FINANCIAL STABILITY REPORT

June 2022

European Insurance and
Occupational Pensions Authority

CONTENTS

FOREWORD BY THE CHAIRPERSON

The pandemic has triggered multiple inflation drivers such as supply chains bottle necks. These pre-existing inflationary pressures have been exacerbated by Russia's invasion of Ukraine, associated with increased uncertainties in global financial markets and substantial downwards revisions of the global, as well as European, economic outlooks with stagflation scenarios as downside risk. To address inflation, central banks are changing from accommodative to restrictive monetary policies. However, the monetary policy is in a difficult position, facing a dilemma between high inflation and low growth and reduced manoeuvre of fiscal policies.

The impact of inflation on insurance and pension undertakings and on policyholders, members and beneficiaries is a crucial topic that requires careful monitoring. Inflation, if combined with higher interest rates, has a positive impact on life insurers and DB pensions schemes with negative duration gaps because the value of liabilities is declining more than assets. However, it could have a negative effect on non-life insurers with a positive duration mismatch and a negative impact of raising claims inflation that is typically increasing even more than an average price of consumer basket. Moreover, high inflation and low economic growth have a negative impact on new business, undermining profitability and ultimately also solvency.

Despite the significant decline in reported cases since the peak of the omicron wave in February, the COVID-19 pandemic still needs to be taken into account going forward. Globally, approximately one billion people are still unvaccinated and the risk of a surge of infections towards the end of the year, remains. Unless new serious mutations or variants will emerge, it seems we have learned to cope with the virus spreading. Therefore, there is the expectation that no strong restrictions will be applied in Europe in the future as was done after the onset of the pandemic.

With the rise of market-based products such as products with profit sharing, unit-linked and defined contribution pension schemes, risk has been shifted to the consumer and if inflation couples with low growth, this will be negative for policyholders, members and beneficiaries as real returns would be lower and consumer purchasing power will be reduced. Moreover, the high inflation environment might potentially trigger lapses

of policies since the weaker real income might urge policyholders to access their funds due to higher cost of living. Furthermore, regarding the voluntary pensions, people might reduce pension contributions or even access their pension pots to navigate through the cost-of-living-crisis.

The long-term upward trend in cyber risk driven by digitalisation and its further intensification by the COVID-19 crisis and growing geographical risks could be clearly observed. At the same time, cyber risk also is an opportunity for the insurance sector as it plays an important role in the economy by providing cyber underwriting policies. Regarding sustainability, long-term investments are needed to ensure transition towards a climate-neutral economy. With climate change and natural catastrophes intensifying and happening more frequently, we can see that many risks are not covered. This raises the question on protection gap and insurability, which could negatively impact overall economic growth by limiting productive investments.

All the above-mentioned topics are very high on EIOPA agenda and we will continue our mission to preserve robust insurance and pension industry to the benefit of all European citizens.

Petra Hielkema

EXECUTIVE SUMMARY

The consequences of Russia's invasion in Ukraine are shaping the current macroeconomic developments. It is a human tragedy and also an economic shock. After a strong economic recovery in 2021, growth slowed significantly in the first quarter of 2022 and high uncertainty resurfaced. Low business and consumer confidence are holding back economic activity. The invasion and sanctions have amplified the rise in inflation rates. Reasons include supply chain disruptions, higher prices for oil and natural gas as well as other imported commodities, which lead to rising input costs and reduce profitability in the real economy. Overall, the European economy is facing a supply shock, which is simultaneously driving up inflation and reducing growth. In financial markets, interest rates levels and volatility increased, bond and equity prices declined, and the risk of a further correction is high. Given the recent upward movements in yield curves, market expectations about inflation and the stance of monetary policy, the ultra-low interest rate environment is no longer the dominant narrative, and the risks triggered by abruptly rising interest rates seem more pertinent.

It is very difficult to predict how the Russian invasion will evolve and what risks might emerge for the insurance and IORPs sectors. A lot will depend on for how long the conflict will continue and whether it will escalate further. Chapter 2, 3 and 4 of this report provide an overview of the situation of insurers, reinsurers and IORPs before the Russian invasion.

The European insurance sector entered year 2022 in good financial conditions with a solid capital buffers. Throughout 2021, gross written premiums grew both for the life and non-life business. The life business growth was relatively stronger also driven by the previous reduction of GWP throughout 2020 during the pandemic; although GWP remains still below pre-Covid levels, in particular for life business. The **share of unit-linked** business in the life segment continued to increase. In the end of 2021, it reached a peak of 39% since the introduction of Solvency II reporting in 2016. The good performance of financial markets and the high returns affected positively insurer's **investment profitability** which returned to pre-Covid the levels. At the same time, lapse rates on life policies remained stable and **underwriting profitability** slightly improved throughout 2021, but was heterogeneous between the lines of business. In particular, the underwriting profitability of miscellaneous financial loss and credit and suretyship improved via claim reduction. On the other side, given the lockdown measures and restrictions on travelling, premiums decreased for transport related lines of business like motor vehicle liability and other motor in 2021. At the beginning of 2022 insurers' **capital buffers** were on aggregate solid with a median SCR ratio of 216%. An improvement was observed for life and composite insurers while a slight decline was observed for non-life insurers. A persistent and high inflation increases to some extent the claims to be paid-out for the non-life business lines, especially those with a relatively longer duration[1] (long-tail LoBs) challenging profitability ratios. Also, the dramatic increase in energy prices could cause a sharp

[1] See topical focus on inflation in December 2022 EIOPA FSR.

reduction of economic growth and hence potentially negatively affect insurance premiums paid and new business.

The European reinsurance sector remained resilient in 2021 despite continued challenges that included high catastrophe losses, inflation expectations and pandemic related uncertainty. "Hardening" market conditions contributed to increase in written premium and improvement in reinsurer's solvency positions. Both traditional and alternative reinsurance capital grew in 2021 as reinsurers sought to take advantage of rate increases, while balancing their exposure to loss affected portfolios. Looking ahead, climate change effects, increasing cyber risk and Covid-19 are expected to remain key sources of risk and uncertainty. Despite a sufficient capital availability, bifurcation between loss affected and non-loss affected portfolios is expected to become stronger in terms of pricing and terms and conditions. Implications of Russia's invasion of Ukraine may have an impact on the reinsurance sector; however the details and magnitude remain unclear at this stage and any claims and actual pay-outs are likely to be subject to legal proceedings. For example, claims could be expected from lessors of airplanes stranded in Russia, as substantial shares of this exposure by primary insurers' has been ceded to reinsurers.

The financial positions of the EEA IORP sector have recovered following the improvement of the financial markets since the Covid-19 pandemic outbreak in 2020. Asset valuations increased over the last year, whereas the liabilities remained more or less unchanged. As a result, the Excess of Assets over Liabilities exhibits a positive trend with the DB IORPs' cover ratios reaching a level of 114%. As for the insurance sector, the latest developments in the markets in relation to Russia's invasion and the increase of geopolitical tension along with the rise in inflation and yield are not yet incorporated in the last available IORPs data.

The direct impact of Russia's invasion of Ukraine on European insurers and IORPs is very limited, but potential second-round effects can be more substantial. The asset exposures towards Russia, Ukraine and Belarus is very low. Insurers hold such assets in the amount of EUR 8.3 bn, less than 0.1% of the total investment and IORPs hold EUR 7.5 bn., 0.2% of the total investments. On the liability side, the volume of technical provisions in the region is negligible. Moreover, only a few European insurance groups are active in those countries through subsidiaries, and they are small. Interest rate derivative exposures and related potential margin calls might be a source of concerns for insurers' liquidity positons because of the increasing and volatile interest rate, but insurers are not exposed to energy-commodity or sovereign default risk derivatives. Going ahead second-round effects (e.g. rising inflation, commodities prices, etc.) of the invasion could potentially emerge. Inflation could negatively impact the financial position of insurers and IORPs or lead to a decrease in purchasing power of policyholders, members and beneficiaries. Insurers are significantly exposed towards banks assets, and in particular hold a significant amount of assets issued by banks that are more vulnerable to the evolution of the current crisis. Insurers also have a significant asset exposure to sectors that are sensitive to energy and gas prices.

An analysis of insurers' trading activity shows that in 2021 insurers are net buyers of equities and are also net buyers of government bonds in 2021, but to a lower extend than historical average. Net purchases of corporate bonds issued by non banks are also low in comparison to previous years. The exposure to the banking sector has continued to decline, as it has over the past two years. Low-risk assets such as covered bonds account for the largest share of bank assets. On the down side,

the senior and the higher-risk subordinated bonds, which account respectively for 44% and 8% of the total exposure towards banks, are now more risky as the banking sector is very sensitive to ongoing macroeconomic developments. Insurers tend to invest predominantly in the domestic banking sector, albeit with a declining share.

Climate risk remains one of the focal points, with Environmental, Social and Governance (ESG) factors increasingly shaping investment decisions of insurers and pension funds but also affecting the underwriting of the latter. Natural disaster losses incurred in 2021 are higher than in the previous year and proved to be the second costliest ever along with 2005 and 2011. Going ahead, extreme weather may put a significant pressure on non-life insurers, especially if they become more frequent and severe due to climate change.

Sustainable finance is a strategic priority in EIOPA[2] . The Commission's Strategy for financing the transition to a sustainable economy encapsulates work by EIOPA in delivering on the Green Deal. The recent developments regarding Russia's invasion of Ukraine could also have an impact on climate change policies. Driving energy and gas prices extremely high and volatile, the Russia's invasion has provoked an extensive debate on how to respond. The European Commission has emphasised the need to accelerate the launch of clean energy technologies. Other politicians have coupled this with the need to exploit domestic fossil-fuel resources as a means of reducing reliance on Russian exports. Overall, the long-term impact of the invasion could be an increase in demand for renewable energy as a response to the need to find new energy supplies to replace Russia's fossil fuels.

Amid Covid-19 remote working arrangements and Russia's invasion in Ukraine, cyber-incidents[3] have increased further. Supervisors expect a rise in the materiality of risks related to digitalisation over 2022. But the challenge that cyber security risk poses to all sectors is a booster for cyber insurance demand going ahead. However, this might also further increase coverage gaps raising issues of insurability with implications on reputational risks for the sector. Due to the increased relevance of digitalisation and cyber risks, EIOPA has enhanced its monitoring framework to start covering these risks. From January 2022, the EIOPA Risk Dashboard includes a new risk category named "Digitalisation and cyber risks" built on three indicators: (i) supervisory assessment of digitalisation and cyber risks; (ii) change in frequency of cyber incidents; and (iii) cyber negative sentiment. These indicators are exploratory and rely on supervisors' responses to the EIOPA Insurance Bottom-Up Survey and on publically available external data and will be improved once new supervisory data becomes available. Moreover, to better monitor cyber underwriting, EIOPA has, in the context of the 2020 review of Solvency II, proposed to the European Commission a new template for the reporting of data for cyber (re)insurance policies. With regards to cyber resilience, the Commission's proposal for a Digital Operational Resilience Act (DORA)[4], included in the EU's digital finance strategy, has now entered into trilogue phase. DORA will require the European Supervisory Authorities to develop several policy deliverables, namely Regulatory Technical

[2] See EIOPA's work programme 2022-2024

[3] Cyber incident refers to both: intentionally and unintentionally provoked events.

[4] Proposal for a Regulation of the European Parliament and of the Council on Digital Operational Resilience for the financial sector and amending Regulations (EC) No 1060/2009, (EU) No 648/2012, (EU) No 600/2014 and (EU) No 909/2014.

Standards, Implementing Technical Standards and Guidelines and ongoing reports to be addressed to the European institutions. EIOPA continues preparatory work to implement the cyber incident reporting envisaged in DORA. This would allow to fully include this risk in a regulatory financial stability risk assessment frameworks. Finally, regarding the evolution of the exposures and the approach taken by EU insurers towards crypto-assets EIOPA is regularly monitoring.

The report consists of two parts – the standard part and the thematic article section. The standard part is structured as in previous versions of the EIOPA Financial Stability Report. The first chapter discusses the macro environment and the key risks identified for the insurance and occupational pension fund sector. The second, third and fourth chapter elaborate on these risks covering all sectors (insurance, reinsurance and IORPs). The fifth chapter provides a more in-depth qualitative and quantitative assessment of the risks identified. Finally, there is one thematic article provided in this report. The article empirically investigates dividend distribution for European insurers in the context of stress tests and Covid-19 outbreak.

PART I

1. KEY DEVELOPMENTS AND RISKS

The European economy is currently in a phase of heightened uncertainty. Macroeconomic conditions have deteriorated as a result of the Russian invasion in Ukraine, which reduces the outlook for growth and leads to increased downside risks for the future course of the economy. Prior to that, in 2021, macroeconomic conditions strengthened as the pandemic situation improved. Real GDP growth 2021 was 5.3%. Recovery from the pandemic is expected to continue in 2022, supported by further progress in global vaccination efforts and the expiration of containment measures.

At the same time, elevated inflation becomes increasingly a concern. Supply chain disruptions and rising commodity prices lead to upward pressure on consumer prices. As a consequence of the Russian invasion and the introduced sanctions, the European economy faces a supply shock, which simultaneously pushes up inflation and reduces growth. This supply shocks comes on top of the Covid-19 related bottlenecks which have already had an inflationary impact on the economies.

On financial markets, interest rates increased accompanied by higher volatility. Markets expect further monetary policy reactions to the rise in inflation. Based on recent upward moves of yield curves, changed market expectations on inflation and the monetary policy path, the ultra-low interest rate environment is no longer the dominant narrative and risks triggered by abruptly rising interest rates appear more pertinent.

The macro and market environment remain challenging for the insurers. Bond and equity prices decreased with the ongoing crisis and the risk of an abrupt correction is material. From a profitability perspective, and taking into account the impact of higher inflation on costs and claims, operating results of insurers could potentially be stressed. However, higher interest rates or upward repricing of premiums can mitigate the higher claims. Overall, the writing of new business might suffer following lower economic sentiment and a slowdown of growth in 2022 GDP.

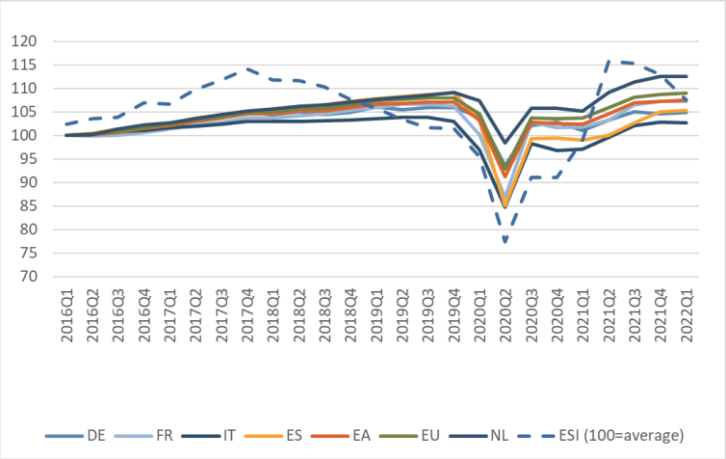
1.1. MACRO AND MARKET RISKS

European macroeconomic conditions have deteriorated with the Russian invasion of Ukraine. In 2021, the European economy recovered from the pandemic and grew strongly. This comes along with the fading impact of the Omicron variant and the reduction of containment measures. At the end of the year 2021, real GDP in the EU exceeded the pre-pandemic peak. However, growth slowed down in the fourth quarter and then fell significantly in first quarter of 2022 (Figure 1.1). In parallel, economic sentiment fell significantly in the first half of 2022, mostly driven by plummeting consumer and industry confidence. The turn of events is the result of the Russian invasion of Ukraine initiated on 24 February 2022.

As of now the situation is dynamic and it is unclear whether Europe falls back into a recession. The conflict has broad consequences on the economic development but the magnitude of the economic impact of the conflict is uncertain. There are significant downside risks to the outlook. In particular, a long conflict and a complete ban of oil & gas imports from Russia would dampen

economic activity.[5] However, current forecasts on economic growth are still quite positive. The Commission Spring 2022 Economic Forecast of real GDP growth in the EU and the euro area is 2.7% in 2022 and 2.3% in 2023, significantly lower than the previous forecast. In case of an outright cut in gas supply, projected growth rates would be significantly lower. The IMF World Economic Outlook of April 2022 forecasts euro area growth of 2.8% for 2022 and 2.2% for 2023.

Figure 1.1: Real GDP growth, by country (2016 Q1=100) and economic sentiment.



Source: ECB, Eurostat and European Commission.
Last observation: Q1 2022.. Note: For GDP, EU and EA time series refer to fixed composition, with EU referring to EU 27.

Europe had sizeable trade links to Russia which can prove a transmission channel for spill-over effects. In 2021, Russia was the EU's fifth largest trade partner, representing 5.8% of the EU's total trade in goods with the world.[6] The EU's imports were worth EUR 158.5 bn., mostly oil & gas and other commodities, while EU's exports in 2021 totalled EUR 99.0 bn. In response to Russian invasion of Ukraine, the EU adopted a broad package of restrictive sanctions which lead to collapse in EU-Russian trade activity. Further intensification of sanctions and Russian retaliations could result in complete trade disruptions, including oil and gas supplies.

Reduced business and consumer confidence drags on growth. The Russian invasion abruptly reduced economic sentiment as citizens expect a decrease of household income and business activity and increased inflation. As a consequence, households could cut back on spending and firms reduce their investments.

The Russian invasion has material effects on commodity markets. Russia and Ukraine are both large exporters of commodities, of oil & gas as well as of metals and food commodities. Sanctions and disruptions reduce these exports and hence supply of commodities. Substitutability of commodities in production processes is often low and demand elasticity is limited. As a result, commodity prices have strongly increased (Figure 1.2). Higher prices have a detrimental effect on

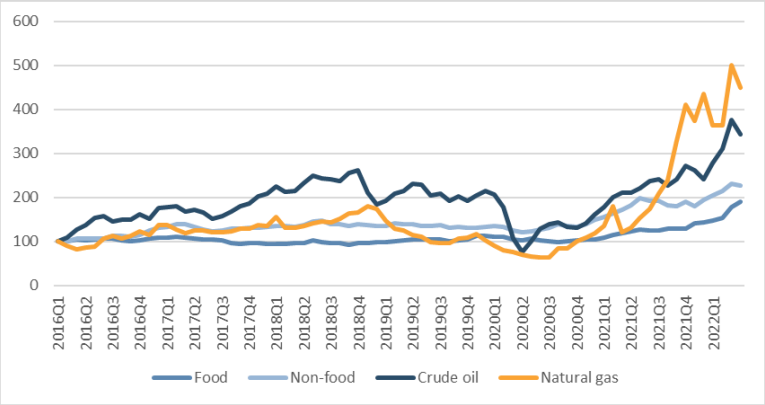
[5] ECB (2022): Natural gas dependence and risks to euro area activity. ECB Economic Bulletin, Issue 1/2022 (link).

[6] https://ec.europa.eu/trade/policy/countries-and-regions/countries/russia/

firms using commodity in the production of goods and a broad effect on producer prices as they are inputs in many production processes.

High prices of commodities imply a supply shock with a negative effect on growth. As Europe is a net importer of energy, rising prices of energy commodities such as oil, gas and coal have a negative income effect. Many industries, for instance basic metals and, chemical, wood and paper production, use energy as an essential input factor. Beyond energy, many other imported commodities become more expensive, for example nickel, and aluminium. This increases input prices for producing firms which leads to reduced profit margins and could eventually lead to reduced investment. As a result, industrial producer prices increased year-over-year over 30%.[7] However, the supply shock might differ across member states as there are notable cross-country differences related to the effect of sanctions, dependency on oil & gas imports from Russia and a decline in trade.

Figure 1.2: Commodity prices (Jan 2016=100).



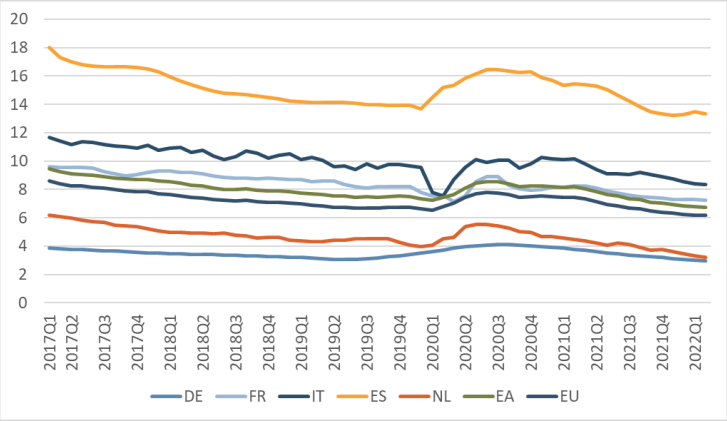
Source: ECB and World Bank.
Last observation: Apr 2022. Note: Food and non-food are commodity price indices compiled by the ECB. Crude oil price displayed is Brent. Natural gas prices displayed is an index covering numerous locations provided by World Bank.

Unemployment rates continue to decrease (Figure 1.3). There is an intact trend of strengthening European labour markets. In the euro area, unemployment is at a long-term low.[8] While low unemployment rates are a signal of economic strength, tight labour markets can contribute to slower economic growth and to inflation through wage pressure. During the pandemic unemployment grew only moderately. This was influenced by the various policies implemented and the job retention schemes. EU unemployment rates are below pre-pandemic levels. Unemployment for the EU is expected to be lower at 6.7% for 2022 and 6.5% for 2023 based on the Commission Spring 2022 Economic Forecast.

[7] https://sdw.ecb.europa.eu/quickview.do;jsessionid=93FFEC98081CE54F80F398ED0FDBE89B?SERIES_KEY=132.STS.M.I8.N.PRIN.NS0020.4.000&start=&end=&submitOptions.x=0&submitOptions.y=0&trans=YPC

[8] https://www.ecb.europa.eu/press/key/date/2022/html/ecb.sp220402_annex~6161c09c24.en.pdf

Figure 1.3: Unemployment rates (% of active population).

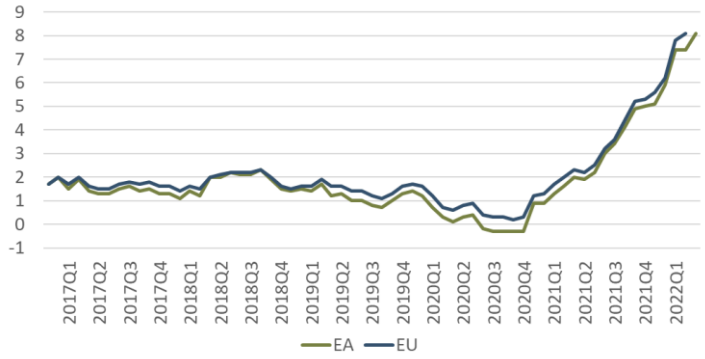


Source: ECB

Last observation: Apr 2022. Note: EU and EA time series refer to 27 and 19 countries.

Inflation continues to rise. The cost of living in the euro area has increased by 2.6% in 2021, which is well above the Eurosystem's target of 2%. Inflation rates further went up at the beginning of 2022 (Figure 1.4) with Euro area annual inflation estimated at 8.1% in May 2022. This is driven by energy prices as well as by other components (Figure 1.5). Regarding 2021, reasons of high inflation were economic growth combined with disruptions in the global supply chain system and the general accommodative fiscal and monetary policies.

Figure 1.4: Inflation (HICP annual % change).

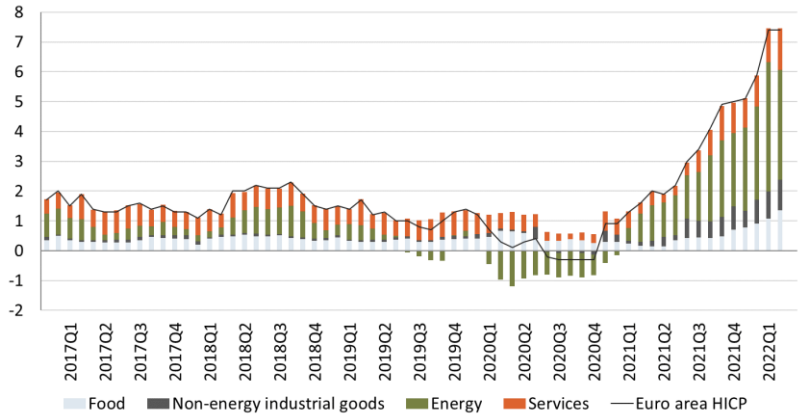


Source: ECB

Last observation: May 2022 for EA and Apr 2022 for EU. Note: EU and EA refer both to changing composition.

The risk of high or even higher inflation is relevant due to the war. In addition to already existing inflationary pressure, energy prices could stay higher for longer, and accompanied by a broader increase of commodity prices, both passing through the economy as higher prices. Accordingly, the 5y5y inflation swap (measuring the average inflation over the five-year period starting five years from now) has increased, and is now well above the Eurosystem's inflation target, while the 5Y ahead expectations signal risk for even higher inflation. The EU Commission projections on inflation have been revised upwards significantly, with annual inflation at 6.8 per cent in 2022, 3.2 per cent in 2023. The IMF World Economic Outlook forecasts euro area inflation rates of 5.3% in 2022 and 2.3% in 2024. Inflation could be considerably higher in the near term.

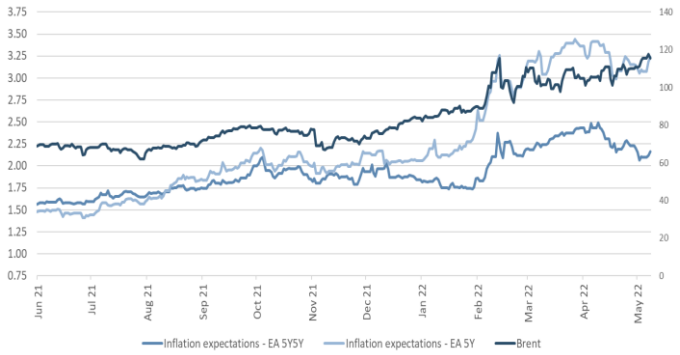
Figure 1.5: HICP main components (annual % changes).



Source: ECB
Last observation: Apr 2022. Note: EA refers to changing composition

The more the conflict reduces the trade links and cuts off energy supplies, the longer market volatility and inflationary conditions could last. The Brent oil price can be used to identify macro and market reactions due to geopolitical induced fears of energy supply disruption. It reveals some correlation of oil price with inflation expectations and volatility (figure 1.6). Future implications are less certain, as countries increasingly look for alternatives to Russian oil and gas imports.

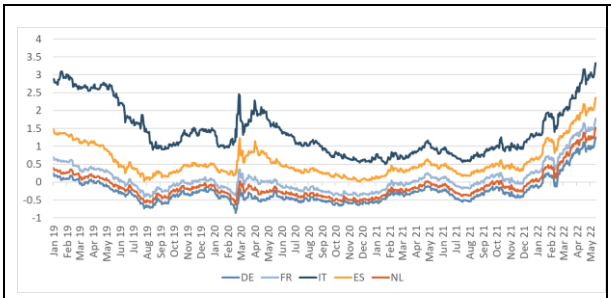
Figure 1.6: Inflation expectations (%, left-hand axis) and Brent price (USD, right-hand axis).

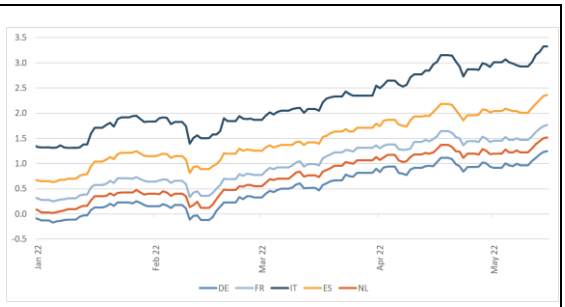


Source: Bloomberg.
Last observation: 31 May 2022.

The yields of sovereign bonds are volatile and increased in 2022. Sovereign yields have increased in Europe after summer 2021 and in the beginning of 2022. This followed from high inflation rates and expectations of tighter monetary policy. This abruptly changed after the Russian invasion when sovereign declined temporarily (figure 1.7). This is attributed to a flight-to-safe assets. Moreover, it reflects lower economic growth prospects and expectations of slower monetary policy tightening. However, quickly, sovereign yields climbed again and quickly exceeded pre-invasion levels. After further increases in Q2, sovereign yields are significantly higher than in the last years.

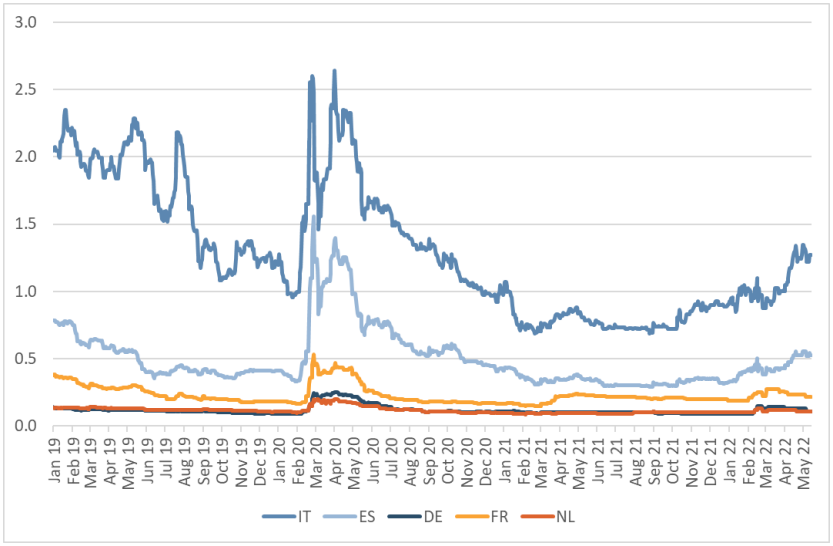
Figure 1.7: 10y government bond yields (in %).





Source: Refinitiv. Last observation: 21/03/2022.

Figure 1.8: Sovereign Credit Default Swaps (5Y) (in %).



Source: Refinitiv. Last observation: 21/03/2022.

Sovereign spreads are increasing. Spreads of Italian and Spanish sovereign bonds increased relative to German sovereign bonds (figure 1.8).

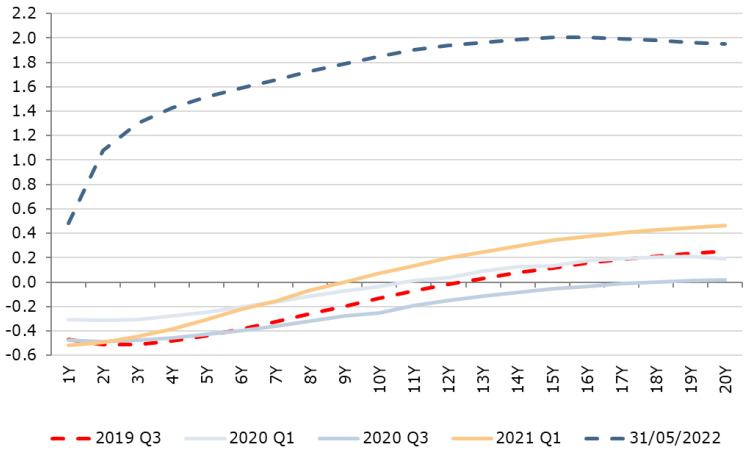
Table 1.1: Government bond yields for different maturities (in %).

		1Y	2Y	5Y	10Y	15Y	20Y
EU- euro area	Austria	0.014	0.422	1.064	1.673	1.888	1.910
	Belgium	0.070	0.528	1.064	1.672	2.107	2.313
	France	0.092	0.510	1.087	1.631	1.984	2.127
	Germany	0.018	0.390	0.817	1.115	1.337	1.367
	Ireland	0.055	0.375	0.924	1.629	1.957	2.101
	Italy	0.412	1.239	2.276	3.164	3.427	3.495
	Netherlands	-0.023	0.430	0.995	1.387	1.640	1.742
	Portugal	0.236	0.687	1.424	2.205	2.581	2.736
	Spain	0.085	0.724	1.504	2.194	2.596	2.731
EEA/EU-non euro area	Bulgaria	-0.173	0.362	1.045	1.658	-	-
	Czech Republic	5.747	5.519	4.859	4.628	4.723	4.823
	Denmark	0.075	0.593	1.158	1.481	1.674	1.764
	Hungary	6.715	6.874	7.118	7.184	7.070	-
	Norway	1.642	2.206	2.669	2.734	-	-
Others	United States	2.114	2.559	2.887	2.813	2.996	3.417
	United Kingdom	1.437	1.581	1.730	2.153	2.434	2.493
	Switzerland	-0.294	-0.037	0.402	0.872	1.057	1.069
	Japan	-0.10148	-0.08119	0.012008	0.268911	0.548341	0.804475

Source: Refinitiv. Reference date: 21/03/2022.

The interest rates increase contracts the ultra-low yield environment narrative. The government bond yields are now in positive territory (Table 1.1). The swap curve steepened during the last months and is outside the negative territory for all tenors (Figure 1.9). The Euro swap curve is now above the level of 2019. Risks triggered by abruptly rising interest rates appear more pertinent.

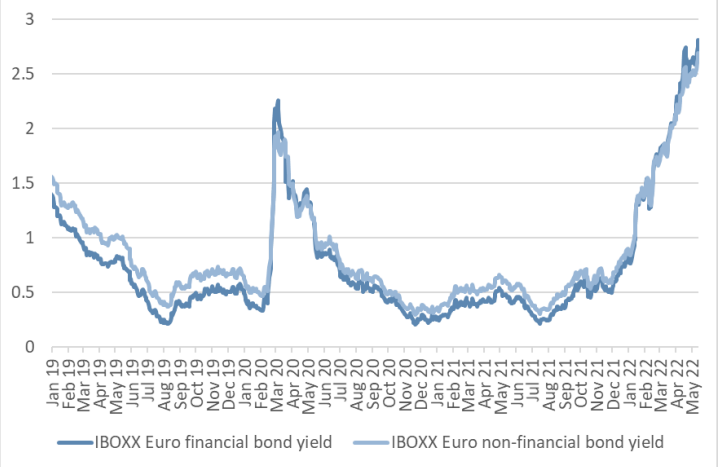
Figure 1.9: Swap curve, in %.



Source: Refinitiv. Last observation: 21/03/2022.

Euro area corporate bond yields have risen from 2021 lows are now above levels observed in March 2020. After yields have reverted to pre-pandemic levels during 2021, they first increased at the end of 2021 and then again after the Russian invasion (figure 1.10). This is in parallel for financial and non-financial corporate bonds. This recent increase comes from a very low base of record low yield spreads in 2021. An explanation is demand for risk reduction in investors' bond portfolios but it is also related to the general increase in interest rates as well as the tighter economic environment.

Figure 1.10: Corporate bond yields (in %).



Source: Refinitiv. Last observation: 21/03/2022.

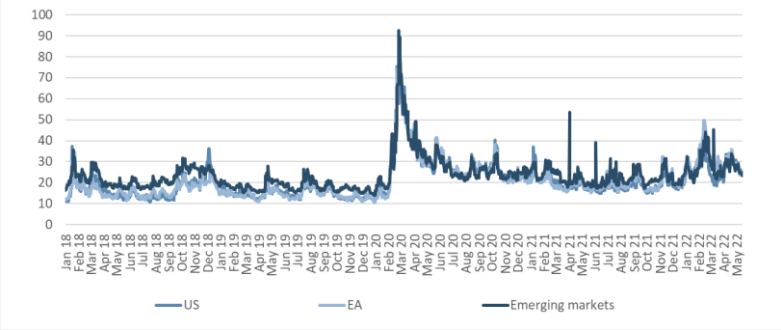
Equity markets are volatile and on a declining path. Equity markets were already on a downward path from the beginning of 2022. They fell further down with the invasion and subsequently they regained some of the losses (figure 1.11). Both in the US and Europe, market reactions are lower

than in March 2020, the outbreak of pandemic, but the downward trend seems to be more persistent. Equity markets in emerging markets developed negative already from the beginning of 2021 and were also hit strongly by the current crisis. Volatility increased significantly but remained far below the levels seen at the outbreak of the pandemic (figure 1.12). Recently, volatility has declined, in some cases to levels of before the invasion.

Figure 1.11: Equity market performance (Index: 01/01/2020=100).

Source: Refinitiv. Last observation: 21/03/2022.

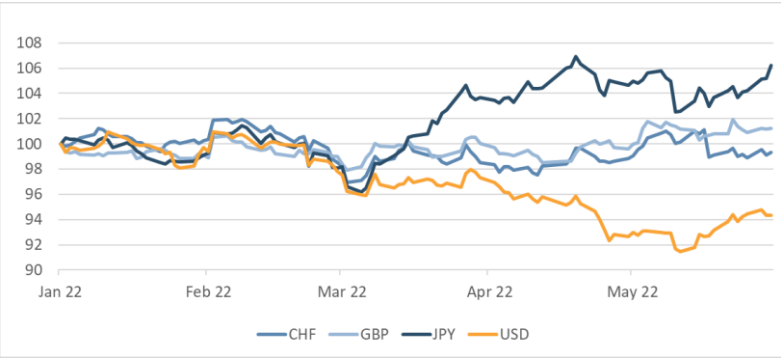
Figure 1.12: Market volatilities.



Source: Refinitiv. Last observation: 21/03/2022
Note: US: CBOE SPX VOLATILITY INDX, EA: VSTOXX Index, Emerging markets CBOE EM ETF Volatility.

Foreign exchange markets are volatile (figure 1.13). The Russian invasion led depreciation of the Euro against major currencies, increasing the inflationary pressures through the import side. This development stopped in March when the Euro partly recovered. The Yen strongly weakened against the Euro after the Bank of Japan re-iterated its loose monetary policy stance.

Figure 1.13: Foreign exchange rate developments against the Euro (03/01/22=100).



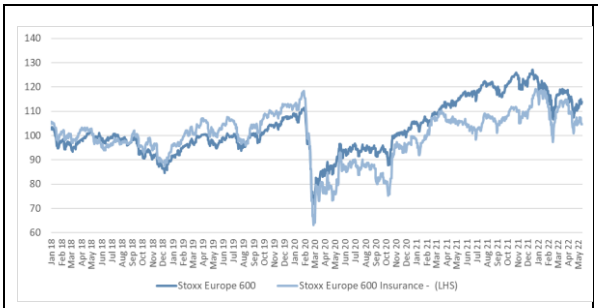
Source: ECB. Last observation: 01/06/2022.

The equity market performance of insurers improved, and before the invasion had recovered the losses from Covid-19. Listed equity of insurers improved in 2021 from the lows observed at the beginning of the outbreak of the pandemic. With the Russian invasion stock prices dropped again but remained above pandemic lows (figure 1.14). Relative to the market, insurer stocks fell stronger but also recovered stronger. Year-to-date, compared to the beginning of 2022, insurer stocks fared better than the overall market. At this stage, insurers' equity are traded at prices similar to the prices in 2018 and 2019.

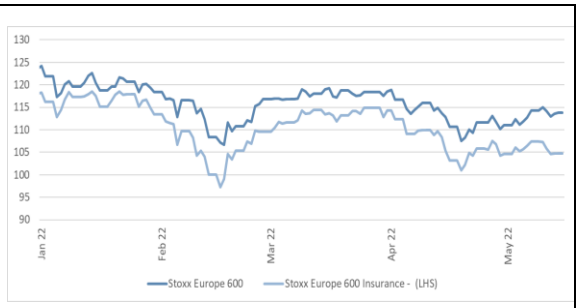
According to market analysts, investors account for vulnerability to financial market volatility and higher inflation. Uncertainty on the liability side of non-life insurance and re-insurance are also relevant aspects with direct exposure to Russia and Ukraine being less of concern for investors.[9]

In this context, the 2020 January-to-date performance for selected markets reflects a general decline of the majority of markets from the pandemic, with the SP500 showing a decline of 14% (Figure 1.15). Notably, European banks and insurers' equity performance is less negative (respectively -5 and 6%) than the Euro Stoxx 600market (-9%).

Figure 1.14: Equity performance of insurers vs. the market (01/01/2018=100).

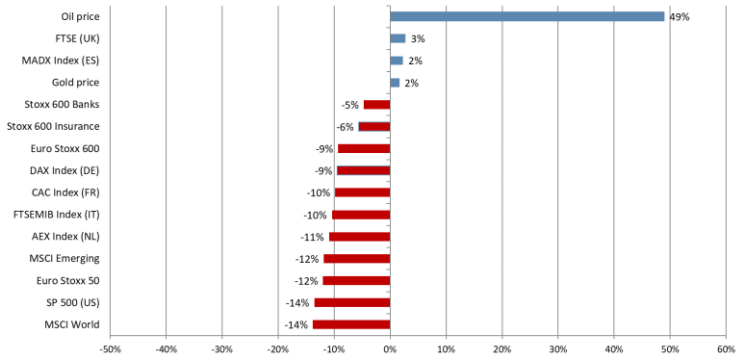


Source: Refinitiv. Last observation: 21/03/2022.



Source: Refinitiv. Last observation: 21/03/2022

Figure 1.15: Selected market performance (Dec 2021- to May 2022).



Source: Refinitiv. Date 30 May 2022.

[9] Fitch - Market Volatility Is Ukraine War's Main Risk for European Insurers. Morgan Stanley – Feedback from the 2022 European Financials Conference.

1.2. CLIMATE RISK AND SUSTAINABLE FINANCE

2021 proved to be the second costliest ever for the insurance sector according to world natural disaster balance. The global losses from natural catastrophes and weather related events in 2021 amounted to USD 280 bn of which approximately USD 120 bn were insured.[10] The Hurricane Ida in US and Canada caused the highest damage of the year in terms of cost with overall losses amounting approximately USD 65 bn of which USD 36 bn were insured. In Europe, the floods in 2021 caused the costliest natural disaster on record in Germany and Europe with losses of USD 54 bn (USD 40 bn in Germany) of which only approximately 24% were insured.

Non-life insurers are becoming more vulnerable to climate change as extreme weather events are expected to become even more frequent and severe. Weather-related disasters have increased over the past 50 years, causing more damage but fewer deaths according to World Meteorological Organization (WMO)[11]. The report[12] states that the number of disasters has increased by a factor of five over the 50-year period, driven by climate change, more extreme weather and improved reporting. Furthermore, its findings show that from 1970 to 2019, weather, climate and water hazards accounted for 50% of all disasters, 45% of all reported deaths and 74% of all reported economic losses.

In its efforts to address the impact of climate related risks, the EU adopted as part of the European Green Deal the European Climate Law[13]. It writes into law the goal set out in the European Green Deal for Europe's economy and society to become climate-neutral by 2050 and sets the intermediate target of reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels.

Regarding the progress achieved so far towards reaching European targets for greenhouse gas (GHG) emission reductions, deployment of renewable energy sources and improvements in energy efficiency, the preliminary data shows that in 2020 targets have been overachieved. Also 2021 might be the first year on the path to Europe's ambitious 2030 targets, which serve as a milestone towards achieving climate neutrality in 2050[14].

With air pollution as the largest environmental health risk in Europe, The Zero Pollution Action Plan aims the reduction of the number of premature deaths due to exposure to fine particulate matter

[10] Source: Munich Re Hurricanes, cold waves, tornadoes: Weather disasters in USA dominate natural disaster losses in 2021 | Munich Re.

[11] World Meteorological Organization (WMO), Weather-related disasters increase over past 50 years, causing more damage but fewer deaths | World Meteorological Organization (wmo.int)

[12] World Meteorological Organization (WMO), WMO Atlas of Mortality and Economic Losses from Weather, Climate and Water Extremes (1970 – 2019)

[13] The European Climate Law was published in the Official Journal on 9 July 2021 and entered into force on 29 July 2021.

14 Trends and projections in Europe 2020, Tracking progress towards Europe's climate and energy targets, EEA (European Environment Agency) Report, No 13/2021

by 55% by 2030, as compared to 2005. For the insurance sector, there might be implications for health and life insurance product design, underwriting and pricing, particularly in highly polluted areas and for portfolios with older persons insured as air pollutant concentrations are a significant risk factor for common diseases of the lung, heart and the brain. According to EEA[15], compared to 2005, in 2019 premature deaths attributed to exposure to fine particulate matter decreased by 33% in the EU-27. Tracking the progress, in 2019, emissions of all key air pollutants in the European Union continued to decline while the provisional data for 2020 shows that the improvement in air quality in 2020 could be explained by weather patterns and the impact of lockdown measures related to the COVID-19 pandemic.

As the insurance and pensions sectors play a significant role in the mitigation and adaptation to climate change through their investments, products and services, EIOPA also focuses on ESG risks and sustainable finance. In this context, sustainable finance is a strategic priority in EIOPA[16], and the Commission's Strategy for financing the transition to a sustainable economy encapsulates work by EIOPA in delivering on the Green Deal. The 7 key[17] areas of activity on sustainable finance for 2022-2024 identified by EIOPA with the aims to ensure that (re)insurers and occupational pension funds integrate sustainability risks in their risk management, to protect consumers and secure financial stability are related to the following: 1) Integrate ESG risks in the prudential framework of insurers and pension funds; 2) Consolidate the macro/microprudential risk assessment of ESG risks; 3) Promote sustainability disclosures and a sustainable conduct of business framework; 4) Support supervision of ESG risks and supervisory convergence in the EU; 5) Address protection gaps; 6) Promote the use of open source modelling and data in relation to climate change risks; 7) Contribute to international convergence for the assessment and management of sustainability risks.

Building on its ambitious agenda for sustainable finance, and in particular on the sensitivity analysis of asset-side transition risks published in 2020, EIOPA launched a follow-up exercise on physical risks in the second half of 2021. EIOPA will shortly publish a discussion paper presenting the first results of this exercise which included a large data collection from industry focused on property, content and business interruption insurance against windstorm, wildfire, river flood and coastal flood risks. These risks have been identified as the most relevant and potentially disruptive on the European property insurance business under a current and forward-looking perspective.

Furthermore, EIOPA published a paper[18] with the purpose to set out methodological principles to incorporate climate change-related risks in a stress testing framework for the insurance sector, which can be used when developing future EIOPA bottom-up stress test (ST) on climate change risks. As such, the paper can be seen as a methodological tool-box which can inform the design and calibration of future supervisory climate STs and is part of EIOPA's broader strategy on integrating sustainability and climate-related assessment into its various supervisory processes and framework.

[15] Air quality in Europe — 2021 web report, EEA (European Environment Agency), Air quality in Europe 2021 — European Environment Agency (europa.eu)

[16] see EIOPA's work programme 2022-2024

[17] EIOPA, eiopa-sustainable-finance-activities-2022-2024.pdf (europa.eu)

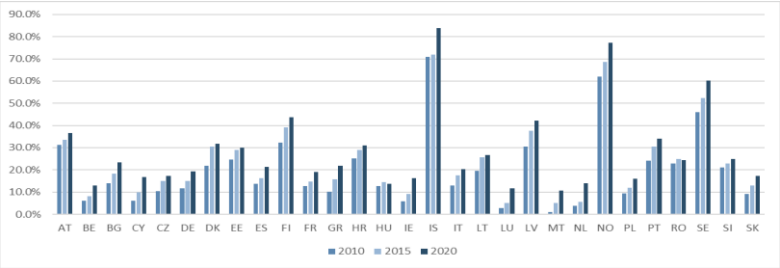
[18] Methodological principles of insurance stress testing - Climate change component, https://www.eiopa.europa.eu/sites/default/files/financial_stability/insurance_stress_test/methodological_principles_of_insurance_stress_testing_-_climate_change_component.pdf

At the same time, sustainability and the management of environmental risks have become key considerations for long-term investors and in particular for European institutions for occupational retirement provision (IORPs). Therefore, in April, EIOPA launched its first climate stress test to gain insights into the effects of environmental risks on the European occupational pension sector. A climate change scenario, developed together with the European Systemic Risk Board and the European Central Bank, will be used to assess the resilience of European IORPs against a sudden, disorderly transition to climate neutrality due to delayed policy action, resulting in a sharp rise in carbon prices.

The recent developments regarding Russia's invasion in Ukraine could also have an impact on climate change policies. With energy and gas prices already at extremely high levels and very volatile, the attack on Ukraine has provoked an extensive debate on how to respond, with regard to oil and gas (other decisions were taken very fast). The European Commission's representatives have emphasised the need to accelerate the launch of clean energy technologies. Other politicians have coupled this with the need to exploit domestic fossil-fuel resources as a means of reducing reliance on Russian exports. Overall, the long-term impact of this invasion could be an increase in demand for renewable energy as a response to the need to find new energy supplies to replace Russia's fossil fuels.

The consumption of energy from renewable sources (Figure 1.20) in the EU-27 countries has been increasing in 2020 by 11.1% compared to the previous year and by 23.9% compared to 2015. Considering benefits such as the reduction of the dependence on imported fuels, the reduction in gas emissions from fossil fuel sources, and the decoupling of the energy costs from oil prices, the latest available figures show that in 2020, renewable energy represented approximately 22.1% of energy consumed in the EU 27.

Figure 1.20: Share energy from renewable sources (% of gross final energy consumption).

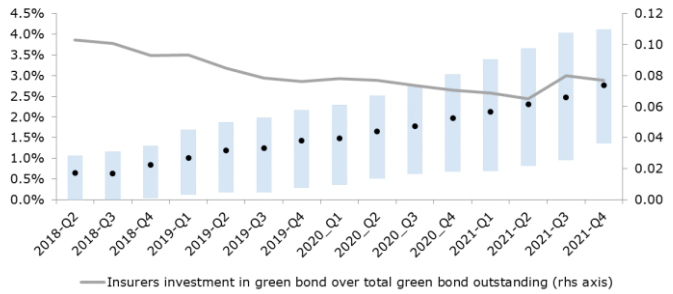


Source: Eurostat, table nrg_ind_ren, Eurostat - Data Explorer (europa.eu)

Last observation available: 2020.

Insurers have the potential to contribute to the increase in demand in renewable energy and to the transition towards a low-carbon economy through their long-term investments. For example, insurers can invest in green bonds that are issued to support such initiatives. Figure 1.21 shows that the median investments in green bonds over corporate bonds portfolio has increased in the last years reaching 2.76% in Q4 2021.

Figure 1.21: Share of insurers' investments in green bonds over corporate bonds.



Source: Refinitiv, EIOPA own calculations based on S.06.02 QRT.
Note: LHS axis shows the distribution of the share of insurers' investments in green bonds over corporate bonds while RHS axis shows the share of insurers' investment in green bond over total green bonds outstanding.

Box 1.1: Trends in green and sustainable bond issuance

The issuance of green and sustainable bonds has reached another peak in 2021 amounting to more than USD 700 bn[19]. This asset class, which is also being referred to as 'ESG bonds' has been dominated by green bonds but comprises also other instruments such as social, sustainability and sustainability-linked bonds (SLBs). In fact, SLBs have overtaken green bonds as the fastest growing segment in 2021. The difference between the different instruments lies in the use of funds. Namely, in the case of green and sustainability bonds their proceeds are earmarked for specific projects. On the other hand, the terms of SLBs are linked to a company's achievement of wider sustainability goals such as for example cuts in carbon emissions.

Since 2018, there continues to be a very high demand from investors for ESG bonds leading to a consistent oversubscription of newly issued instruments.[20] Furthermore, there is an evidence that investors are willing to pay a 'greenium' or 'socium' respectively, i.e. a premium for bonds labelled 'green' or 'social' compared to otherwise identical instruments without a label.[21] The positive growth trend and strong demand from investors are expected to continue. The sustainable bond issuance is expected to reach up to USD 1.35 trn globally in 2022.[22] The transition towards green economy and reduction in greenhouse gas emissions require long-term financing. European Commission estimated that achieving the envisaged reductions[23] in greenhouse gas emissions will

[19] Please consult In charts: Green and sustainability bonds | Financial Times (ft.com) for further details.

[20] Please consult https://reports.insuranceeurope.eu/annual-report-2020-2021/investment-resilience/ and 'Do-Good' Bonds Promise Social Change Investors Take on Faith (bloomberglaw.com) for concrete examples.

[21] Achievements and challenges in ESG markets (bis.org).

[22] 'It's greenwashing': Climate Action 100+ members let standards slip | Financial Times (ft.com).

[23] In the EU, policymakers committed to reduce EU greenhouse gas emissions by at least 55% by 2030. As described in the section above, progress data from 2020 and 2021 indicated that the respective targets for these years had been overachieved.

require significant investments reaching more than EUR 260 bn a year by 2030.[24] Another building block, the Sustainable Europe Investment Plan should mobilise through the EU budget and the associated instruments at least EUR 1 trn of private and public sustainable investments over the upcoming decade. The European insurance industry planned to allocate over EUR 140 bn to sustainable investments by 2022 and continued to call for increasing the availability of sustainable and long-term assets[25].

Despite promising market outlook and interest from investors, some concerns regarding this asset remain. In particular, the rapid growth in the issuance and demand in the absence of binding and harmonised taxonomy has posed a potential concern of "greenwashing", i.e. fast issuance without ensuring appropriate quality. In the case of green bonds, this risk has been mitigated by the recent adoption of an EU taxonomy for green bonds.[26] However, in the case of the fastest-growing element of the ESG bonds – the SLBs – no such standard is yet in place.

The market for ESG bonds has gained prominence and popularity and it is important that the public's and investor's trust into this asset class is maintained. Therefore, close monitoring of the evolving trends and development of binding standards for new types of instruments is needed to ensure that this asset class can continue financing the transition towards a sustainable and greener economy.

1.3. CYBER RISK AND THE INSURANCE SECTOR

Supervisors assess the materiality of digitalisation and cyber risks to have increased over the last quarter. The results of the EIOPA Spring 2022 insurance bottom-up survey (BUS) among supervisors show digitalisation and cyber risks ranking in the third place in terms of materiality, after market and macro risks, but above e.g. credit and profitability and solvency risks. This represents an increase in materiality when compared to the EIOPA Autumn 2021 BUS, which ranked digitalisation and cyber risks in the fifth place. When considering the expected developments in terms of risk materiality over the next year, digitalisation and cyber risks are ranked second, behind macro risks.

Cyber security risks are seen as the main driver of the developments in digitalisation and cyber risks (92% of supervisors), followed by cyber underwriting risks (4%).

Russia's invasion of Ukraine raises concerns of a potential increase in cyber risk. Several supervisors associate the current conflict between Russia and Ukraine and resulting uncertainty to a potential increase in cyber risks. This adds to an already higher vulnerability of the sector during

[24] This estimate by the European Commission refers to less ambitious climate plans for 2030 of at least 40% cuts in greenhouse gas emissions (from 1990 levels). The European Climate Law foresees a cut by 55%. Please refer to COM(2020) 21 final; COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Sustainable Europe Investment Plan European Green Deal Investment Plan;https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0021&from=EN; p.1.

[25] Investment resilience - Annual Report 2020-2021 (insuranceeurope.eu).

[26] EU taxonomy for sustainable activities | European Commission (europa.eu)

the Covid-19 pandemic due to an increased reliance on remote work and on digital solutions and infrastructure.

Fears of repercussions due to EU and US sanctions are leading governments and security experts to encourage citizens and businesses to take actions to protect themselves.[27,28] The impact could range from ransomware assaults on personal devices to attacks on critical infrastructure. With technology providing so many of our fundamental needs, the consequences may be wide-ranging. Up to now, cyber threats outside the conflict area appear to have been fewer than expected.

Cyber insurers are bolstering up wording to protect them against losses and could eventually adjust also pricing.[29] Insurers have pushed up attempts to tighten policies and to clarify coverages in the case of a retaliation by Russia and its allies in response to sanctions. At dispute is the so-called war exclusion, which dictates that losses caused by armed conflict are usually not compensated. The uncertainty is on whether the coordination of hacking and military action could trigger the exclusion, with the associated impact on insurers and policyholders. In this context, clear communication and disclosure to policyholders on the scope of the coverage and level of protection offered by insurance policies is crucial, in order to avoid a mismatch between their expectations and the actual coverage provided. If contracts are reviewed to limit the scope of cyber coverage, it is important that there is a balancing of interests which also takes into account policyholders interests. Cyber insurance pricing has been on a rise in recent years due to an increased frequency and severity of events and it could be further impacted by the ongoing conflict.

Due to the increased relevance of digitalisation and cyber risks, EIOPA has enhanced its monitoring framework to start covering these risks. From January 2022, the EIOPA Risk Dashboard includes a new risk category named "Digitalisation and cyber risks" built on three indicators: (i) supervisory assessment of digitalisation and cyber risks; (ii) change in frequency of cyber incidents; and (iii) cyber negative sentiment. These indicators are exploratory and rely on supervisors' responses to the EIOPA Insurance Bottom-Up Survey and on publically available external data. They will be improved once new supervisory data becomes available.

The results of the April 2022 Risk Dashboard show an increase of digitalisation and cyber risks from medium to high level since January.[30] The increase is driven by all three indicators and the high risk level equates only to macro risks.

The inclusion of cyber risks in the EIOPA Risk Dashboard is one of the deliverables of the EIOPA Strategy on Cyber Underwriting.[31] One of the key objectives of this strategy is to establish an adequate assessment and mitigation tools to address potential systemic cyber and extreme risks. Besides the enhancement of the Risk Dashboard, another deliverable with regards to this objective is to include cyber risk events and cyber incident scenarios in the EIOPA stress testing framework to

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[27] Protect yourself from Russian cyber-attacks right now with these tips (usatoday.com)

[28] Ukraine fallout expected to test companies' hardened cyber defences | Financial Times (ft.com)

[29] Russian Cyber War Poses Threat to Insurers as Well as Ukraine - Bloomberg

[30] April 2022 RDB on EIOPA's website.

[31] EIOPA, 2020, EIOPA Strategy on Cyber Underwriting. Cyber underwriting strategy | Eiopa (europa.eu)

assess potential vulnerabilities/losses to cyber risk in underwriting. In this respect, throughout 2022 and 2023 EIOPA will be working on improving its methodological framework for bottom-up insurance stress tests, including cyber risk.[32]

Another priority of EIOPA Strategy on Cyber Underwriting is to ensure appropriate cyber underwriting and risk management practices, and to establish good supervisory procedures, in particular in the area of non-affirmative risk. While common efforts to assess and address non-affirmative cyber risks are underway, the lack of quantitative approaches, explicit cyber exclusions and action plans to address non-affirmative cyber exposures suggest that insurers are currently not fully aware of the potential exposures to cyber risks. Having clear, comprehensive and common requirements on the governance and management of non-affirmative cyber risks would help to ensure the safe provision of insurance services.

Cyber-related claims are increasing alongside a growth in the frequency and sophistication of cyber incidents across financial sectors. As a consequence, cyber risk coverages are under increasing scrutiny given a frequent lack of clarity and ambiguous terms and conditions regarding cyber coverages of some traditional insurance policies. Past incidents have demonstrated the potential of significant and unexpected losses and accumulation of losses across lines of business, including long, time-consuming, expensive and unpredictable litigation.

To better monitor cyber underwriting, EIOPA has, in the context of the 2020 review of Solvency II, proposed to the European Commission a new template for the reporting of data for cyber (re)insurance policies. The fields included in the template cover, among other items, premiums, claims paid (both in amount and number), identification of lines of business, and also some more detailed descriptions of the risks being covered.

With regards to cyber resilience, the Commission's proposal for a Digital Operational Resilience Act (DORA)[33], included in the EU's digital finance strategy, entered in January 2022 into trilogue phase. DORA will enhance and streamline the financial entities' conduct of ICT (Information and Communications Technology) risk management, establish a thorough testing of ICT systems, increase supervisors' awareness of cyber risks and ICT-related incidents faced by financial entities, as well as introduce powers for financial supervisors to oversee risks stemming from financial entities' dependence on ICT third-party service providers. The proposal will also create a consistent incident reporting mechanism that will help to reduce administrative burden of financial entities and strengthen supervisory effectiveness. Furthermore, DORA will provide the competent authorities with a comprehensive set of rules against which the supervision of digital operational resilience can be effectively performed, including a set of administrative and (at discretion of member states) criminal penalties.

DORA will require the ESAs to develop several policy deliverables, namely Regulatory Technical Standards, Implementing Technical Standards and Guidelines and ongoing reports to be addressed to the European institutions. Furthermore, the proposed regime for oversight of Critical Third Party Providers of ICT services (CTPPs) will be a major ongoing commitment for the ESAs once

[32] EIOPA, January 2022, Revised Single Programming Document 2022-2024.

[33] Proposal for a Regulation of the European Parliament and of the Council on Digital Operational Resilience for the financial sector and amending Regulations (EC) No 1060/2009, (EU) No 648/2012, (EU) No 600/2014 and (EU) No 909/2014.

DORA enters into application. As part of the preparatory work, ESAs' staff is going to undertake a joint high level market assessment of the landscape of ICT third party providers to the financial sector in cooperation with NCAs.

EIOPA continues preparatory work to implement the cyber incident reporting envisaged in DORA. Until DORA is in place, EIOPA will continue to promote an effective exchange of information with national supervisors on cyber security and cyber-incidents, in accordance with Article 29(1)(b) of the Founding Regulation.[34] This activity contributes to the overall objective of EIOPA to build up a common supervisory culture, and closely intertwines with the on-going regulatory developments at European level on the digitalisation of financial services and strengthening of operational digital resilience.

In December 2021, the European Systemic Risk Board (ESRB) approved a Recommendation building on one of the envisaged roles of the ESAs under DORA. It foresees the development of a pan-European systemic cyber incident response framework for financial authorities (EU-SCICF). [35] The objective of the framework is to enable an effective Union-level coordinated response in the event of major cross-border ICT related incidents or related threats having a systemic impact on the Union's financial sector as a whole. The ESAs have started preparatory activities to establish the framework. An interim and a final report to the European Parliament, the Council, and the Commission by the ESAs on the EU-SCICF implementation are due 6 and respectively 18 months after DORA enters into force.

EIOPA is regularly monitoring the evolution of the exposures and the approach taken by EU insurers towards crypto-assets. Based on an analysis of Solvency II data, a very limited number of European insurance undertakings, concentrated in only a few jurisdictions, are active in crypto assets investments. The materiality of this investment is so far negligible and almost entirely concentrated in unit-linked life insurance products where the risks (and benefits) are borne completely or partially by the consumer (99.97%). Similarly, the underwriting crypto asset-related risks market is very limited. To enhance the monitoring of these exposures going forward, EIOPA proposed to the European Commission as part of the 2020 review of Solvency II that specific attributes are reported for the assets to ease the identification of investments in crypto-assets.

According to a recent report by the Financial Stability Board (FSB), crypto-assets still account for a relatively small part of total global financial system assets, but there has been a 3.5 times increase in the market capitalization in 2021, to USD 2.6 trn. The FSB reports that direct links between crypto-assets, systemically significant financial institutions and core financial markets are limited at the moment, despite their fast growth, but that institutional participation in crypto-asset markets has increased in the recent year (both from an investor and service provider perspectives). Crypto-asset markets entail a number of vulnerabilities, including: (i) increasing linkages between crypto-asset markets and the regulated financial system; (ii) liquidity mismatch, credit and operational risks that make stablecoins susceptible to sudden and disruptive runs on their reserves, with the potential to spill over to short term funding markets; (iii) the increased use of leverage in

[34] Regulation (EU) No 1094/2010 of the European Parliament and of the Council of 24 November 2010 establishing a European Supervisory Authority (EIOPA)

[35] Recommendation of the ESRB of 2 December 2021 on a pan-European systemic cyber incident coordination framework for relevant authorities (ESRB/2021/7) (europa.eu)

investment strategies; (iv) concentration risk of trading platforms; (v) and the opacity and lack of regulatory oversight of the sector.

From a regulatory perspective, EU bodies are discussing the Legislative Proposal on Markets in Crypto Assets (MICA). The new rules seek to clarify the application of existing EU rules to crypto-assets, and will allow operators authorised in one Member State to provide their services across the EU ('passporting'). To this extent, the legislative proposal introduces a number of safeguards including capital requirements, custody of assets, complaint handling processes, and common disclosure standards for the issuance of Initial Coin Offerings (ICOs). Insurers are excluded from the scope of application of the forthcoming legislation, but would be captured by MICA when acting as insurance intermediaries, which are included in the scope. The MICA proposal is currently being discussed between the European Parliament and the Council and expected to be approved later this year.

1.4 REGULATORY DEVELOPMENTS

In September 2021, following a consultation and the performance of an impact assessment, **EIOPA published its approach on IBOR transitions**[36]. EIOPA's approach included the detailed changes in the RFR methodology with regards to the change from the existing (L)ibor rates for all currencies to the new OIS rates. The impact assessment performed showed the impact of the change from all (L)IBOR[37] rates to the new OIS rates is marginal for (re)insurance undertakings in the EEA except for the case of the euro. Currently, there is no indication the EURIBOR will cease in the near future. However, EIOPA continues to monitor market developments closely according to the published methodology. Within EIOPA's RFR production framework, the GBP LIBOR changed to SONIA as of 1 January 2022. The transition of the CHF and the JPY to the new OIS will be reviewed within 2022 within the annual DLT assessment. Currently EIOPA uses government bonds for those two currencies. The USD LIBOR is expected to cease to exist by mid-2023 (official end date) but the transition to the new OIS is not planned yet. EIOPA's approach for the transition is based on two specific preconditions: market liquidity of the new OIS rates and curve proximity, which aims at a smooth transition with a minimal impact.

In December 2021 and, as a result from a Commission Call for Advice on Pension tools, EIOPA issued the **Technical Advice on the development of a Pension Tracking System (PTS)**. The PTS should help citizens to understand what income they can expect in their retirement and raise their awareness on whether this will be sufficient. Currently, in 20 Member States citizens are unable to obtain an overview of their pension entitlements in one place, in an accessible and understandable way. The advice is a practical tool for EU Members States who wish to establish their own national pension tracking system. The set of principles, good practices and recommendations included in the advice are aimed to facilitate citizens' digital access to personal pension information. Building a pension tracking system can take several years. To facilitate this process for Member States, EIOPA has developed a visual roadmap that contains phases from preparation to launch.

[36] Available under this LINK)

[37] https://www.theice.com/iba/libor

Together with the advice on pension tracking systems, EIOPA submitted on 1 December 2021 its **Advice to the European Commission on pensions' dashboards**. The aim of the pensions dashboard is to increase transparency on adequacy and sustainability of national pension systems in order to support policy makers at national and EU level to make informed decisions.

EIOPA advises to develop a visual pension dashboard to strengthen the monitoring of pension developments in the Member States by presenting a complete set of indicators that allow for enhanced analysis and comparison and are also easy to comprehend. In particular, the Advice recommends using indicators drawn from the European Commission's triennial Ageing, Pension Adequacy and Fiscal Sustainability reports. These indicators need to be complemented with key information on the contribution of privately provided occupational and personal pensions.

In addition, EIOPA recommends that additional pensions data are collected from private pension providers, including non-pension fund providers. The Advice identified substantial data gaps with key data only being available for half of the supplementary pension plans and products offered in the EU. Therefore, resolving these data gaps is essential to enable Member States to make pension projections and design suitable policy responses coping with future pressure on public finances or poverty of the senior population. A step-by-step approach is recommended in the implementation by using currently available pensions data and enhancing the indicators over time.

EIOPA issued in October 2021 an **Opinion on the supervisory reporting of costs and charges by Institutions for Occupational Retirement Provisions (IORPs)**. Annual costs and charges of 1% of assets may reduce pension income by more than 20% after 40 years of pension saving. Therefore, in order to protect members and beneficiaries, a transparent and comprehensive view of all costs and charges is essential for IORPs, social partners and supervisors.

The Opinion sets out expectations on the supervisory reporting of costs and charges of IORPs. It provides a classification of costs to be reported to national supervisors and introduces a practical guidance for supervisors and IORPs - complete with reporting templates - on how to collect data. It lays out principles for the compilation of cost information and stipulates that not only direct but also indirect costs incurred by asset managers and investment funds should be reported.

The Opinion also gives guidance on the supervisory use of cost data. National supervisors are expected to assess the cost efficiency of IORPs, the affordability for sponsors and the value for money offered to members and beneficiaries. The outcomes of the comparative analysis should be considered within the supervisory review process, including in the dialogues with the IORPs' management boards.

EIOPA issued in April 2021 an **Opinion on the supervision of the use of climate change risk scenarios in ORSA**. The Opinion was addressed to the national competent authorities on the basis of Article 29(1)(a) of Regulation (EU) No 1094/2010 and aims to enhance supervisory convergence. The Opinion sets out supervisory expectations on the integration of the use of climate change scenarios by insurance undertakings in their Own Risk and Solvency Assessment ORSA. Given that undertakings will be impacted by climate change-related physical and transition risks, EIOPA believes it is important to encourage a forward-looking management of these risks, also in the long term. Currently, only a small minority of undertakings assess climate change risk using

scenario analysis in the ORSA. Moreover, where undertakings perform a quantitative analysis of climate change risk, most assessments take a short-term perspective.

The **application guidance** of December 2021 is a follow-up from EIOPA's Opinion on the supervision of the use of climate change risk scenarios in ORSA ("Opinion") published in April 2021 (EIOPA-BoS-21-127 - EIOPA, 2021a). During the public consultation of the Opinion, nearly all respondents provided comments and suggestions on the application guidance for developing and including climate change risk scenarios in ORSA (Annex 5 of the Opinion). EIOPA therefore decided to elaborate on application guidance, seeing the advantages of developing and providing optional guidance for materiality assessment in the context of climate change, climate change scenario design and specifications using concrete case studies. This would also contribute to lowering implementation costs for insurance undertakings, in particular small- and mid-sized ones, and to enhancing the comparability of reported information.

Protection gap dashboard. In light of climate change, EIOPA is concerned that affordability and insurability of natural catastrophes (Nat Cat) insurance coverage is likely to become an increasing concern. Currently, only 35% of the total losses caused by extreme weather and climate-related events across Europe are insured (EIOPA, 2019). The uninsured part is therefore equal to 65% of the losses for climate-related events, which shows that there is a protection gap. Climate change will continue for many decades to come. Improved climate projections provide further evidence that future climate change will increase climate-related extremes (e.g. heat waves, heavy precipitation, droughts, flood, top wind speeds and storm surges…) in many European regions (EEA, 2017).

In order to address the protection gap, increasing the insurance penetration is not sufficient as due to the increasing frequency/intensity of some events, some risks might become uninsurable. Pro-active measures on buildings' vulnerability, localisation of exposure and optimised insurance coverages will be important elements of a resilient society. It is therefore key to understand the current insurance protection gap and identify where it comes from.

The main purpose of the dashboard is to monitor the risks related to the insurance protection gap for Nat Cat in Europe. In addition, such a dashboard should also help to: a) Increase the awareness of the protection gap issues for all stakeholders, b) promote a science-based approach to protection gap management and decision-making, c) identify at-risk regions and identify the underlying protection gap risk drivers, d) develop pro-active prevention measures based on a granular assessment of risk drivers and e) identify the potential for synergies between national policies to improve protection against natural catastrophes across borders at European level.

In July 2021, EIOPA published its **Methodological Paper on the potential inclusion of climate change the in the Nat Cat standard formula**. To ensure continuing policyholder protection and stability of the insurance market, the Solvency Capital Requirements (SCR) for natural catastrophe underwriting risk should reflect the expected impact of climate change. The methodological paper discusses the methodology used so far for the Nat Cat SCR calibration and presents perils and countries, which may be materially impacted by climate change. The paper elaborates on how to include climate change in the Nat Cat SCR calibration in the standard formula. In 2022, EIOPA will start the first reassessment of the natural catastrophe risk standard formula capital charges. This exercise will also take into account the use of models which explicitly consider climate change as well as the possibility to include new countries, or further perils, such as for example wildfire or

drought. More transparency is an important element for adequate consideration of climate change. The use of open source models where possible and appropriate will also help to allow for more transparency and the possibility for firms to better understand the recalibration.

2. THE EUROPEAN INSURANCE SECTOR

The European insurance sector entered 2022 in a good shape notwithstanding the adverse developments since the Covid-19 outbreak two years ago. During 2021, gross written premiums (GWP) for the life business grew (y-o-y) quite substantially (+14%), while growth was lower for the non-life business (8%). The positive move has partially been driven by the previous reduction of GWP throughout 2020 during the pandemic; although GWP remain still below pre-Covid levels, in particular for life

The share of unit-linked in the life segment continued to increase. It reached now a peak of 39% since the introduction of Solvency II reporting. The financial markets turbulence experienced after the outbreak of the Covid-19 pandemic seems not to have reduced the appeal of these products.

Insurer's investment profitability was satisfactory in 2021. The good performance of financial markets and the high returns obtained sustained insurer's profitability up to the levels reached back in 2019. The median return on assets reached 0.57% from 0.38% last year.

Underwriting profitability slightly improved throughout 2021, with differences across lines of business. In particular, the underwriting profitability of miscellaneous financial loss and credit and suretyship improved via claim reduction; This claim reduction was to a large extent the result of government support for business during Covid. On the other side, given the lockdown measures and restrictions on travelling, premiums decreased for transport related lines of business like motor vehicle liability and other motor. Workers' compensation underwriting profitability also deteriorated via claims increase partially offsetting the increase of premiums.

At the beginning of 2022 insurers' capital buffers on aggregate are solid with a median SCR ratio of 216%. An improvement was observed for life and composite insurers while a slight decline was observed for non-life insurers.

Looking ahead, further intensification of sanctions and Russian retaliations could pose some threats. An assessment of insurers' investments in Russia, Ukraine and Belarus shows that direct business exposures are not material (see for more details chapter 5.3). It also shows that some large cross-border groups have subsidiaries in the named countries, but these represent only very small fractions of overall assets. However, it is not possible to rule out indirect effects namely potential spill-overs from other sectors.

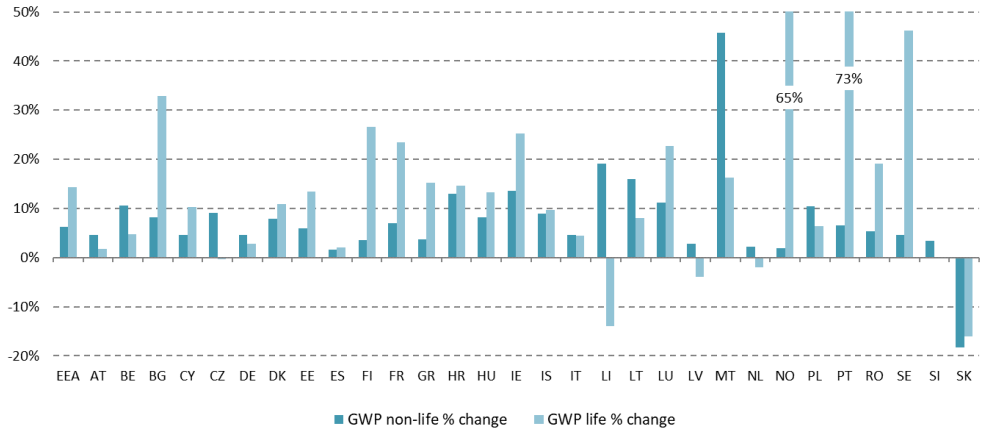
The high inflation and geopolitical tensions could potentially deteriorate insurer's underwriting profitability and business prospects. A persistent and high inflation increases to some extent the claims to be paid-out for the non-life business lines, especially those with a relatively longer duration[38] (long-tail LoBs), therefore potentially deteriorating profitability ratios. Also, geopolitical tensions and the sharp increase in energy prices could cause a sharp reduction of economic growth and hence potentially to a reduction of insurance premiums paid and lower new business.

[38] See topical focus on inflation in December 2021 EIOPA FSR.

2.1 MARKET SHARE AND GROWTH

Gross written premiums (GWP) increased in both life and non-life sectors in 2021. Life GWP (y-o-y) increased more than non-life GWP (Figure 2.1). After the -7% contraction, observed in 2020 after the outbreak of the pandemic, the life business bounced back to a strong positive growth of +14%. In particular the largest expansion is observed in Portugal (+73%), Norway (+65%) and Sweden (+46%). On the other hand, similarly to previous years, the non-life-business continued to exhibit a positive growth of +8%, supported by Malta (+46%), Liechtenstein (+19%) and Ireland (+14%) that displayed the highest growth. In 2021 GWP increased across all countries with only few exceptions.

Figure 2.1: Total Life and Non-Life GWP growth from 2020 to 2021 (in %, year-on-year)



Source: EIOPA Quarterly Reporting Solo.
Note: EEA weighted average. The decline observed for Slovakia for life and non-life business is driven by a structural change in the market due to the transformation of two insurance undertakings into foreign undertakings.

Russia's invasion of Ukraine and the related geopolitical tension could potentially challenge the business prospects of European insurers. Households and companies are already facing high inflation and this could persist or even get worse. Due to the ongoing crisis, an economic slowdown is expected and major European economies could potentially even enter into recession. No reporting data covering the ongoing crisis are available yet, but the direct impact on the insurance sector is expected to be limited, as the overall liability and also investment exposure to Russia, Ukraine and Belarus are both not material. Some exception might be represented, by groups which have subsidiaries in the affected countries.[39]

EEA insurers' investments exposures towards Russia, Ukraine and Belarus are very low and the largest share is via collective investment funds. Additionally almost half of the investments towards these countries are unit-linked investments[40] and for these products, the financial risk is ultimately borne by policyholders, but it is noteworthy to point out that insurers might potentially

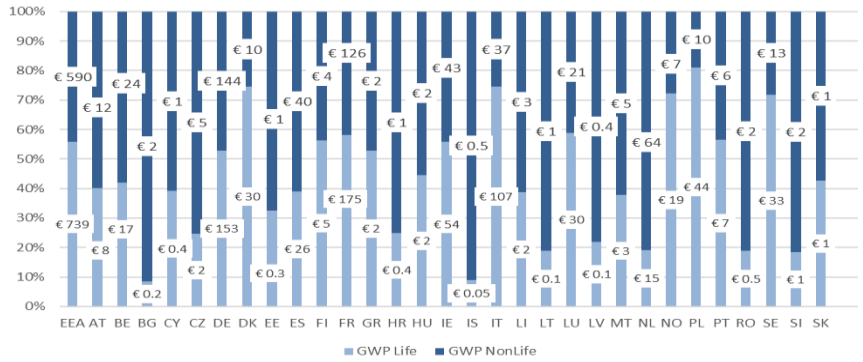
[39] See Chapter 5 Risk Assessment where investments and liabilities in Russia, Ukraine and Belarus are extensively discussed and analysed.

[40] This aspect is investigated in CH5 Risk assessment in a special focus on investments exposures towards Russia, Ukraine and Belarus.

face reputational risk in case losses would materialise, or face liquidity strains in case policyholders will demand to withdraw while funds might temporarily stop redemptions.

The potential impact on the demand of insurance could vary significantly across EEA countries and undertakings due to country specificities and different business mixes of insurers (Figure 2.2.)

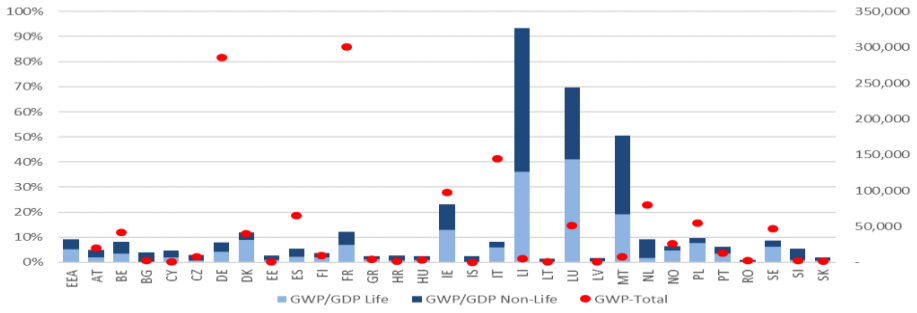
Figure 2.2: GWP Non-life as a share of total GWP (in %) and GWP Life as a share of total GWP (in %), and in EUR billions in 2021.



Source: EIOPA Quarterly Reporting Solo.

Overall, GWP of the European insurance sector as a percentage of total GDP increased to 9% in 2021 from the 8% observed in the previous year as GWP grew relatively more than GDP. On the other hand, total assets as a share of GDP decreased by 1 percentage point to 72% because GDP grew relatively more than total assets.

Figure: 2.3: GWP as a Share of GDP (in %) (LHS) and total GWP (in EUR million) (RHS) by country in Q4 2021.

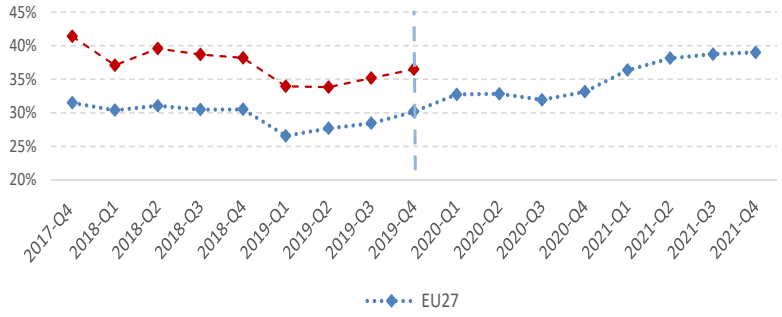


Source: EIOPA Quarterly Reporting Solo and Eurostat.
Note: EEA weighted average.

The share of unit-linked in the life segment continues to increase. The share of unit-linked GWP in the total life business reached now the peak of 39% since the introduction of Solvency II reporting (Figure 2.4). For individual insurers' exposures the entire cross-sectional distribution (percentile 10, 25, median, 75, 90) of unit-linked as a share of GWP-life business shifted upward with respect to the previous year. (Figure 2.5). However, considerable differences in the popularity of unit-linked products remain across countries. Countries with high unit-linked shares such as Liechtenstein, Finland, Ireland and Denmark (Figure 2.6) continued an increasing demand of unit-linked products over the last year. The strongest increase was observed for Portugal and Bulgaria.

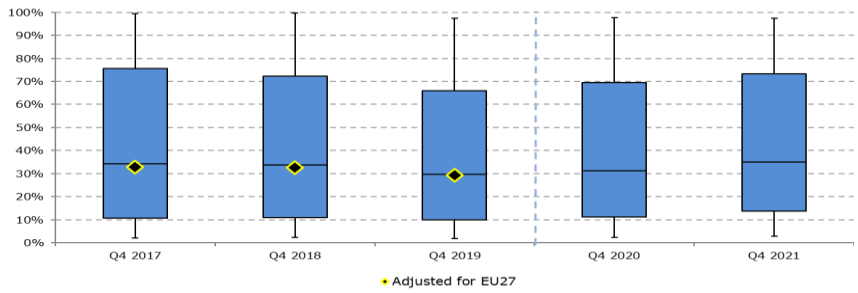
Few considerations can be made regarding the trend in UL. First, the growth tendency in the UL segment is mostly related with a shift in insurance sector's offer strategy, driven by the low interest rate environment (which has been changing recently, as mentioned through this report). Second, the financial markets turbulence experienced after the outbreak of the Covid-19 pandemic seems not to have lowered the appeal of these products. On the contrary, unit-linked have emerged as credible and popular investment plans that can help consumers addressing inflation risk. These investments yield market-linked, inflation-adjusted returns because they provide the option to invest in diversified equities. Equities promise to generate higher returns than any other asset class such as debt over the longer term and also beat inflation. Finally, with Russia's invasion of Ukraine in February the situation has changed abruptly. It is noteworthy that the negative investment outcomes resulting from the ongoing geopolitical tensions and the related economic environment deterioration will be challenging policyholders. Also, going ahead, the slowdown of growth prospects might be discouraging risk taking and lowering the demand of unit-linked products.

Figure 2.4: GWP-Life business: Unit-linked share development over time.



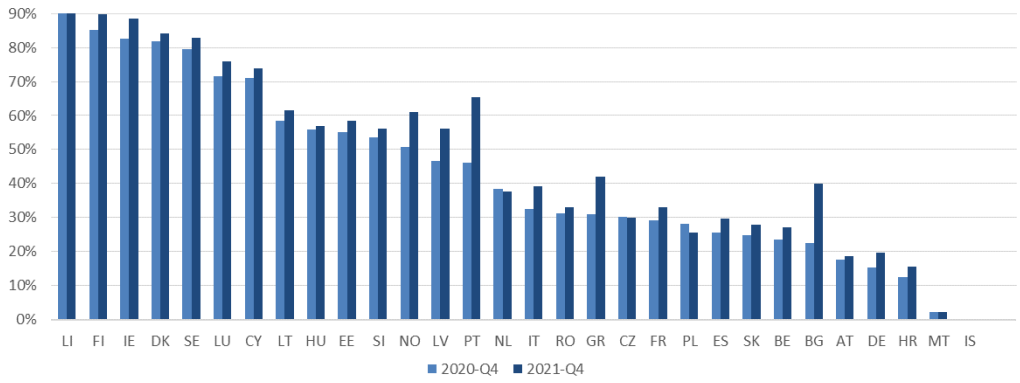
Source: EIOPA Quarterly Reporting Solo.
Note: The red line includes UK which in the end of 2019 stops reporting under Solvency II. The blue line shows figures for EU27 (excluding UK).

Figure 2.5: Unit-linked as a share of GWP-Life business (in %; median, interquartile range and 10th and 90th percentile).



Source: EIOPA Quarterly Reporting Solo.
Note: The sample is sized on insurance companies which have reported unit-linked business (life and life part of composite insurance companies). The figures prior to 2020 do include United Kingdom (UK), therefore the median values before 2020 are also reported for EU27 (excluding UK).

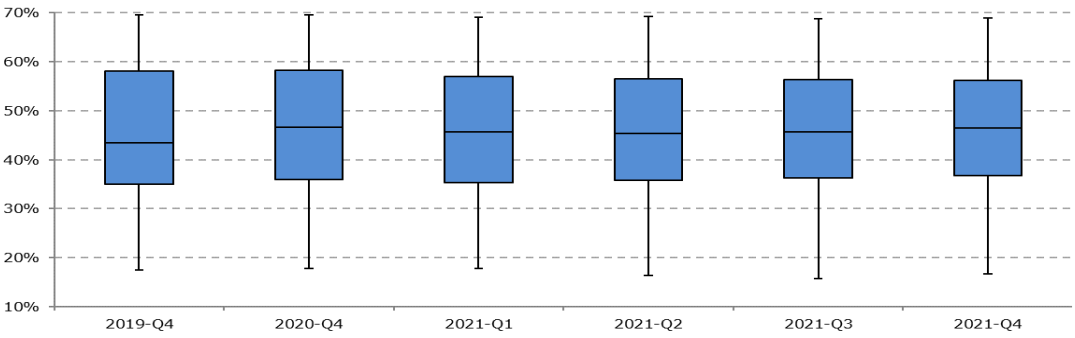
Figure 2.6: Unit-linked as share of GWP-Life business across countries (in %).



Source: EIOPA Quarterly Reporting Solo

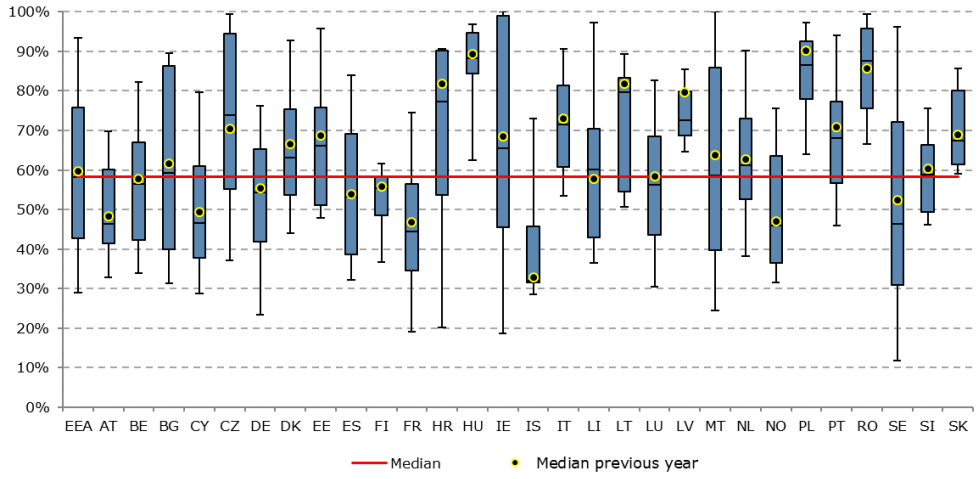
The liquid asset ratio is quite stable throughout the years (Figure 2.7), but it varies considerably across EEA countries. The median value hovers around 46% also at the end of 2021. For France, Iceland and Norway the distribution of the individual undertakings' liquidity asset ratio tend to be below the EEA median. Instead, Croatia, Hungary, Italy, Poland, Romania and Slovakia hold relatively more liquid assets, as the distributions tend to be above the EEA median (Figure 2.8).

Figure 2.7: Liquid assets ratio (in %; median, interquartile range and 10th and 90th percentile).



Source: EIOPA Quarterly Reporting Solo.
Note: The liquid assets ratio shows the proportion of liquid assets on total assets (excluding assets held for unit-linked). The ratio is calculated by applying different weights (ranging from 100% for cash to 0% for intangible assets) to different assets, according to the liquidity profile). The methodology has been reviewed in order to align with the enhancement of the liquidity risks category from October 2021 in the EIOPA's Risk Dashboard.

Figure 2.8: Liquid assets ratio by country (in %; median, interquartile range and 10th and 90th percentile) and EEA median in Q4 2021.

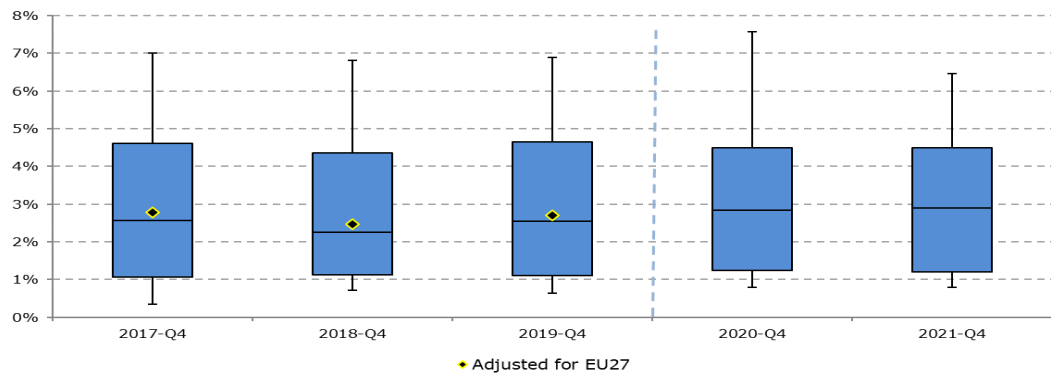


Source: EIOPA Quarterly Reporting Solo.

Note: The liquid assets ratio shows the proportion of liquid assets on total assets (excluding assets held for unit-linked). The ratio is calculated by applying different weights (ranging from 100% for cash to 0% for intangible assets) to different assets, according to the liquidity profile. The methodology has been reviewed in order to align with the enhancement of the liquidity risks category from October 2021 in the EIOPA's Risk Dashboard.

Lapse rates in the life business remain stable (Figure 2.9) in 2021 as well. The lapse rate experienced only a modest increase after the outbreak of the pandemic, with the median value moving from 2.7 to 2.8% in 2020. Looking ahead two elements might potentially increase lapse rates. The first would be an economic recession which might have a negative effect on income. The second would be a strong increase in yields that could create incentives to lapse on old contracts to look for higher returns elsewhere.

Figure 2.9: Lapse rates (in %).



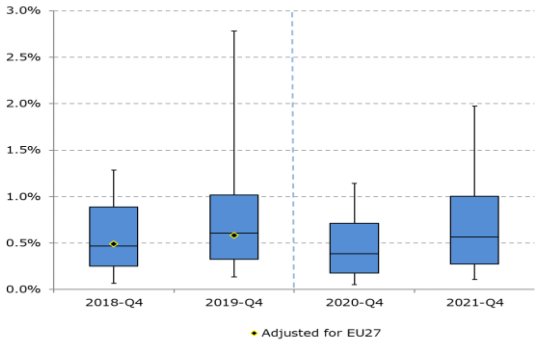
Source: EIOPA *Quarterly Financial Groups.*

Note: The figures prior to 2020 do include United Kingdom (UK), therefore the median values before 2020 are also reported for EU27 (excluding UK).

2.2 PROFITABILITY

Insurer's investment profitability was satisfactory in 2021. The good performance of financial markets and the high returns obtained during the past year sustained insurer's profitability up to the levels reached back in 2019. The median return on assets (ROA) increased to 0.56% from the 0.38% observed in the previous year. Likewise the median return on excess of assets over liabilities, that is a proxy of return on equity, increased to 8.2% from the 5.5%. (Figure 2.10 and Figure 2.11).

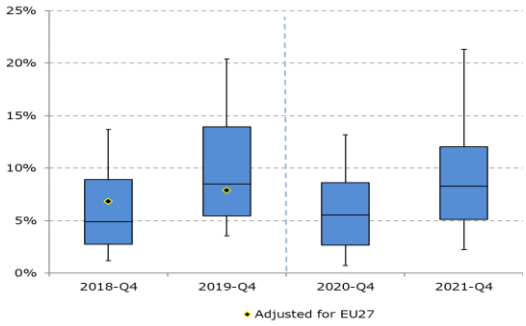
Figure 2.10: Return on Assets (in %; median, interquartile range and 10th and 90th percentile).



Source: EIOPA Quarterly Financial Groups (Templates S.39.01.11 and S.02.01.02).
Note: Note: The figures prior to 2020 do include United Kingdom (UK), therefore the median values before 2020 are also reported for EU27 (excluding UK).

The outlook on financial market remains highly uncertain. So far, financial losses related to the Russia's invasion of Ukraine and the measures taken by the international community are limited. However, the situation could escalate further and additional, more detrimental measures might be introduced. On the good side, the risk-free interest rate is on an upward trend. This is expected to improve insurer's capital positions in the first quarter of 2022, as the duration of liabilities tends to be longer than for the assets. But also, if the upward trend of interest rates continues this will improve profitability fixed-income portfolios over the long run.

Figure 2.11: Return on Excess of Assets over Liabilities (in %; median, interquartile range and 10th and 90th percentile).



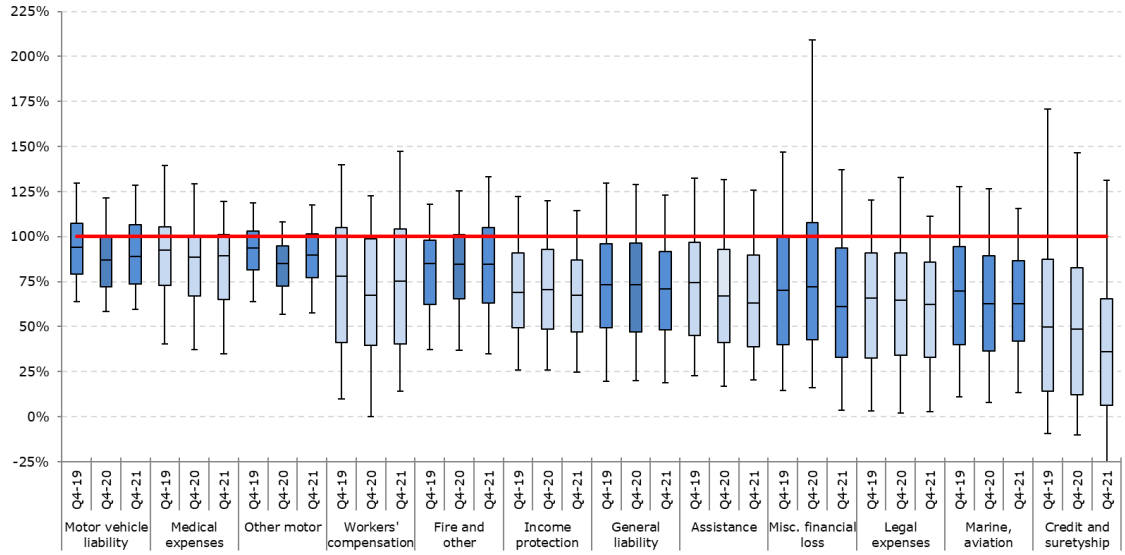
Source: EIOPA Quarterly Financial Groups. (Templates S.39.01.11 and S.02.01.02).
Note: Note: The figures prior to 2020 do include United Kingdom (UK), therefore the median values before 2020 are also reported for EU27 (excluding UK).

In any case, stable expected profits in future premiums (EPIFP)[41] from Q4 2020 to Q4 2021 (10.9%) suggest no expectations of profitability improvement looking ahead.

Underwriting profitability slightly improved throughout 2021, with differences across lines of business. The median Gross Combined Ratio for non-life business remained below 100% across all lines of business, indicating that most EEA insurers were able to generate positive underwriting results (Figure 2.12). In particular, the underwriting profitability of miscellaneous financial loss and credit and suretyship improved via claim reduction. On the other side, given the lockdown measures and restrictions on travelling, premiums decreased for transport related lines of business like motor vehicle liability and other motor eroding their profitability ratios and approaching pre-pandemic levels. Workers' compensation underwriting profitability also deteriorated via a claims increase partially offsetting the increase on premiums reaching profitability levels close to pre-pandemic values.

High inflation and geopolitical tensions tend to negatively impact insurer's underwriting profitability. A persistent and high inflation increases the claims to be paid-out for the non-life business lines, especially those with a relatively longer duration[42] (long-tail LoBs), therefore potentially deteriorating profitability ratios. On the other hand, the ongoing geopolitical tensions and a sharp increase in energy prices could led to a slowdown of economic activities resulting a reduction of premiums paid and lower new business.

Figure 2.12: Gross Combined Ratio across lines of business (in %; median, interquartile range and 10th and 90th percentile).



Source: EIOPA Quarterly Reporting Solo

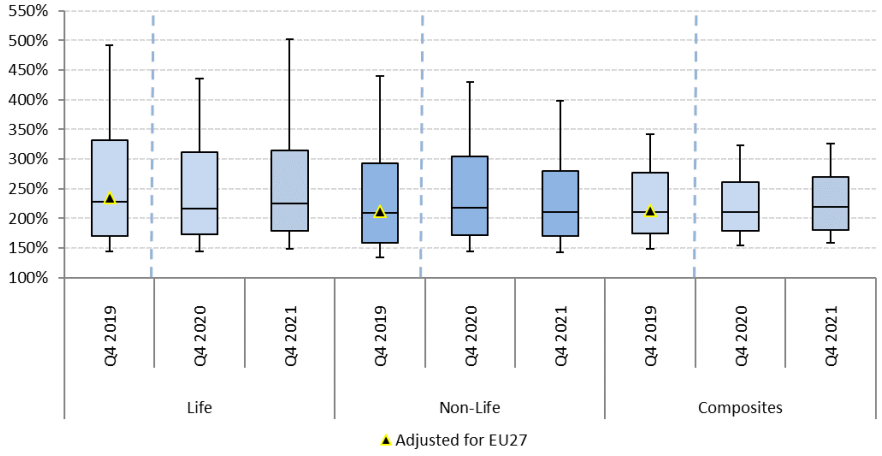
[41] Expected profits included in future premiums (EPIFP) are profits which result from the inclusion in technical provisions of premiums on existing (inforce) business that will be received in the future, but that have not yet been received."

[42] See topical focus on inflation in December 2021 EIOPA FSR.

2.3 SOLVENCY

The insurance sector entered 2022 with solid capital buffers. An improvement is observed for life and composite insurers while a slight decline for non-life insurers (Figure 2.13). Throughout 2021, and especially in the last months of the year, the risk-free interest rate increased. Due to the long maturities of life insurers' liabilities the value of technical provision decreased relatively more than the value of assets, with a positive effect on net capital. This contributed to an increase the median SCR ratio for life insurers, from 216% to 225%. However, the SCR ratio did not reach the high levels observed at the end of 2019 (236%). On the other hand, the median SCR ratio for non-life insurers slightly decreased from 218% towards 211%. This could be driven by the increase in claims affecting negatively the liabilities of some representative undertakings, combined with the fact asset values declined more than liabilities when the interest rates increased as non-life insurers tend to be characterised by a positive duration gap.

Figure 2.13: SCR ratio (in %; median, interquartile range and 10th and 90th percentile).

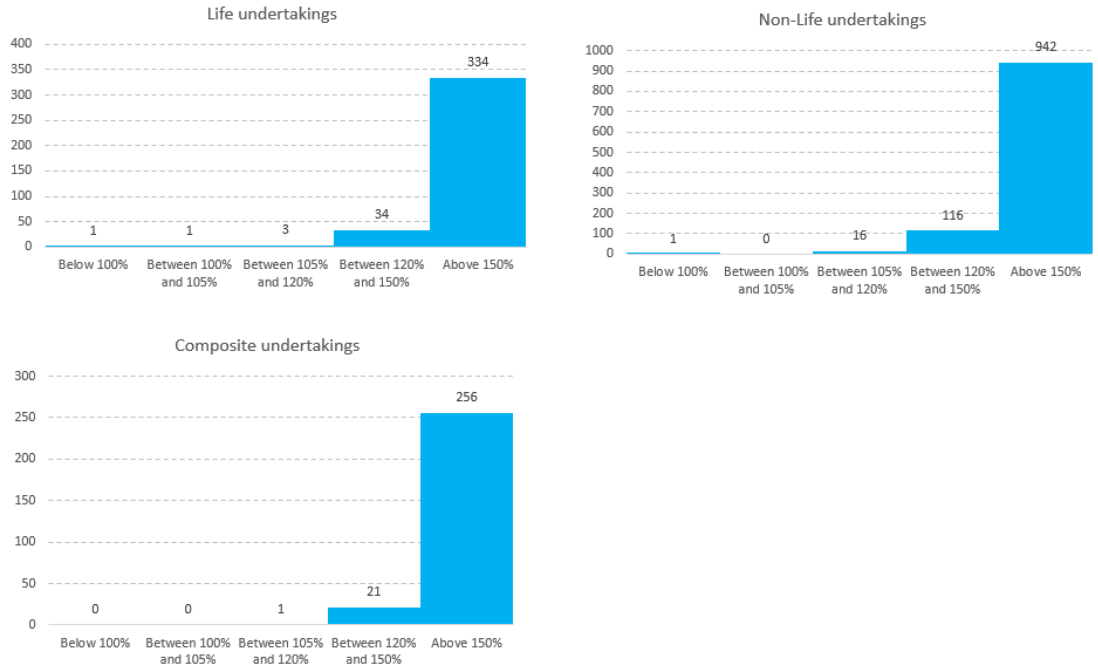


Source: EIOPA Quarterly Solo

Note: The figures prior to 2020 do include United Kingdom (UK). Therefore, the median values before 2020 are also reported for EU27 (excluding UK).

The number of life insurance undertakings with SCR ratios below 100% raised to one in the end of 2021 (zero in Q4 2020 and Q4 2019), likewise the number of non-life insurance undertakings with SCR ratios below 100% increased to one (zero in Q4 2020 and seven in Q4 2019). The number of undertakings with SCR ratios above 150% decreased, both for life and non-life undertakings.

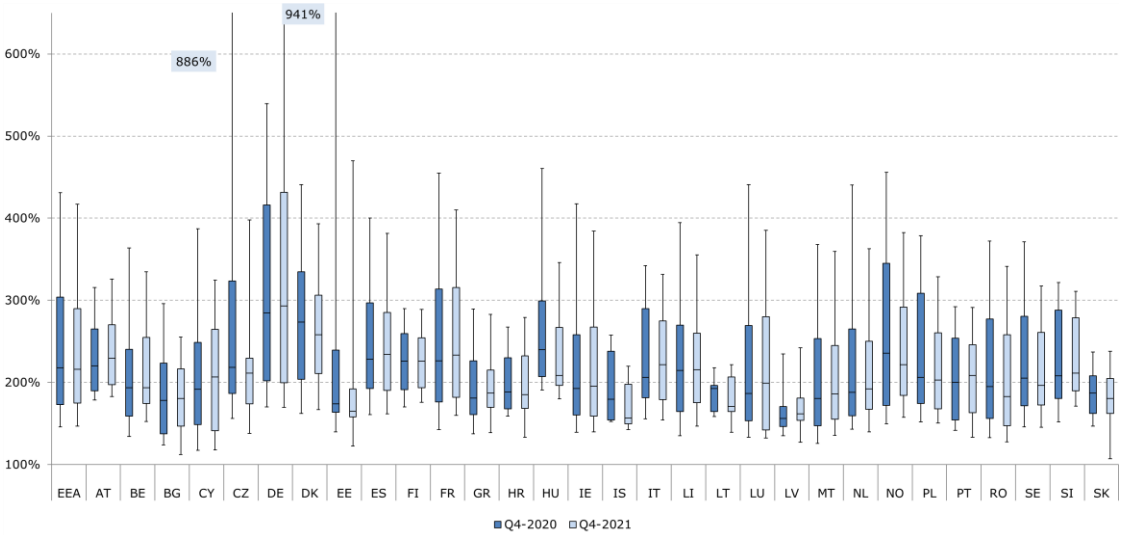
Figure 2.14: Intervals of SCR ratios for solo undertakings as of Q4 2021 by type of undertaking.



Source: EIOPA Quarterly Solo

The recovery of the economic and financial situation in most of the EEA member states after the pandemic is reflected in the better capitalization of the insurance sector across different EEA countries (Figure 2.15). The differences across countries and heterogeneous pandemic impact on the national economies could lead some countries to experience a slower recovery.

Figure 2.15: SCR ratio by country (in %; median, interquartile range and 10th and 90th percentile).



Source: EIOPA Quarterly Solo.

Looking ahead, a worsening of the Russian invasion scenario could pose some threats. An assessment of insurers' investments in Russia, Ukraine and Belarus shows that direct exposures are

not material. It also shows that some large cross-border groups have subsidiaries in the named countries, but these represent only very small fractions of overall assets. However, it is not possible to rule out indirect effects namely potential spill-overs from insurer's exposures towards entities which in turn are extensively exposed to the crisis, such for example banks.[43]

[43] This aspects are investigated in CH5 Risk assessment in a special focus on investments exposures towards Russia, Ukraine and Belarus.

3. THE EUROPEAN REINSURANCE SECTOR

The European reinsurance sector remained resilient in 2021 despite continued challenges that included high catastrophe losses, inflation expectations and pandemic related uncertainty. "Hardening" market conditions contributed to increases in written premium and improvement in the solvency position of reinsurers. Both traditional and alternative reinsurance capital grew in 2021 as reinsurers sought to take advantage of rate increases on policies, while balancing their exposure to loss affected portfolios.

Looking ahead, climate change effects and COVID-19 are expected to remain key sources of risk and uncertainty for the European insurers and reinsurers. Despite sufficient capital availability, bifurcation between loss affected and non-loss affected portfolios is expected to become stronger in terms of pricing and terms and conditions.

The recent geopolitical developments surrounding Russia's invasion of Ukraine have an impact on the reinsurance sector; the details and magnitude remain however unclear at this stage. Equally, the associated sanctions against Russia may affect reinsurers. For example, significant claims of up to USD 13 bn are expected from lessors of airplanes stranded in Russia since the onset of sanctions. It is estimated that 30% to 40% of this exposure has been ceded by primary insurers to reinsurers.[44] Any claims and actual pay-outs are likely to be subject to legal proceedings.

3.1 MARKET SHARE AND GROWTH

Reinsurance GWP for both life and non-life segments increased significantly in 2021. Reinsurance GWP comprises 15% of the total GWP for insurance and reinsurance business in the EEA in 2021, standing at EUR 204 bn (Figure 3.1). Within this category, non-life reinsurance represents 11% of total GWP (EUR 146 bn), while life reinsurance accounts for 4% (EUR 58 bn). Overall reinsurance premiums increased by 12% since 2020, with life reinsurance, non-life proportional reinsurance and non-life non-proportional reinsurance witnessing double digit growth (Figure 3.2). The biggest absolute increase came from non-life proportional reinsurance wherein fire and other damage to property, general liability and motor vehicle liability lines of business accounted for majority of the increase (Figure 3.3). Non-proportional premiums increased by 13%, with property accounting for biggest absolute and relative increase among the four line of business (Figure 3.4). This could indicate higher demand for reinsurance in light of heightened risk environment due to COVID-19 and high natural catastrophe losses, as well as reinsurers willing to write more business to capitalize on "hardening" market conditions and the ability to achieve a more risk-adequate pricing.

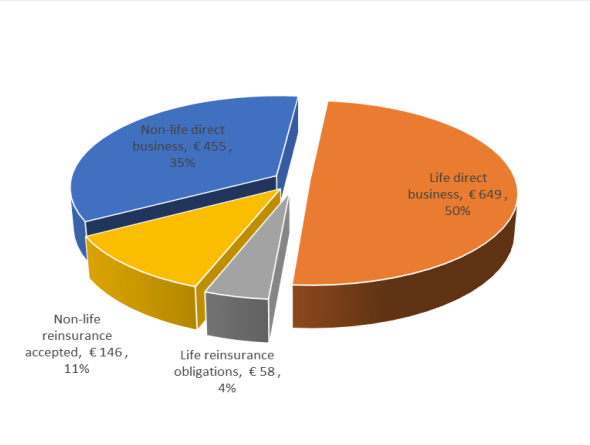
Reinsurers are well capitalised. The global reinsurance capital increased to USD 660 bn at the end of June 2021 compared to USD 650 bn at the end of 2020. This rise was driven by increases in both

[44] Aviation Re/insurers Face Claims as High as $10B From Planes Grounded in Russia (insurancejournal.com).

the traditional and alternative market.[45] Capitalisation of traditional reinsurers rose by USD 7 bn to USD 563 bn (YE 2020: USD 556 bn), as reinsurers generally reported strong earnings, despite additional losses related to COVID-19 (mainly in the life business) as well as the impact of natural catastrophe losses. Since 2011, reinsurance capital grew by 45 %, which can be split into an increase of USD 135 bn in traditional capital and USD 69 bn in alternative capital. The alternative reinsurance market remains attractive due to the diversifying nature of catastrophe-exposed business and the relatively high returns, especially after a potential re-evaluation of risk.

The property catastrophe bond market performed strongly and reached an all-time high in 2021. The total outstanding insurance linked securities (ILS) amounted to USD 35.9 bn at YE 2021[46] with newly issued ILS of USD 14 bn. Thus, the issuance hit a new record, surpassing the 2020 annual record by almost USD 2 bn.

Figure 3.1: Gross Written Premiums in the EEA (in EUR billion and %).

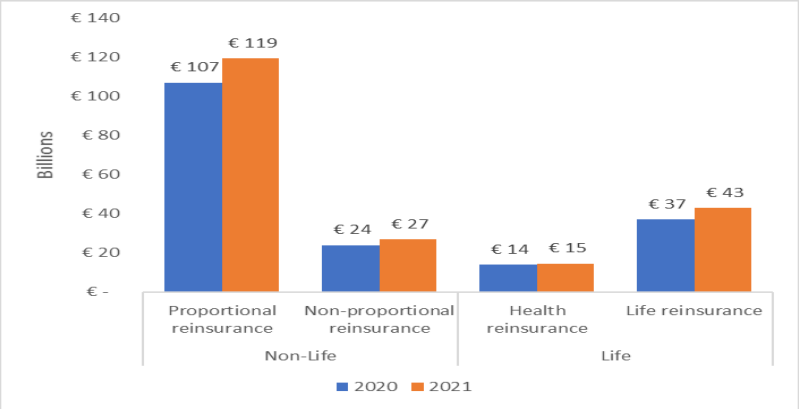


Source: EIOPA Quarterly Solo.
Reference date: Q4 2021.
Figures do not include UK.

[45] AON Benfield: Reinsurance Market Outlook October 2021

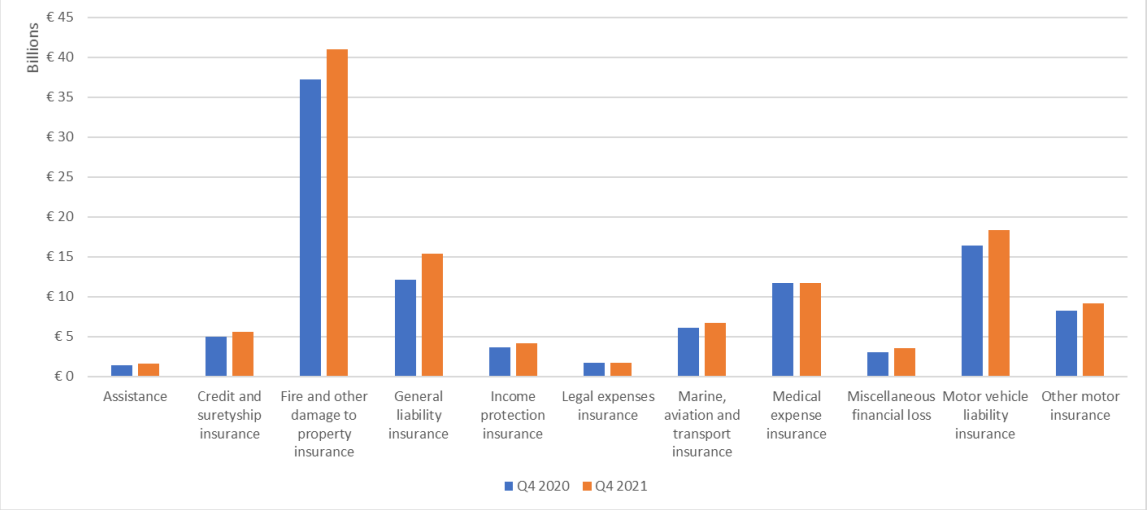
[46] ARTEMIS Website: https://www.artemis.bm/dashboard/catastrophe-bonds-ils-issued-and-outstanding-by-year/ and ARTEMIS: Q4 2021 Catastrophe Bond & ILS Market Report

Figure 3.2: Reinsurance Gross Written Premiums in the EEA (in EUR billion)[47].



Source: EIOPA Quarterly Solo.
Reference date: Q4 2020 and Q4 2021.
Figures do not include UK.

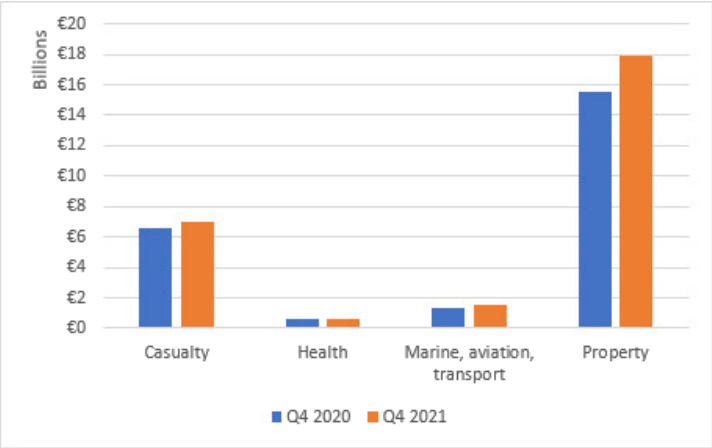
Figure 3.3: Gross Written Premiums for non-life proportional reinsurance by Line of Business (in EUR billion).



Source: EIOPA Quarterly Solo.
Note: Figures do not include UK.

[47] Please note that in this chart, *Q4 2020 reinsurance premiums from the spring 2021 FSR have been revised in light of certain data quality issues which have been resolved since its publication.*

Figure 3.4: Gross Written Premiums for non-life non-proportional reinsurance by Line of Business (in EUR billion).



Source: EIOPA Quarterly Solo
Note: Figures do not include UK.

Prices for reinsurance renewals increased as of January 2022.[48] Average global property catastrophe prices increased by 10.8%[49]. However, outcomes varied widely depending on the underlying risk, loss experience, claims performance, strength of management, business strategy, perceived adequacy of pricing and structure, and depth of the client relationship.[50] Capacity was sufficient for many lines but more constrained for retrocession and some components of property, including loss-impacted lower catastrophe layers and aggregates. Retrocession, always a more competitive and often a more challenged area of reinsurance, experienced rising prices. Catastrophe retro rates (i.e. premium rates paid by a reinsurer for transferring the risks reinsured to another reinsurer) increased by 15% on average.

Unlike 2020, Europe witnessed significant upward price corrections in 2021, largely due to higher catastrophe losses – most notably from the flood Bernd. In highly affected areas, namely Germany, Switzerland, Austria and Belgium, price increases of more than 50% were observed.[51] In loss free territories, including the UK, Nordic countries and France, risk adjusted pricing increased by 5%.

3.2 PROFITABILITY

The year 2021 was the second-costliest ever for the insurance sector, alongside record years 2005 and 2011. According to estimates, natural catastrophes caused worldwide economic losses of USD 280 bn, an increase of 33.3% compared with the previous year (USD 210 bn). The insured losses amounted to USD 120 bn, against a total of USD 82 bn in the previous year. The number of fatalities increased from 8,200 in 2020 to 9,200 in 2021. As in the previous year, weather-related catastrophes in North America dominated the statistics. A hurricane season significantly above the long-term

[48] Gallagher Re: 1st View 1 January 2022.

[49] Guy Carpenter Global Property Catastrophe Rate-on-Line Index.

[50] Guy Carpenter: January 2022 Reinsurance Renewal Briefing

[51] Gallagher Re: 1st View 1 January 2022

average, a series of tornados in central and southeastern US and an exceptional cold wave led to an US share of losses of 51.8% in terms of economic losses and 40.5% in terms of insured losses.

The costliest natural disaster in 2021, both in terms of overall and insured losses, was Hurricane Ida, which made landfall on 29 August south of New Orleans (Table 3.1). Overall losses amounted to approximately USD 65 bn, of which approximately USD 36 bn were insured (55%). Going forward, natural catastrophe losses are likely to continue to grow more than global GDP given increases in wealth, urbanisation and climate change.[52]

Table 3.1: The five largest natural catastrophes in 2021, ranked by insured losses.

Date	Event	Region	Fatalities	Overall losses (USD bn)	Insured losses (USD bn)
29 Aug - 2 Sep	Hurricane Ida	United States, Canada	114	65.0	36.0
12 - 17 Feb	Winter storm, cold wave	United States	235	30.0	15.0
12 - 19 July	Flood, flash floods	Europe	228	54.0	13.0
10 - 11 Dec	Tornado (series), convective storm	United States	88	5.2	4.0
27 - 29 Apr	Convective storm	United States	0	3.3	2.5

Source: Munich Re, NatCat SERVICE. *Estimates at January 2022

Underwriting profitability of European reinsurers varied significantly across segments and lines of business in 2021. The median gross combined ratio for EEA reinsurers for non-life accepted proportional reinsurance has decreased from 92.6% in 2020 to 90.3% in 2021 (Figure 3.5). However, the median gross combined ratio for accepted non-proportional reinsurance has increased from 74.5% in 2020 to 89.4% in 2021, with a significant number of undertakings reporting a ratio of above 100% (Figure 3.6). This performance can be attributed to the property sub-segment wherein gross incurred claims, driven by heavy catastrophe losses during the year, increased by 67% (Table 3.2), substantially outpacing the increase in gross earned premiums (18%). Likewise the life reinsurance segment witnessed an increase of 25% in incurred claims against 16% increase in earned premium, reflecting high COVID-19 related mortality claims. On the other hand, several other lines of business such as, but not limited to, miscellaneous financial loss and credit and suretyship insurance appear to have benefited from lower COVID-19 related claims and experienced material decline in overall claims incurred.

Despite large losses from natural catastrophe events in 2021, European reinsurers enjoyed better Property & Casualty (P&C) results. The largest four European reinsurers (Munich Re, Swiss Re, Hannover Re and SCOR) have reported better P&C results in 2021 as the COVID-19 losses decreased relative to 2020. However, higher mortality claims in 2021 meant that the life segment results for the reinsurers deteriorated since 2020.[53]

[52] Global insured catastrophe losses rise to USD 112 billion in 2021, the fourth highest on record, Swiss Re Institute estimates | Swiss Re

[53] European reinsurers enjoy better P&C results as COVID recedes - Reinsurance News

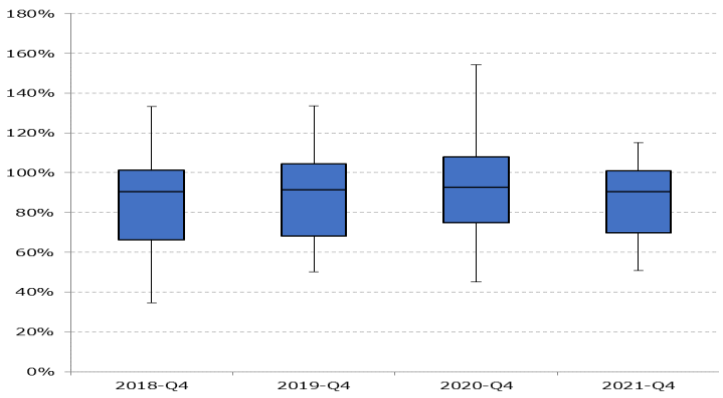
Table 3.2: Gross Earned Premium and Claims incurred per line of business for EEA reinsurance undertakings.

Line of business	2020		2021	
	Gross earned premium	Gross claims incurred	Gross earned premium	Gross claims incurred
	€ bn	€ bn	€ bn	€ bn
Medical expense insurance	3.0	2.1	2.6	2.0
Income protection insurance	1.6	0.9	1.5	0.9
Workers' compensation insurance	0.3	0.3	0.4	0.3
Motor vehicle liability insurance	14.9	9.6	14.8	10.3
Other motor insurance	7.3	4.4	7.4	4.9
Marine, aviation and transport insurance	3.9	2.6	4.5	2.8
Fire and other damage to property insurance	28.2	19.1	29.6	19.9
General liability insurance	8.7	5.9	10.6	7.2
Credit and suretyship insurance	4.2	2.3	4.2	1.4
Legal expenses insurance	0.6	0.3	0.4	0.3
Assistance	0.2	0.1	0.2	0.1
Miscellaneous financial loss	1.7	2.3	2.1	1.7
Proportional Reinsurance - total	**74.5**	**49.8**	**78.5**	**51.7**
Health	0.5	0.4	0.5	0.3
Casualty	5.3	4.4	5.9	4.8
Marine, aviation, transport	1.0	0.7	1.1	0.6
Property	12.1	9.6	14.3	16.0
Non-Proportional Reinsurance - total	**18.9**	**15.1**	**21.7**	**21.7**
Non-Life - total	**93.4**	**65.0**	**100.2**	**73.4**
Health reinsurance	11.5	9.0	12.5	9.3
Life reinsurance	23.8	19.9	27.5	24.8
Life - total	**35.3**	**28.9**	**40.1**	**34.1**
Total	**128.7**	**93.8**	**140.3**	**107.5**

Source: EIOPA Quarterly Solo (reinsurance undertakings)

Note: *Figures do not include UK*

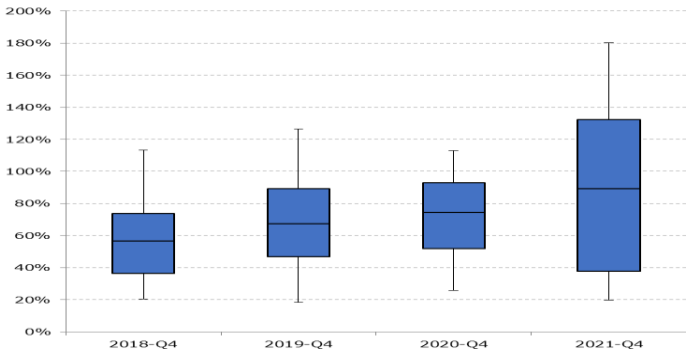
Figure 3.5: Gross Combined Ratio for non-life accepted proportional reinsurance of EEA reinsurance undertakings (in %; median, interquartile range and 10th and 90th percentile).



Source: EIOPA Quarterly solo.

Note: Figures do not include UK.

Figure 3.6: Gross Combined Ratio for accepted non-proportional reinsurance of EEA reinsurance undertakings (in %; median, interquartile range and 10th and 90th percentile).



Source: EIOPA Quarterly solo.

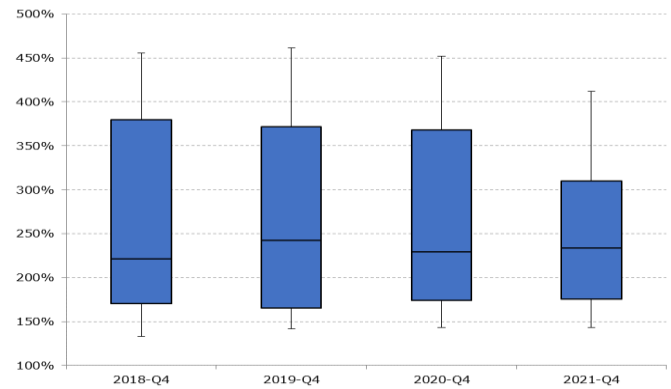
Note: Figures do not include UK.

3.3 SOLVENCY

Solvency positions of EEA reinsurers slightly improved during 2021. The median solvency ratio increased in the first half of 2021 (236%), and then dropped marginally by the end of the year (233%) (Figure 3.7) but still remaining higher than that at the end of 2020 (229%). The variability of SCR ratios above the median value has reduced significantly during 2021, while increasing only slightly for those below the median.

Record high capital availability combined with rising premiums and heightened risk awareness, inter alia, have contributed to steady solvency position of the reinsurers. However, prevailing market conditions could continue to test the resilience of reinsurers' capital position. Climate change, inflation and pandemic concerns still create significant uncertainty for reinsurers.

Figure 3.7: Solvency ratio of EEA reinsurance undertakings (in %; median, interquartile range and 10th and 90th percentile)



Source: EIOPA Quarterly Solo.

Note: All figures exclude UK.

Box 3.1: How significant are reinsurance recoverables and what can they tell us about evolution of reinsurance market?

Reinsurance recoverables represent the proportion of a (re)insurer's losses that can be recovered from its reinsurer. They are estimates and include unearned premiums paid to the reinsurer. Since they are the part of liabilities that can be recovered, they appear on the asset side of the balance sheet. One of the ways a shock to the reinsurance sector could affect the primary insurance sector and the broader financial system is through reinsurance recoverables. Primary insurers could be left with a heavy share of obligations in the event of full or partial failure of reinsurers. The issue becomes highly relevant with the increasing role of reinsurance in the current environment.

At roughly a quarter of the eligible own funds, reinsurance recoverables represent a sizeable asset for the EEA insurance and reinsurance undertakings. Without this asset the median SCR ratio of solo undertakings in EEA would decrease by 26 percentage points.

Breakdown of recoverables by country of reinsurer residence suggests significant differences between life and non-life segments. While large majority of the life recoverables come from reinsurers based in France, the non-life recoverables are relatively more spread across reinsurers in different countries. Germany accounts for the highest amount of non-life recoverables by a significant margin but the countries following it (i.e. Switzerland, France and Bermuda) appear to be comparable to each other on this metric.

Geographical concentration of reinsurance recoverables, as measured by Herfindahl-Hirschman Index (HHI), has reduced in the recent years (Table B3.1). The non-life segment in particular appears to be no longer in the concentrated range as of 2020. This is evident in the significant increases in recoverables from reinsurers residing in Switzerland, France, Bermuda and UK coupled with a marginal decline in the same from reinsurers in Germany. Overall, recoverables from third country domiciled reinsurers have increased at a faster rate than those from EEA countries for both life and non-life segments (Figure B3.1).

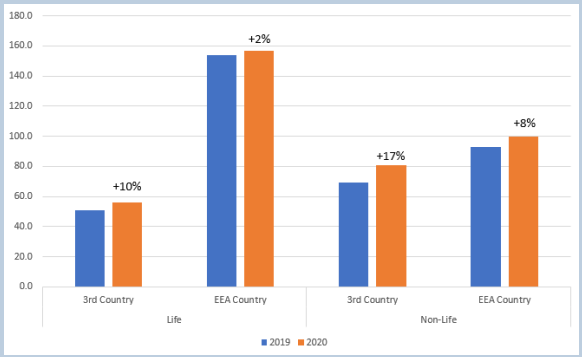
Table B3.1: Geographic concentration of reinsurance recoverables.

Herfindahl-Hirschman Index (HHI): Reinsurance recoverables by country of reinsurer residence			
	2020	2019	2018
HHI Total Reinsurance Recoverables	2161	2256	2716
HHI Non-Life Reinsurance Recoverables	1415	1547	1660
HHI Life Reinsurance Recoverables	4175	4223	5362
# countries of residence	164	167	163

RED =	High concentration (HHI above 2500)
ORANGE =	Moderate concentration (HHI between 1500 & 2500)
GREEN =	Low concentration (HHI below 1500)

Source: EIOPA Annual Solo. Note: All figures exclude UK.

Figure B3.1: Reinsurance recoverables[54] by country of residence for solo undertakings.

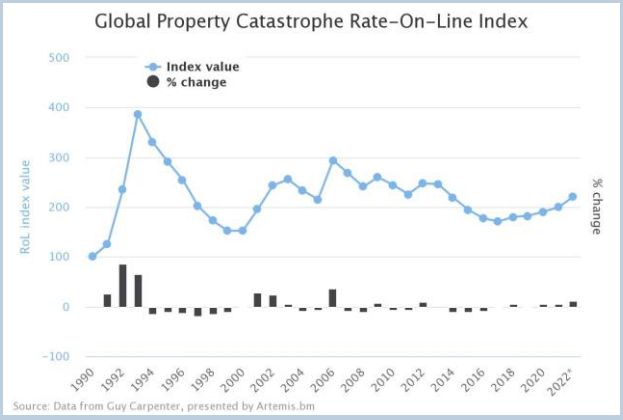


Source: EIOPA annual solo. Note: Figures do not include UK.

Indeed, geographical location of the reinsurer alone is not sufficient to draw definitive conclusions, but it provides a starting point for further analysis.

While the precise reasons underlying this shift warrant a more detailed analysis, some contemporary trends in the reinsurance sector are likely to have contributed to it. The period since 2018 has witnessed "hardening" of reinsurance markets, as evident by the increases in Global Property Catastrophe Rate-On-Line Index (Figure B3.2). Broker driven markets of Bermuda and London have attracted more capital with the expectation to take advantage of higher pricing. The capital inflow is also partly attributed to the limited opportunities available elsewhere to investors in the low interest rate environment. Proximity to US, Solvency II equivalence and tax advantages make Bermuda attractive to major European re/insurers, who continue to maintain and/or increase their presence on the island nation through subsidiaries.

Figure B3.2: Global Property Catastrophe Rate-On-Line Index.



[54] Excluding adjustments for expected losses due to counterparty default.

4. THE EUROPEAN PENSION FUND SECTOR

The financial position of EEA IORPs has recovered following the improvement of the financial markets since the Covid-19 pandemic outbreak in 2020. The total amount of assets displays an increase over the last year, whereas the liabilities remained more or less unchanged. Likewise, the Excess of Assets over Liabilities exhibits a positive trend. As for the insurance sector, the latest developments in the markets in relation to Russia's invasion of Ukraine and the increase in geopolitical tensions along with the rise in inflation and yield are not yet incorporated in the last available IORPs data.

The direct impact of the Russian invasion of Ukraine on IORPs' financial position appears to be limited, as the asset exposures of IORPs towards Russia, Ukraine and Belarus is low. However, going ahead indirect effects (e.g. rising inflation, commodities prices, etc.) of the invasion could potentially affect the financial position of IORPs considerably. **Inflation could negatively impact the financial position of IORPs or lead to a decrease in purchasing power of members and beneficiaries.** The potential impact will depend on the specificities of IORPs across Member States, along with their asset allocations.

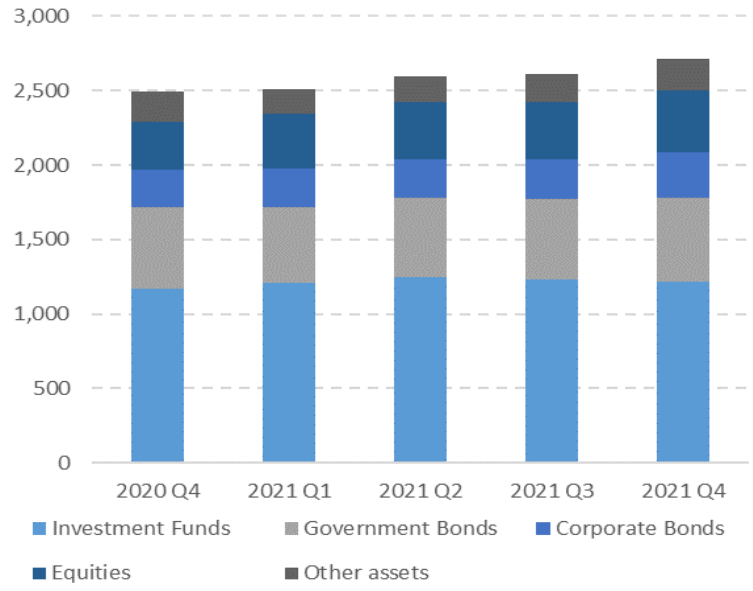
4.1 FINANCIAL POSITION AND SIGNIFICANCE OF THE PENSION SECTOR

The financial position of EEA IORPs improved since the end of 2020. The value of the assets grew by EUR 222 bn from EUR 2,491 bn at the end of the fourth quarter of 2020 to EUR 2,713 bn one year later (Figure 4.1). The liabilities remained on the other hand stable around EUR 2,300 bn (Figure 4.2). Consequently, the financial position of IORPs continuously improved during 2021. The excess of assets over liabilities grew from EUR 181 bn to EUR 416 bn (Figure 4.3).

Liabilities of IORPs, and in particular the technical provisions in defined benefit (DB) pension schemes, may be established, depending on national valuation standards, using market interest rates. This means that a rise in interest rates will decrease the value of the technical provisions. Conversely, **in case of an extreme scenario event with higher inflation rates the financial situation of IORPs could be negatively affected,** especially where pension entitlements are linked to inflation or wage growth. Moreover, high inflation could put upward pressure on contributions by sponsors and members, in particular for pension schemes with unconditional inflation compensation. A loss of purchasing power for current and future beneficiaries may occur in pension schemes with no or conditional indexation, if inflation is not fully compensated for. The specificities of IORPs across Member States, along with their assets allocations, will determine the potential impact of rising interest rates and high inflation. In this regard, the 2022 EIOPA's Climate stress test for the occupational pensions sector includes a specific questionnaire to analyse the potential effects of inflation on members' and beneficiaries' retirement income, focusing on the extent to which scheme characteristics and national frameworks provide for mitigating measures or adaptations to protect against inflation.

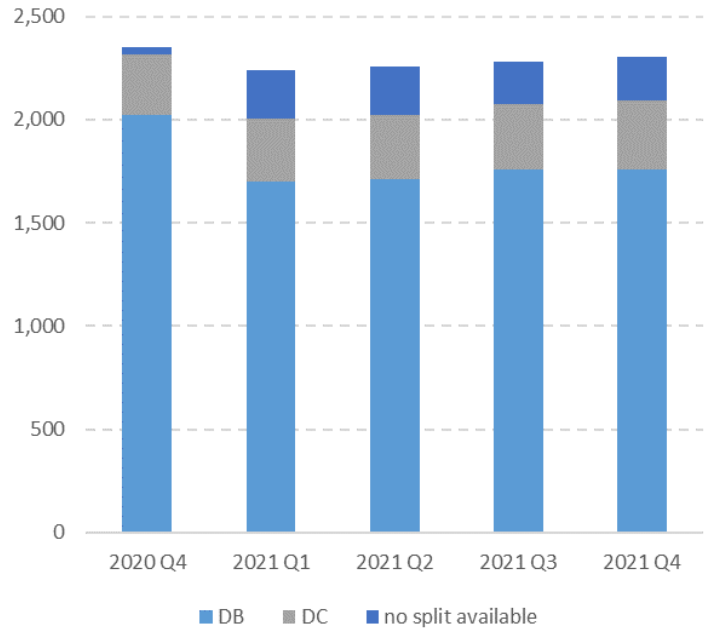
Further, a deterioration of the market conditions driven by the increase in geopolitical tensions could have a negative impact on the financial position via investment losses, in particular for pension schemes which offer inflation compensation.

Figure 4.1: Total Assets (in bn euro).



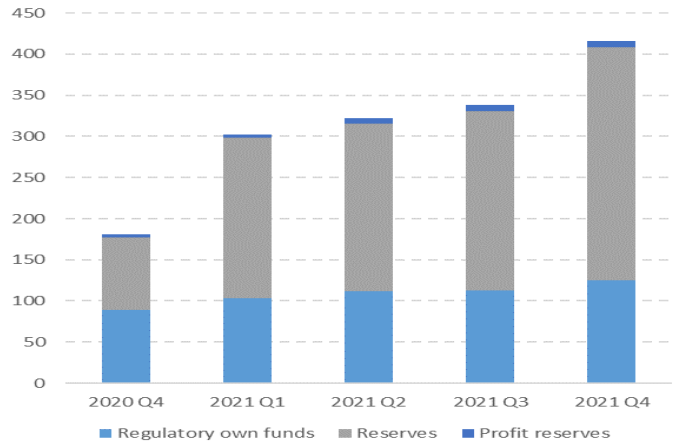
Source: EIOPA IORPs Statistics, Balance Sheet.

Figure 4.2: Total Liabilities, broken down by pension scheme (in bn euro).



Source: EIOPA IORPs Statistics, Balance Sheet.

Figure 4.3: Excess of Assets over Liabilities (in bn euro).

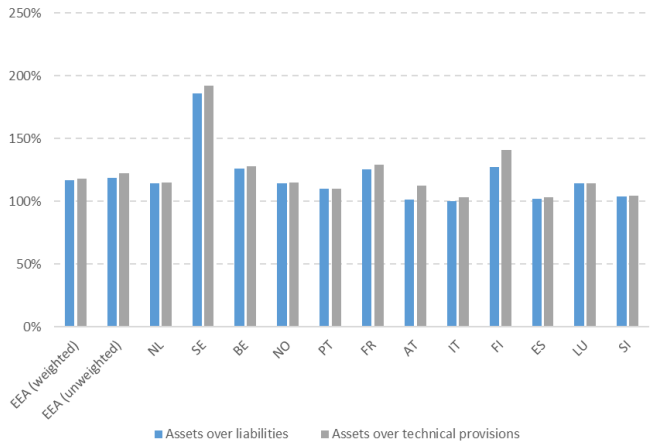


Source: EIOPA IORPs Statistics, Balance Sheet.

Defined benefit systems are predominant within the European Economic Area (EEA) if measured by size of the assets. Member states that mainly have DB pension schemes are Belgium, the Netherlands, Norway and Portugal. DC pension schemes are especially prevalent in Italy. In Sweden, half of IORPs' liabilities related to DB pension schemes and the other half to DC pension schemes. Countries in which the DB or DC breakdowns relies on less than three IORPs are classified in the category 'no split available' in figure 4.2.

In all Member States, the cover ratios of IORPs providing DB schemes in aggregate exceed 100% (Figure 4.4). One year earlier, at the end of 2020, this was not the case. For the EEA as a whole, the cover ratio, i.e. total assets relative to total liabilities, is 117% for 2021 Q4. Sweden has the highest cover ratio (186%), whereas Spain has the lowest covered ratio by 2021 Q4 (102%). Only DB assets and liabilities are taken into account in the calculation of the cover ratios. Looking ahead, the recent geopolitical developments and the increase in inflation, may negatively affect cover ratios, whereas the rise in interest rates may have a positive impact, depending on national specificities.

Figure 4.4: Cover ratios by EEA Member State (DB schemes,)[55].

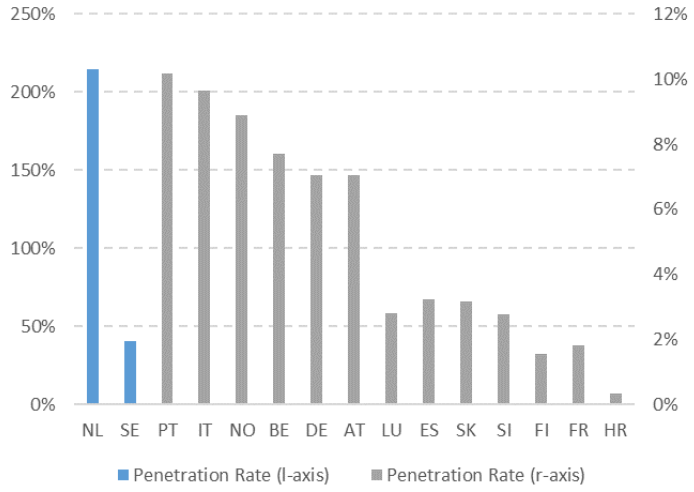


Source: EIOPA IORPs Statistics. Calculations based on Balance Sheet.

Reference date: Q4 2021.

The penetration rate, measured as the ratio between the value of the total assets of the IORP sector and the gross domestic product (GDP), shows the significance of the IORPs' assets relative to the size of the Member State's economy (Figure 4.5). The holdings of Dutch IORPs represent more than 200% of the country's GDP. For the other Member States, the penetration rates are much lower. For Germany, the second largest IORP sector within the EEA, the penetration rate stays around 7%. So, German IORPs, whilst holding EUR 251 bn, have a relatively modest size in comparison to the German economy.

Figure 4.5: Penetration rates



Source: EIOPA IORPs Statistics, Balance Sheet and Eurostat GDP.

Reference date: Q4 2021.

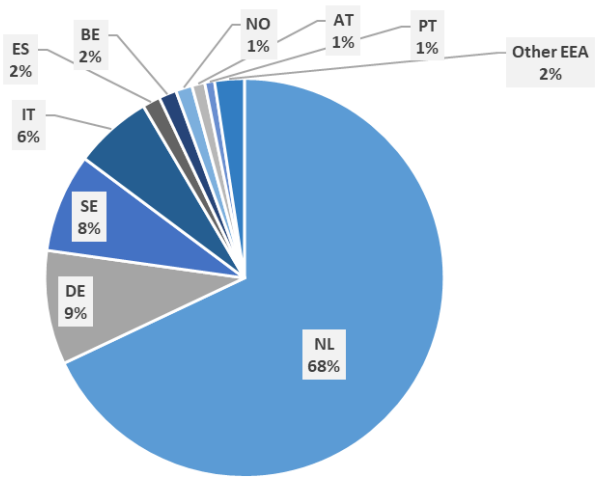
[55] In the case of Italy, due to the current restructuration of several DB schemes, the data on technical provisions that are reported to EIOPA are set as equal to the assets held. Notice that the overall share of DB schemes in Italy is only around 2.6%. of total assets.

4.2 ASSET ALLOCATION OF IORPS

IORPs invest half of their assets (EUR 1,213 bn) via investment funds (CIUs) (Figure 4.6). The other major investment categories are government bonds (EUR 567 bn), corporate bonds (EUR 305 bn) and equities (EUR 414 bn). The other assets (EUR 213 bn) mainly contain investments in real estate, mortgages and loans and derivatives.

The direct exposures show that the value of investments in **equity rose, whereas the value of investments in government and corporate bonds remained stable** (Figure 4.7). This probably reflects the positive developments on international stock markets in 2021 in combination with a return to pre-pandemic equity investment levels via rebalancing. IORPs usually invest according to long term investment plans. After a major shock, like the outbreak of the pandemic, it normally takes some time before the investment levels return to the predefined levels.

Figure 4.6: Relative size of the pension sector by EEA Member State



Source: EIOPA IORPs Statistics, Balance Sheet.

Reference date: Q4 2021.

The heterogeneity of the IORPs' asset allocations in the different Member States may lead to dissimilar exposures to market risks and financial shocks. Some 68% of the assets are held by Dutch IORPs (Figure 4.8). Therefore, financial developments in the Dutch IORP sector dominate the overall picture. Nevertheless, IORPs from Germany (9%), Sweden (8%) and Italy (6%) also hold substantial investments.

The asset allocations of IORPs vary between Member States (Figure 4.8). Although IORPs in nearly all Member States invest via investment funds, in some countries IORPs invest a larger part through CIUs. This especially applies to Austria and Belgium, where IORPs invest nearly 95% respectively

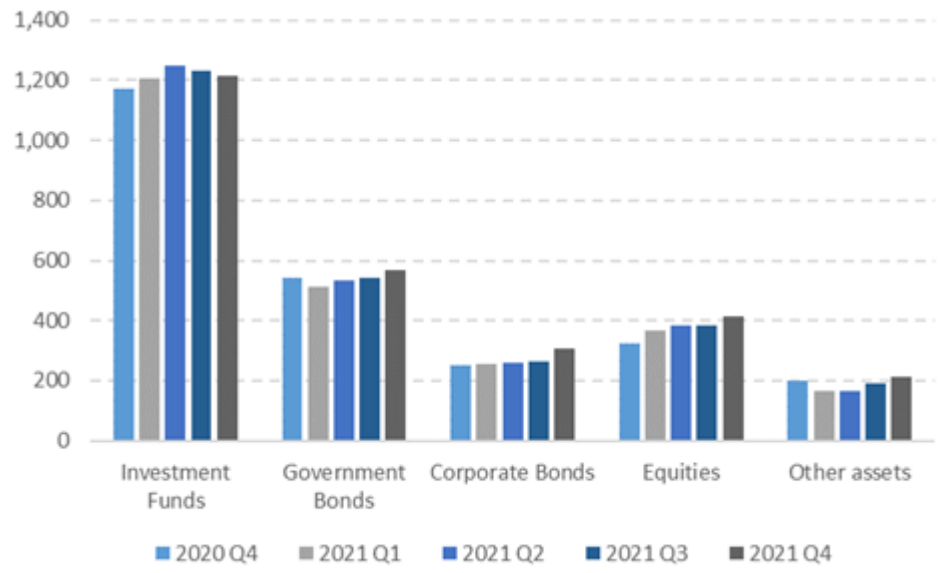
80% via CIUs. In contrast, IORPs in some other countries mainly invest directly, without using CIUs. This applies especially to IORPs in Sweden, Slovenia, Croatia and Portugal. The asset allocation of Swedish IORPs stands out, investing almost half of their assets directly in equities.

The asset allocation of IORPs' investments within CIUs also shows differences between Member States (Figure 4.9). In nearly all Member States, investments of IORPs via CIUs contain 40% equity investments. However, this does not hold true for German and French IORPs, which invest much less in equity via CIUs. The investments of IORPs of these two countries via CIUs are mainly allocated to debt funds, money market funds and asset allocation funds (fund with mixed allocation assets).

Applying the full look through principle the investments via CIUs are attributed to the respective investment categories. This way it becomes clear that IORPs invest nearly half of their assets in bonds and some 35% in equity (figure 4.10). The remaining 15% is mainly invested in property.

Regarding the asset allocation between schemes, **IORPs providing DB schemes exhibit a higher exposure to government bonds (Figure 4.11), while DC schemes tend to invest a higher share of their assets in corporate bonds and equities (Figure 4.12)**. In the event of adverse financial market developments, DC pension schemes will be more exposed to a fall in prices of risk assets than DB pension schemes.

Figure 4.7: Developments per asset category (in bn euro).



Source: EIOPA IORPs Statistics, Balance Sheet.

Reference date: Q4 2021.

Figure 4.8: Asset allocation.

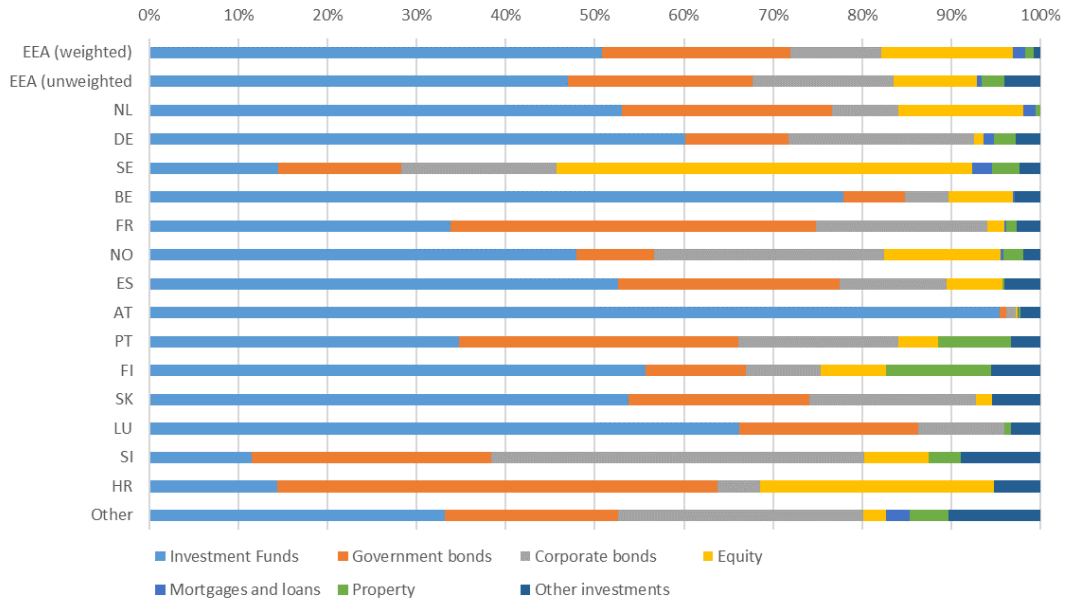
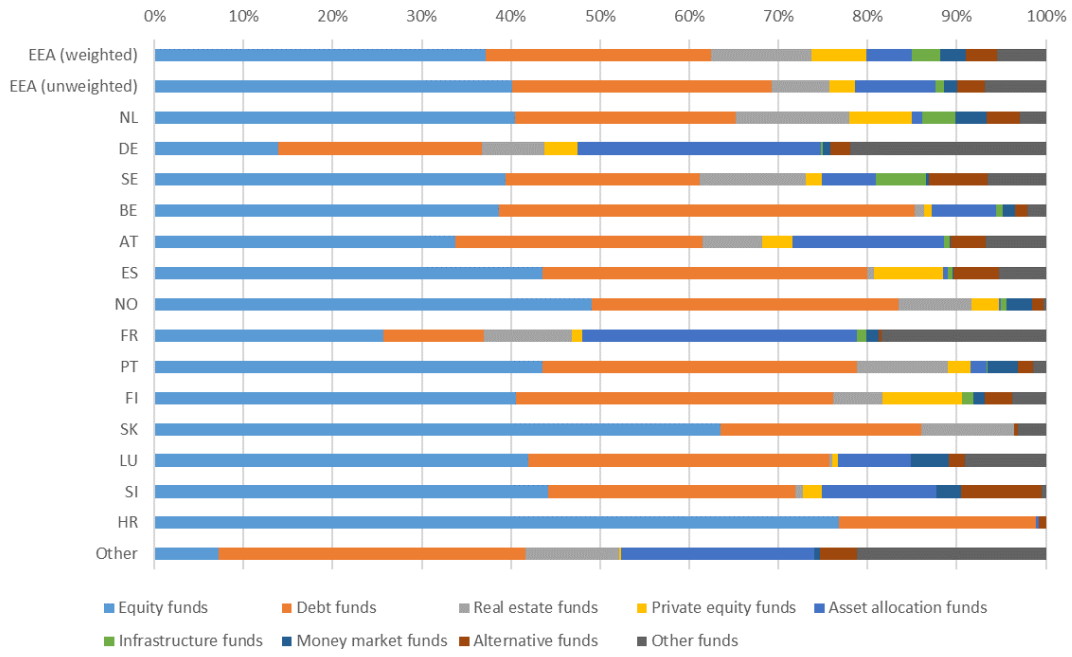


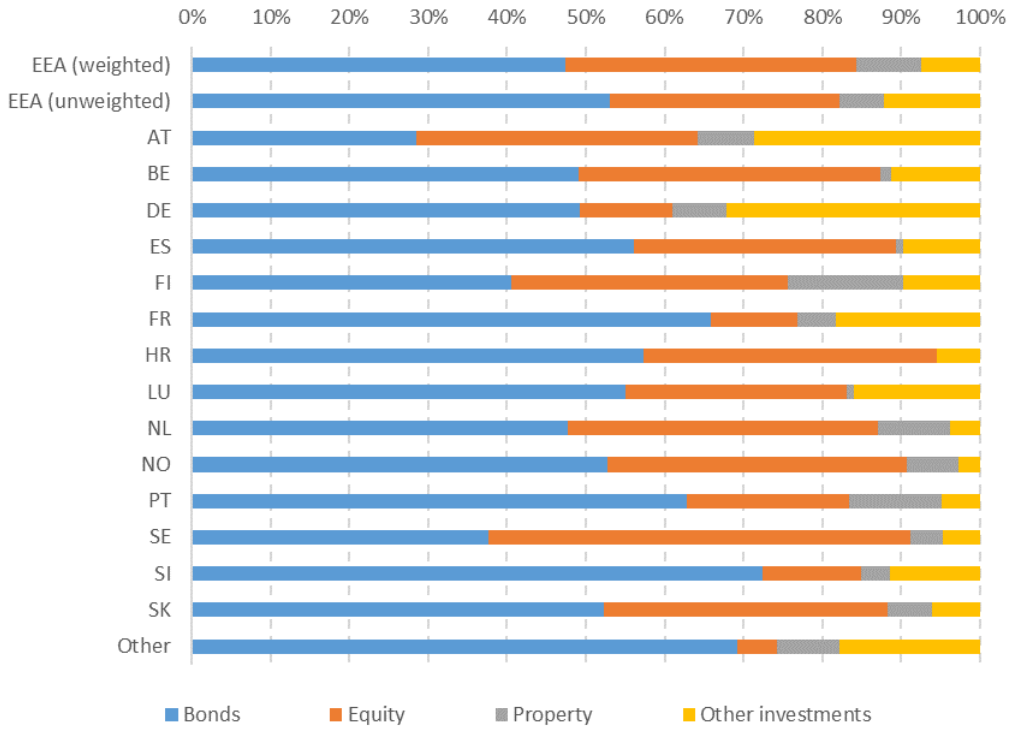
Figure 4.9: Investment funds: breakdown by subcategories.



Source: EIOPA IORPs Statistics, Asset Exposures.

Reference date: Q4 2021.

Figure 4.10: Asset allocation including full look-through approach.



Source: EIOPA IORPs Statistics, Asset Exposures.

Reference date: Q4 2021

Note: Bonds consist of government bonds, corporate bonds, mortgages and loans, debt funds and money market funds. Equity consists of direct equity, equity funds and private equity funds. Property consists of direct property, real estate funds and infrastructure funds and 'other' investments consists of direct other investments, asset allocation funds, alternative funds and other funds.

Figure 4.11: DB schemes: Asset allocation including full look-through.

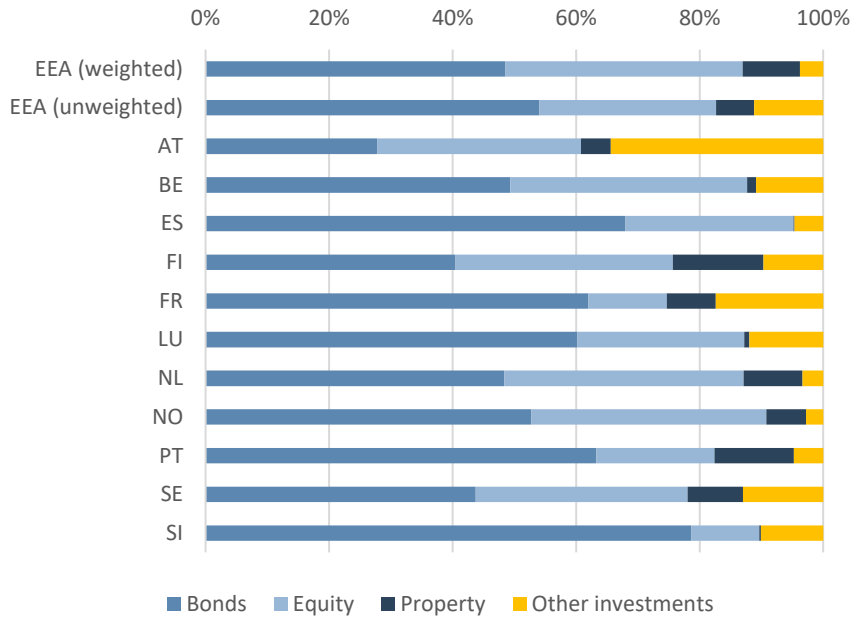
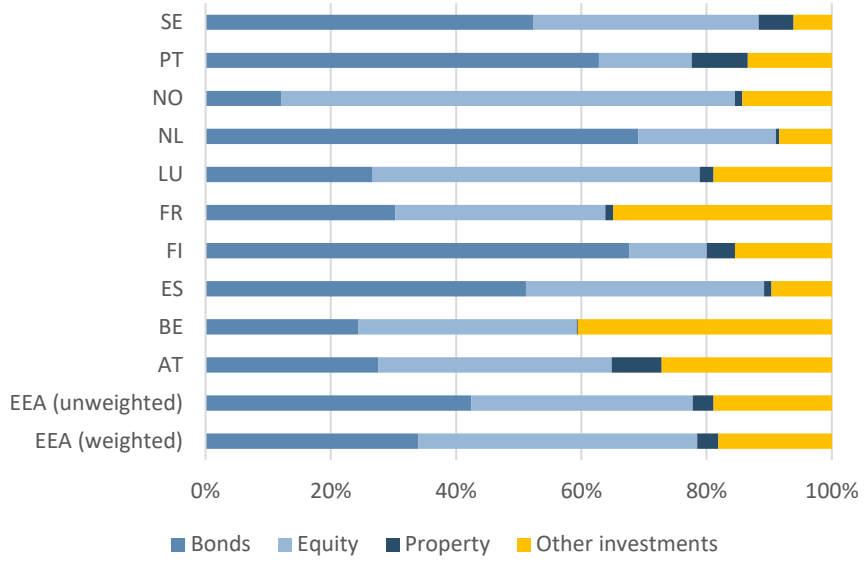


Figure 4.12: DC schemes: Asset allocation including full look-through.



Source: EIOPA IORPs Statistics, Asset Exposures.

Reference date: Q4 2021

Note: Bonds consist of government bonds, corporate bonds, mortgages and loans, debt funds and money market funds. Equity consists of direct equity, equity funds and private equity funds. Property consists of direct property, real estate funds and infrastructure funds and 'other' investments consists of direct other investments, asset allocation funds, alternative funds and other funds.

4.3 MEMBERS AND BENEFICIARIES

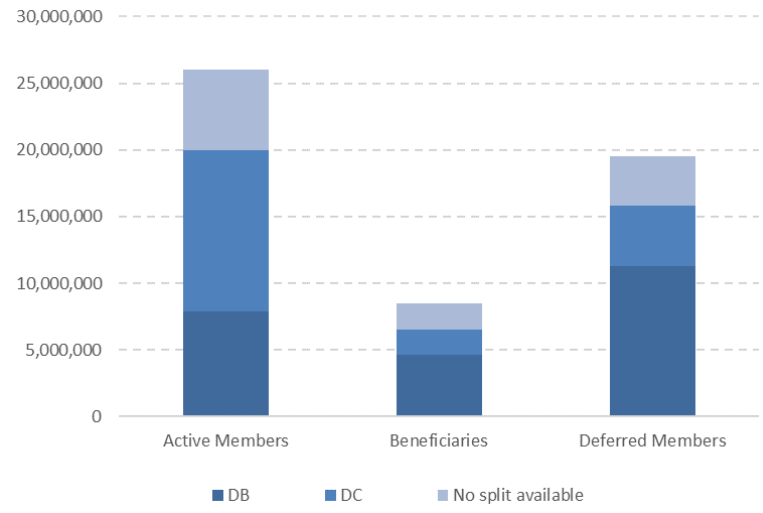
About 26 million employees are active members of an IORP in the EEA, in the possession of retirement plans (Figure 4.13). Nearly half of them (12 million persons) participate in defined contribution (DC) pension schemes and nearly 8 million in defined benefit (DB) schemes. For some 6 million persons, the split by pension type cannot be shown for reasons of confidentiality.

Some 8.5 million persons are registered as beneficiary. The vast majority of this group (4.6 million persons) receives an occupational pension via DB pension schemes. The number of beneficiaries in DC pension schemes is much more limited (1.8 million). In some cases, DC pension schemes do not offer a lifetime benefit, but instead provide a lump sum at the moment of retirement. In that case, accumulated savings are transferred to another financial institution, e.g. when the retiree buys an annuity at an insurer, and the retiree is not registered as a beneficiary.

The number of deferred members is nearly 20 million, of which 11.3 million in DB pension schemes. In these figures double counting occurs. For example, a person can be registered as an active member at one IORP and a deferred member at another. Similarly, one person can be registered as a beneficiary at multiple IORPs.

The Netherlands, Germany and Italy are the three EEA Member States with the most active members, nearly 70% of all active members are registered at IORPs in these countries, followed by Sweden, Spain and Belgium (Figure 4.14).

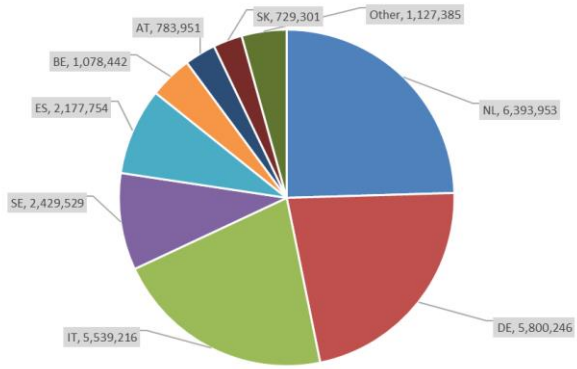
Figure 4.13: Members of IORPs, split by pension type.



Source: EIOPA IORPs Statistics, Members.

Reference date: 2020.

Figure 4.14: Active members (2020).



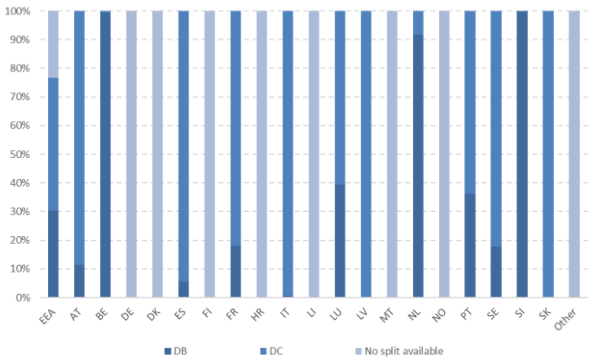
Source: EIOPA IORPs Statistics, Members.

Reference date: 2020

Whereas most active members from Dutch IORPs are contributing to defined benefit schemes, active members at Italian IORPs are mainly contributing to DC pension schemes (Figure 4.15).

In some Member States, reforms are underway to transform DB schemes into DC schemes, thereby transferring risk from IORPs to members. One such country is the Netherlands, whereas Italy has established a pension funds system which is DC since the onset. DC pension schemes tend to be more individually designed, for example via life-cycle investment approaches or by offering a choice of investment options with different levels of investment risk. A major challenge in DC based pension systems will be the mitigation of risks for its members and offering them sufficient information to base their choices on. EIOPA is currently carrying out a project on good practices regarding the design of DC schemes.

Figure 4.15: Active members by Member State, broken down by pension type.



Source: EIOPA IORPs Statistics, Members.

Reference date: 2020.

5. RISK ASSESSMENT

5.1. RESULTS OF CONDUCTED SURVEY AMONG NATIONAL COMPETENT AUTHORITIES

In order to assess the key risks and vulnerabilities for the insurance and IORP sectors, EIOPA conducted a qualitative survey among National Competent Authorities (NCAs) in March, shortly after Russia invaded Ukraine. NCAs' responses often include direct indications from insurers and IORPs.

The results of the survey indicate that market and macro risks remain key risks for both the insurance and IORP sectors (Figures 5.1 and 5.2). While the EEA macroeconomic environment continues to recover from the pandemic, new uncertainty emerged in late February when Russia invaded Ukraine. As a consequence, Q1 2022 was characterized by increased volatility in financial markets and a significant reduction in economic growth. On the macro side, the reduction of consumers' purchasing power due to increasing costs and rising inflation expectations are amplified by the ongoing conflict. Moreover, the capacity of public authorities to support the economy narrowed because of the increased governments' indebtedness after the pandemic.

Figure 5.1: Risk assessment in terms of materiality for the insurance sector.

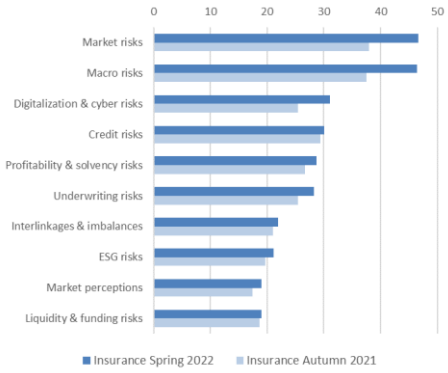
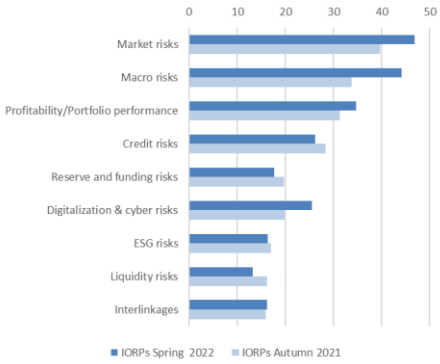


Figure 5.2: Risk assessment in terms of materiality for the IORP sector.



Source: EIOPA Insurance Bottom Up Survey Spring 2022 and Autumn 2021.
Note: Based on the responses received. Risks are ranked according to probability of materialisation (from 1 indicating low probability to 4 indicating high probability) and the impact (1 indicating low impact and 4 indicating high impact). The figure shows the aggregation (i.e. probability times impact) of the average scores assigned to each risk. The results were subsequently normalised on a scale from 0 to 100.

The EEA insurance sector overall direct exposure to Russia and Ukraine is limited (see section 5.3). The risk of second and third round effects via spill overs from other parts of the financial sector might be more substantial and challenge European insurers. High volatility and the perceived risk

of a potential market correction could have a negative impact on fixed income and equity investments.

Among market risks, **equity and interest rate risks** are indicated as the main concerns (Figure 5.3). This reflects the increased volatility of bond and equity markets during the conflict. Some NCAs noted the decrease in equity markets and further concerns remain going forward. In consideration of the ongoing conflict and the sanctions, geopolitical risks and the international macroeconomic environment are the main drivers of macro risk (Figure 5.4).

Digitalization and cyber risks are ranked in the third place in terms of materiality for insurers (Figure 5.1). In the last years, digitalization and cyber risks have increased in importance, in particular due to the home office set up and digital distribution channels established after the pandemic outbreak. The new way of working has brought an increase in the number of cyber-incidents, affecting directly insurance undertakings, both on the operational risk side and on the underwriting side in a growing cyber insurance market. In the last months, there has been a resurge of cyber security issues (Figure 5.5) and concerns of a hybrid geopolitical conflict.

Figure 5.3: Main drivers for market risks for the insurance sector.

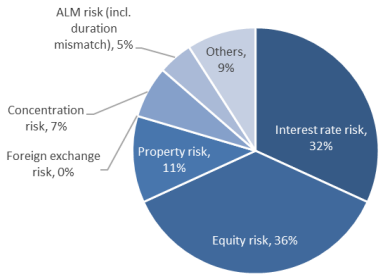


Figure 5.4: Main drivers for macro risks[56] for the insurance sector.

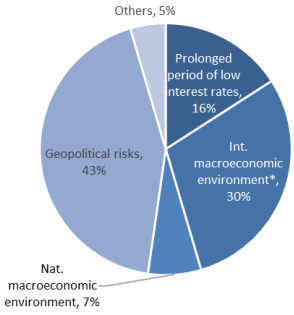
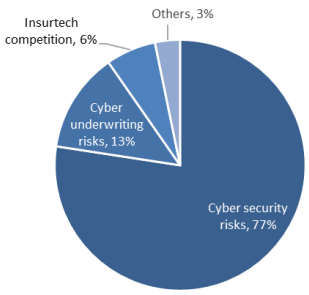


Figure 5.5: Main drivers for digitalization & cyber risks for the insurance sector.



Source: EIOPA Insurance Bottom Up Survey Spring 2022 and Autumn 2021.
Note: Based on the responses received.

The results of the survey indicate that to withstand the challenge of digitalization and cyber risks, insurance undertakings and IORPs have adopted new risk assessment tools. The growing trend of cyber threats is encouraging insurers and IORPs to develop comprehensive cyber risk management frameworks in order to keep interruptions to a minimum and to ensure the return to normal operations as soon as possible. At the same time, the new technologies used by insurers to enhance underwriting, claims and operational management is raising the awareness of IT functioning dependency. Further, those insurers that will not be able to follow the digital transformation might lose market share and might reduce premium income.

The results of the survey indicate that the need to integrate measures to mitigate digitalization and cyber risks raised over the last year. Insurers and IORPs also indicated that improvements in IT

[56] International and national macroeconomic environment drivers in macro risk category do not include prolonged low interest rates, which is a category *per se*.

services are needed (e.g. migration and modernization of legacy systems, improvements of security services, etc.). The need to introduce and reinforce measures to mitigate digitalization and cyber risk is still perceived to be important. For macro risks, 43% (36% in autumn 2021) and 42% (19%) of members consider it necessary to reinforce existing measures for insurers and IORPs, respectively.

Risks related to the shift away from guaranteed products are still mentioned as a latent risk for the insurance sector. Life insurers continuously reduce guaranteed rates for new products and also shift new business away from traditional products, which provide the policyholders with a guaranteed return, to capital market-linked products and biometric products. When using these types of products, policyholders bear market risk and are therefore more exposed to potential negative market developments[57].

Figure 5.6: Risks with the highest expected increase in materiality over the next 12 months for the insurance sector.

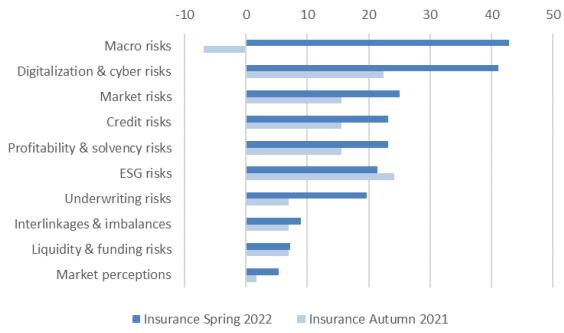
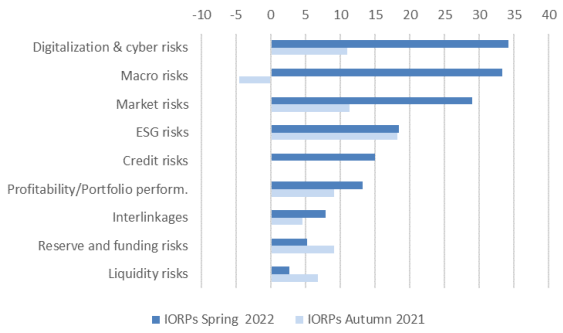


Figure 5.7: Risks with the highest expected increase in materiality over the next 12 months for the IORP sector.



Source: EIOPA Insurance Bottom Up Survey Spring 2022 and Autumn 2021.
Note: Based on the responses received. Risks are ranked according to the expectation for the future movements of each exposure (from -2 indicating strongly decrease to +2 indicating strongly increase). The figure shows the aggregation of the average scores assigned to each risk. The results were subsequently normalised on a scale from -100 to 100.

Profitability/Portfolio-performance remains a challenge for the IORPs sector, standing in the third position of the risk assessment (Figure 5.2). Most IORPs recovered the losses experienced after the onset of the Covid-19 pandemic, however the impact of the Russian invasion on the markets could again negatively affect the return of the assets. For Defined Benefit plans this might lead to the need of additional support from sponsors, while for Defined Contribution plans to lower pension accruals. On the other hand, the rising interest rates, observed since the end of 2021, could improve the profitability of fixed-income investments, but this effect will take time to materialise as bonds with higher rates will enter portfolios only gradually.

Macro and digitalisation and cyber risks, which are the main risks in terms of expected increase for the insurance and the IORPs sector, are expected to remain a challenge going forward (Figures 5.6 and 5.7). The prolonged invasion scenario, the increase in volatility and the perceived risk of a

[57] That holds at YE 21, but on the other hand, as discussed in Chapter 2: "*the slowdown growth prospects might be discouraging risk taking and lowering the demand of unit-linked products*".

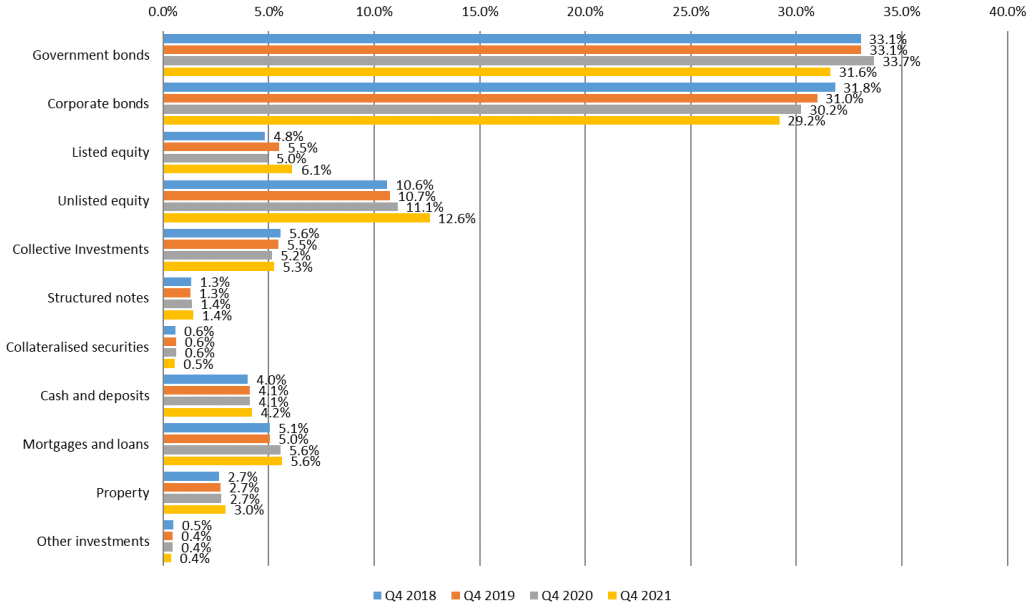
potential market correction could worsen insurers' and IORPs' investment prospects. Also, the risk of cyber threats remains high.

5.2. QUANTITATIVE RISK ASSESSMENT OF THE EUROPEAN INSURANCE AND IORPS SECTORS

This section further assesses the key risks and vulnerabilities for the European insurance and IORPs sectors identified in previous parts of the report. It discusses the breakdown of the investment portfolio and asset allocations with a focus on specific country and sectoral exposures, as well as home bias. The next and final section discusses the impact of the Russia's invasion in Ukraine on insurance and IORPs.

The share of government and corporate bonds decreased by three percentage points from Q4 2020 to Q4 2021. On the other hand, the shares of listed and unlisted equity increased. In principle, these changes are driven by the combination of price and quantity effects. During the last year, there have been strong market movements. Increasing bond yields reduced bond prices, while equity prices increased over the course of the year. Hence, the dynamics of market prices should be the main explanation for the change of portfolio shares.

Figure 5.8: Investment split in Q4 2021 compared to previous year-end for the insurance sector.



Source: EIOPA Quarterly Reporting Solo.
Reference period: Q4 2018-2021.Note: Look-through approach applied. Assets held for unit-linked business are excluded. Equities include holdings in related undertakings. Unlike for equity, in SII reporting data, exposures to corporate bonds cannot be further classified according to their liquidity.

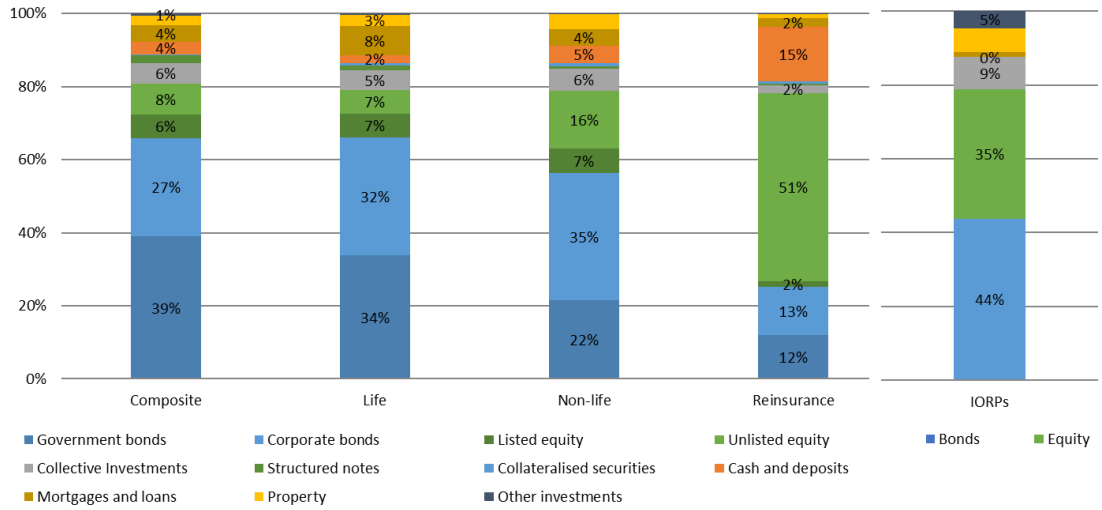
INVESTMENT HOLDINGS

Asset allocations for insurers remained broadly stable on aggregate, with dominant exposures towards fixed income assets and equities. Government and corporate bonds make up around two-

thirds of the total investment portfolio whereas equities (listed and unlisted) follow in terms of materiality (Figure 5.8). This makes insurers' portfolios sensitive to interest rate risk, credit risk and equity risk.

There are significant differences between undertakings. Composite and life insurers invest more in government and corporate bonds, whereas non-life companies are mostly exposed to corporate bonds, government bonds and, in addition, unlisted equities (which are mainly participations). Reinsurers have the highest exposure towards unlisted equities. However, this includes holdings in related undertakings, which account for most of the equities held. Reinsurers also have the largest holdings of cash and deposits (Figure 5.9).

Figure 5.9: Investment split in Q4 2021 by type of undertaking.

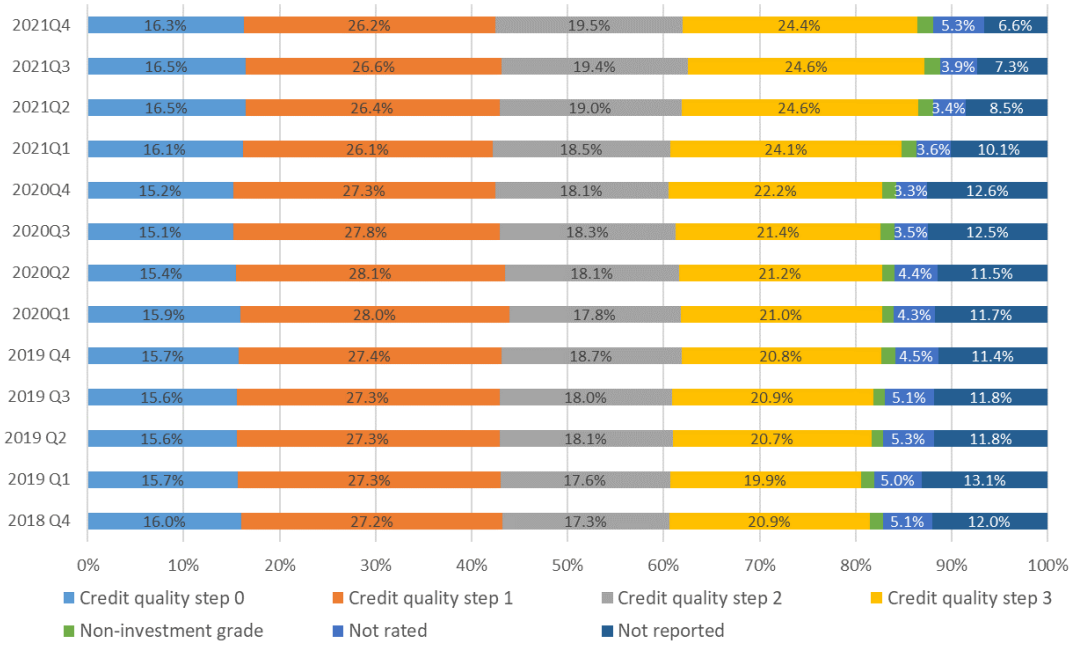


Source: EIOPA Quarterly Reporting Solo and EIOPA IORPs reporting.
Reference date: Q4 2021.
Note: Look-through approach applied. Equities include holdings in related undertakings, which account for most equities held by reinsurers. Assets held for unit-linked business are excluded. Split into government and corporate bonds and listed and unlisted equity for IORPs' collective investments is not available.

Asset allocations for IORPs differ from those of insurers. IORPs have lower exposures towards fixed income assets and higher exposures towards equity and property. EEA IORPs' predominant investment class is bonds which represents 44% of total assets (Figure 5.9). The second most important asset class are equity investments amounting to 35% of the total assets. In this context, IORPs are more affected by equity markets volatility and potential price corrections than insurers. The exposure towards property, mostly in the form of investment in real estate investment funds, is about 6% of total assets.

Investment decisions for insurers and IORPs are difficult amid uncertainty in the financial markets. Volatility of asset prices has increased after Russia's invasion in Ukraine. Large short-term movements in interest rates and credit spreads need to be appropriately factored into investment decisions. Moreover, potentially increased liquidity needs could challenge the asset allocation, as this could increase the risk that assets do not match the characteristics of the liabilities. Furthermore, the uncertainty regarding equity markets and the apparent decoupling from the economic outlook, as well as the uncertainty regarding alternative investments, could increase investment risk when insurers invest in these asset classes.

Figure 5.10: Credit quality of bond portfolio for the insurance sector.



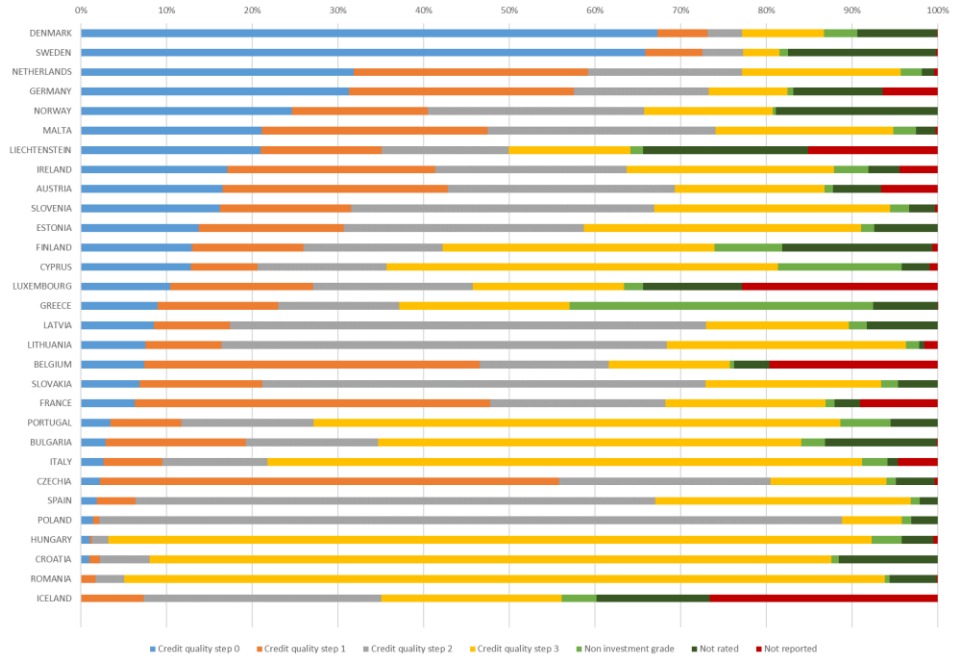
Source: EIOPA Quarterly Reporting Solo.
Reference date: Q4 2021.
Note: Government and corporate bond portfolios combined. Assets held for unit-linked are included.

The concentration in lower quality bonds could potentially be a risk transmission channel. The economic outlook is uncertain and there is a significant downside risk for the corporate sector. This can affect the credit quality of insurer's bond portfolio. The vast majority of bonds held by European insurers are investment grade, with most rated as CQS1 (AA) (Figure 5.10). CQS3 (BBB) bonds amount approximately to 24% of the market value of total bonds held, anincrease compared to last year. These bonds are subject to the risk of being downgraded below investment grade. A massive rating downgrade could significantly impact the market value of the asset portfolio and, at the same time, potentially increase the solvency capital requirement for spread risk.

For the majority of bonds (60%) held by European IORPs, the information on credit quality is missing in the reported data. Data quality is expected to improve in the next rounds of reporting.

The level of concentration of insurers' exposures to low quality bonds differs greatly between countries. In Denmark, Sweden, Germany and Netherlands more than 50% of corporate bonds are CQS 0 (AAA) or CQS 1 (AA) (Figure 5.11). On the contrary, in other countries, such as Spain and Italy, this share is below 10%. The main reason for this cross-country difference is the rating of the home sovereign, which influences the rating of local corporates. Insurers tend to prefer to hold domestic corporate bonds (see next subsection on home bias). The credit quality split alone provides only a partial picture of investment risk. In particular, it also depends on the diversification within the credit quality steps of the bond portfolio.

Figure 5.11: Credit quality of bond portfolio across countries for the insurance sector.



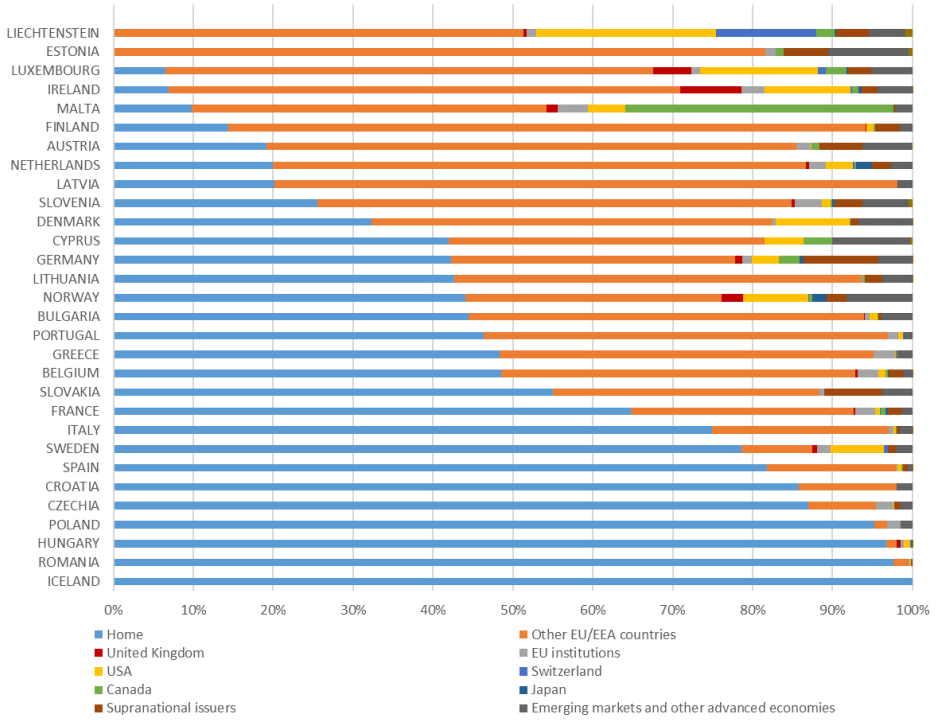
Source: EIOPA Quarterly Reporting Solo.
Reference date: Q4 2021.
Note: Government and corporate bond portfolios combined. Assets held for unit-linked are included.

HOME BIAS

Insurers hold a sizeable proportion of bonds issued by counterparties in their home country. This implies concentration risks. The economic shock as a consequence of the Russian invasion differs across countries. Certain countries are more affected by a reduction in economic growth. A geographical investment focus amplifies the concentration risk of the insurance and the IORPs sectors, both of which have significant home bias in bond investments. The insurers' holdings of government bonds continue to show significant home bias (Figure 5.12). In most countries, more than 30% of the government bonds held by insurers is issued by the home sovereign. This holds in particular for large countries with a deep sovereign bond market, but also for many smaller jurisdictions.

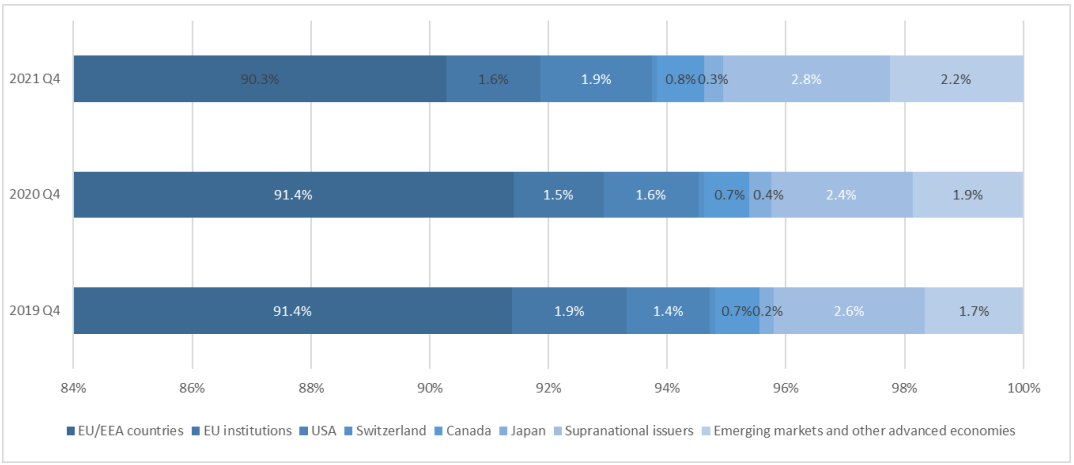
Looking at the EEA aggregate, most government bonds held by insurers are from EEA countries. The share of non-EAA government bonds has slowly increasedto a low level of 8% (Figure 5.13). US government bonds have the largest share among non-EAA bonds with 2%, observing a slight increase compared to the last year. The share of investments in emerging markets and other advanced economies is only 2.2%, registering also a slight increase compared to last year. Although emerging markets could be explored in the search for higher yields, they could be a potential source of risk due to higher volatility and lower stability of the economies, also as a consequence of geopolitical tensions. For details on the asset exposure to Russia, Ukraine and Belarus see the next subsection.

Figure 5.12: Holdings of government bonds by issuer country for the insurance sector.



Source: EIOPA Quarterly Reporting Solo.
Reference date: Q4 2021.
Note: Look-through approach is not applied. Assets held for unit-linked business are included.

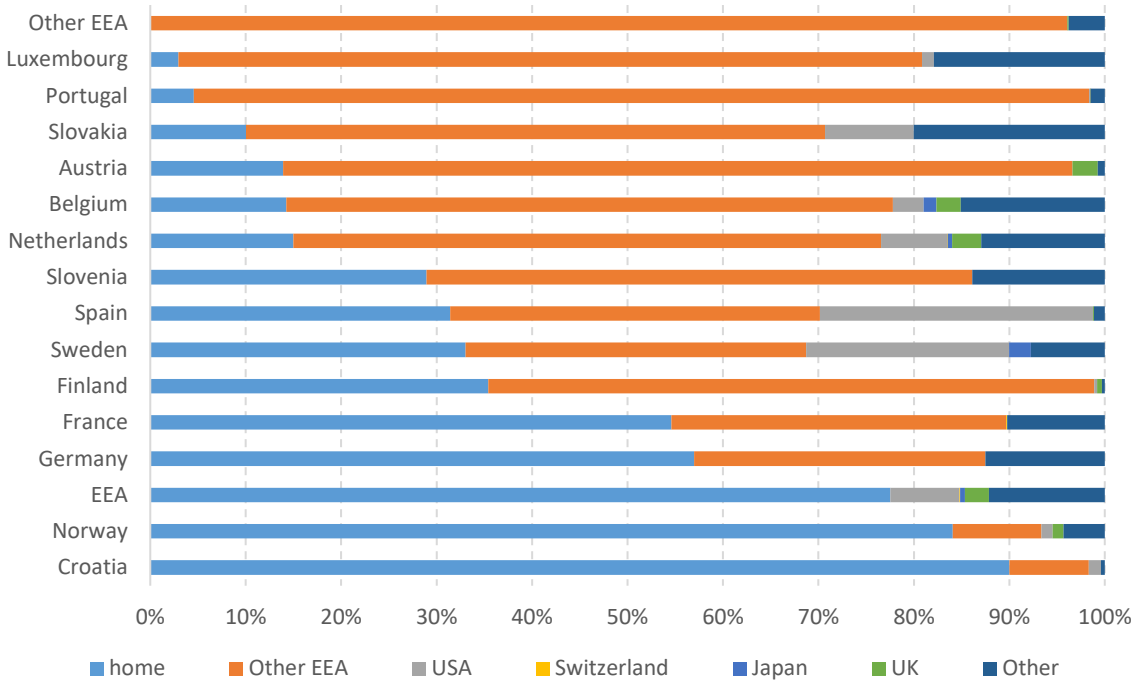
Figure 5.13: Overall government bonds exposures to different countries for the insurance sector.



Source: EIOPA Quarterly Reporting Solo.
Reference period: Q4 2019-2021.
Note: Look-through approach is not applied. Assets held for unit-linked business are included.

IORPs also invest a large share in domestic government bonds, albeit to a lesser extent than insurers (Figure 5.14). In addition, IORPs invest a larger share in U.S. sovereign bonds (7%) than insurers.

Figure 5.14: Holdings of government bonds by issuer country for the IORPs sector.

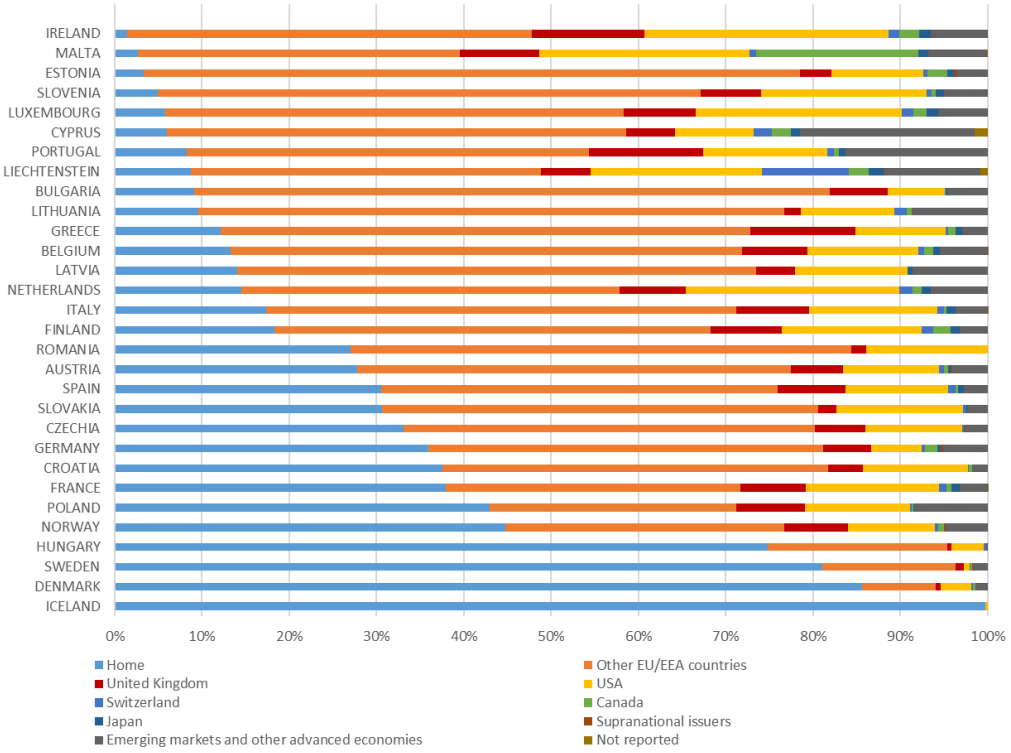


Source: EIOPA IORPs reporting.
Reference date: Q4 2021.

Note: Look-through approach is not applied.

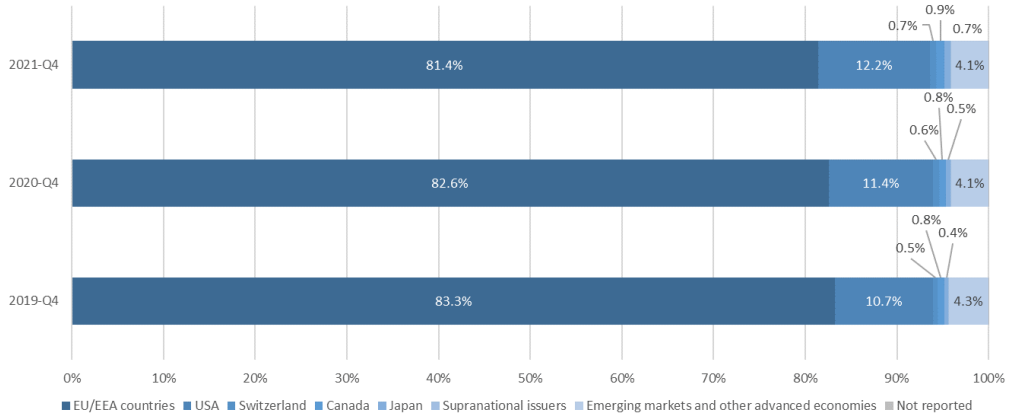
Insurers' home bias for corporate bonds is lower compared to government bonds. This holds for most countries (Figure 5.15). Insurers invest approximately 80% of the aggregate portfolio in EEA countries and 12% in US markets, the largest and most liquid corporate bond market in the world. The share of U.S. corporate bond investments has slightly increased compared to last year and the year before (Figure 5.16). It is significantly higher than for government bonds. The share of corporate bonds from emerging markets and other advanced economies is 4% and mostly stable over time.

Figure 5.15: Holdings of corporate bonds by issuer country for the insurance sector.



Source: EIOPA Quarterly Reporting Solo.
Reference date: Q4 2021.
Note: Look-through approach is not applied. Assets held for unit-linked business are included.

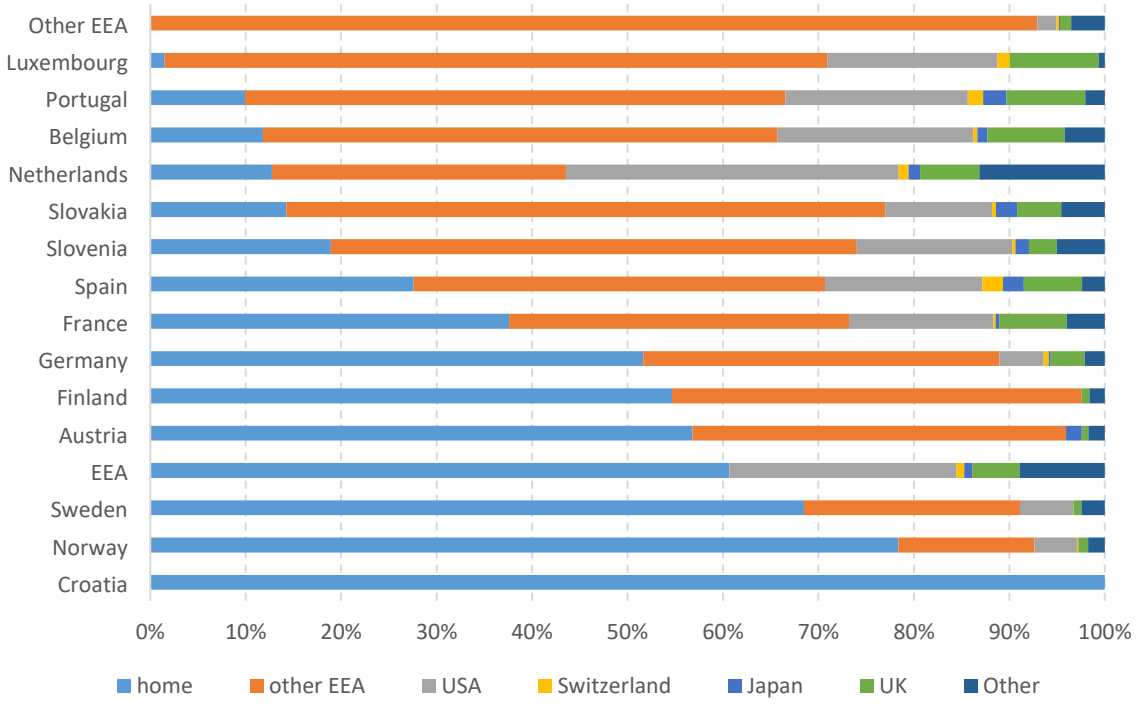
Figure 5.16: Overall corporate bonds exposures to different countries for the insurance sector.



Source: EIOPA Quarterly Reporting Solo.
Reference period: Q4 2019-2021.
Note: Look-through approach is not applied. Assets held for unit-linked business are included.

IORPs also invest a large share in domestic corporate bonds. On an EEA level, 64% of the corporate bonds held by IORPs are issued by companies from the EEA Member States. 20% of the corporate bonds held by IORPs are issued by US companies. The share of UK corporate bonds is 5%. Hence, IORPs diversify more internationally than insurers with regards to corporate bonds. This is a similar pattern as for government bonds. For the two countries with the largest IORPs sectors, Netherlands and Germany, domestic investment in corporate bonds is slightly less than for the insurance sector (Figure 5.17).

Figure 5.17: Holdings of corporate bonds by issuer country for the IORPs sector.

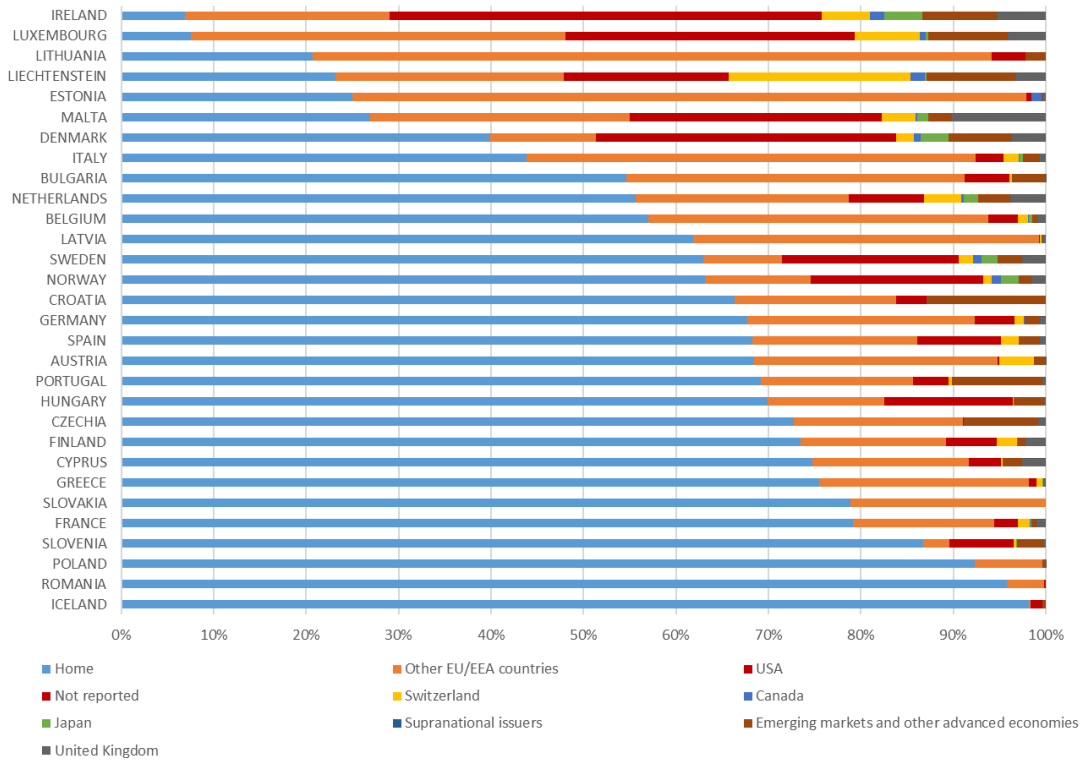


Source: EIOPA IORPs reporting.
Reference date: Q4 2021.
Note: Look-through approach is not applied

Insurers' and IORPs' equity investments also show high degree of home bias (Figures 5.18 and 5.19). The share of domestic investments is for equity higher than for bonds. For insurers, equity exposures towards EEA countries decreased compared to last year, while the share of US equity increased significantly over the last two years (Figure 5.21). This could be explained by the strong performance of the U.S. stock market over this period.

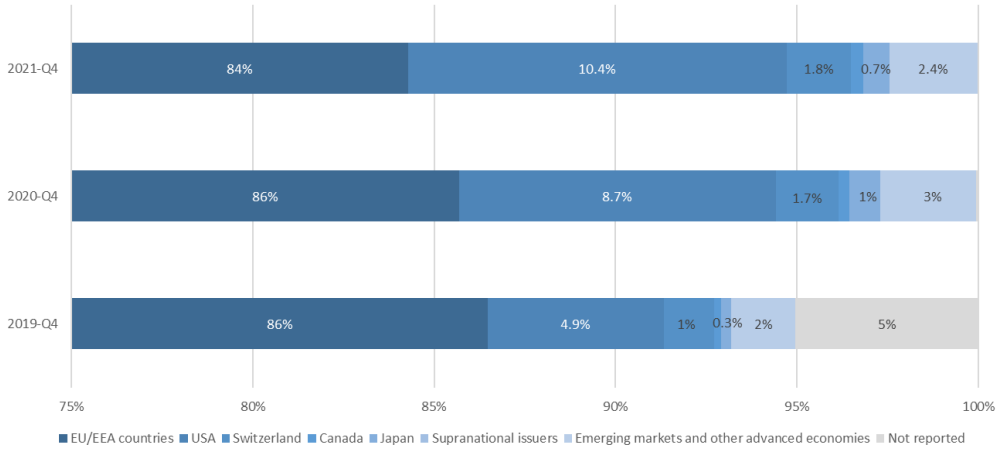
When looking at IORPs' equity investments it stands out markedly that the share of US equity is very high, 43% of the total (Figure 5.20). This is much higher than in the case of insurers (10.4% in Q4 2021). This might be related to a more favourable treatment of currency risk in the determination of capital requirements.

Figure 5.18: Holdings of equity by issuer country for the insurance sector.



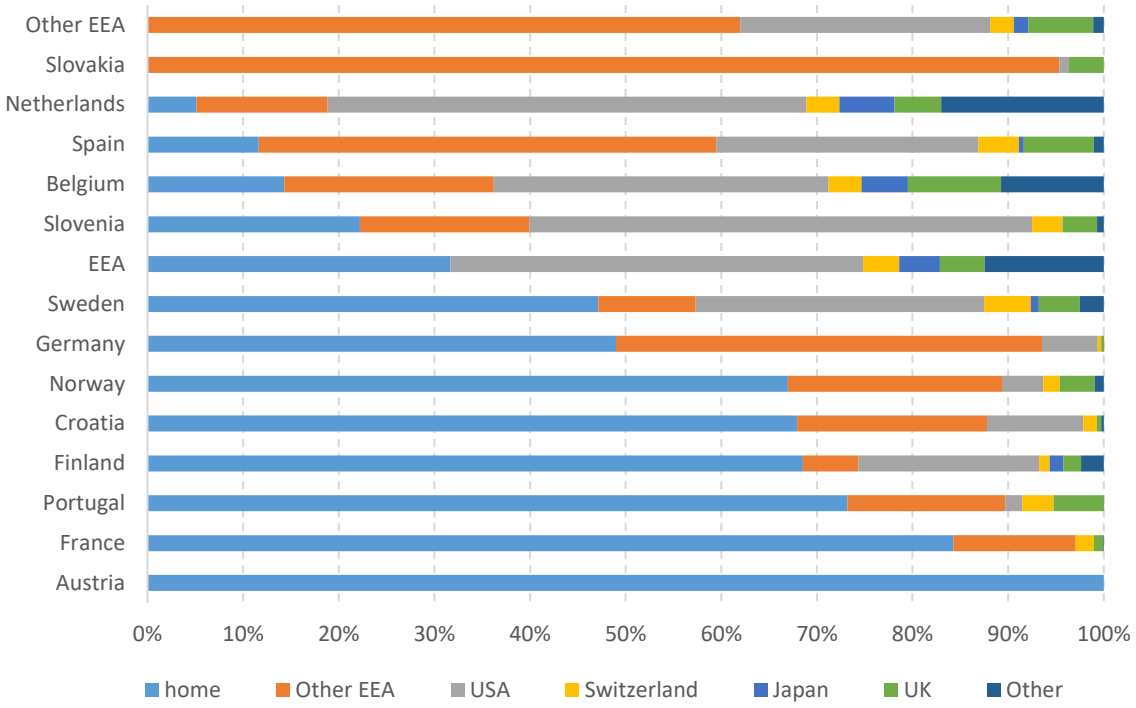
Source: EIOPA Quarterly Reporting Solo.
Reference date: Q4 2021.
Note: Look-through approach is not applied. Assets held for unit-linked business are included.

Figure 5.19: Overall equity exposures to different countries for the insurance sector.



Source: EIOPA Quarterly Reporting Solo.
Reference period: Q4 2019-2021.
Note: Look-through approach is not applied. Assets held for unit-linked business are included.

Figure 5.20: Holdings of equity by issuer country for the IORP sector.



Source: EIOPA IORPs reporting.
Reference date: Q4 2021.
Note: Look-through approach is not applied.

EEA INSURERS' TRADING ACTIVITY DURING 2020 AND 2021

In 2021, insurers net buy a modest amount of corporate bonds issued by non-banks. An analysis of insurers' trading activity shows that, historically, insurers tend to be net buyers of corporate bonds (Figure 5.21).[58, 59] Throughout the sample, up to Q4 2019, average quarterly net purchases of corporate bonds issued by non-banks are EUR 11.8 bn. (+1.4% of initial quarter positions).[60] In 2020, insurers remain net buyers of non-bank corporate bonds. Average net buys are EUR 8.7 bn. (0.9% of the initial quarter position). The amount was higher than the historical average in the first half of 2020 but then slowed down significantly. In 2021, insurers were only net buyers of a modest amount of 3.6 EUR bn. (on average +0.4% of initial quarter positions).

An explanation for lower net buys after Q3 2020 may be on the supply side. There have been record issuances of corporate bonds in Q2 2020 with a significant reduction in issuances over the course of the year. In parallel, purchases of non-bank corporate bonds peaked in Q2 2020 and have

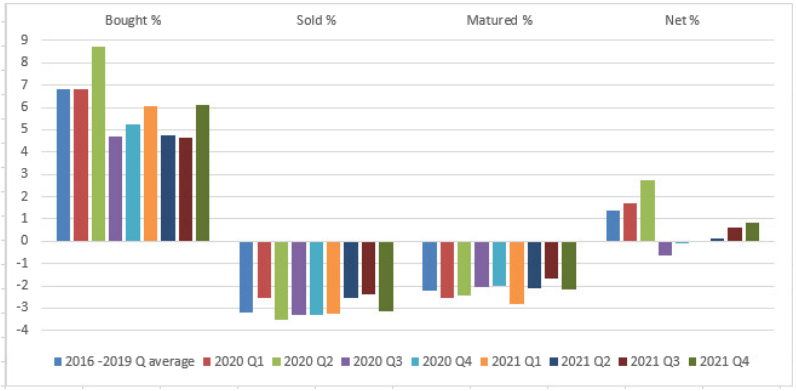
[58] Net buying is calculated as the difference between purchased, sold and matured bonds.

[59] In the analysis of trading activity, no-look-through is applied and only direct holdings are considered because only for these purchased and sold quantities can be calculated using item-by-item Solvency II reporting data. The analysis is based on quarter-end asset holdings, transactions within the quarters which are not reflected at the quarter-end cannot be observed. All aggregate numbers exclude the United Kingdom and therefore differ from the numbers reported in the Financial Stability Review December 2020. For the methodology see also EIOPA Financial Stability Review December 2020 chapter 2.

[60] For details on bank bonds please refer to subsection on insurers' exposure to the banking sector.

been lower since. It could be the case that insurers used the record issuances in Q2 to load-up corporate bonds and in this process they reached or increased their target holdings. Low purchases from 2020 Q3 onwards could be a re-adjustment.

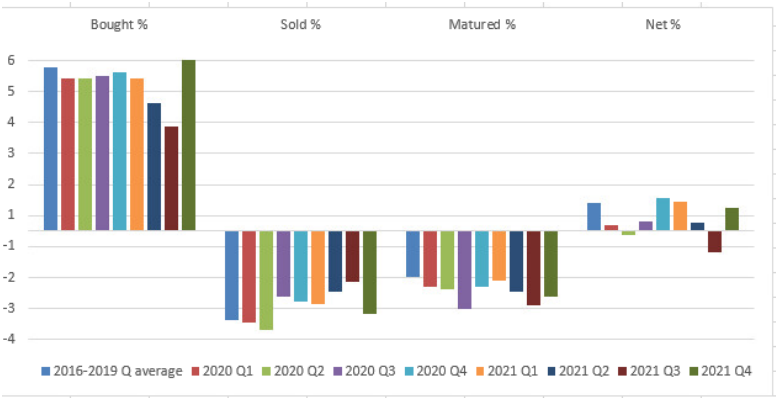
Figure 5.21: Insurers' quarterly trading activity of corporate bonds issued by non-banks.



Source: EIOPA Quarterly Solo and EIOPA calculations.
Reference period: 2016 Q1 to Q4 2021.
Figures are in % with respect to the initial quarter Solvency II market value of the positions.

Insurers' net purchases of government bonds in 2021 exceeds net purchases of non-bank corporate bonds. Historically, insurers tend to be net buyers of government bonds (Figure 5.22). Up to Q4 2019 average quarterly government bond net purchases are EUR 18.0 bn. (+0.9% of initial quarter positions). This decreased for the last two years. In 2021, average quarterly government bond net purchases are EUR 6.8 bn. (+0.3% of initial quarter positions). This number is lower than the historical average, but not to the extent down as the purchase of non-bank corporate bonds.

Figure 5.22: Insurers' quarterly trading activity of government bonds.



Source: EIOPA Quarterly Solo and EIOPA calculations.

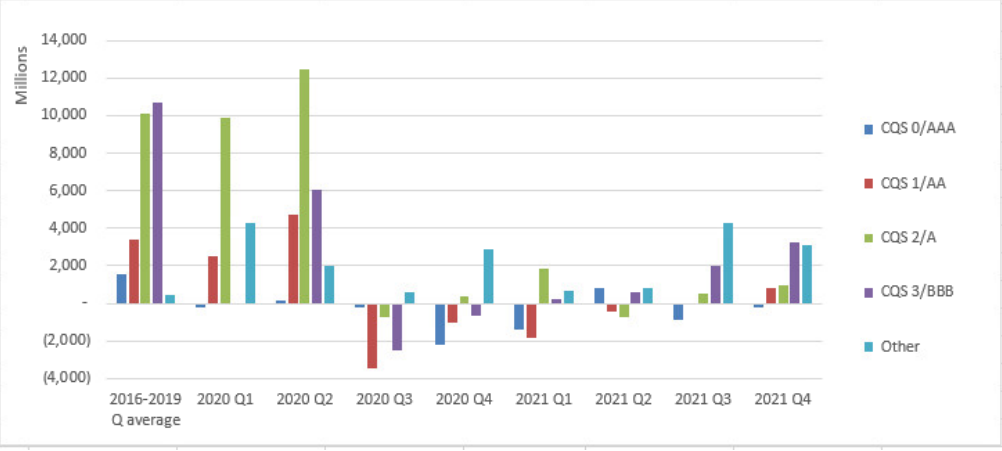
Reference period: 2016 Q1 to Q4 2021.
Figures are in % with respect to the initial quarter Solvency II market value of the positions.

With regards to ratings, insurers have reshuffled their non-bank corporate bond portfolios in 2020 and 2021. In the years 2016-19, non-bank corporate bonds net purchases have mostly an A or BBB rating (Figure 5.23). Accordingly, these rating classes dominate in insurers' portfolios. In 2021, insurers were net sellers of AAA and AA bonds. Instead, they were net buyers of bonds rated A, but to a low extent compared to the historical average. BBB rated were bought more in 2021 than in

2020, but lower than the historical average. In the last two quarters of 2021, insurers bought over-proportionally not-rated or below investment grade rating bonds.

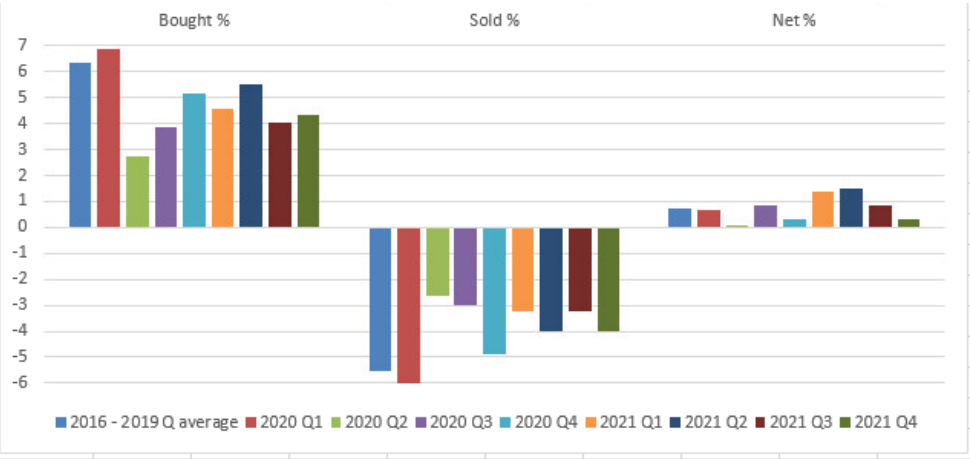
Insurers are net buyers of equity in 2021 (Figure 5.24). Up to 2019 average equity net purchases are EUR 4.7 bn. (+0.7% of initial quarter positions). Insurers also remain net buyers of equity in 2020, but the net buys are lower than the historical average. On the contrary, net buys in 2021 are above the historical average with EUR 8.8 bn. (+1.0% of initial quarter positions).

Figure 5.23: Insurers' quarterly net-buying or selling of non-bank corporate bonds by rating.



Source: EIOPA Quarterly Solo and EIOPA calculations.
Reference period: 2016 to Q4 2021.
Figures are million Euros.

Figure 5.24: Insurers' quarterly trading activity of equity.



Source: EIOPA Quarterly Solo and EIOPA calculations.
Reference period: 2016 to Q4 2021.
Figures are in % with respect to the initial quarter Solvency II market value of the positions.

EXPOSURE TOWARDS THE BANKING SECTOR

The insurance sector is interconnected with the banking sector through investments exposures. At the end of 2021, on average approximately 13% of insurers' total investments is concentrated

towards banks (Table 5.25). This is a slight reduction (14% in 2019, 16% in 2020). The cross-country differences are large. A significant exposure towards the banking sector could potentially become a channel of risk transmission and contagion. At the same time, insurers could have a stabilizing effect on the bank sector, and hence on financial markets as a whole, as they are usually long-term investors and tend to trade less to short-term market fluctuations than other investors (see also EIOPA FSR December 2021 chapter "Contagion Risk Analysis of the Impact of a Bank's Failure on the Insurance Sector"). [61]

Figure 5.25: Exposures towards banks as a percentage of total investments at country level for the insurance sector.

Country	% Exposure to banks	Country	% Exposure to banks
EU/EEA average	**13%**	ITALY	7%
AUSTRIA	14%	LATVIA	16%
BELGIUM	7%	LIECHTENSTEIN	26%
BULGARIA	10%	LITHUANIA	14%
CROATIA	8%	LUXEMBOURG	17%
CYPRUS	23%	MALTA	13%
CZECHIA	15%	NETHERLANDS	11%
DENMARK	26%	NORWAY	18%
ESTONIA	41%	POLAND	12%
FINLAND	19%	PORTUGAL	12%
FRANCE	11%	ROMANIA	14%
GERMANY	15%	SLOVAKIA	16%
GREECE	13%	SLOVENIA	10%
HUNGARY	6%	SPAIN	10%
ICELAND	21%	SWEDEN	26%
IRELAND	16%		

Source: EIOPA Quarterly Reporting Solo.
Reference date: Q4 2021.
Note: The data presented is obtained by restricting the issuer with the NACE codes K64.1.9 and K64.9.2. Unit-linked and index-linked data have been excluded. Exposures refer to the following banks' assets: equity, bonds, cash and deposits, structured notes, collateralised securities, mortgages and loans and other investments. Notice that only for direct investment holdings it is possible to identify exposures to banks; hence exposures towards banks via investment funds are not included. The blue colour highlights the lowest exposures towards banks while the red colour highlights the highest exposures towards banks. Look-through approach is not applied.

The IORPs sector exposure towards the banking sector is also material. At the end of 2020, on average approximately 11% of IORPs total investments is concentrated on exposures towards banks

[61] To better shed light on the interconnectedness between the insurance and the banking sector, EIOPA is collaborating with the Single Resolution Board (SRB). Based on scenarios of shocks to European banks, EIOPA and the SRB simulate potential losses to insurers' investments in banks under consideration of the specific bank liability structure and the liability cascade. This makes it possible to monitor the amount of investment losses of European insurers in case of a shock to the banking sector, or to specific banks.

(Table 5.26). There is a large dispersion in the relevance of holdings of assets issued by banks across countries.

Corporate bonds are the most important asset class issued by banks in which insurers invest. The second largest category is cash and deposits (Figure 5.27). Bank equity represents only a small share.

Figure 5.26: Exposures towards banks as a percentage of total investments at country level for the IORPs sector.

Country	% Exposure to banks
EEA (w)	6%
EEA (un-w)	11%
AT	3%
BE	2%
DE	15%
DK	30%
ES	7%
FI	7%
FR	8%
HR	3%
LU	0%
LV	11%
NL	3%
NO	13%
PL	28%
PT	12%
SE	14%
SI	13%
SK	11%

Source: EIOPA IORPs reporting.
Reference date: Q4 2021.
Note: The data presented is obtained by restricting the issuer with the NACE codes K64.1.9 and K64.9.2. Exposures refer to the following asset classes issued by banks: equity, bonds, cash and deposits, structured notes, collateralised securities, mortgages and loans and other investments. Notice that only for direct investment holdings it is possible to identify exposures to banks; hence exposures towards banks via investment funds are not included. The blue colour highlights the lowest exposures towards banks while the red colour highlights the highest exposures towards banks. Look-through approach is not applied.

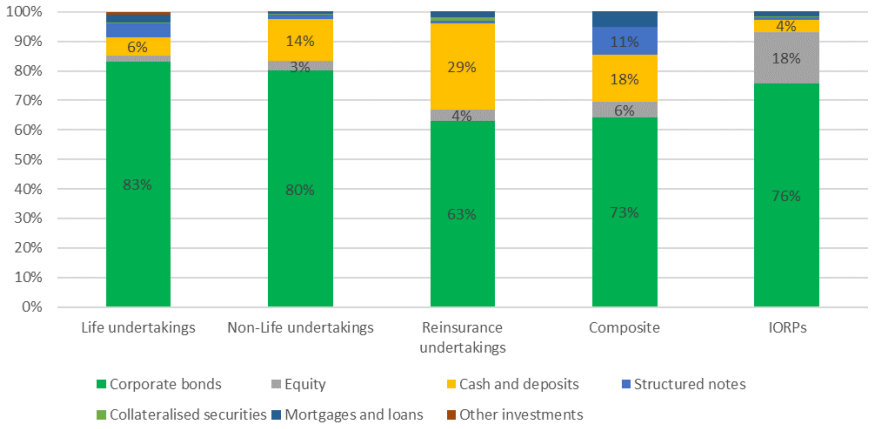
Bonds are also the most important asset class issued by banks in which IORPs invest, similarly to insurers (Figure 5.27). The second largest category is the one of equity, which at the end of 2020 accounted for approximately 18% of the bank assets held by IORPs, which is considerably higher than insurers' investments in bank equity.

The risk associated to the various types of bank bonds differs widely. Covered bonds (i.e. secured bonds) is the largest subcategory of insurers' bank bonds held with a share of 45% of total bank bonds, these bonds are characterised by low risk (Figure 5.28). The second largest subcategory is the one of senior bonds (unsecured), which at the end of 2020 were accounting for approximately 44% of the bank bonds. It is the most junior bonds that are first in line to be facing the losses when creditors are "bailed in". Junior bonds include subordinated bonds, hybrid bonds and convertible

bonds, which amount to 8% of the total exposure to bank bonds. Finally, insurers have substantial cash and deposit exposures. An additional type of exposure is the one on derivatives with positive Solvency II values (where the bank owes to the insurer), but these positions are collateralised, therefore the counterparty risk is taken care off so this type of risk exposures is not dependent on the creditworthiness of the bank.

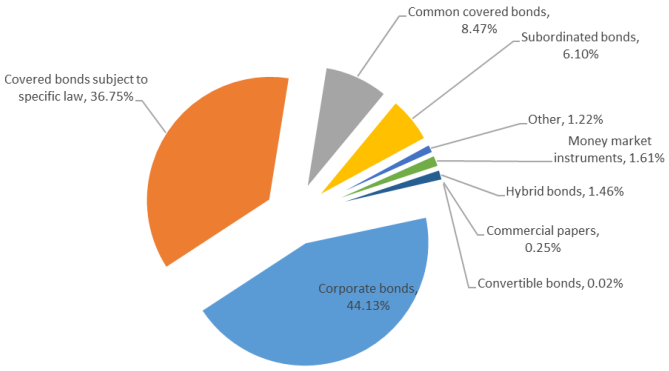
Negative effects could be amplified with high concentration of subordinated bank bonds. The breakdown of insurers' bond portfolio by country reveals some degree of concentration of subordinated bonds (Figure 5.29). This could be a potential risk transmission channel, if the banking sector for certain countries faces severe challenges.

Figure 5.27: Exposures to banks by type of instruments and type of business.



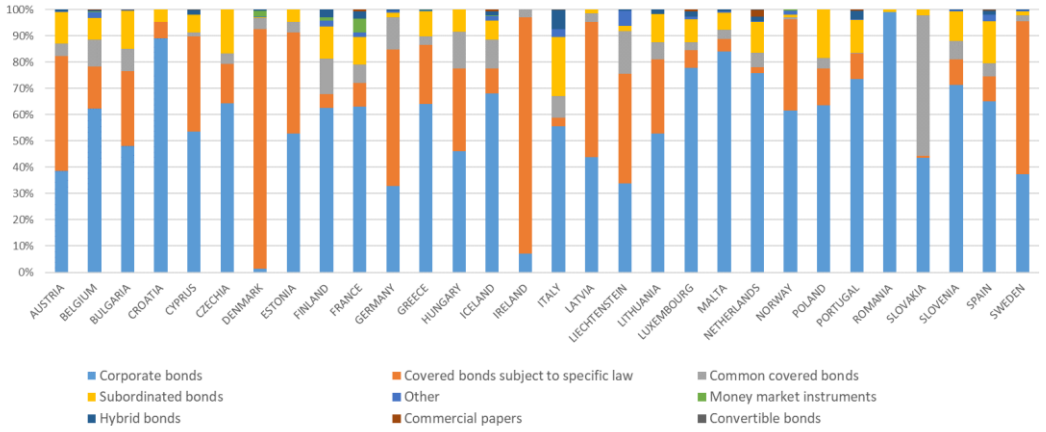
Source: EIOPA Quarterly Reporting Solo and IORPS reporting.
Reference date: Q4 2021.

Figure 5.28: Breakdown of exposures to bank corporate bonds for the insurance sector.



Source: EIOPA Quarterly Reporting Solo.
Reference date: Q4 2021.
Note. The subcategory corporate bonds, i.e. CIC 21, represents senior unsecured bonds, both preferred and non preferred as in Solvency II it is not possible to distinguish them.

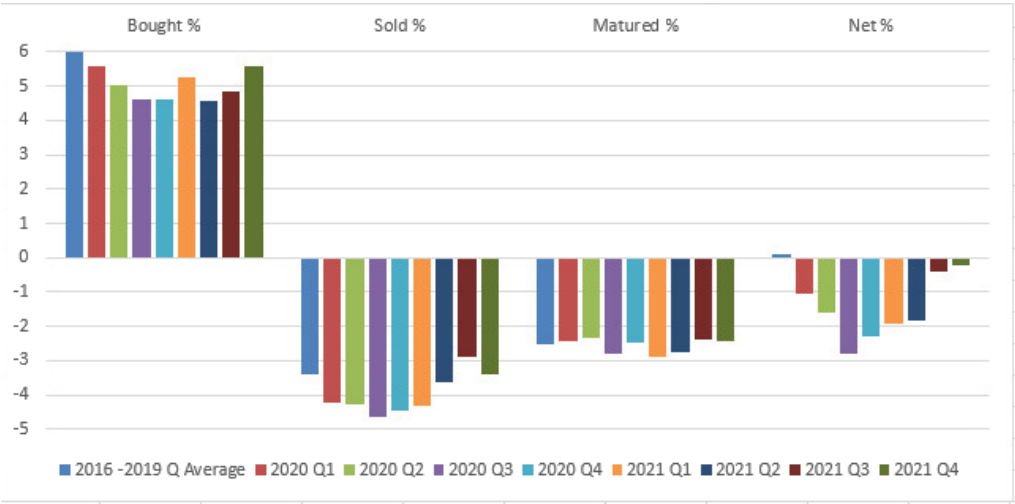
Figure 5.29: Breakdown by subcategories of exposures to bank corporate bonds (CIC2) by country for the insurance sector.



Source: EIOPA Quarterly Reporting Solo.
Reference date: Q4 2021.

Trading activity shows that insurers have been moving away from the banking sector. Trading activity on bank bonds shows a trend of reducing exposures from the second quarter of 2019 onwards. This trend has gained momentum in 2020 as European insurers moved out of banks bonds during the pandemic (Figure 5.30).[62]

Figure 5.30: Insurers' quarterly trading activity of corporate bonds issued by banks.



Source: EIOPA Quarterly Solo and EIOPA calculations.

In 2021, insurers' net sold EUR 8.7 bn. (-1.1% of the initial quarterly holdings). The net sales are the result of both reduced buying and increased selling. These net sales revert the trend of previous

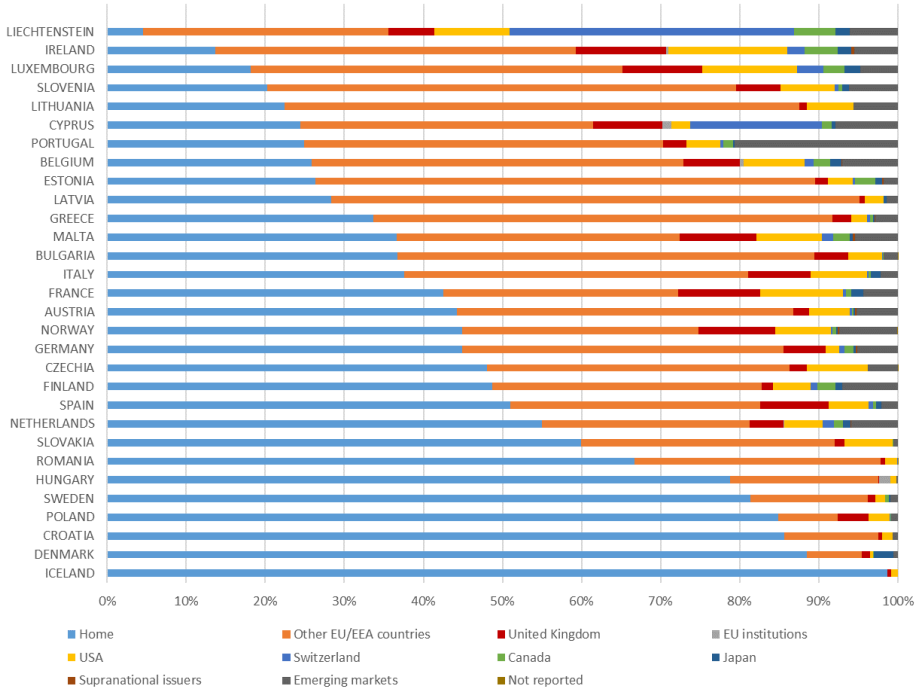
[62] All numbers are neither unit-linked nor index-linked and exclude the United Kingdom. In the analysis of trading activity, no-look-through is applied and only direct holdings are considered because only for these can purchased and sold quantities be calculated using item-by-item Solvency II reporting data.

years. European insurers have been net buyers of bank bonds between the years 2016 to 2019 albeit only to a small extent. However, in the second half of 2021, net sales of bank bonds were significantly lower than in the previous quarters of 2020 and 2021.

The reduction of the exposure to bank bonds in 2020 and 2021 could be the result of de-risking through sector rotation. The financial turmoil in the beginning of 2020 highlights the vulnerabilities in the banking sector – in particular when compared to those corporate bonds issued by sectors less affected by the pandemic. In this situation, insurers might have shifted from bank bonds to other corporate bonds with the aim to reduce sectoral risk. Another explanation may be on the supply side. There have been record issuances of corporate bonds in 2021 by non-financial firms, which is not observed for issuances of bank bonds.[63]

Insurers tend to invest predominantly in the domestic banking sector, albeit with a declining share. The share of the domestic banking sector differs across countries (Figure 5.31).

Figure 5.31: Exposure towards the banking sector, domestic versus cross-border in % for the insurance sector.



Source: EIOPA Quarterly Reporting Solo.
Reference date: Q4 2021.
Note: The data presented is obtained by restricting the issuer with the NACE codes K64.1.9 and K64.9.2. Unit-linked and index-linked data have been excluded. Exposures refer to the following asset classes issued by banks: equity, bonds, cash and deposits, structured notes, collateralised securities, mortgages and loans and other investments. Notice that only for direct investment holdings it is possible to identify exposures to banks; hence exposures towards banks via investment funds are not included.

[63] ECB Statistical Data Warehouse, Net issues of debt securities by euro area non-financial corporations vs. Net issues of debt securities by euro area MFIs.

A comparison of the aggregate holdings of assets issued by the domestic banking sector relative to assets issued by cross-border banks reveals that over the last years the share of assets invested in the domestic bank sector decreased. Investment in the domestic banking sector could imply that if a specific country is heavily impacted by the pandemic, the effect could be amplified for an insurer with a high concentration in the banking sector of that specific country. It is noteworthy that insurers hold also large amounts of domestic government bonds and that the creditworthiness of the banking sector is tightly linked to the one of the local government and vice versa (the so called "sovereign bank nexus"). For these reasons, in some countries, a potential materialisation of risk exposures to the banking sectors could be amplified.

5.3. IMPACT OF THE RUSSIA'S INVASION OF UKRAINE ON INSURERS AND IORPS

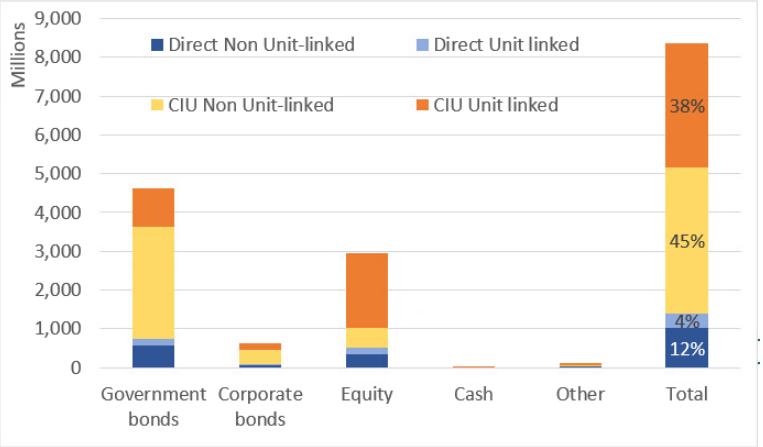
This chapter analyses European insurers' and IORPs' vulnerabilities to the economic shock triggered by Russia's invasion in Ukraine. It first presents and analyses the asset exposures of insurers and IORPs towards Russia, Ukraine and Belarus. Then, it assesses the exposure through liabilities and subsidiaries. This is followed by an analysis of vulnerability through derivative exposures. Finally, this section examines potential second-round effects. In this respect, three aspects related to asset exposures are covered. First, exposures to banks in Russia that are excluded from SWIFT. Second, exposures to European banks, which are assumed to be the most impacted by the ongoing crisis. And third, exposures to sectors sensitive to energy and gas prices. This part concludes with an assessment related to cyber risk.

ASSET EXPOSURE

EU insurers hold only limited assets issued in Russia, Ukraine and Belarus. Those assets amount to EUR 8.3 bn, which is less than 0.1% of the total investments. The exposure to Russia is EUR 6.3 bn, which is 0.066% of total investments and the asset exposure to Ukraine is EUR 1.8 bn, which is 0.019% of total investments. The exposure to Belarus is negligible.

Most of the investments towards Russia are not direct exposures but through investment funds. Only 16% of total investments issued in Russia are direct holdings. Two asset classes are relevant as direct investments: sovereign bonds mainly backing non-unit-linked portfolios (EUR 2.9 bn) and equity mainly backing unit-linked portfolios (EUR 2.8 bn). Within funds, the largest asset classes are represented by sovereign bonds that are mainly associated with traditional life portfolios, and equities associated to unit-linked portfolios (Figure 5.32).

Figure 5.32: Investment exposure towards Russia, Ukraine and Belarus for the insurance sector.



Source: EIOPA Quarterly Reporting Solo.
Reference date: Q4 2021.

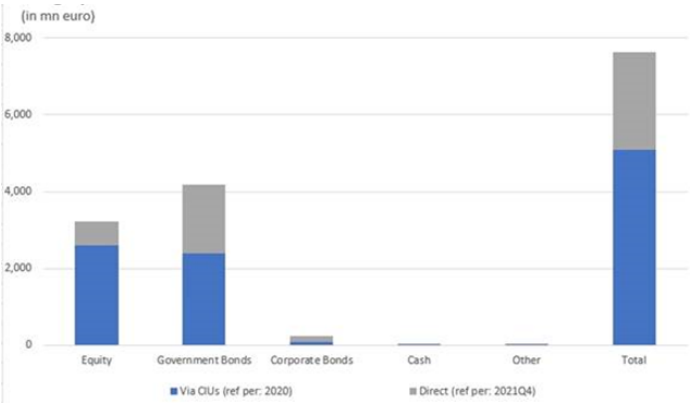
A large share of investments to Russia, Ukraine and Belarus (42%) is index- and unit-linked. Plain unit-linked products transfer market risks to policyholders limiting direct consequences to undertakings but generating direct impacts from the markets to policyholders. Therefore, risks to insurers' balance sheets are limited to non-unit-linked assets.

The direct exposure is clustered in a few sectors. More than 50% of direct investments in Russia and Ukraine is in the sector public administration, defence and compulsory social insurance; these are mostly sovereign bonds. For Russia, around 26% of investments are in the financials and insurance sector. Other relevant sectors are mining and quarrying (9%) and manufacturing (8%). Other sectors are of minor importance. For Ukraine, assets have a large share in the sectors public administration, defence and compulsory social insurance (approximately 58%) and financials and insurance (approx. 33%).

With regards to IORPs, the asset exposures are limited as well, with EUR 7.5 bn. In absolute numbers this is similar to the exposure of the insurance sector. It is worth noting that the size of the IORPs total investment is smaller with respect to the insurance sector which brings the relative exposure to 0.23% of the total IORPs investments (Figure 5.33). In detail, total investments to Russia, Belarus and Ukraine are EUR 5.8 bn, 0.22% of total investments, EUR 0.08 bn, 0.003% of total investments and EUR 1.63 bn, 0.06% of total investments, respectively.

As in insurance, few sectors dominate the asset exposure. For Russia, 61% of assets are in the public sector, 12% in mining, 11% in manufacturing and 9% in information and communication. For Ukraine, 98% of asset exposure is in the public sector.

Figure 5.33: Investment exposure towards Russia, Ukraine and Belarus for the IORPs sector.



Source: EIOPA IORPs reporting.
Reference date: Q4 2021.

The limited asset exposures would cause a minor impact on insurers in case of adverse developments. This assessment is based on simulations using two scenarios which assume haircuts applied on the insurers' assets in Russia. The first scenario assumes haircuts of 50% for government bonds, 70% for corporate bonds and 100% for equity. The second scenario assumes the worst case, namely a full loss on all asset exposures. These scenarios result in a drop in the aggregate solvency ratio respectively by 0.3 p.p. to 235.7% and by 0.5 p.p. to 235.5%.

For IORPs, the limited exposures would also cause only a minor impact. According to the preliminary simulations based on the same two scenarios applied to insurers, the drop in the assets over liabilities ratio is limited to 0.17 p.p. and 0.22 p.p., respectively.

The asset exposure to banks excluded from SWIFT is negligible. Risks might emerge from the exclusion of a number of Russian banks from the SWIFT system (Bank Otkritie, Novikombank, Promsvyazbank, Rossiya Bank, Sovcombank, VNESHECONOMBANK (VEB) and VTB BANK). However, European insurers hold only very limited amounts of assets issued by those banks. Only two undertakings have assets issued by one bank out of the seven banks mentioned.

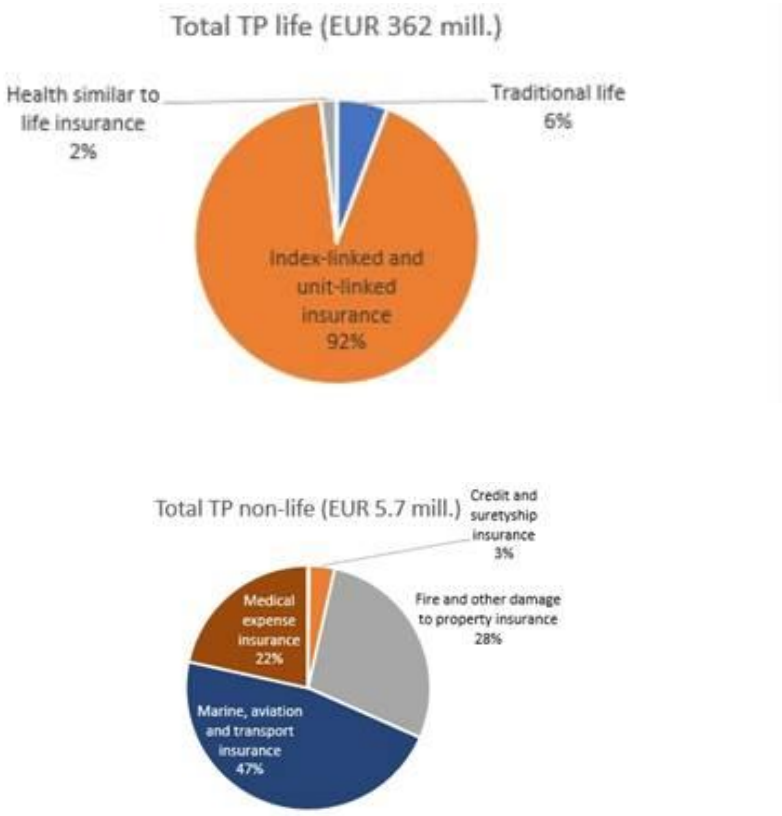
LIABILITIES SIDE AND SUBSIDIARIES INSURERS

European insurers have limited activities in the Russian, Ukrainian and Belarusian markets. A low number of EEA groups are active in those countries through subsidiaries. Their size in terms of total assets is minimal if compared to the total assets of the groups. Underwriting activities cover life and non-life business in Russia, whereas it is limited to non-life business in Ukraine. In detail, in Russia EEA groups have 28 subsidiaries with total assets of EUR 3.2 bn, which is 0.04% of groups' total assets. In Ukraine, 7 EEA groups have 27 subsidiaries with total assets of EUR 0.6 bn, 0.05% of groups' total assets. In Belarus, 2 EEA Groups have 3 subsidiaries with total assets of EUR 0.3 bn which is 0.06% of groups' total assets.

In terms of liability portfolios the exposures are limited, too. Total technical provisions in Russia, Ukraine and Belarus are EUR 0.36 bn, mostly concentrated in the life business. More than 90% of

this is index-linked and unit-linked insurance (Figure 5.34). The volume of the technical provisions is negligible when compared to the total technical provisions of the groups. In detail, for life it is EUR 0.36 bn (0.005% of total technical provisions), for non-life EUR 0.06 bn (0.002% of total technical provisions).

Figure 5.34: Technical provisions (life and non-life) in Russia, Ukraine and Belarus for the insurance sector.



Source: EIOPA Annual Reporting Solo.
Reference date: 2020.

DERIVATIVES EXPOSURE

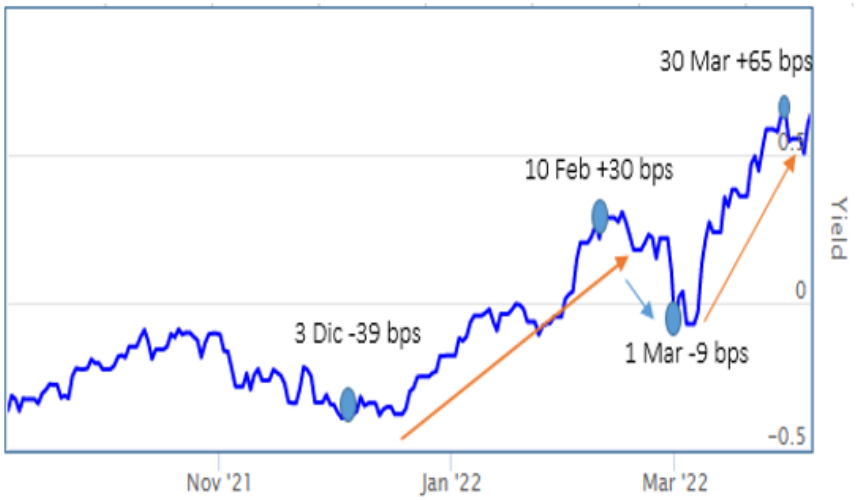
Major movements where observed on derivatives linked to commodities and energy related commodities. In any case, direct implications of Russia's invasion of Ukraine on insurers are not material as derivative exposures to commodities, to energy related commodities, to corporate and sovereign credit are very limited.

Interest rate derivative exposures and related potential margin calls might be a source of concerns for insurers. Insurers are sensitive to margin calls on interest rate swaps (IRSs) especially when interest rates are increasing because they tend to be exposed predominantly to IRSs where the floating (FL) rate is paid and the fixed (FX) rate is received; this type of exposure synthetically extends the duration of the assets and allows insurers to reduce the negative duration gap. IRS are subject to clearing in Central Counterparties (CCPs) and variation margins (VMs) need to be provided and/or

received in cash on a daily basis, based on changes in market value of insurers' portfolio of contracts.[64]

An upward trend on the interest rate was already observed since fall 2021, however the outbreak of the conflict introduced short-term volatility, potentially increasing the pressure on the liquidity position of insurers stemming from margin calls.

Figure 5.35: Risk-free rate trend and volatility. Germany 10 Year[65] government bond yield (x-axis is % terms).



From 3 December to 10 February the 10 year bund rate increased by approximately 70 bps (see Figure 5.35). In this period insurers have paid margins. Subsequently, it declined by 40 bps and they got back part of the margins paid before, but then it increased again by more than 70 bps and insures had to pay margins again.

As of Q4 2021 around 150 insurers do report positions on IRS. 90 insurers have net positive pay FL get FX exposures (hedging liabilities or negative duration gap), while 59 insurers have net positive pay FX get FL exposures (hedging fixed income portfolio). On aggregate, the amount of IRS where insurers pay FL and get FX prevails.

The result of a sensitivity analysis[66] show that when the risk-free rate increases by 50 basis points (Bps) 90 insurers pay VM for a total amount of EUR 36.4 bn while 59 insurers get VM for an amount of EUR 1.0 bn. Several insurers would have to pay material VMs. The median and the 90th percentile of cash needed as % of total investments, across the top 20 largest exposure, are respectively 3.3% and 7.8%.

[64] An extensive analysis on the liquidity aspects due to variation margins of IRS positions has already been published in the EIOPA Financial Stability Report of December 2019 with data for Q4 2018. Key elements of this analysis are then replicated in FSR July 2020 to reflect the evolution of IRS positions in Q4 2019 and the shock in March 2020 right after the outbreak of the Covid-19 pandemic.

[65] The 10 year tenor for the interest rate is chosen because FL-FX have a duration which is approximately of 11 years.

[66] For each individual solo insurer the weighted average duration of all IRS contracts by TYPE (i.e. FL-FX and FX-FL)) is calculated. A shift of the risk-free rate is applied and the change of the market value of IRSs positions is calculated. In this analysis, it is assumed that insurers do net margins on offsetting positions (if there are any).

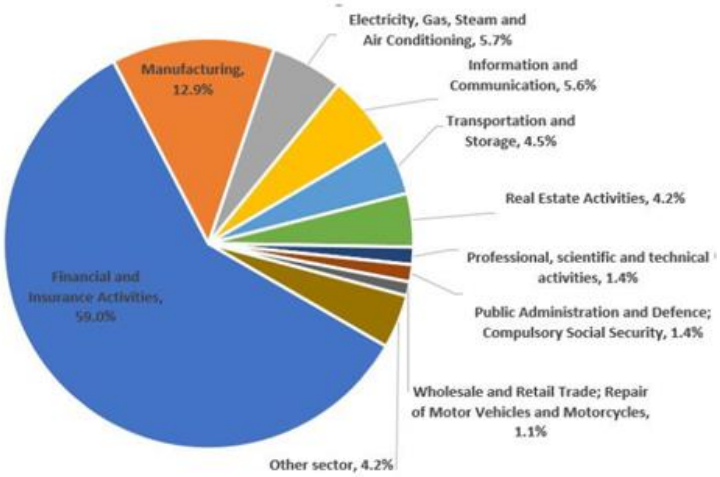
SECOND ROUND EFFECTS

A source of concern is the possibility of second-round effects. Second-round effects could emerge via exposures to sectors which, in turn, are highly exposed to the current crisis. With regards to assets, two areas are most relevant: the exposures to the banking sector and the exposure to sectors of the economy that are more sensitive to energy and gas prices. Losses in these sectors could have spill-over effects to insurers through losses on investments.

The asset exposure to banks that are more vulnerable to the evolution of the current crisis is significant. Insurers have significant holdings of bank assets, and in this context also hold a significant amount of assets issued by banks that are more vulnerable to the evolution of the current crisis i.e. banks which have sizeable exposures to Russia. The exposure of EEA insurers to those banks sums to a total amount of EUR 55 bn. (0.57% of total investments). Some concentrated exposures are observed.

Insurers have significant asset exposure to sectors sensitive to energy and gas prices. Increases in natural gas and electricity prices can affect insurers through their investments in companies that depend directly and indirectly on the price of gas and electricity. An assessment looks into the exposure through corporate bonds and equity holdings to five of the top direct and indirect gas and electricity using sectors (basic metals, other non-metallic mineral products, mining and quarrying and non-energy producing products, paper products and printing, chemical and chemical products). The total exposure sums up to EUR 174 bn. which includes almost 3% of the equity portfolio of insurers and 7.5% of corporate bond holdings (Figures 5.36 and 5.37).

Figure 5.36: Breakdown by sector of corporate bond portfolio for the insurance sector.



Source: EIOPA Quarterly Reporting Solo.
Reference date: Q4 2021.

Figure 5.37: Breakdown by sector of equity bond portfolio for the insurance sector.

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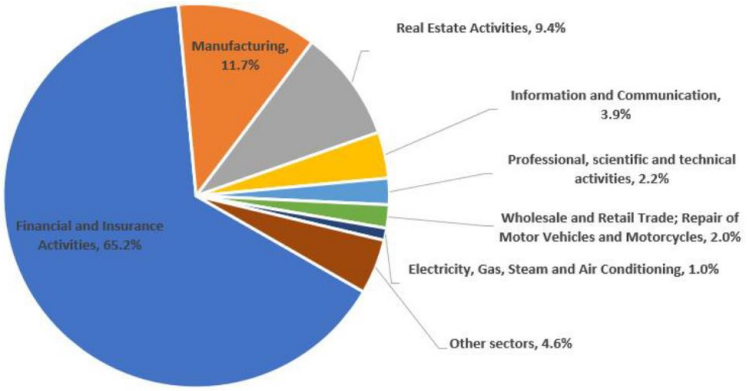


Source: EIOPA Quarterly Reporting Solo.
Reference date: Q4 2021.

CYBER RISK

The current crisis amplifies the risk of cyber-incidents[67], which concerns insurers through cyber insurance coverage as well as via operational risk. Results of the EIOPA Spring 2022 insurance bottom-up survey among supervisors show that digitalisation and cyber risks rank in the third place in terms of materiality, after market and macro risks, but above e.g. credit and profitability and solvency risks. This represents an increase in materiality when compared to the EIOPA Autumn 2021 survey, which ranked digitalisation and cyber risks in the fifth place. When considering the expected developments in terms of risk materiality over the next year, digitalisation and cyber risks are ranked second, behind macro risks. Cyber security risks are considered the main driver of the developments (92% of supervisors), followed by cyber underwriting risks (4%). Several NCAs consider the ongoing Russia's invasion of Ukraine and the associated uncertainty and geopolitical situation as a driver for a potential increase in cyber risks over the next 12 months.

Besides being a potential target for cyber-attacks, insurers are also offering policies covering business continuity, which might include, if not explicitly excluded, cyber events. These coverages make insurers exposed to claims but also catastrophe risks in case of cyber incidents affecting large cloud platforms (e.g. Amazon cloud, Microsoft Azure).

Against the recent geopolitical developments, it is of utmost importance to improve monitoring and to increase cooperation and the exchange of information between relevant authorities with regards to cyber risk. Important initiatives in this context are described in Section 1.3 of this report.

[67] Cyber incident refers to both intentionally and unintentionally provoked events.

Box 5.1: SENSITIVITY AND DISCRETIONARY BENEFITS: EVIDENCES FROM THE 2021 INSURANCE STRESS TEST EXERCISE

The life insurance business is becoming more exposed to investment based products designed to generate a return to policyholders based on the return on investment of the collected premiums. Biometric coverages represent an ancillary part of the policy, shaping a risk profile of the portfolios where market risks are predominant with respect to the traditional insurance specific risks.

With the aim of reducing the risk exposures, insurers structure products that transfer the market risk to policyholders, avoiding to take long term commitments on fixed guaranteed returns which are particularly onerous in the low-yield environment. Profit participation products which entail discretionary benefit mechanisms offer to undertakings the discretion to adjust the amount to be transferred to policyholders according to the performance of the backing portfolios and, as a consequence, the technical provisions of such products move in line with the expected profits made on the market. This characteristic is reflected under the Solvency II regime in the concept of Loss Absorbing Capacity of Technical Provisions that, together with the Loss Absorbing Capacity of Deferred Taxes (LACDT)[68], shall reflect potential compensation of unexpected losses through a simultaneous decrease in technical provisions or deferred taxes or a combination of the two.[69] Financial products are underwritten for investment purpose, hence with expectation of a profit. Undertakings operating in the life business have investment strategies based on the optimization of their portfolios with respect to the duration/return of their liabilities. Offering profit participation products in a competitive market might trigger search for yield incentives to undertakings to be able to meet the expectation of policyholders on receiving discretionary benefits. Operating in a low yield environment, undertakings might invest in assets with higher risk to generate additional return to distribute, making them more prone to market shocks.

The results of the 2021 stress test exercise[70] showed that the European insurance industry is prone to market shocks when materialised in form of a double-hit scenario where the risk-free rate and risk premia move in diverging directions. More in detail, the results showed that an higher drop in the solvency ratio (computed as a first difference between the post-stress and pre-stress solvency

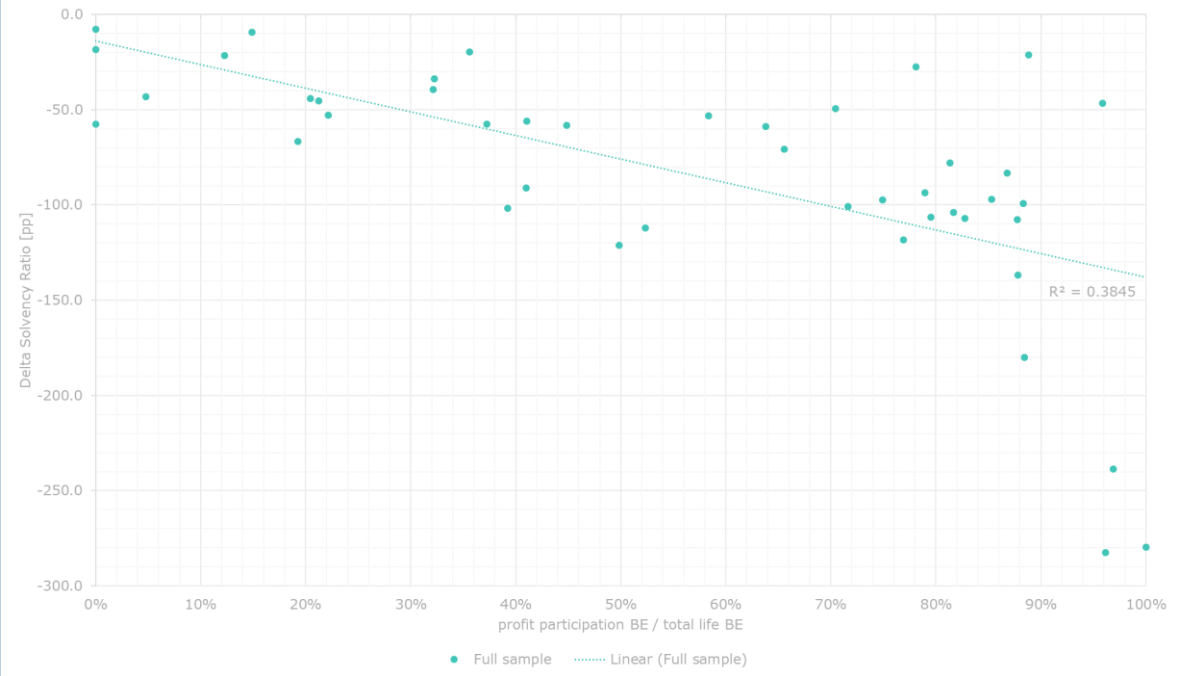
[68] Article 103(c) of the Solvency II Directive 2009/138/EC.

[69] The adjustment shall account for the mitigating effect provided by future discretionary benefits of insurance contracts, to the extent insurance and reinsurance undertakings can establish that a reduction in such benefits may be used to cover unexpected losses when they arise. The risk mitigating effect provided by future discretionary benefits shall be no higher than the sum of technical provisions and deferred taxes relating to those future discretionary benefits. The concrete effect of the LACDT and LACTP is a reduction of the BSCR (for those undertakings using standard formula) obtained by the application of the prescribed shocks up and shock down to the Own Funds.

[70] The capital component of the 2021 Stress Test exercise was designed in full adherence with the Solvency II framework, including the recalculation of LACTP and LACDT. The calculation of the LACDT depends on the tax regimes in force in the jurisdictions where an undertaking is active, making any analysis at EU level more complex or at least introducing country biases. On the contrary, the calculation of the LACTP depends on the structure of the products and it is not related to local elements making it more suitable for EU-wide cross sectional analysis.

ratio) was associated to those participants with a higher exposure towards profit participation products (computed as a ratio between the best estimates of profit participation products direct business plus inward reinsurance over the total life best estimates).[71]

Figure B5.1: Drop in Solvency Ratio Vs. Share of Profit Participation Best Estimates



In this analysis we test the following hypothesis:

Liability portfolios characterised by large discretionary benefit components increase the incentive to invest in riskier assets. Therefore, undertakings with larger exposure to discretionary benefits are more sensitive to market shocks.

In particular, we decomposed our hypothesis in two parts and checked whether:

i) there is a statistically significant relation between the drop in the post stress solvency ratio and the pre-stress best estimate liability of products with profit participations, and

ii) the asset allocation of undertakings more exposed to profit participation products is riskier compared to other undertakings.

[71] A similar relation can be observed with respect to the contribution of LACTP to the baseline SCR: the higher the contribution of the baseline LACTP to the baseline SCR, the larger the drop in the Solvency Ratio under adverse scenario.

To test the hypothesis we rely on the information submitted by the 44 participants to the 2021 stress test exercise.[72] Specifically, we focus on a full set of baseline information including Solvency Ratio, assets and liabilities information, and SCR related information complemented by the post stress Solvency Ratio.

In terms of riskiness of the asset allocation, we used as a proxy the baseline exposure of the investment portfolios to corporate bonds, equity listed and equity non-listed, which are considered to be riskier under the Solvency II regime than the sovereign bonds.

To test the existence of a statistically significant relation between the sensitivity of the solvency ratio and the exposures to portfolios based on profit participation mechanisms we specified the following model:

$$\Delta SR^i = \alpha BEPP_0^i + \beta^i Control_0^i + \varepsilon^i$$

Table B5.2: OLS model.

VARIABLES	(1) Delta-SR - Size	(2) Delta-SR - SCR	(3) Delta-SR - EOF
ProfitPartic	-1.199***	-1.281***	-1.268***
	(-3.147)	(-3.374)	(-3.077)
A_RISK	-0.0399	-0.135	-0.0756
	(-0.0520)	(-0.162)	(-0.0925)
BLexposure	-0.00681	0.00292	-0.000311
	(-0.986)	(0.346)	(-0.0395)
Size	-0.0612		
	(-0.958)		
Guaranteed	-0.0908	-0.0584	-0.0911
	(-0.426)	(-0.253)	(-0.388)
SCR_0		0.0377	
		(0.370)	
EOF_0			0.00223
			(0.0234)
Constant	0.976	-0.648	-0.125
	(0.907)	(-0.448)	(-0.0895)
Observations	43	43	43
Adjusted R-squared	0.295	0.282	0.277
F test	16.67	17.17	16.94

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The three specifications were defined to account for the high correlations between Size, SCR and EOF. Despite controlling for different aspects,

$\Delta \boldsymbol{SR^i}$ is calculated as the difference between the post stress Solvency Capital Requirement under fixed balance sheet assumptions and the baseline Solvency Capital Requirement ($SCR^i_{FBS} - SCR^i_0$) for participant *i*;

$\boldsymbol{BEPP^i_0}$ is the ratio of the best estimates for profit participation products underwritten via direct business and reinsurance agreement over the total life best estimate reported by participants *i* in the baseline;

$\boldsymbol{Control^i_0}$ are a set of control variables defined as follows:[73]

$\boldsymbol{Size^i_0}$ is the *ln* of the total assets reported by participant *i* in the baseline.

$\boldsymbol{SCR^i_0}$ is the *ln* of the Solvency capital requirement reported by participant *i* in the baseline.

$\boldsymbol{EOF^i_0}$ is the *ln* of the Eligible Own Funds reported by participant *i* in the baseline.

$\boldsymbol{Guaranteed^i_0}$ is the ratio of the best estimates for Contracts with options or guarantees underwritten via direct business and reinsurance agreement over the total life best estimate reported by participants *i* in the baseline;

[72] EIOPA (2021) Template for the data collection – Capital component. Available at: https://www.eiopa.europa.eu/sites/default/files/financial_stability/insurance_stress_test/insurance_stress_test_2021/template-for-data-collection-capital-component-v1.1.xlsx

[73] We also controlled for the approach used for the calculation of the SCR (standard formula, partial internal model, full internal model). It turned out to be not statistically significant both in uni- and multivariate OLS models

such as the dimension, the overall riskiness and the capitalization, they are all linked to the dimension of the company. We do not directly use the LACDT as a regressor to avoid endogeneity biases in the model (The LACTP is a constituent of the SCR, hence directly included in the Solvency Ratio). Correlation among regressors has been tested to avoid multicollinearity.

$\boldsymbol{BLexp_0^i}$ is the business mix approximated as the ratio of non-life technical provision over life technical provision ($NLTP_0^i/LTP_0^i$) reported in the baseline Solvency II balance sheet by participant *I;*

Risky assets = Equity + corporate bonds / total assets: $\boldsymbol{A\_RISK_0^i}$ is the baseline exposure of participant i to Equity listed, Equity unlisted and corporate bonds over total assets $(A\_EQL_0^i + A\_EQNL_0^i + A\_CORP_0^i)/A\_TA_0^i$.

The OLS model confirms the statistically significant inverse relation that exists between the sensitivity of the solvency ratio to the adverse scenario and the exposure to products with profit participation. This is driven by the erosion of the LACTP component of the SCR under adverse scenario.

We also used the model to test the sensitivity of the assets over liabilities ratio against the same set of independent variables. The exposure to profit participation products does not qualify as a statistically significant regressor potentially due to the co-movements of assets and liabilities for the specific portfolios.

To assess if the asset allocation of undertakings more exposed to profit participation products differs from the other, we clustered the 44 participants into two buckets using as a threshold the median exposure to profit participation products over total best estimates. We then checked whether and to what extent the asset allocation of the undertakings belonging to the two clusters differs.

Table B.5.3: Bucketing exposure to high risky assets.

	Low Profit Participation	High Profit Participation
Observations	22	22
Median	0.131	0.243
Average	0.181	0.244
Weighted average	0.137	0.244
St. Dev	0.144	0.094
Variance	0.021	0.009

Weighted average computed on Total Assets

While not statistically significant in the model specification, the bucketing allows us to observe that the 22 participants with higher profit participation products have higher exposures to equity and corporate bonds. Participants with lower profit participation products report an average (weighted) exposure to corporate bonds and equities of 13.7%, whereas for participants with a

higher volume of products with profit participations in their portfolios the exposure increases to 24.4%.[74]

Concluding, within the limitation of the model and of the sample we showed that:

i) a larger exposure to products with profit participation is associated to a higher sensitivity in terms of Solvency Ratio to a double hit scenario such as the one included in the 2021 Stress test exercise due the erosion of the LACTP component of the SCR;

ii) the change in assets over liabilities does not return a statistically significant difference related to the exposures to products offering discretionary benefits; and

iii) in terms of asset allocation, those participants with higher portion in the liability portfolios of products entailing discretionary benefits are investing in riskier assets.

The explanation of the higher sensitivity in the Solvency Ratio lies in the large depletion of LACTP against the adverse scenario. However, we also observed that those participants with higher portion in the liability portfolios of products entailing discretionary benefits are investing in riskier assets to meet policyholders' expectations. Such expectations might generate search for yields behaviours in undertakings that tend to invest in riskier products making them prone to market volatility.

The minor differences observed in the Assets over Liabilities lies in the valuation of the assets and of the liabilities. Profit participation products liabilities adjust according to market movements in line with the valuation of the assets; hence, the assets over liabilities ratio does not capture the movements.

Further analysis can be conducted on the movements of the assets and of the liabilities in isolation and on a more granular assessment of the asset allocation.

[74] Equities and corporate bonds are considered more risky products with respect to sovereign bonds due to their higher volatility. The higher risk is reflected in the scenario of the 2021 Stress Test exercise in higher shocks to these asset classes. This justifies the larger impact of the scenario to these participants.

Box 5.2: Impact of inflation on the Belgian insurance sector[75]

Introduction – Rising inflation

Since the start of Solvency II, insurance companies have only experienced moderate or low inflation. After COVID-19, and the strong economic recovery that followed, inflation has risen to a level not seen since the early 1980s. This surge in inflation could have a material impact on an inflation-sensitive insurance sector. An impact which could translate both to insurance products and to the investments.

In this context, the National Bank of Belgium (NBB) carried out an analysis covering three main elements: A top-down analysis simulating the impact of an increase in the inflation rate on insurance products and investments, an analysis of the considerations on inflation included in the ORSA of insurance companies and the SCR coverage of inflation risks in the Solvency II Standard Formula for Belgian insurance products.

Inflation-sensitive insurance products

Insurance products can be sensitive to inflation. In an environment of rising inflation, this could impact the solvency position of insurers through an increase in the Best Estimate of Liabilities. However, not all types of products show an inflation sensitivity. To this end, the NBB executed an analysis of the Belgian insurance products and the practices observed for the Best Estimate modelling to assess to which extent an inflation impact can be expected.

A first material driver of inflation sensitivity concerns the expenses projected in the Best Estimate irrespective of whether it concerns Life, Non-Life or Health business. This constitutes a present value of 32 bn EUR at 31/12/2020 for the total Belgian insurance sector. These expenses are, amongst others, linked to the personnel of the insurance undertaking and therefore salary growth tends to impact the total volume of these expenses. A shock in inflation can as such translate to a shock in future expenses.

A second consideration concerns the technical cash-flows for Life business (i.e. claims, benefits, premiums, commissions, and other technical cash-flows) with a total present value of 224 bn EUR at 31/12/2020 in the Belgian market. An analysis was performed at the level of individual insurance products. Based on this analysis, it was observed that the Belgian legislation or the insurance policies foresees that certain limits are automatically indexed or inflated (e.g. the limits used for Occupational or Personal Pension products). However, in practice, undertakings will typically not offer a guaranteed rate on future premiums which serve to finance increases in this

[75] This is an application for the Belgium case which has been prepared by the National Bank of Belgium.

limit. This type of limit therefore generally lies beyond the contract boundaries applied in Solvency II and is therefore not incorporated in the Best Estimate. The technical cash-flows for Life insurance are therefore often not very inflation sensitive.

A third aspect consists of the technical cash-flows for Non-Life business with a total present value of 15 bn EUR at 31/12/2020. Based on analyses performed at the level of the individual lines of business, one can observe that claims are often sensitive to inflation. For instance, for Motor Third Party Liability and General Third Party Liability, claims are often driven by the impact of bodily injuries. In Belgium, jurisprudence and claims management practices commonly incorporate some notion of inflation in the bodily injury claims payment which can be linked to salary growth or to the general CPI inflation. For Property business, the claims are often driven by the reconstruction prices of the dwelling. Here a dedicated index, i.e. the ABEX index, gives an indication of this specific property inflation. For premiums however, rate increases often lie beyond contract boundaries since policies typically only have a one-year term.

A final driver of inflation in the context of liabilities consists of the technical cash-flows of Health business with a total present value of 5 bn EUR at 31/12/2020. For this business, one can observe quite material inflation sensitivity which is typically due to Retail Medical Expense business and due to Worker's Compensation business. In the first case, the Belgian Verwilghen law[76] will put a framework around Retail Medical Expenses and assure that they have a very long-term nature. For Worker's Compensation business, the laws of '67 (for public sector employees[77]) and '71 (for private sector employees[78]) ensures that disability annuities are indexed under certain conditions. For both cases, these products show material inflation sensitivity due to their long-term nature.

[76] Law of 1st of July 2007 on health insurance agreements transposed into the Law of 4th April 2014 on insurance.

[77] Law of 3th of July 1967 concerning the prevention of or the compensation for worker's accidents, road accidents from and to the work place and of professional illnesses in the public sector.

[78] Law of 10th of April 1971 on worker's accidents.

In the table below, a summary of the analysis can be found, per product type:

<table>
<tr><th colspan="2">Best Estimate Cash-Flows</th><th>Claims & Benefits</th><th>Premiums & Commissions</th><th>Expenses</th></tr>
<tr><td rowspan="4">Life</td><td>Retail With Guarantee</td><td colspan="2" rowspan="3">Indexation beyond Contract Boundaries</td><td rowspan="9">Salary growth</td></tr>
<tr><td>Retail Unit-linked</td></tr>
<tr><td>Employee Benefits</td></tr>
<tr><td>Pension products (1st pillar)</td><td colspan="2">Health inflation</td></tr>
<tr><td rowspan="3">Non-Life</td><td>Liability (MTPL & GTPL)</td><td>Claims inflation (Salary growth)</td><td rowspan="3">Inflation beyond Contract Boundaries
(with the exception of some Corporate business)</td></tr>
<tr><td>Property</td><td>Claims inflation (Construction prices)</td></tr>
<tr><td>Other LoBs</td><td>Claims inflation</td></tr>
<tr><td rowspan="5">Health</td><td>Retail Medical Expenses</td><td colspan="2">Medical inflation and index</td></tr>
<tr><td>Corporate Medical Expenses</td><td colspan="2">Medical inflation</td></tr>
<tr><td>Worker's Compensation</td><td>Health inflation</td><td>Salary inflation</td></tr>
<tr><td>Retail Income Protection</td><td colspan="2">Fixed cash-flows (e.g. indexation fixed at 2%)</td></tr>
<tr><td>Corporate Income protection</td><td colspan="2">Inflation beyond Contract Boundaries</td></tr>
</table>

Not inflation sensitive
Less material product or inflation sensitivity
Higher inflation sensitivity

To manage this inflation sensitivity, certain undertakings put in place dedicated reinsurance structures. This consists of so-called asset intensive reinsurance where almost all risks are reinsured for a portfolio of insurance liabilities and covering assets. Typically, upon payment of a reinsurance premium, a fixed percentage of the movements of assets and liabilities is ceded to the reinsurer. This can result in a material reduction of the inflation risk for the undertakings concerned.

Investments in inflation-linked bonds (ILBs) & inflation derivatives

As the liabilities of insurance companies are mainly negatively affected by an increase in the inflation rate, some insurance companies resort to inflation-linked investments to properly match the inflation sensitive liabilities. This is done mainly through two channels: inflation-linked bonds and inflation-linked derivatives.

Inflation-linked bonds are a type of bond where the payment of principal and interest is contractually linked to a specific price index such as European inflation (e.g. Harmonised Indices of Consumer Prices excluding Tobacco or HICPxT). This provides investors a tool to hedge against rising price levels.

Investments of Belgian insurers in inflation-linked bonds could be assessed based on the list of assets (Quantitative Reporting Templates (QRT) report) and by cross-identifying a list of ISIN codes for inflation-linked bonds. It should be noted, however, that this assessment is not exhaustive, as there are no clear criteria in the list of assets to identify this specific type of product.

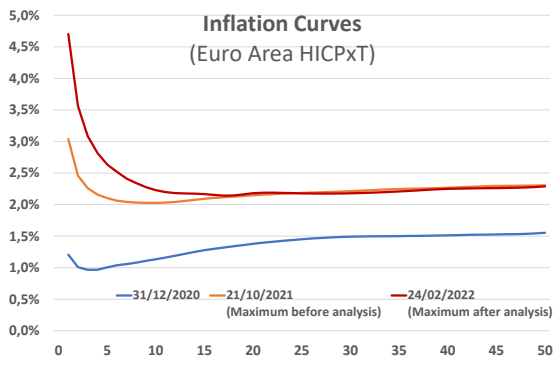
In total, €2.4 billion of inflation linked bonds held by insurance companies were identified at 31/12/2020. Those are issued mainly by France (€1 185M), Germany (€421M), Italia (€373M), Fédération Wallonie-Bruxelles (€313M). The insurance companies holding these bonds are mainly composite insurance companies with long-term life insurance technical provisions and/or significant workers' compensation insurance activities which, as mentioned above, are sensitive to inflation risk.

A limited number of Belgian insurance companies have also used inflation derivatives to hedge against inflation risk. This was usually done via inflation swaps and/or caps. They cannot be identified via the QRT reportings, so the information was gathered on the basis of on-site inspections and ad-hoc communication with the companies concerned.

Sensitivity analysis and Impacts

To assess the impact of rising inflation on the solvency position of insurance undertakings, the NBB revalued the aforementioned inflation-sensitive balance sheet positions.

Firstly, an inflation curve was derived from the financial markets. Zero-coupon inflation swaps exist whose nominal amount is indexed on the Harmonised Index of Consumer Prices excluding Tabacco (HICPxT). This is a CPI inflation measure relevant for the entire Euro Area. If one analyses these curves at different times, one can observe that at Q4 2020 the inflation curve was quite moderate with long-term rates between 1.5% and 2%. At 21/10/2021 an increase in the curve took place with a 3% inflation in the short term decreasing towards to 2.5% in the long-term. After the analysis was performed, a comparison was made with a more recent inflation curve at 24/02/2022, taking into account the context of the Russian invasion in Ukraine and the surge in energy prices. Based on this comparison, it was observed that the inflation curve showed a strong increase in the short term, but that in the long term no change was observed. Given that the majority of the impact is determined by the longer term cash-flows, one can assume that the analysis globally still holds in the current context.



Secondly, it should be observed that insurance liabilities are often not linked to Euro Area inflation, but more to idiosyncratic inflation representative of the specific insurance benefits, claims, premiums, and expenses. To capture this inflation basis risk, the NBB calibrated an inflation wedge which represents this difference in inflation between the insurance specific and the HICPxT inflation indices. Ideally, such calibration should under Solvency II be based on financial market data. However, typically no liquid market instruments exist which can be used for such purposes. A historical calibration was therefore performed. The different indices used can be found in the table above.

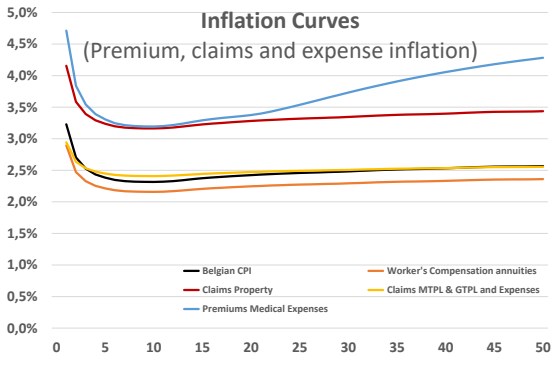
	Cash Flows	Index
Expense CFs	Expenses	Salary growth
Technical Non-Life CFs	Claims Property	Construction prices (ABEX)
	Claims Liability (MTPL & GTPL)	Salary growth
	Claims Other LoBs	Belgian CPI
Technical Health CFs	Worker's Compensation annuities	Health index
	Premiums Medical Expenses	Medical index
	Claims Medical Expenses	Medical inflation

For the construction of the wedge, a linear model was constructed. This allowed to capture the characteristic that also for the different insurance inflation wedges, an increase is expected in the short term, but a more stable value can be expected in the long term, similar to the HICPxT inflation curve.

$$i_t^{wedge} = \beta_0^{wedge} + \beta_{HICPxT}^{wedge} \cdot i_t^{HICPxT} + \epsilon_t^{wedge}$$

Adding the wedges to the HICPxT inflation curve then allows to construct specific inflation curves which are representative of the different insurance cash-flows. An overview of these curves at Q4 2020 can be found in the graph below. It is shown that mainly premiums for Medical Expenses and Property claims show a higher inflation, ranging between 3% and 3.5% in the middle to long term. Other inflation curves have more moderate values between 2% and 2.5%.

This set of curves was also constructed at 21/10/2021. The difference between the two sets of curves was then used to revalue the different balance sheet positions, i.e. Best Estimate of Liabilities, investments, derivatives and reinsurance.



For investments and liabilities, aggregate methods were used based on the individual cash-flows of the liabilities or on the duration of the investments. However, given the non-linear behaviour

of derivatives and reinsurance treaties, a precise repricing was performed based on individual positions. It should however be noted that elements such as the SCR, the Risk Margin and Deferred Taxes were not recalculated. The results of this top-down exercise should therefore be seen as an approximation of reality.

An overview of the impact on the SCR ratio (changes are expressed in percentage points) can be found below for the total Belgian insurance sector and for a specific set of undertakings concerned (e.g. those who implemented inflation hedges or asset intensive reinsurance treaties).

	Total Impact Belgian Insurance sector	Impact undertakings concerned
Expenses	-8%	-8%
Worker's Compensation	-4%	-8%
Non-Life	-4%	-4%
Medical Expenses	4%	6%
Inflation hedges	1%	10%
Inflation Linked Bonds	1%	2%
Reinsurance	-0,003%	-17%
Life	0%	0%

TOTAL	-10%

The total impact of the recent increase in inflation is -10% at the level of the SCR ratio. This is mostly driven by an impact on expenses (-8%), Worker's Compensation (-4%), Non-Life (-4%) and Medical Expenses (+4%). It should be noted that Medical Expenses lead to an increase in SCR ratio since the positive impact on the premiums is typically larger than the negative impact on the claims. Furthermore, at the level of the total market inflation hedges, inflation-linked bonds and reinsurance are less material. However, if one zooms in on the undertakings concerned which have acquired the specific set of instruments targeted, one can see that the impact is stronger. The inflation hedges and inflation-linked bonds increase the SCR ratio as expected and the reinsurance compensates the increase in the SCR ratio which would otherwise be observed for these undertakings leading to a stabilisation of the solvency position.

SCR for inflation risk

Next to the impact analysis for inflation risk, NBB also assessed whether the Solvency Capital Requirements sufficiently capture inflation risk. To this end, a comparison was made between the shocks used in the Standard Formula and the maximal historical inflation shocks observed for the different inflation indices. An overview of this comparison can be found in the table below.

Source Inflation risk	Capital Requirement	SCR Inflation shock	Maximal Inflation shock
Expenses	SCR Life/Health Expense risk	+1%	+1,1%
Property	SCR Reserve risk	8%	+8,1%
	SCR Premium risk	7%	
Liability (i.c. MTPL)	SCR Reserve risk	8%	+4,0%
	SCR Premium risk	9%	
Medical Expenses	SCR Disability / Morbidity	+1% up	+1,1% up
		N/A down	-0,9% down
Worker's Compensation	None	N/A	+6,5%

Here we see that for expenses within Life and Health underwriting expense risk an inflation shock is incorporated, which is broadly in line with historical observations (1% in the SCR versus 1.1% in history).

For Property and MTPL, comparisons have also been performed. The calibration of premium and reserve risk will implicitly also capture inflation shock on respectively future and past claims. A comparison can therefore be performed based on the volatility calibration of the Standard Formula considering the average duration of these products for the Belgian insurance market. The implied SCR inflation shocks can therefore be compared to a maximum inflation shock. Also, for these Lines of Business the shocks seem broadly adequate. Remaining premium and reserve risk volatility not related to inflation can of course exist and have been analysed separately.

Lastly, for Retail medical expenses and for Worker's Compensation, it is observed that no equivalent shock exists. No SCR inflation shock is applied to disability annuities. Furthermore, for future medical expense claims and premiums, only upward SCR inflation shocks are captured in the Standard Formula. Since premiums typically move more than claims, this leads to a decrease in the Best Estimate of Liabilities for this product. Decreasing inflation shocks would however lead to an increase of the Best Estimate for this product. This is not captured in the Standard Formula.

To summarise, the Standard Formula reflects appropriately inflation risks for generic Life and Non-Life products but does not capture the inflation risks related to specific Belgian Worker's Compensation and Retail Medical Expense business. Businesses which show greater exposure to these products are expected by NBB to perform dedicated analyses in the context of their ORSA.

ORSA - Own assessment of inflation risk by insurance companies

To assess Belgian insurance companies' perception of inflation risk and to support our analysis and results, we conducted a horizontal qualitative analysis of ORSAs. A significant proportion of them addressed inflation, with some similarity in the way they did.

Insurance companies that address inflation in their ORSA have mainly done so via sensitivity analysis or stress testing. Even though their shock scenario naturally differs, sometimes significantly, those companies which are the most sensitive according to their own analysis have also often been identified as outliers in our analysis. In some cases, they considered their results as a cause for further follow-up. When insurance companies were preparing their ORSAs (i.e., in 2021), the inflation theme was not yet as important as in the first half of 2022, and some outliers in our analysis therefore did not cover this theme in their ORSA. These cases were further discussed with the insurance companies concerned.

Conclusion

The National Bank of Belgium performed a top-down impact analysis which shows that recent inflation shocks lead to an aggregate impact of -10% on the average SCR ratio of the Belgian insurance sector explained mostly by expenses (-8%), Worker's Compensation (-4%), Non-Life (-4%) and Medical Expenses (+4%). The sensitivities calculated are broadly confirmed by the analyses that the undertakings performed in their own ORSA.

Undertakings typically have measures in place to absorb certain parts of these shocks where e.g. indexation of premiums can compensate inflation of claims. Other insurers implemented targeted inflation hedges or reinsurance treaties to cede these risks to third parties.

The Solvency Capital Requirements should also assure that sufficient capital is present to absorb the recently observed inflation shocks. However, for specific Belgian Health business, the Standard Formula seems not to adequately capture the risk. As such, insurance undertakings more exposed to inflation risk and to this business are followed more closely and additional analyses and measures have been asked by the NBB.

PART II

Thematic Article

Do EU-wide stress tests affect insurers' dividend policies?[79]

Petr Jakubik[80] and Saida Teleu[81]

Abstract

The article employs panel data to investigate whether stress test results and other characteristics associated with European insurers vulnerabilities affect dividend distributions and share buybacks. We focus on the EU wide insurance stress test conducted in 2018 and 2021 as in this way we can also capture a behaviour of insurers during the COVID-19 crisis. Our empirical results suggest that two stress tests considered had no significant impact on changes in dividend distributions. However, more resilient insurers measured by assets-over-liabilities ratio seem to have higher dividend payout ratios including share buybacks. On the contrary, higher generated profit tend to be reflected in lower payout ratio.

Keywords: dividend distributions; dividends and share buybacks; European insurers; EU-wide insurance stress test, COVID-19

1. Introduction

The introduction of a regular stress test of the insurance industry has positively influenced risk management of insurance companies. Stress tests aim to test resilience against potential future adverse scenario, in particular negative macroeconomic development. In this respect, it supports more prudent and forward-looking approach taking into account different tail risk scenarios. Moreover, the Solvency II regulation based on a market consistent valuation enhance a proper reflection of all risks insurers are exposed to. Overall, insurers should not focus only on a point-in-time estimate of the riskiness of a portfolio, but also on future portfolio exposures given assumption about a future macroeconomic development. Thus, EU-wide insurance stress test conducted by the European Insurance and Occupational Pensions Authority (EIOPA) enhanced a regulation of insurance solvency position by providing a more forward-looking and flexible process for assessing risks that might not be fully captured by risk-based solvency standards.

However, considering that the market can negatively responds to capital plan objectives of an individual insurance company, and complementary to weak stress test results, insurers might have incentive to manage their financial positions. This can be visible in capital ratios (e.g. SCR or asset-

[79] The views expressed in this paper are exclusively those of the authors and do not necessarily reflect those of the institutions with which the authors are affiliated.

[80] European Insurance and Occupational Pensions Authority (EIOPA).

[81] Central Bank of Malta.

over-liability ratio), but can also be explored in capital actions such as dividend payments. Several research papers investigate the implications of stress test on financial institutions, e.g., Cornett et al. (2018) find that banks involved in stress test lower their dividend payouts significantly more in comparison to non-stress tested banks. Gallardo et al. (2015) find that banks have tendencies to manage capital more proactively as stress testing matures.

Using a sample of stress test insurance companies, we examine insurer behaviour employing Solvency regulatory data. We test for changes in dividend payout ratio given the results of stress test, and macroeconomic situation. Currently, literature related to implication of insurance stress tests and other regulatory measures is rather limited. This is mainly driven by confidential nature of data. In terms of available information on resilience of individual insurance companies, there is a substantial difference between the European banking and insurance sectors. While the individual results of EU-wide banking stress tests are regularly disclosed providing additional information on banks' vulnerabilities to market participants, this is not the case for the insurance sector. Contrary to European Banking Authority, the European Insurance and Occupational Pensions Authority (EIOPA) does not have a legal power to request individual disclosure from the participants of the EU-wide insurance stress tests. Therefore, market participants might be more sensitive to any disclosed information related to insurance companies' resilience. In this context, Jakubik and Teleu (2021a) evaluate the effect of the dividend-based prudential regulation of the European insurance regulator (EIOPA) in complementing the existing solvency regulation. Their finding indicates that dividend signalling theory is relevant in the context of European insurance company' market of operation. Furthermore, Jakubik and Teleu (2021b) found that while the market does not strongly respond to the disclosure of insurance stress test information, the public disclosure seems to have impact on systemic risk.

Insurance sector-wide stress tests share some similar characteristics with banking exercises. They are forward-looking and focus on tail risks by putting weight on highly adverse scenarios. Additionally, the same scenarios are applied to all insurance and re-insurance companies to obtain consistent supervisory risk assessments across (re)insurers. However, there are also many differences in insurance and banking exercises. While bank system-wide stress tests typically use a 3-year horizon, insurance stress tests use the concept of static exercise with instantaneous shocks. The reason is that an insurance business is much more complex with the main challenge of modelling liabilities reflecting a long-term business. Contrary, bank stress tests focus primarily on asset side as liabilities typically reflect deposits that do not require any modelling for solvency exercises. Furthermore, system-wide bottom-up banking stress tests were extensively used to determine the level of capital needed after the financial crisis in 2007 that changed in later years using stress test exercises as a supervisory tool. In the case of EU-wide bottom-up insurance stress tests conducted by EIOPA, it has never been considered as a pass-or-fail or capital exercise. Instead, the exercises have been tailored to assess the resilience of the European insurance sector to market adverse scenarios and insurance specific shocks with potential negative implications for the stability of European financial markets and the real economy. As the main evaluation metric is typically used not only a solvency capital ratio (SCR), but also an assets-over-liabilities ratio.

The paper is organized as follow. Section 2 discusses the latest literature. Sector 3 presents the methodology and results. Finally, Section 4 concludes on the main findings obtained.

2. Literature Review

The literature related to the determinants of firms' dividend policy and dividend payouts built on the theoretical model proposed by Modigliani and Miller's in 1959 on dividend irrelevance framework in the efficient market. By relaxing certain assumptions of efficient market, scholars intend to provide evidence on key factors of dividend payouts.

Existing literature on dividend policy can help to find determinants of insurer's dividend payouts. Economic theory suggests that the management of a firm might be better informed about the true value of their firms, so that dividends can be used as a form of information to investors about future cash flow. This so-called signalling hypothesis developed by Bhattacharya (1979) shows that dividend announcement inform about current and future earnings with implication on dividends. In other words, managers may use dividend changes to overcome information asymmetries by signalling revisions to earnings expectations to existing and prospective investors (e.g., Lintner 1956). Akhigbe et al. (1993) find that life insurers' stock prices response to dividend changes was less pronounced, conveying less asymmetric information than those of other insurers. This indicates that shareholders could be interested in sensitive information about future cash flows, and dividend signalling may have higher importance in the nonlife insurance industry. Following the emergency fund theory and unemployment, the life insurance sector is more prompt towards the macroeconomic environment due to the deteriorating economic conditions of individuals (Geneva Association, 2012).

Based on the data from the European Monetary Union (EMU) as a whole, Germany, and Italy, Reddemann et al. (2010) analyse the dividend policy of the European insurance industry. They find no clear empirical evidence suggesting that dividend signalling are relevant economic phenomena for Germany and the EMU. Their finding advice that insurers may cut dividends to strengthen financial stability during the crisis without necessarily having to fear adverse consequences given by investors assuming that this measure is a clear sign for future issues. On the contrary, insurers in Italy feared more that shareholders could interpret a suspension of dividend payouts as a sign of future problems. Hence, this indicates that dividend smoothing is a relevant economic phenomenon for Italian insurance sector.

From the agency theory perspective, proposed by Jenden and Meckling (1979), diverting the company's free cash flow from shareholders' private benefit might be proceed as expropriation (La Porta et al. 2000; Faccio et al. 2001). David, et al. (2016) explore payout channel choices via the agency theory. He finds that firms with significant institutional investors are more prompt to payout the dividends in economic downturn to maintain confidence in the market. At the same time, it is suggested that the agency theory might not hold for highly regulated financial firms as a strong external monitoring is carried out by the regulators, in particular in crisis time (Casey et al. 2009, Reddmen et al. 2010)

From the regulatory perspectives, there are numerous tools available for regulators to constrain dividend payouts by insurance companies. While banks are primarily constrained by regulators in their dividend payout policy, which implies that better capitalized banks pay higher dividends

(Kroszner and Strahan 1996, Casey and Dickens 2000, Theis and Dutta 2009), for insurance companies, not only a solvency capital ratio (SCR), but also assets over liabilities ratio, is typically used as an evaluation metric. The literature on insurance insolvency in relation to the macroeconomic environment, risk appetite, and portfolio choices suggests that equities of both life and non-life insurance companies fluctuate with the macroeconomic environment (Browne, et, al., 1999; Kim, 2005; EIOPA, 2018a), and economic and market conditions affect investor and shareholder reaction to identical events (Gallo et al. 2016, Gupta et al. 2018). In general, insurers are often regarded as special considering their high dependence on the financial soundness of the overall insurance sector of a country. Therefore, the insurance industry in the EU and other parts of the world is subject to a very tight financial regulation. In this respect, insurance regulators primarily aim to guarantee the solvency of insurance firms. Harrington (1981), based on his analyses of the dividend policy of U.S. life insurers, argues that high dividend payouts can weaken the financial soundness of insurance companies. His findings indicate that the dividend policy of U.S. insurance companies overall does react rather slowly to changes in firm earnings. In general, the resolution of an insurance company is three to five times more expensive than that of other financial institutions (Grace, et al., 2003), which justifies its highly regulated environment. Hence, investors prefer a high degree of leverage in the insurance sector because not just customers, but also shareholders are protected against insolvency by regulators (Lee et al. 1980, Casey, et al. 2007). This mean that shareholders can use dividend income from insurers to obtain other financial assets, simultaneously maintain a constant amount of funds in their portfolio of insurance stocks and higher level of relatively risk-free leverage.

3. Methodology

This article aims to identify whether the EU-wide insurance stress test results of 2018 and 2021 conducted by EIOPA, and pre-existing vulnerabilities as a weaker capital position or profitability can explain the changes in dividend pay-out ratio of European insurers. We use a sample of listed insurance companies at group level that participated in the EIOPA insurance stress tests of 2018 and 2021. For those companies, we consider the period of 2015-2021. In this way, we cover also the COVID crisis and its implications to insurers' distribution policies.

As the dependent variable, we use the dividend payout ratio (DP) based on the definition employed by Reuters. We consider not only dividends payout, but also share buybacks. It is quite important aspects as a decline of dividend payout could be compensated by increase share buybacks aiming at the same target. We use a Tobit specification to account for the fact that insurance dividend payouts are truncated at zero (Amore and Murtinu, 2019).

$$y_{i,t} = \beta_0 + \beta_1 y_{i,t-1} + \sum_{j=1}^{N} \beta_{2,j} x_{j,i,t-1} + \sum_{k=1}^{M} \beta_{2,k} z_{k,i,t-1} + \varepsilon_{it} \quad (1)$$

where y_{it} denotes dividend payout of insurance company *i* at time *t*, $x_{j,i,t-1}$ represents the *j*-th variable for insurance stress test results for insurer *i* at time *t*-1, $z_{j,i,t-1}$ represents the *k*-th control variable corresponding to the specific insurer i at time t-1 and ε_{it} corresponds to an error term for insurance company *i* at time *t* that follows a normal distribution $N(0, \sigma^2)$.

Our main explanatory variables come from individual insurance stress test results. We consider the exercises for groups in 2018 and 2021, because the one conducted in 2016 was covering solos only. Among our insurance specific variables, we employ solvency capital ratios post-shocks for the tested scenarios. In particular, for the 2018 stress test, we included both yield curve up ($ST2018_{up}$) and yield curve down ($ST2018_{down}$) scenarios. The yield curve down scenario tested the resilience of the European insurance sector to a prolonged low yield environment while the yield curve down corresponds to a sudden reversal of risk premia (EIOPA, 2018b). For the 2021 exercise, we consider results for the fix balance sheet ($ST2021_f$) and the constraint balance sheet ($ST2021_c$) even if the results for constraint balance sheet are available only for the limited number of participating companies (EIOPA, 2021).

Based on the literature review of determinants of companies' dividend policy, we build a set of control variables. In particular, return on equity (ROE) as a proxy for asymmetric information, significance/size of insurance company in terms of total assets (natural logarithm of total assets denoted as TA) in the context of agency cost theory, and solvency capital ratio (SCR) and assets-over-liabilities ratio (AoL) covering regulatory perspectives. Additionally, we added GDP growth and time-fixed effects for control for changes in financial and macroeconomic environment. Considering that we are having all groups in the sample with extensive gross boarder business, we consider EU GDP instead of GDP of countries of home supervisors.

All dependent and control variables were lagged by one year given the fact that insurance pay-outs are agreed during shareholder meetings early in the financial year, based on financial information at their disposal from the previous year. This also helps us to tackle any potential endogeneity related with simultaneity.

4. Empirical results

Our dataset shows that the median payout ratio corresponds to 54% over the whole considered time period, so lightly more than half of the generated free cashflows are paid out as dividends or share buybacks. In addition, the impact of EIOPA insurance stress tests scenarios corresponds to drops in SCR below 100% for the 10th quantile, while it is not the case for the 25% quantile. As those scenarios tested were designed as extreme but plausible, the results suggest high level of resilience of the participating insurance groups. The high level of capitalisation is confirmed also by high SCR and AoL ratios over the whole observed period as the values of this indicator are sufficiently above the regulatory thresholds even for the 10th quantile. Moreover, good financial conditions of insurers are also supported by the return on equity indicator standing at 3% even for the 10th quantile. This conclusion is further strengthen by the fact that our sample covers also adverse macroeconomic development as the 10th quantile for GDP growth corresponds to -4% (Table A1).

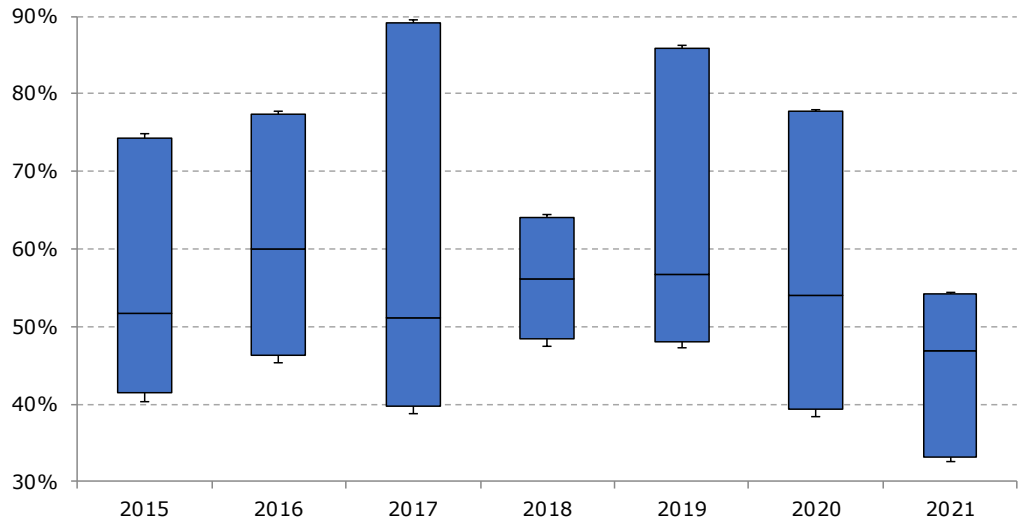
Table A1: Descriptive statistics for the dataset

Variable	Abbrevaiation	Quantile				
		10	25	50	75	90
Payout ratio	DP	25%	40%	54%	75%	100%
Stress test 2018 - yield curve up	$ST2018_{down}$	82%	108%	139%	158%	171%
Stress test 2018 - yield curve down	$ST2018_{up}$	65%	127%	142%	166%	181%
Stress test 2021 - fix balance sheet	$ST2021_{F}$	91%	104%	121%	157%	182%
Stress test 2021 - constarint balance sheet	$ST2021_{C}$	70%	112%	137%	158%	173%
Return on equity	ROE	3%	7%	10%	13%	19%
Natural logarithm of total assets	TA	7.58	8.54	9.59	11.09	11.35
SCR ratio	SCR	161%	180%	201%	221%	257%
Assets-over-liabilities	AoL	105%	108%	112%	122%	138%
Gross domestic product	GDP	-4%	1%	2%	3%	5%

Source: Authors' calculations

The development of distribution of dividend payout ratios including share buybacks over time suggests increased payout in 2016 (60% for the median company). This trend was reversed in 2017 for the median company, but the distribution was significantly widening suggesting that some insurers' payout ratios reached their maximums over the observed period. The increased payout ratio for the median company in 2018 was complemented by narrowing the distribution. Despite the long and stable economic growth for the period between 2015 and 2019, the median payout ratio fluctuated between 51% and 60%. Since 2020, the payout ratios has been moving down reaching their minimums in 2021 (47% for the median company) as a consequence of the COVID-19 crisis (Figure A1).

Figure A1: Distribution of payouts ratios of European insurers including both dividends and share buybacks



Source: Reuters

The results of the estimated model (1) reveals that EIOPA insurance stress test in 2018 and 2021 had no any significant impact on insurers' dividend distributions including share buybacks (Table A2). It might suggest that information related to the EIOPA stress test results were already known

by the respective insurance companies and therefore did not influence their decision on dividends distributions and share buybacks. Moreover, as EIOPA has no legal power to disclose the individual results of the EU-wide stress test exercise, insurers do not need to take into account such an information being judged by the market participants. Furthermore, the results of the two considered exercise revealed good resilient of the European insurance sectors and the majority of the participating companies were well capitalised against potential adverse scenarios. This could also drive the fact that insurers did not need to make any significant changes in their distributions based on the EU-wide stress test results.

Table A2: Results of the Tobin model for dividend distributions and share buybacks

Variable	Abbrevaiation	Estimate	Std. error	t value	Pr(>t)
Intercept		-138.345	103.5871	-1.565	0.0571 *
Lagged payout ratio	DP	0.4995	0.5025	1.349	0.1773
Stress test 2018 - yield curve up	$ST2018_{down}$	-29.4301	59.1123	-0.498	0.6186
Stress test 2018 - yield curve down	$ST2018_{up}$	24.1158	40.8934	0.59	0.5554
Stress test 2021 - fix balance sheet	$ST2021_{F}$	-30.5715	9686.677	-0.003	0.9975
Stress test 2021 - constarint balance sheet	$ST2021_{C}$	-34.047	5535.035	-0.006	0.9951
Return on equity	ROE	-148.471	127.3872	-1.941	0.0585 *
Natural logarithm of total assets	TA	3.4444	4.9095	0.121	0.3147
SCR ratio	SCR	5.9276	14.5892	0.846	0.5425
Assets-over-liabilities	AoL	61.6648	56.4288	1.695	0.0586 *
Gross domestic product	GDP	0.7293	2.2607	0.527	0.6651

Source: Authors' calculations

Despite the stress test results do not seem to have any significant impact on the payout ratios when control for other relevant factors, our empirical results suggest that insurers follow prudential approach with their higher payout ratios associated with better capital positions measured by an assets-over-liability ratio (positive and significant coefficient for AoL). It suggests the relevance of dividend signalling hypothesis for European insurers.

Moreover, our results further suggest that insurers might behave counter-cyclically retaining more generated cashflows to build up capital in a good time when profitability is higher instead of increasing payout ratios. This could to some extend support dividend smoothing policy (negative and significant coefficient for ROE).

Overall, our results might be a good news for a regulators and policy makers alike suggesting that insurers apply prudent policy decreasing payout ratios in case of weaker capital position. At the same time, they seem to act counter cyclically, increasing payout ratios in good times to build up higher capital buffers and reducing in crises time. This might have a positive impact on financial stability.

Conclusion

Dividend distributions has become highly debated topic with the recent pandemic crisis. However, despite the global interconnectedness of financial system, there is currently no coordinated approach nor agreement on payout restrictions among members of various international fora as e.g., Financial Stability Board, the Basel Committee, etc. (ESRB 2020). Due to the Covid-19 outbreak, there were strong macroprudential initiatives for a wide-ranging restriction on payouts across the different financial segments, applicable to financial institutions irrespective of their capital levels. Our findings help to identify the key determinants that influence the decision of financial institutions to payout dividends and contribute to the ongoing discussion on potential effects and consequences of regulatory announcements and communications towards market participants.

As various elements of the regulatory and prudential framework are in place to constrain dividend payouts of insurers, it is important to better understand all transmission channels as well as insurers' behaviour to consider all those aspects when deciding on the appropriate supervisory measures. Moreover, better knowledge on the relevant dividend distribution aspects could allow to project a dividend income, which is sensitive to financial and macroeconomic variables, under different adverse scenarios within stress testing frameworks. Our empirical results suggest the relevance of dividend signalling as well as some elements of dividend smoothing hypotheses.

Based on our best knowledge, this is the first paper on the implications of regulatory stress tests on dividend distributions of insurance companies. Our results are in line with the conclusions available in the existing literature as well as the arguments provided in the introduction of this paper. Furthermore, it supports currently widely discussed topic by policy makers that restrictions of dividend distributions could be used as a macroprudential measure helping to reduce uncertainty on potential inadequate solvency positions in the crisis time.

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