect liabilities of insurance companies. Under stress conditions, the amount of claims may be expected to rise and the level of premiums to fall, which would definitely cause insurance companies' profitability and solvency indicators to deteriorate.

Conclusion

The purpose of stress testing, as an analytical and macroprudential tool in the classic sense, is to create stress conditions in periods lacking a systemic stress and thus to test the resilience of the system to disturbances and provide an insight into potential structural vulnerabilities. In the current circumstances involving significant uncertainties following the materialisation of a systemic risk that has already affected the resilience of the financial system, there is increased importance to determine sufficient liquidity and capital system buffers, that will be able to withstand future similar or equal shocks. Bearing in mind the growing importance of the financial services sector for the preservation of the financial stability of the entire system, it is extremely important to make a conservative assessment of the effects of the crisis on the stability of the financial services sector for the rest of the year. The presentation of disturbance spillover channels affecting companies' business operations helps raise awareness of the risks the sector is exposed to, while the quantification of the effects enables market participants to position their expectations within a realistic range of possible outcomes. In a potential scenario involving additional shocks in the upcoming period, this may reduce the possibility of a panic reaction by market participants, that might result in additional costs, and in extreme situations even jeopardise the functioning the financial system.

The simulation results need to be interpreted primarily within the context of initial assumptions and scenarios presented, where the calibration of the scenarios and their spillover to business operations of the sector are addressed holistically (internally consistent), making partial observation of the impact of individual modules (or disturbances in individual markets) impossible. At the same time, the assumed outcomes of the scenarios are possible, but they are still relatively more conservative than the objective expectations.

The methodological framework set presents a basis for macroeconomic stress testing of the financial services sector, that will be expanded and upgraded in the upcoming period as one of the basic macroprudential tools. In line with this, this framework needs to include a liquidity component, both for individual companies and financial markets, that can suddenly vanish in unexpected systemic episodes, and further deepen the crisis. Considering the fact that the financial services sector accounts for 31% of assets of the domestic financial system and for 51% of the gross domestic product, secondary feedback effects are possible, when collective reactions by companies supervised by Hanfa might amplify the initial shock and exert a negative impact on the economy. Moreover,

even though behavioural reactions by the participants are difficult to predict and model, precisely they define the course of the spillover of the systemic shock in crisis situations.

Taking account of the restrictions mentioned and the necessity to interpret the result within the context of the initial scenario assumptions, the simulation results show the level of exposure of the financial services sector to the additional systemic shock in the second half of the year. Even in the most conservative scenario, that assumes the loss of the investment grade credit rating for government bonds and rather unlikely bond market corrections, the amount of assessed losses sustained by funds at the system level in 2020 is smaller than the amount of gains recorded in the previous year. On the other hand, according to the simulation results, insurance companies' balance sheets absorb the shock produced in the financial markets as the reduction in the value of liabilities due to a rise in the discount rate exceeds the market decrease in the value of the companies' assets. This result lays additional emphasis on the advantages of diversification offered by funds, that become fully evident under stress conditions, but also on the relative stability of insurance companies, that are accounting for an ever larger share of the financial market and whose basic activity is precisely risk management.

List of abbreviations

bn – billion

CBS – Croatian Bureau of Statistics

CEE – Central and Eastern Europe

CES – Croatian Employment Service

CNB – Croatian National Bank

EC – European Commission

ECB – European Central Bank

EIOPA – European Insurance and Occupational Pensions Authority

ESRB – European Systemic Risk Board

EU – European Union

EUR – euro

GDP – gross domestic product

GVA – gross value added

HAMAG-BICRO – Croatian Agency for SMEs, Innovations and Investments

Hanfa – Croatian Financial Services Supervisory Agency

HBOR – Croatian Bank for Reconstruction and Development

HR – Republic of Croatia

HRK – Croatian kuna

IMF – International Monetary Fund

MCR – Minimum Capital Requirement

m – million

OECD – Organisation for Economic Cooperation and Development

pp – percentage point

SCR– Solvency Capital Requirement

UCITS – undertakings for collective investments in transferable securities

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; SE – Sweden; SI – Slovenia; SK – Slovakia; UK – United Kingdom; USA – United States of America