



Unmasking inflation

Best practices for (re)insurance
Risk Managers

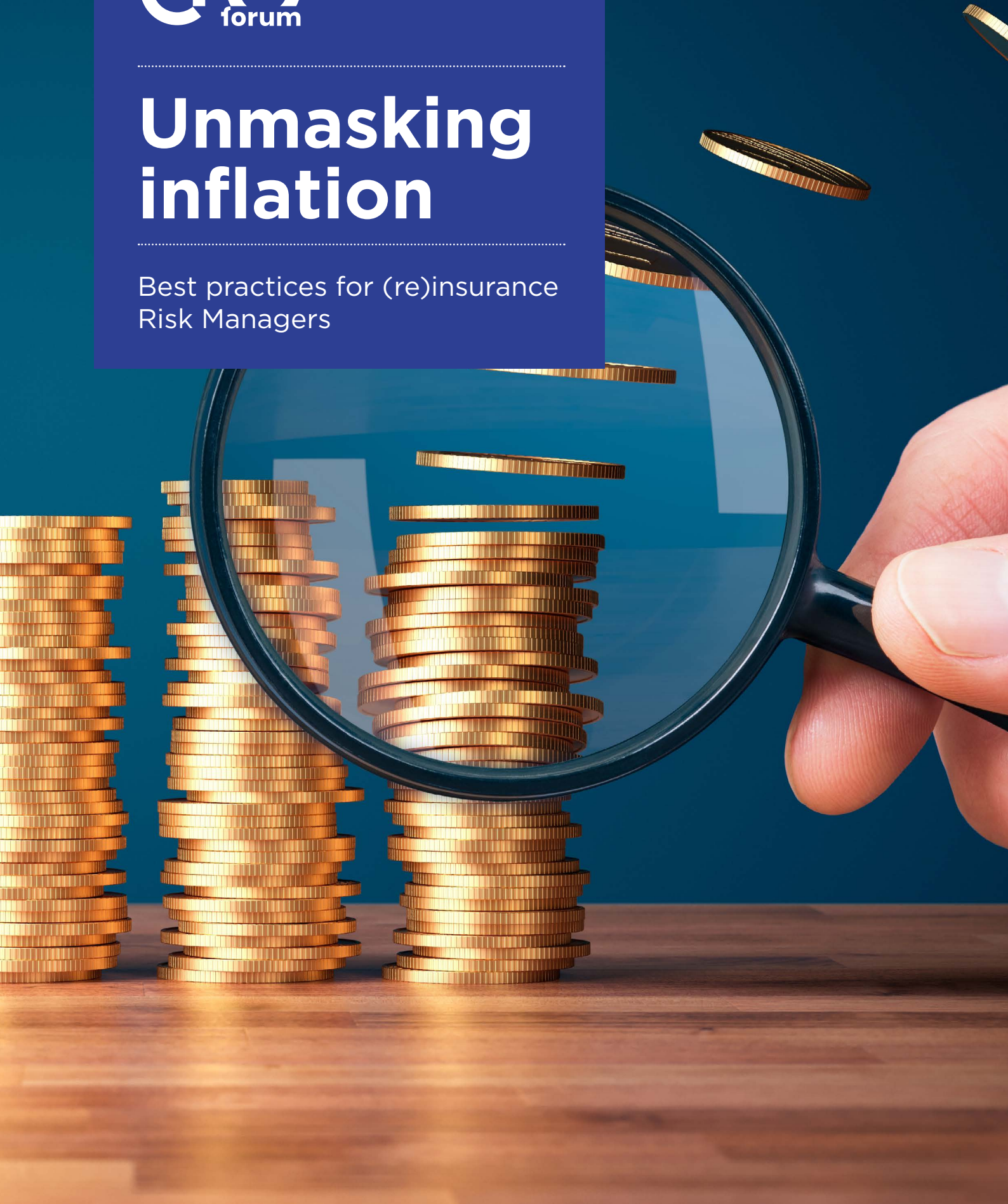


Table of Contents

Executive Summary	3
Introduction	4
1. The return of Inflation: recent developments	6
1.1 Inflation drivers	8
1.2 Inflation regimes and associated effects	9
2. Expected and potential impacts of inflation on (re)insurance business	12
2.1 Universal implications on both non-life and life (re)insurance	12
2.2 Non-life (re)insurance focused insights and considerations	17
2.3 Life (re)insurance focused insights and considerations	20
3. Tools to measure and forecast inflation risk	23
3.1 Inflation risk indicators	23
3.2 Scenarios for inflation risk	26
3.3 Including inflation risk in ORSA scenario analysis and stress-tests	27
3.4 Inclusion of inflation risk in risk models	30
4. Inflation Risk Monitoring and Management Best Practices	34
4.1 Inflation risk monitoring practices	34
4.2 Inflation risk management practices	35
Conclusion and food for thought	43
References	44
Annex 1: 1970s versus 2021 inflation rising: Similarities and differences	45
Annex 2: 1970s Volcker disinflation process: Applied again in 2021	47
Annex 3: Explanations to the Non-Life management actions Dashboard	48
Annex 4: Explanations to the Life management actions Dashboard	50

Executive summary

Inflation is back after a hiatus of more than 30 years, spiking during 2021-22 in most advanced economies. The consensus among Chief Risk Officers (CROs) is that monetary policy actions and supply-demand imbalances due to the pandemic, coupled with ongoing geopolitical conflicts and tensions, have been and continue to be the key factors influencing recent inflation dynamics.

While economists are still debating if inflation will be transitory or not, evidence from the world's major economies indicates that inflationary pressures are now abating. Part of the credit this time can be attributed to the clear Central Banks mandate for price stability.

Nevertheless, most CROs within the Chief Risk Officers Forum (CRO Forum) rank inflation among the top 10 risks in their risk taxonomies according to a survey in 2023. They view it as an underlying force or factor influencing other risks within the taxonomy.

Non-life (re)insurers with short-tail business are more likely to have experienced profitability erosion due to inflation at date of publication. However, for long-tailed Non-Life lines, of business, challenges are heightened as risks may be more intractable. For Life (re)insurers, the immediate impacts on profitability determined by the surge in interest rates are favourable, but general economic uncertainty and an increase in lapse rates is expected to have longer-term effects. For both industries, optimising asset allocation during rapidly rising interest rates, volatile markets, and uncertain economic outlooks is a winning strategy.

As each company faces a very specific type of inflation, there is no one-size-fits-all approach in modelling inflation risk exposure. Our CRO survey suggests that, currently, the most common modelling practice is a stochastic approach where inflation risk is included in the Internal/Economic capital model, or via sensitivity and stress analysis and many companies do both. Risk managers involved in forecasting and stress testing inflation must strike a balance between complexity and specificity. Moreover, the longer the time horizon for inflation expectations, the greater the forecasting sophistication required.

Robust and agile governance systems together with granular and timely data allow management early sight of increasing inflation risk and efficient management within tolerance. For Non-Life companies the most common management actions are underwriting and pricing adjustments, while for Life companies, actions are more varied and primarily focus around reviewing strategic asset allocation and stringent ALM practices.

Overall, the insurance industry has for the most part successfully navigated the recent period of high inflation. In order to enhance performance, the CRO survey consensus emphasizes the importance of focusing on improvements in modelling, regular stress testing, and/or in-depth macroeconomic analyses.



Introduction

After at least 30 years of very low indicators in developed economies including negative lows in interest rates, the Consumer Price Index (CPI) caught economic forecasters by surprise in reaching unpredicted heights by end-2022. Known as one of the most boring parameters to forecast, inflation was also one of the more reliably flat, given the monetary policy tools and mandates developed by Central Banks (as well as the disinflationary impact of China's emergence as a global manufacturer).

A survey conducted by the Chief Risk Officers Forum (CRO Forum) of European Insurers to all its members, in 2023, shows that more than half of the respondents didn't increase their focus on high inflation until 2022, most likely after the turmoil created by the Russian invasion of Ukraine and the subsequent increase in energy and commodity prices. While Central Banks responded as one would expect by tightening monetary policy, this may have been a little too slow, and consequently interest rates have had to be held higher for longer.

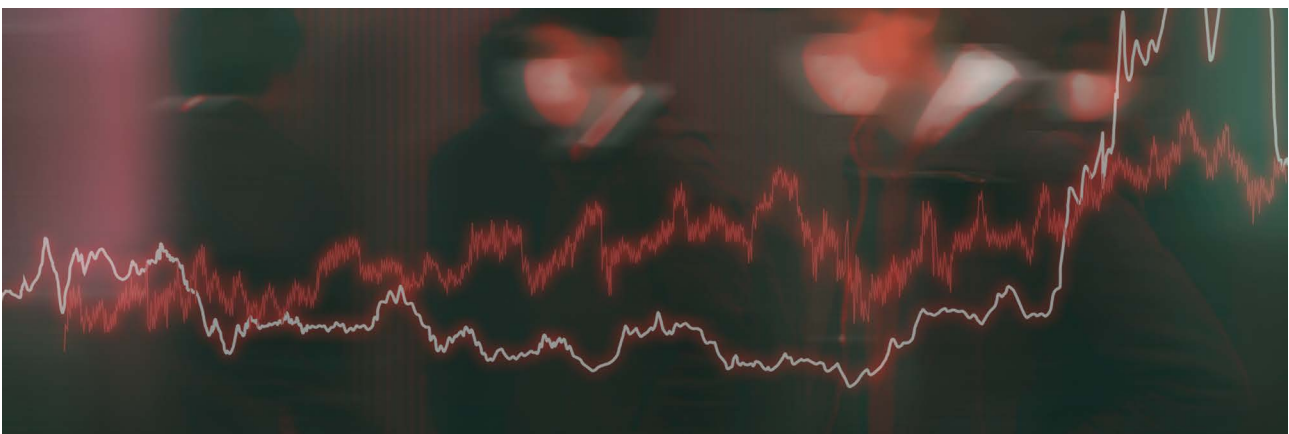
Today inflation has subsided, notwithstanding unstable geopolitical and economic environment, so why write a paper now?

All things considered, the insurance sector has weathered the inflationary period rather well. It also weathered the pandemic rather well. Nevertheless, let's not forget that inflation is a fundamental parameter in many models, that has gone awry in the past. It is also a parameter that is well known. Even if it has not appeared since the 80's, at the time it was a gamechanger.

In its mission to outline best practices in risk management for the industry, the CRO Forum probed the key components used by companies to face this "ghost from the past". They were able to weather the impact by developing and/or finetuning tools – qualitative and quantitative – that helped them make the appropriate decisions and many of these tools are here to stay. More importantly, our survey of CRO Forum members shows how their companies were able to rely on mature decision-making processes that almost always involved risk management and the CROs that represent them. Risk is in a unique position to understand and address the impact of risk factors and scenarios on all items of the balance sheet and bring these together into a single indicator, and that is the most precious tool of all. It helps to understand a company's risk profile, and how sensitive it is to what management thinks may lie ahead.

What may remain unique perhaps about this past inflationary surge is the magnitude and velocity with which it developed, prompting companies to adapt future assumptions on how quickly things can change. This can only be of added value as it helps to plan for highly stressful scenarios.

General Helmuth von Moltke once said that no plan survives contact with the enemy, but it is crucial to plan and adapt. As the world moves to a phase where inflation is under control, for now, the risk of recession or a new phase of inflation due to escalating geopolitical events looms. Nevertheless, companies continue to plan, waiting for contact with the next macroeconomic shock. As they continue to finetune their models for inflation, companies will further be able to find ways to use inflation to their advantage, not by moving with big steps but more tactical shifts that may even contribute to keeping inflation under control.



Therefore, the first part of this report aims to assess how ready risk management processes were on the eve of the 2022 inflation spike, with reference to measuring, modelling, monitoring and control, and the consequent management actions undertaken. The second part draws some key conclusions about best practices but also about what can be done better in the future. It is organised reflecting the same high-level “IMMMR” process that has always been used to define risk management:



- **Identifying the risk:** setting the scene by analysing the key evidence and causes underpinning the resurgence of inflation and further develops this by describing the main impacts on the capital position and profitability of (re)insurance companies of a high inflation regime in conjunction with a rapid increase in interest rates. These paragraphs are needed to understand what the companies faced, in addition to providing some indication on what drivers and impacts CROs need to look out for to confront any future inflationary surges proactively.



- **Measuring the risk:** providing a deep dive on practices related to the main measuring approaches adopted, as well as risks and opportunities linked to more sophisticated approaches.



- **Managing the risk:** Final considerations on the management tools that were and still being used, together with the role of the CRO in the processes that lead to remediating decisions, and whether or not these decisions had a direct impact on Solvency levels.

To strike a practical tone, the paper includes findings from the CRO Forum survey of 19 member companies conducted in August and September of 2023 and small case studies that attempt to illustrate some of the concepts put forward.

Note

For the purposes of this study the term “non-life” will include non-SLT Health (re)insurance as defined by the Solvency II legislation while the term “life” will include SLT Health (re)insurance as defined by the Solvency II legislation.



1. The return of inflation: recent developments

The inflation surge in 2021-2022 marked a significant shift in global economic trends. For over two decades, there had been modest price growth and supportive Central Bank policies, especially after the 2008 financial crisis and the 2011-2012 sovereign debt crisis. However, between 2021 and 2022, inflation spiked, exceeding 8% in major developed economies (see Figure 1).

In response and to dampen inflationary pressure, major Central Banks, including the Federal Reserve (FED) and the Bank of England (BoE), implemented substantial policy changes, leading to the most significant interest rate increase in decades, from 0% to 5% in just over a year (see Figure 2). The European Central Bank (ECB) also followed suit (ECB, 2022). This swift transformation upended the previously low-interest rate environment in financial markets, marking the onset of a new economic era characterized by rising prices and interest rates. It also caught many financial analysts by surprise (Reis, 2022).

While the Russian invasion of Ukraine notably amplified inflationary pressures, several other factors laid the groundwork for this surge:

- **High oil and commodity prices:** Besides natural gas prices significantly increasing in early 2022, oil and overall commodity prices had already escalated in the latter half of 2020 (see Figure 3).

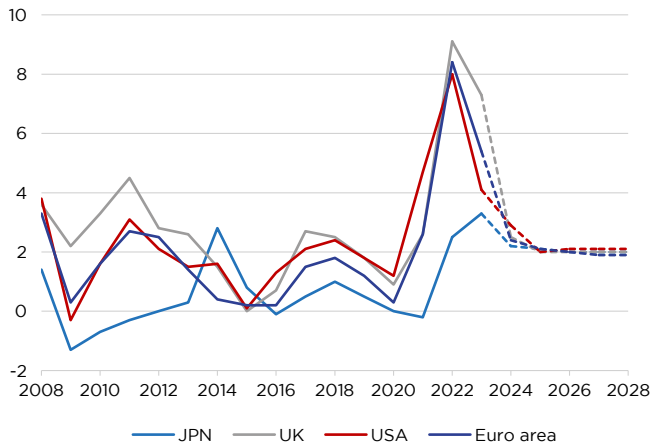
- **Disrupted supply:** Pandemic-induced lockdown measures had substantial impacts on global value chains. An examination of the Global Supply Chain Pressure Index from the Federal Reserve Bank of New York highlights two major spikes in pressures on global value chains: the first during the 2020 pandemic due to disruptions in the manufacturing sector, and the second in 2021, following a surge in shipping costs (Kemp et al., 2023; see Figure 4).
- **Strong demand:** post-pandemic recovery, fuelled by fiscal stimulus and increased demand (IMF, 2021), resulted in exceptionally strong growth exceeding +5% in most major developed economies (see Figure 5).
- **Further monetary easing:** In 2020, the Federal Reserve responded to the pandemic by significantly reducing the FED funds rate to curb the spread of the disease. This easing of monetary policy also extended to bond markets, as illustrated in Figure 6.

In 2023, the inflation trend reversed and is returning to targeted levels. This, however, has come at the potential cost of economic downturns, prompting Central Banks to contemplate a return to expansionary monetary policies to counteract these effects. In any case, these two years have demonstrated that inflation is not confined to the past but can resurface under specific economic conditions, causing significant impacts on financial markets.



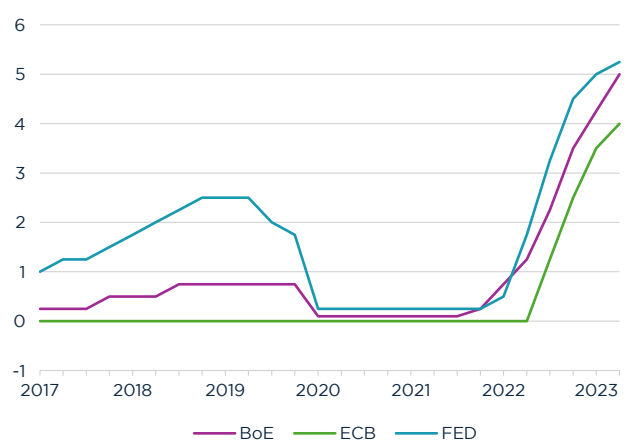
7 Unmasking inflation – Best practices for (re)insurance Risk Managers

Figure 1 Inflation, average consumer prices (%)



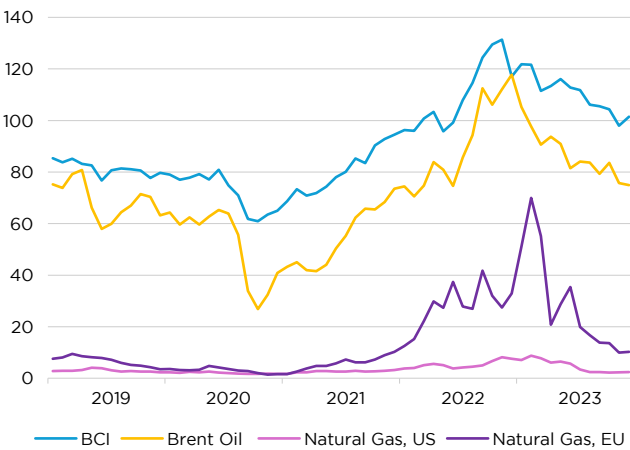
Source: CROF elaboration on IMF data.
Notes: Inflation is computed as average consumer prices and projected after 2023.

Figure 2 Policy rates, quarterly view (%)



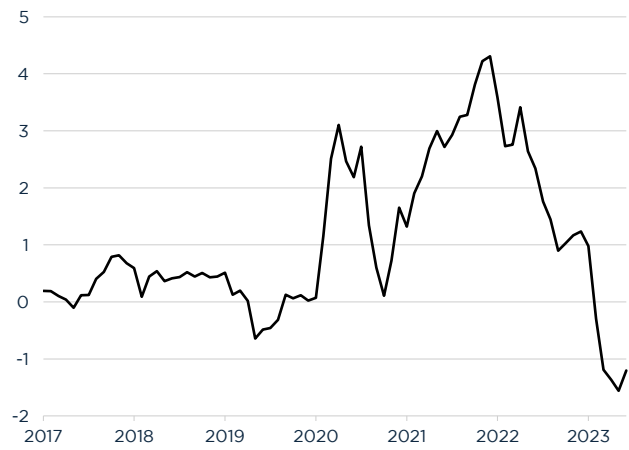
Source: CROF elaboration on LGSE Datastream data.
Notes: Quarterly observation. Last observation Q2 2023.

Figure 3 Commodities index and energy prices (Index, USD)



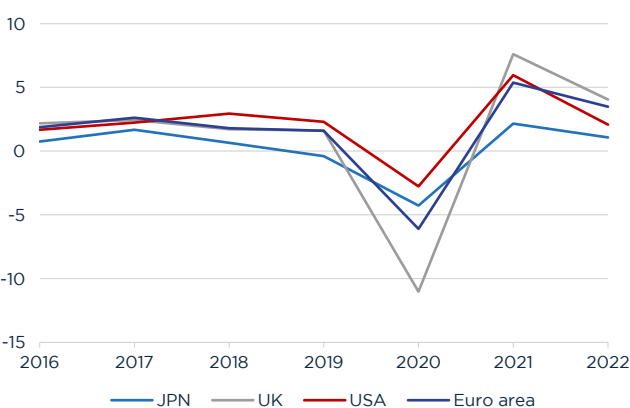
Source: CROF elaboration on IMF and Bloomberg data.
Notes: BCI is Bloomberg Commodity Index, while Oil data is expressed in USD per barrel and Natural Gas data in USD per Metric Million British thermal unit.

Figure 4 Global Supply Chain Pressure (Standard Deviation)



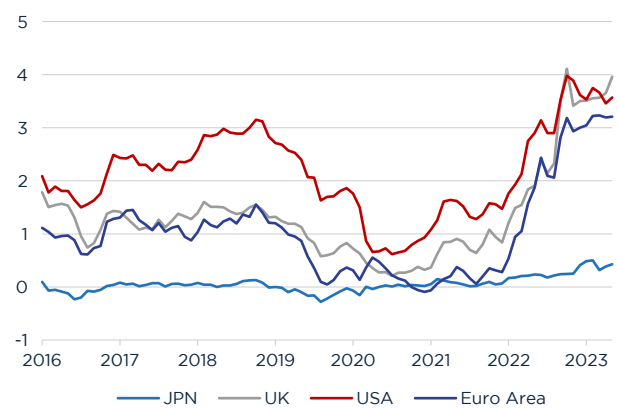
Source: CROF elaboration on Federal Reserve Bank of New York, Global Supply Chain Pressure Index.
Notes: Standard deviation from average values.

Figure 5 GDP growth (%)



Source: CROF elaboration on IMF data.
Notes: GDP growth rate in constant prices.

Figure 6 Government Bonds 10-Years (%)



Source: CROF elaboration OECD data.
Notes: Last observation May 2023.

1.1 Inflation drivers

Traditional inflation drivers can be categorized mainly into three groups: demand-pull (demand shock inflation), cost-push (supply shock inflation), and inflation expectations (Ramlee and Sern)¹.

- **Demand-pull** (Demand Shock Inflation) arises when aggregate demand exceeds aggregate supply, exerting upward pressure on prices. This could stem from increased consumer spending due to lower unemployment or interest rates, elevated government expenditure, or a positive economic outlook prompting higher business investments and, consequently, increased aggregate demand.
- **Cost-push** (Supply Shock Inflation) occurs when external disruptions or shocks impact essential input commodities, leading to a decrease in aggregate supply. This results in heightened production costs and, subsequently, an increase in the price level, even if demand remains constant. Disruptions may originate from abrupt changes in energy or raw material prices, labour strikes, natural disasters, or geopolitical instability affecting international trade.

- **Inflation expectations** reflect what individuals, businesses, and policymakers think future inflation trends will be. If not well-anchored, inflation expectations can cause higher actual inflation and potential economic instability. Therefore, maintaining credibility in the Central Bank's inflation-targeting policy is crucial for managing inflation expectations and securing economic stability.

The future dynamics of inflation will hinge on the interplay of factors within these broad categories of drivers. Specifically, drawing on the experiences of the past two years, members of the CRO Forum shared their perspectives on the drivers most relevant to shaping future inflation dynamics, encompassing both financial and non-financial aspects. The results are depicted in Figures 7 and 8.

Figure 7

Answers to the question:

In the current context, what do you think will be the most relevant financial drivers in determining the future inflation dynamics?

Note: Select up to 3 most significant

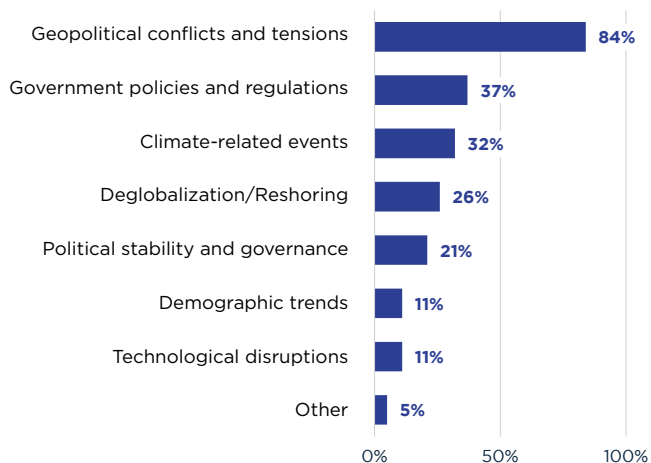
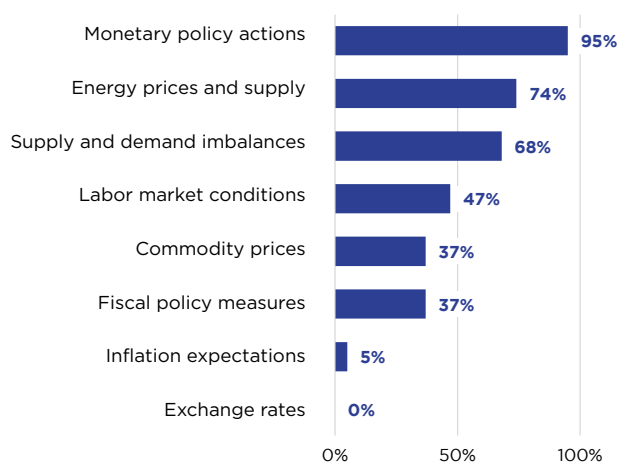


Figure 8

Answers to the question:

In the current context, what do you think will be the most relevant non-financial drivers in determining the future inflation dynamics?

Note: Select up to 3 most significant



¹ BIS Irving Fisher Committee on Central Bank Statistics (IFC) Bulletin No 39

Regarding financial drivers, unsurprisingly, Central Bank decisions are perceived as crucial in impacting both short-term and long-term inflation trends, as demonstrated in the past two years. Additionally, a considerable number of participants highlighted energy prices and supply pressure, supply and demand imbalances and labour market conditions as important factors. This reflects on-going concerns about further potential disruptions in the supply chain and possible wage increases, both of which could, in turn, fuel inflation.

Regarding non-financial factors, nearly all respondents consider geopolitical conflicts and tensions as the most relevant driver in determining future inflation dynamics. The risk manager's perspective aligns with the current global landscape characterized by escalating political tensions, which have the potential to disrupt trade relations, triggering shifts in supply chains, causing shortages, and leading to spikes in energy and commodity prices. Currently, these are the factors causing the most concern regarding future price growth. Other significant factors cited by participants include government policies and regulations, climate-related events, deglobalization/reshoring, and political stability and governance, underscoring companies' awareness of the potential impacts these factors can have on inflation.

1.2 Inflation regimes and associated effects

Following significant financial and non-financial shocks, inflation can embark on a sustained growth trajectory, deviating from the Central Bank's inflation target (i.e. 2%). This persistent price growth typically unfolds in two phases:

- The initial phase, termed **inflation rising**, is characterized by a positive trend in inflation, where the impact of inflationary shocks on the general price index prevails. In this phase, companies typically grapple with increased costs throughout their value chain. A parallel historical example resembling the current inflation episode is the "Great Inflation" observed between 1970 and 1980 (see Annex 1);
- The subsequent phase, referred to as the **disinflation process**, involves a reduction in inflation, typically resulting from Central Banks implementing monetary tightening measures. Companies face a normalization of price development, albeit at the expense of a weakened real economy. A pertinent historical illustration of this phase is the 1980 "Volcker Disinflation Period" (see Annex 2).

Inflation rising

During rising inflation, there is a persistent increase in the general Consumer Price Index. Monetary policy has not yet taken effect or actions are lagging in containing inflation and therefore it is in a pre-peak phase. Companies face heightened cost pressure, often dealing with increases in the prices of intermediate products and raw materials. Social tensions are exacerbated due to the loss of purchasing power for pensions and wages. Expectations of individuals, businesses, and policymakers progressively shift, leading to inflation surpassing the Central Banks' target level. This, in turn, increases uncertainty about future economic developments, contributing to financial market volatility.

When cumulative inflation accelerates to a rate exceeding 100% over three years (IASB, 2001), the economy is said to be hyperinflationary. Historical evidence suggests a strong correlation between hyperinflation and declining public trust in government policies and currency stability. Additionally, as tax revenues are generally insufficient, governments resort to expanding the money supply to finance expenses, further fuelling inflation, and eroding the purchasing power of the currency.

Disinflation Process

Disinflation is characterized by a sustained and consistent decrease in inflation, eventually reaching a low and stable level. While a countershock in energy prices may initiate this process, the primary driver is typically a restrictive monetary policy implemented by the Central Bank. The onset of disinflation occurs when monetary policy is judged to be effective, prompting adjustments in consumer behaviour and expectations of households and firms regarding price dynamics. This framework was prominent in the early '80s, exemplified by the "Volcker disinflation" policy (Annex 2) that successfully brought inflation back under control. It remains relevant today, with a reduction in inflation reflecting both monetary tightening and declines in fuel and non-fuel commodity prices.

Within this regime, potential risks to the economy emerge from the impact of excessive monetary tightening on economic activity. This raises the concern of falling into a deflation trap, wherein weak aggregate demand causes inflation to decline and potentially turn negative. A recessionary situation, in which aggregate demand decreases, or a prolonged stagnation of growth could also result in a fall in the general price index; deflation occurs exactly in the case where the price growth rate is negative.

10 Unmasking inflation – Best practices for (re)insurance Risk Managers

Naturally, monetary authorities and Central Banks face their own risks. Adopting a cautious approach, characterized by being ‘too little too late,’ may result in a failure to achieve policy goals and the continuation of a high inflation environment. Striking the right balance is crucial to avoid the pitfalls of both excessive tightening and insufficient responsiveness, thereby fostering economic stability.

In the 2021-2023 inflation episode, Central Banks demonstrated an assertive stance, concluding the tightening phase in October 2023 (ECB, 2023) after noting a substantial decrease in upward price pressure on core inflation. In less than two

years, inflation has been brought under control, emphasizing the pivotal role of Central Banks, as highlighted by the CRO Forum members (see Figure 9).

Forward looking inflation scenarios

In the current scenario, inflation is expected to return to the target level by 2025 (see Table 1). According to International Monetary Fund (IMF) forecasts, advanced economies are expected to experience a consistent trajectory of inflation, hovering around 2% from 2025 to 2028. Meanwhile, global inflation is projected to be approximately 4%, primarily due to the contribution of emerging economies.

Figure 9

Answers to the question:

What are in your opinion the main differences between the inflation in 70-80s cycle and the one we are experiencing now?

Note: Select up to 3 most significant

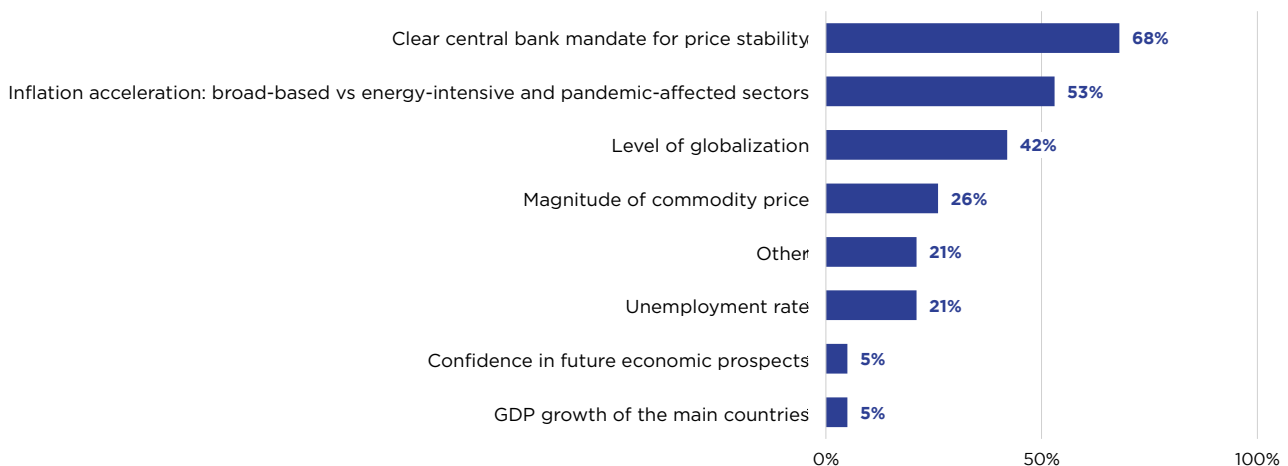


Table 1 IMF Inflation forecasts (%)

Country	Consolidated				Forecasts					
	2020	2021	2022	2023	2024	2025	2026	2027	2028	
United Kingdom	0.9	2.6	9.1	7.3	2.5	2.0	2.0	2.0	2.0	
United States	1.2	4.7	8.0	4.1	2.9	2.0	2.1	2.1	2.1	
Euro area	0.3	2.6	8.4	5.4	2.4	2.1	2.0	1.9	1.9	
Advanced economies	0.7	3.1	7.3	4.6	2.6	2.0	2.0	2.0	2.0	
Emerging market and developing economies	5.2	5.9	9.8	8.3	8.3	6.2	4.9	4.4	4.3	
World	3.2	4.7	8.7	6.8	5.9	4.5	3.7	3.5	3.4	

Source: IMF data (2024, April extraction)

11 Unmasking inflation – Best practices for (re)insurance Risk Managers

The observed patterns affirm a typical progression in the current inflation cycle, showing an increase in 2021-2022 followed by a return to stability in 2023-2024. Usually, however, this process is not so linear.

In the current situation, it is important to monitor the speed at which inflation reverts to the target level and its subsequent impacts on the economy, as the present landscape poses the potential for either a “soft landing,” or a “hard landing,” with key consideration outlined below:

- **Soft Landing:** when inflation is gradually absorbed with limited effect on real growth. This scenario represents a transition to a “new normal.” Ordinary financial and non-financial drivers play a moderate role in determining the inflation landing. Notably, attention is directed toward current monetary tightening and economic downturn, which are currently leading the gradual decline in inflation.
- **Hard Landing:** characterized by a sudden decline in inflation leading to a recession, typical of prolonged period of monetary tightening coupled with an economic crisis. All this happens at the expense of the real economy. Another influential factor of the hard landing scenario is the decline in energy or commodity prices, which can significantly impact a key component of inflation.
















After experiencing a “soft” or “hard landing,” various scenarios open towards future inflationary trends.

We might encounter a period of “low inflation” or “prolonged deflation,” resembling the pre-Covid-19 environment. Conversely, a “double peak” scenario is possible, where inflation experiences a subsequent rise.

- **Low Inflation/Prolonged Deflation:** If monetary tightening persists for an extended period, it might lead to persistent low inflation or prolonged deflation. This could be further exacerbated by a potential drop in energy/commodity prices, economic downturn, and climate-related events posing risks to the economy. In such cases, monetary policy might undergo a radical shift towards expansion, but there is a significant risk of falling into a deflation trap.
- **Double Peak:** the possibility that inflation could return. Various expansionary drivers, such as monetary easing, expansive fiscal policies, and labour market expansion, may contribute to this scenario. Currently, geopolitical tensions, impacting global value chains, and the accompanying surge in energy prices are particularly noteworthy in the present context.

The following table is intended as a potential monitoring tool of inflation drivers that can help risk managers envisage the type of future scenario to be considered. This step is crucial to aid identifying the risk by assessing its potential impacts on their company in terms of Solvency but also of profitability.

Table 2 Inflation driver relevance

Scenarios type Drivers	Current scenario		Future evolution	
	Soft Landing	Hard Landing	Low Inflation/ Prolonged Deflation	Double Peak
Monetary tightening				
Monetary easing				
Economic downturn				
Labour market expansion				
Expansionary fiscal policy				
Energy/commodity price surge				
Energy/commodity price drop				
Geopolitical tension				
Climate related events				

Legend  Medium relevance  High relevance

2. Expected and potential impacts of inflation on (re)insurance business

Part of *Identifying the risk* is also assessing how the inflationary environment impacts (re)insurance companies. Companies have been met with challenges in this regard given the multiple areas affected in such a short timeframe; reinsurers in particular, due to the time lags in the availability of data from direct insurers.

Recognising the uniqueness of each company's profile, encompassing activities, markets, customer base, distribution methods, and cost structures, is paramount. Consideration must be given to potential disparities in impact, such as those between two companies writing motor insurance but possessing different pricing power levels due to distinct competitive market environments. Likewise, variations may arise, for example, between two companies with a strong traditional life insurance business but providing to diverse policyholder profiles, thus exposing them differently to the risk of policy lapses.

This chapter describes how the current inflationary environment, subsequent interest rate dynamic, and potential future scenarios have or may further impact the (re)insurance companies based on the experience provided by the CRO Forum members through a survey and working group.

2.1 Universal implications on both non-life and life (re)insurance

The table on the following page summarises the CROs answers on observed and potential impacts considered for those areas that are shared between the non-life and life businesses.



13 Unmasking inflation – Best practices for (re)insurance Risk Managers

Table 3 Observed and potential impacts and their effects on Profitability, Capital and Liquidity

		Impact Profitability	Impact Solvency II/ SST solvency ratio	Impact Liquidity
Observed impacts	Increase in fixed cost base and cost of operational events	Negative, increases losses	Negatively impacts OF/AFR	Increases outflows
	Decrease in asset valuations to the extent they are mismatched to liabilities	Negative, incremented realised & unrealised losses posted to P&L	Negatively impacts OF/AFR; Some benefit to the SCR/TC calculation through reduced Market Risk exposure - likely to be at least partially offset by increased Market Risk shocks	Liquidity stress (lower asset value to cover liquidity gaps)
	Changes in policyholder behaviour resulting in less propensity to insure	Negative, increases claims and loss in volumes	Negatively impacts OF/AFR	Decreases inflows
	Increase in discount rates	No direct impact (increased discounting on cashflows)	Decreases technical provisions	Potentially modifies cashflows (and potential need to change collateral posted to cover derivative transactions)
	Higher credit spreads	Potentially positive, higher investment returns although potentially higher unrealised losses	Negatively impacts OF/AFR - will be dampened by matching adjustments and/or volatility adjustments; Some benefit to the SCR/TC calculation through reduced exposure - likely to be at least partially offset by increased credit spread shocks (particularly if higher spreads reduce credit quality)	Liquidity stress (fewer assets to cover liquidity gaps)
	Volatility in FX rates	<i>Dependent on risk profile</i>	<i>Dependent on risk profile</i>	<i>Dependent on risk profile</i>
Potential emerging risks	Reputational damage	Potentially negative, loss in volumes	Decreases exposures in SCR/TC	Decreases inflows
	Increased frequency of operational risk events	Negative, incremented losses	Negatively impacts OF/TC	Increases outflows
	Increased level of regulatory intervention	<i>Likely to be negative</i>	<i>Likely to be negative</i>	<i>Likely to be negative (if any impact)</i>

Acronyms: Own Funds (OF) / Available Financial Resources (AFR) / Solvency Capital Requirement (SCR) / Target Capital (TC)

Source: CRO Forum Working Group on Inflation

Example on how to read this table

An overall decrease in asset valuations can be assumed due to the volatility arising from higher interest rates in an inflationary environment, to the extent the assets are not matched to the liabilities. This puts downward pressure on the income statement due to realised losses in the case of assets sales and an increase in unrealised losses posted to the income statement. The overall negative impact on profitability in turn impacts the OF/AFR on the Solvency balance sheet. Some benefit might be provided by a decreased SCR/TC because valuations of assets have decreased resulting in a lower Market Risk exposure. However, any benefit to the SCR/TC calculation is likely to be at least partially offset by higher shocks generated by Market Risk models. Finally, liquidity is stressed as there are lower asset values in the cash pool or contingency portfolio to cover liquidity gaps.

Overall Magnitude – Important but less than expected

Based on the CRO Forum member survey most respondents ranked inflation as within the Top 10 risks in their risk taxonomies. Variations in the answers is represented by the different risk profile of companies where, non-life business for example, are more impacted. It should be noted that for (re) insurers, a high inflationary environment may not materially impact profitability and the Solvency II/SST ratio in the short term. In the long run, when consumer purchasing power is eroded, inflation risk may take on a higher ranking, highlighting the importance of considering potential emerging risks.



Figure 10

Answers to the question:

In terms of materiality, how is inflation risk positioned compared to other risks in your taxonomy?

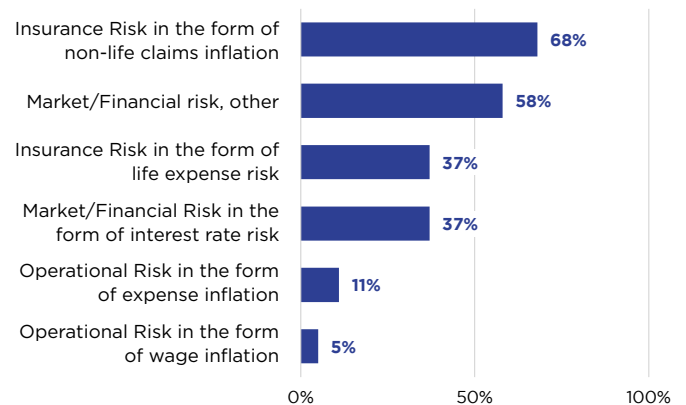


Figure 11

Answers to the question:

Where is inflation defined in your taxonomy?

Note: Select all that apply / Please select only if risk is explicitly defined



Interestingly, despite the survey allowing for these options, none of the respondents included inflation in their taxonomies as part of Business/Strategy Risk or as a risk category on its own. This is partly because inflation is a pervasive compounding factor to other risks, currently considered difficult to isolate in the taxonomy. As will be discussed in chapter 3 however, it could be separately modelled as an isolated risk driver.

Impact on costs – Here to stay

High inflation means that increases in the (re) insurer’s fixed cost base are more volatile compared to the average inflationary scenario, negatively impacting profitability and the Solvency II/SST ratio. Therefore, fixed costs such as outsourcing services, inflation indexed office-rent, IT and office equipment and staff costs will increase. In a subsequent disinflationary scenario, these increases in fixed cost may not be reversible without significant restructuring. In the quest to restore margins to pre-inflationary levels, variable costs such as the cost of claim settlements may be restructured, exacerbating the hard-landing scenario and possibly even be a contributing factor.

Rising inflation will also have an impact on the cost of operational events which in turn will impact the Solvency II/SST ratio through deterioration of profit and loss. Fix up costs may require additional short-term external resources to remediate the issue. Although the rise in operational events for the (re)insurer may not always directly follow a prescribed published index (e.g. fines based on a maximum fixed cost amount), it is important that risk managers carefully consider the overall operational risk drivers when evaluating the financial consequences of rising inflation on potential operational event exposures.

Impact on investments – It depends, extent of ALM matching is key

Recent interest rate changes have strongly affected investment portfolios, altering yields on fixed income securities and overall portfolio profitability. While interest rate hikes generally reduce asset valuations (and vice versa in disinflationary

scenarios), the extent of this impact depends on how well opposing effects on liabilities offset these changes, known as asset-liability matching. Elevated inflation (and deflation) can also increase economic uncertainty, leading to equity market volatility and higher risk premiums. While for some specific sectors rising inflation could increase corporate profits, in many sectors stock values are characterized by downward trends, especially if investors believe in the prospect of a future recession. Sectors like tourism and leisure typically fare worse during high inflation scenarios, while utilities tend to perform better. Expectations of higher interest rates negatively affect bond portfolios, reducing bond returns in real terms. Additionally, rising interest rates may decrease real estate values and potentially lead to a property value crash.

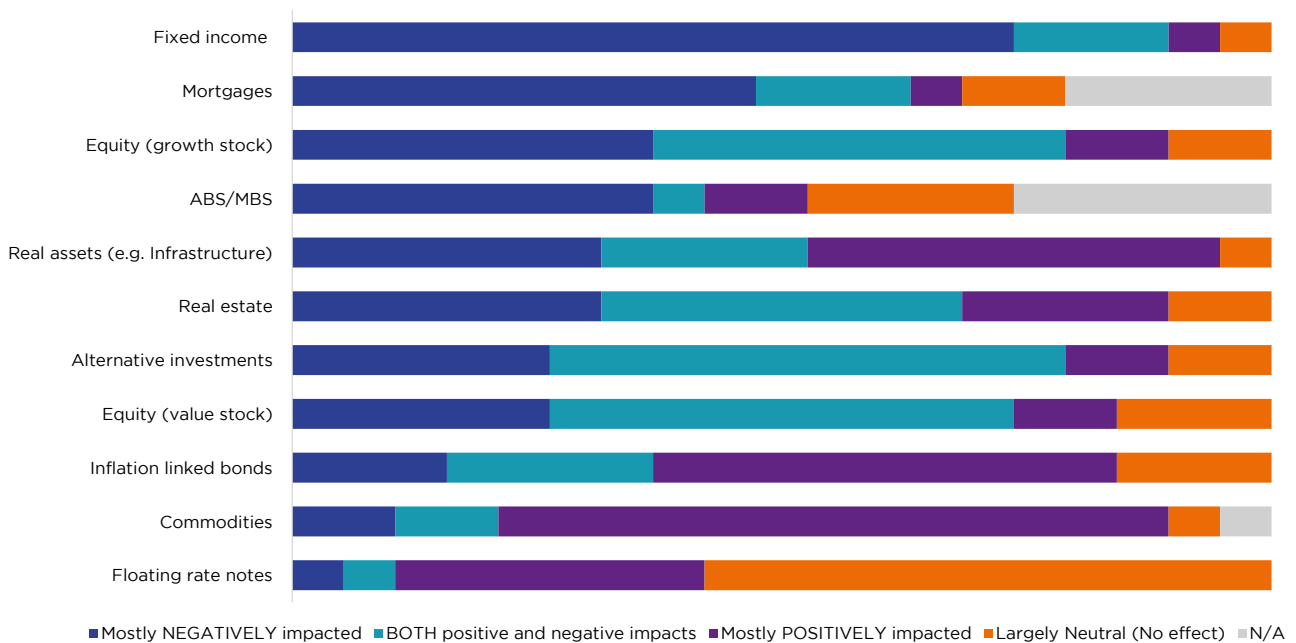
The following chart details the observed impact of inflation on various asset classes according to the member survey responses:

Figure 12

Answers to the question:

How would you assess the impact of inflation on the following asset classes (short-term time horizon)?

Note: Please consider a short term time horizon / Please factor in the rise in interest rates as part of the question



Fixed income and mortgage assets are viewed to be most negatively impacted. Whereas mortgage loans as an asset class are not significantly present in most portfolios, fixed income on average makes up approximately 60% of European (re)insurers portfolios², providing an idea of how material the inflationary impact has been.

Conversely inflation linked bonds, floating rate notes and commodities are typically viewed as being either positively impacted or at least largely neutral providing evidence that these may be viewed as a natural hedge against inflation. Other asset types resulted in a variety of responses with, in particular, real estate and infrastructure assets providing some evidence of a mixed view on their hedging effectiveness.

In addition to the valuation of assets, the changing macroeconomic environment also has an impact on credit spreads. For example, in inflationary scenarios, allowances for credit defaults and downgrades are likely to increase and adversely impact the Solvency II/SST solvency ratio by increasing the allowance for credit risk in the technical provisions and SCR/TC and decreasing the Own Funds. While firms with an approved volatility adjustment and/or matching adjustment may be immunised somewhat against these changes to credit spreads, such firms may typically have a risk profile that is exposed to deteriorations in the credit environment. This situation would deteriorate further in scenarios such as a hard-landing and a double peak where some sectors may have difficulty surviving two shocks and/or a prolonged recession.

Impact on Liquidity – Beware the stress

Risk managers should also consider the effect of the scenarios described in chapter 2 on liquidity, linked to profitability and capital strength. For example, increase in cost of claims, asset deteriorations and/or changes in policyholder behaviour impacting persistency/renewals or lapse may result in less cash being available to pay claims when they are due and the necessity to sell devaluated assets. In this case, cash flow projections (in force and new business) and liquidity risk analysis under stress conditions could help to assess potential liquidity shortfalls going forward and help identify potential management actions to take (see case study 2 – Life case study).

Impact on discounting – Positive, but sometimes not enough

Discounting future liabilities at higher risk-free rates has yielded advantages for future liability assessments, expense cashflows, and prior-year reserving. However, the overall benefit on profitability and solvency ratios hinges on an imperfect alignment between the (re)insurer's liabilities and the assets invested to cover them. Perfect ALM matching eliminates the influence of interest rate changes on Solvency II/SST balance sheets but achieving it may not always be practical or desirable in real-world scenarios. For example, some (re)insurers may have recently released capital (e.g., through dividend payment) partly due to increased discounting benefits, however this potentially could reduce capacity to absorb solvency ratio deteriorations if interest rates decrease going forward.

In disinflationary scenarios, policymakers may decide to reverse interest rate rises to stimulate economic activity, potentially requiring (re)insurers to raise capital to restore solvency ratios if sufficient offsetting benefits cannot be found elsewhere. For those (re)insurers using hedging techniques such as interest rate swaps, will see the value of the fixed-rate leg decreases as interest rates rise, requiring additional collateral from the fixed-rate receiver. Conversely, the floating-rate receiver may see the value of their position increase, reducing required collateral.

Other Impacts to consider – Changed assumptions and volatile FX Rates

Under a holistic Solvency II/SST assessment, changes in risk profiles and exposures, such as adjustments to underwriting risk calibrations or asset valuations, can alter SCR/TC calculations and projections. This affects the risk margin/market value margin element of technical provisions, thus impacting the solvency ratio.

(Re)insurers with assets and liabilities in multiple currencies should also assess the potential impact of foreign exchange rate fluctuations on their base currency, especially when exposed to varying inflationary environments and subsequent monetary responses across different countries.

² EIOPA Statistics - Accompanying note Group/Annual/Published 20231026

Potential Emerging Risks

Considering the future possible scenarios in the previous chapter, especially those leading to recessions or further rises in inflation, risk managers should consider the potential for the rise of new risks linked to the increasing uncertainty.

- **Reputational damage:** One risk that may arise is that of reputational damage to individual (re) insurers or to the sector. For example, in the non-life sector, contract limits may no longer be sufficient to cover repair/replacement costs after a natural catastrophe event, or pricing adjustments may be severe, leading to a perception that the industry is not doing enough to support society in these circumstances.
- **Increased frequency of operational risk events:** factors such as the potential for more litigation on wording in contracts or higher volumes of complaints impacts operational risk exposures and potentially increases the risk of reputational damage. The appetite to litigate or formalise complaints could increase because higher nominal amounts are at stake. In some

jurisdictions, discrepancies in handling litigations and complaints also leads to higher sanctions by the regulator. Another factor is claims fraud, where the appetite to defraud the (re)insurance company increases whether by claiming higher amounts than those actually incurred or by faking events.

- **Increasing level of regulatory intervention:** Prolonged increases to the cost of living may also lead to increasing levels of regulatory intervention in some jurisdictions, such as restrictions or caps imposed on tariff increases.

2.2 Non-life (re)insurance focused insights and considerations

The following table summarises the observed and potential impacts considered for those areas that are specific to the non-life business.

Table 4 Specific non-life impacts and their effects on profitability, capital, and liquidity

		Impact Profitability	Impact Solvency II/ SST solvency ratio	Impact Liquidity
Observed impacts	Increased claims severity and frequency	Negative, increases losses	Negatively impacts OF/ AFR, increases exposure and underwriting risk calibrations in SCR/TC	Increases outflows
	Challenges to implementing management actions	May not be possible to fully mitigate increasing cost of claims	May not be possible to fully mitigate negative impacts	Difficulty in adjusting inflows to cover outflows
	Adverse development in factors used in prior year reserving	Negative, increases reserves	Negatively impacts OF/ AFR, increases exposure and underwriting risk calibrations in SCR/TC	Potentially reduces level of liquid assets available
Potential emerging risks	Decreasing renewals and new business volumes	Negative, loss in volumes	Decreases exposures in SCR/TC	Difficulty in adjusting inflows to cover outflows
	Social unrest/increased crime	Negative, increases losses	Negatively impacts OF/ AFR, increases exposure and underwriting risk calibrations in SCR/TC	Increases outflows
	Contagion of commercial defaults	Negative, increases losses	Negatively impacts OF/ AFR, increases exposure and underwriting risk calibrations in SCR/TC	Increases outflows

Acronyms: Own Funds (OF) / Available Financial Resources (AFR) / Solvency Capital Requirement (SCR) / Target Capital (TC)

Source: CRO Forum Working Group on Inflation

Impact on claims – Severe impact on severity but also frequency

While non-life claims may not follow prescribed indices due to their nature, rising costs have had a large adverse impact on claims severity, depending on the business line impacted, with respect to profitability, Solvency II/SST ratio and liquidity of (re)insurance companies. Examples of negative impact drivers are increases in commodity costs on property lines, salary inflation and legal expenses on liability lines, or the combination of multiple drivers on motor line.

High inflation scenarios can lead to increased claims frequency as policyholders may be more inclined to claim against higher nominal amounts, particularly if policy limits are more likely to be exceeded. For example, rising costs of car repairs may prompt policyholders to file claims for costs they previously deemed too small to pursue. For the same reasons, also reinsurance treaty thresholds are reached more quickly although this effect will probably be offset later by revised treaty conditions. Other factors affecting claims frequency and severity include geographical location, expected liability duration, and retention limits for reinsurers.

Table 5 collates the member survey responses (based on a 1 to 5 impact), indicating a clear distinction in the lines of business impacted by inflation, with short-tailed lines like motor and property seeing the most immediate impact:

While the survey responses reflect the current inflationary environment, longer-tail lines such as liability are anticipated to experience a higher impact in prolonged inflationary scenarios. In deflationary scenarios, some immediate benefits in motor and property lines could be expected due to lowering costs. However, longer-tailed lines are less likely to benefit from disinflationary environments due to challenges in reversing already crystallised professional fee increases.

Impact on adjustments – Challenges to Implementation






Care should be taken when considering the choice of management actions in response to rising claims costs. The quality of data (particularly claims data) will influence the potential efficacy of these actions. The availability of management actions may be restricted by the (re)insurer’s internal systems and policies/code of conduct such as restrictions on discriminating against a certain class of policyholder, while market factors like changing consumer behaviours, restrictions imposed by regulators or by competitive environment, may impact a (re)insurer’s ability to carry out specific management actions in a timely fashion. In any case, regardless of efficacy, time lags between the crystallisation of inflationary impacts and the implementation of management actions could still result in adverse impacts being felt in the short term. In addition, industry-wide actions that result in higher insurance coverage costs are likely to contribute to inflationary spirals further exasperating the impact on frequency and severity of claims (see chapter 4).

Impact on Reserves – Possible adverse developments

The rising cost in claims are likely to distort development factors. This will increase the volatility of development triangles causing further uncertainty in a (re)insurer’s prior year reserves. The overall impact will depend on the (re)insurer’s business mix in relation to the duration of liabilities, such as for longer-tailed lines of business will be experiencing higher levels of distortion.

In the specific case of disability annuity claims, these may be linked to a published inflation index resulting in reserves increasing. In this case, the overall extent of the impact will depend on the extent that these liabilities have been matched by the (re)insurer’s assets.

Table 5 Magnitude of impact per line of business

Line of business	Motor	Property	Liability	Non-Life Health	Other
					
Weighted impact	4.4	3.9	3.3	2.3	1.1

CASE STUDY 1

Second order costs you may not have thought about.

Contrary to first order impacts in claims inflation (e.g. labour costs, costs of materials etc.) second order impacts tend to come to the surface as they are experienced, requiring therefore adjusted plans and forecasts as they happen. They are less well known and predictable, and often don't find their way into financial planning or scenario testing. The following example of second order impacts on Company A, which has experienced high inflation within the claims process, demonstrates this issue.

Excess levels/Deductibles

Due to high inflation, many incidents exceed standard policy deductible levels, resulting in claims that were previously not reported, also in part because policy holders did not want to put their no-claims-bonus at risk.

Property claims

In the refurbishment of the home of a claimant, Company A faced very low accommodation availability and far higher rental costs than previously expected. Moreover, time for completion of the refurbishment was longer due to labour and parts shortages, impacting consumer satisfaction for the longer claim settlement compared to prior years.

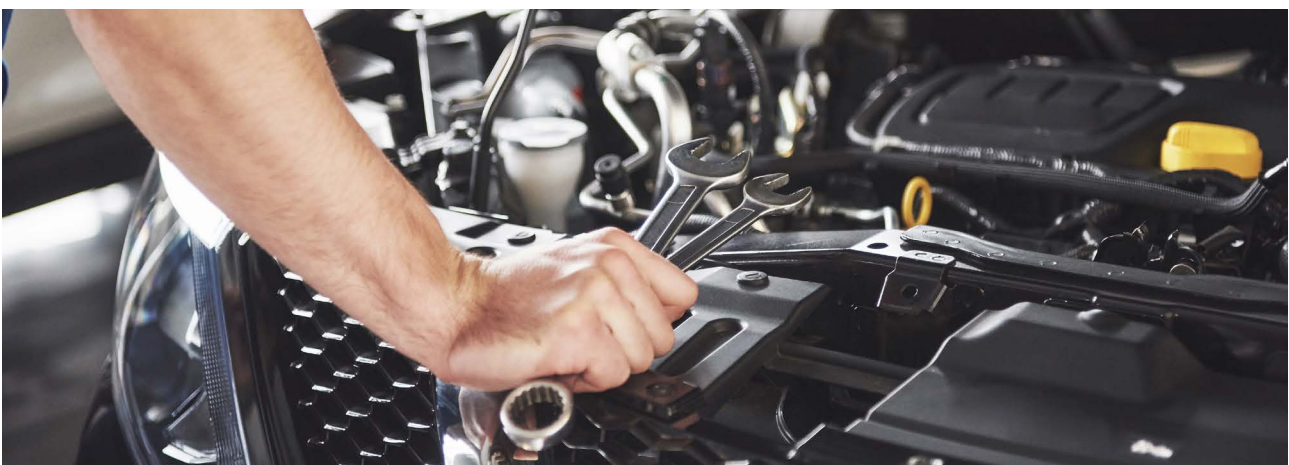
Motor claims

As previously cited, labour costs increase, and parts shortage has meant that the time required for car repairs is longer coupled with substantially increase costs on rental car availability for longer.

Potential Emerging Risks

Considering the future possible scenarios in the previous chapter, especially those leading to recessions or further rises in inflation, risk managers should consider specific potential risks that are linked to the increasing uncertainty.

- **Decreasing renewals and new business volumes:** As prices increase in the economy, proportions of individuals and families will experience a cost-of-living crisis and priorities are likely to move to the “essentials goods” like food, heating, and clothing. Business also will suffer hardship and focus scarcer resources on maintaining profitability. Appetite for insurance may decrease and competition may increase as consumers pay more attention to value for money, resulting in higher cancellations or non-renewal of non-compulsory coverage, increased deductibles, and reduced sums insured. Changes to customer behaviour may take time to materialise and their impacts will be dependent on the duration of the inflationary environment.
- **Social unrest/increased crime:** Increasing food and energy prices may result in social unrest leading to widescale property damage and business interruptions. Likewise, given the rise in value of commodities, used cars, etc., there is a risk of an uptick in theft and fraud leading to increased claims frequencies. This could adversely impact property and motor lines.
- **Contagion of commercial defaults:** A prolonged recession could also lead to an increased likelihood of counterparty default (or rating migration) and contagion of commercial defaults due to rising borrowing costs. Aside from having knock-on effects on all types of business lines, this situation would directly affect trade credit & surety and directors & officers' lines, as well as unemployment coverage in the context of mortgage loans.



2.3 Life (re)insurance focused insights and considerations

The following table summarises the observed and potential impacts considered for those areas that are specific to the life businesses.

Table 6 Specific life impacts and their effects on profitability, capital, and liquidity

		Impact Profitability	Impact Solvency II/ SST solvency ratio	Impact Liquidity
Observed impacts	Materialization of basis risk	Dependant on level of difference in the bases used to measure assets and liabilities	Dependant on level of difference in the bases used to measure assets and liabilities	Dependant on level of difference in the bases used to measure assets and liabilities
	Contract guarantees biting less	Positive, guarantees less likely to be triggered	Positively impacts OF/AFR, decreases exposures in SCR/TC	Potentially increases level of liquid assets available
	Adverse impact on fees (Unit-linked)	Reduction in fee income offset by higher expected future returns	Dependant on offset between loss of fee income and higher expected future returns	Dependant on offset between loss of fee income and higher expected future returns
	Increased lapse rates	Dependant on profitability of lapsed policies	Dependant on profitability of lapsed policies	Inflows and outflows will be impacted
Potential emerging risks	Decreasing new business volumes	Negative, loss in volumes	Decreases exposures in SCR/TC	Difficulty in adjusting inflows to cover outflows
	Adapting to new business mix	Potentially positive depending on change in business mix	Potentially positive depending on change in business mix	Potentially increases inflows
	Mass lapse	Negative, reduced volumes to cover fixed expenses	Negatively impacts OF/AFR, decreases exposure SCR/TC	Increases outflows, liquidity stress (no cash pools/contingency portfolios, fire sale of assets)

Acronyms: Own Funds (OF) / Available Financial Resources (AFR) / Solvency Capital Requirement (SCR) / Target Capital (TC)

Source: CRO Forum Working Group on Inflation

Impact on liabilities – Do not forget basis risk

Many life (re)insurance contracts have insurance liabilities that remain nominal and consequently unaffected by the scenarios outlined in chapter 1, excluding expenses accounted for separately. Exceptions include contracts tied to specific published indices, like pension fund buyout or income protection contracts where annuity payments may be linked to inflation indices. Profitability and Solvency II/SST solvency ratio impacts in such cases hinge on contract structures (e.g., caps/floors) and the extent the asset mix matches liabilities. Even where proceeds from fixed-income assets are closely aligned with payments, an element of basis risk may arise where both are not indexed on the same rate such as when liabilities are linked to wage inflation while inflation-linked bonds are tied to price inflation indices.

Guarantees biting and unit-linked fees – Changing assumptions

Higher interest rates, particularly persistent high interest rate scenarios, are likely to reduce the probability of contract guarantees being triggered, as was the case for a large share of old-guaranteed rate products in French and German life insurance portfolios.

In the specific case of unit-linked business, where a (re)insurer’s income is obtained via fees and commissions, changes in interest rates will have several opposing impacts on the valuation of the business. While an increase in interest rates will most likely result in a reduced net asset value of the funds, and potentially the value of income to the (re)insurer, this will be offset by higher expected future returns.

Impact on Lapse – Shifts towards higher yields

The case of life business is complicated by the attractiveness of newly emitted debt instruments with higher yields. This may prompt policyholders to surrender their policies to re-invest elsewhere. The ease with which policyholders may do so depends on many factors such as the existence and level of penalties, the retail/corporate profile of the policyholders and (re)insurer engagement methods

(e.g. direct contact vs online). Asset deterioration combined with higher lapse rates can strain liquidity, potentially requiring liquidation of devalued assets if not offset by increased inflows (in the case of new product offerings for example, as shown in the following case study).

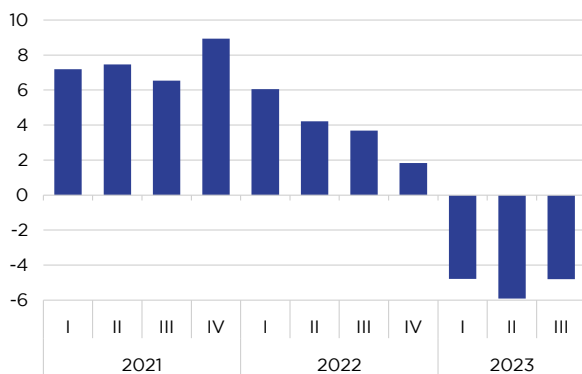
CASE STUDY 2

Life case study – Heightened lapse rates in the Italian market.

During 2022-2023, Italy’s life insurance sector faced significant challenges. High interest rates and reduced household savings led to a decline in policy uptake. Net collection dropped by 46.6% compared to 2021, turning negative in 2023 (see Figure 13). This trend correlated negatively with

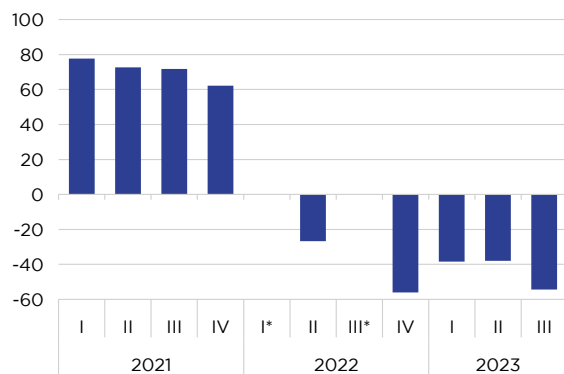
rising inflation and short-term Italian government bond yields³ (ANIA, 2023). Notably, the first quarter of 2023 saw a EUR 4.8 billion negative net collection whilst the 6-month BOT interest rate exceeded 3%. Italian National Insurance Association (ANIA) reported a EUR -15.5 billion inflow for the first nine months of 2023, driven by reduced premiums (-3.7%) and increased expenses (+48%) due to higher redemption amounts of with-profit products.

Figure 13 Italian market quarterly Life net Cash Flow (EUR bln)



Source: CROF elaboration on ANIA data (Italian National Association of Insurance companies).

Figure 14 Italian market quarterly Life unrealized Gains/Losses (EUR bln)



Source: CROF elaboration on ANIA data (Italian National Association of Insurance companies).

Notes: *data granularity not available for quarter I and III of 2022.

The described situation materialized following a prolonged period of low interest rates, known as the “Low-Rate Environment.” During this period, Insurance companies likely pursued more dynamic investment strategies to maintain average portfolio rates, including high yield and emerging market instruments, illiquid assets, and duration extension. However, imperfect Asset-Liability Matching highlights the need for effective liquidity and credit risk management.

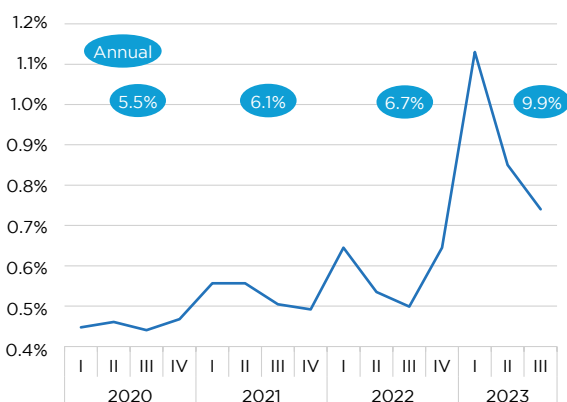
The market value of fixed income investments declined between 2022 and 2023 due to rising

interest rates combating inflation, resulting in unrealized losses (see Figure 14). Should policyholders choose to redeem their insurance policies to reinvest in government bonds or cover rising expenses, lapse risk would rise significantly (see Figure 15), exposing companies to realized losses and reduced capital.

Yield spread increases between Italian government bonds and traditional with-profit products impacted new business development and led to higher lapse rates in the Italian life insurance sector. The Eurovita crisis exacerbated

³ ANIA Trends – life flows and reserves 3rd quarter 2023 direct business – 3rd November 2023

Figure 15 Italian Lapse on Reserves Ratio, monthly (%)



Source: CROF elaboration on ANIA data (Italian National Association of Insurance companies).

this trend later in the year. Eurovita, a medium-sized life insurance company with approximately EUR 15 billion in reserves, faced challenges due to the situation described above, resulting in a breach of regulatory capital requirements. Majority shareholders opted to not recapitalise and the company was placed in administration, temporarily freezing surrender options for policyholders. Market players intervened, with five top insurers partnering with major distributing banks to provide a credit facility to cover lapses.

Analysis of surrender options for the Italian market reveals a decreasing trend until 2020, followed by a slight increase until 2022 and a significant acceleration in 2023, reaching levels

reminiscent of those seen in 2009-2010, with lapse rates returning to 10% of reserves.

A detailed examination of lapse rates by distribution channel can better explain this trend. Bank assurance channels exhibited higher lapse rates compared to traditional agency or broker networks, suggesting a need to consider the unique dynamics between insurers and their distribution partners in understanding mass lapse events.

Client wealth and behaviour are also significant drivers, with high-net-worth individuals demonstrating a propensity to swiftly adapt to higher returns from alternative financial products. Monitoring customer portfolio concentrations in relation to individual contract sizes is important.

The economic significance of lapse risks for insurers is substantial. Mass lapse events can jeopardize liquidity, necessitating asset sales that could impact product returns. Such events need to be offset by new business to avoid eroding future profits. Realized losses may exacerbate surrender option phenomena and higher lapse rates can tarnish an insurer’s reputation, further exacerbating lapses and deterring new business, leading to a “snowball effect.”

To mitigate these risks, robust asset-liability management and liquidity risk policies are essential. Stress testing asset-liability matching and liquidity gaps under adverse conditions is imperative to ensure resilience against lapse-related challenges.

Potential Emerging Risks

Considering the future possible scenarios in the previous chapter, especially those leading to recessions or further rises in inflation, risk managers should consider specific potential risks that are linked to the increasing uncertainty.

- **Decreasing new business volumes:** like the non-life business, changes to the macroeconomic environment in the longer term will have a discernible impact on policyholder behaviour. As families have less spendable income, the ability to save will decrease regardless of the attractiveness of higher interest rates, potentially leading the entire life insurance market to shrink.
- **Adapting to new business mix and levels of guarantee:** Some life (re)insurers may also take the choice of improving their customer proposition by offering product guarantees that

would not have been feasible in low inflation/low interest rate environments. Especially in a scenario of persistently high interest rates, risk managers should make note of such a change in business mix to the life (re)insurer’s risk profile and help ensure liability valuations are calculated appropriately.

- **Mass lapse:** Recent uncertain financial markets and macroeconomic conditions have led to an increase in liquidations and bankruptcy in the banking sector and is a reminder of how such stress situations could materialise. A combination of specific factors previously disclosed at the beginning of the chapter, could contribute to such an event materialising.

3. Tools to measure and forecast inflation risk

The next step is **Measuring the risk**. In this phase, a risk manager of an (re)insurance company is typically faced with the challenges of how to monitor inflation in terms of indicators, how to form a view on potential outcomes of future inflation and ultimately how to include inflation risk in the risk management process in the form of scenarios, stress testing and risk models. The challenge lies in considering all this while achieving a balanced representation of the company's risk profile and ensuring appropriate capital adequacy.

3.1 Inflation risk indicators

Like managing most other quantifiable risks in an (re)insurance company, monitoring inflation risk is important in order to be able to react quickly to movements and volatility. Unlike some financial risks that exhibit a broader industry correlation, inflation risk tends to have a direct company-specific impact

and may have indirect impacts through changes to policyholder behaviour and market dynamics as explored in chapter 2. The nuances of inflation risk exposure can encompass annuity claim payments linked to broad inflation indices like the CPI or more granular factors like raw materials and labour costs impacting non-life or non-SLT health insurance claim expenses.

Consequently, the initial steps in measuring and forecasting inflation risk involve a deep understanding of the nature of the exposure. Once this comprehension is established, methodologies for measurement, forecasting, and modelling can be tailored to the unique characteristics of the exposure.

The following table provides several indicators most commonly used to monitor the development of inflation.

Table 7 The main indicators for inflation

Inflation type indices	Companies monitoring	Risk management insight
Broad inflation indices: <ul style="list-style-type: none"> CPI Core Inflation HICP (Harmonized index of CPI) Subcomponents of CPI/ HICP 	Indirect Exposure: companies with indirect exposure use inflation indices to gain insight on volatility and direction or form views on Central Bank monetary policy. Direct Exposure: companies with assets or liabilities directly linked to broad inflation indices.	Indirect Insight: <ul style="list-style-type: none"> Understand economic and social inflation trend. Anticipate Central Bank actions. Make informed decisions on investments and product development. Direct Insight: Monitor and manage assets or liabilities directly affected by the broad inflation indices.
Leading inflation indices: <ul style="list-style-type: none"> Producers prices Import prices Measures of economic activity (PMI, GDP, unemployment) 	Indirect exposure: producers prices/import prices provide companies with insight on future inflation movements linked to non-life business. Measures of economic activity allow companies to gain further insight on future trends of inflation and the monetary policy of central banks.	Indirect insight: monitor certain backward-looking measures that tend to, or at least can be, indicative of future inflation development as seen in chapter 1.
Claims inflation indices: <ul style="list-style-type: none"> Derived internally Derived with sub-indices 	Direct exposure: for internal indices, measurement of the on the different drivers of the overall claims costs is typically meaningful, for example, to capture differences between countries, regions, and distribution channels. This could also be measured using a claims inflation index based on sub-indices from the cpi data.	Direct insight: <ul style="list-style-type: none"> Monitor claims inflation. Draw assumptions on changes to future cost of claims. Provide better insight into Asset/ Liability inflation mismatches or basis risk.
Measurement of secondary effect: <ul style="list-style-type: none"> Lapse rates Churn rates Retention rates 	Direct Exposure: part of the continuous risk monitoring activity of a (re)insurance company	Indirect Insight: extrapolate forecasts from these indices, whether company specific or industry wide, and use them as inputs to specific scenarios for example those outlined in chapter 1.

24 Unmasking inflation – Best practices for (re)insurance Risk Managers

The survey conducted among CRO Forum members reveals diverse indicators are used to measure historical inflation, from broad national or international indices to more specific sub-indices or in-house indices based on claims history.

The latter is a commendable practice, especially among non-life companies. Conversely, life insurance risk managers tend to favour broader national indices.

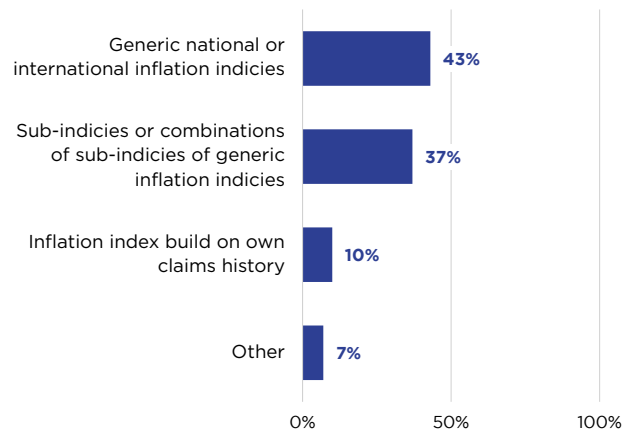
Respondents who chose “Other” in the survey offered diverse approaches, such as aggregated claims level measurement and market-specific research from third-party sources. Reinsurance companies, particularly in non-life treaty business, face a significant challenge in accurately measuring and tracking claims inflation due to the lack of detailed claims data.

The following case studies shed light on how companies navigate and measure their specific exposure to claims inflation.

Figure 16

Answers to the question:

How do you measure historical claims inflation?



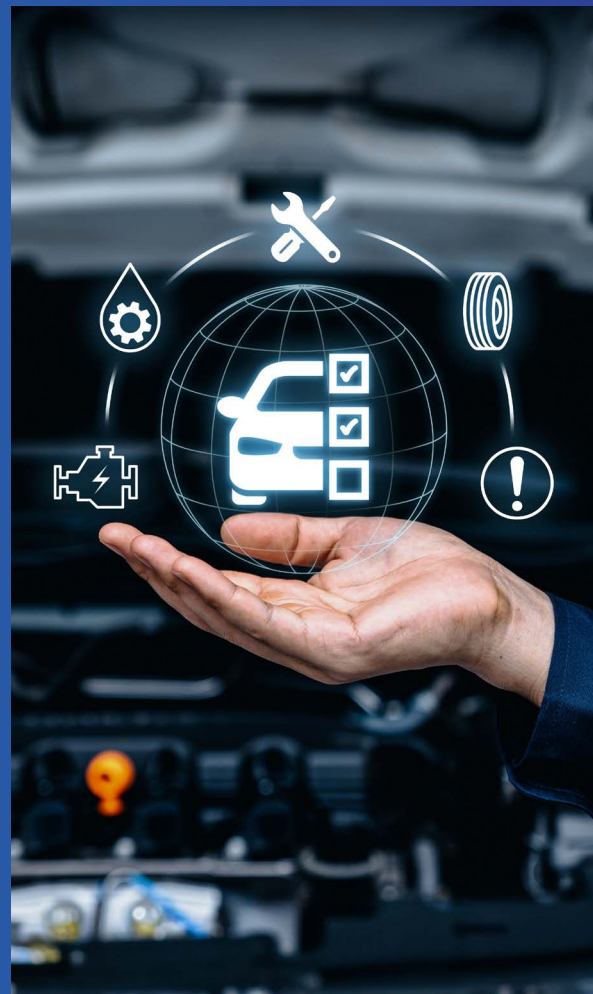
CASE STUDY 3

Understanding the company's Non-Life specific inflation risk

Claims inflation is generally an understood concept, but it is arguably challenging to define and measure precisely in practical applications. In modelling future benefits and claim payments it is often natural to include a claim inflation effect, but in the calibration of the models it is often hard to make a distinction between realized claims inflation and other effects.

With Motor insurance as an example, technological developments such as adding driver supporting systems often leads to a lower claim frequency but a higher severity per claim due to more expensive sensors, radars and cameras to replace in case of an accident. When measuring the claims inflation, such effects need to be considered and managed.

In the case of a large composite insurer, company B, claims inflation is projected using a “basket of goods” approach, which involves splitting total claims into component elements (e.g., car parts) to generate a bespoke inflation estimate. This modelling of internal observed data is supplemented by external insight (e.g. buying daily data sets).

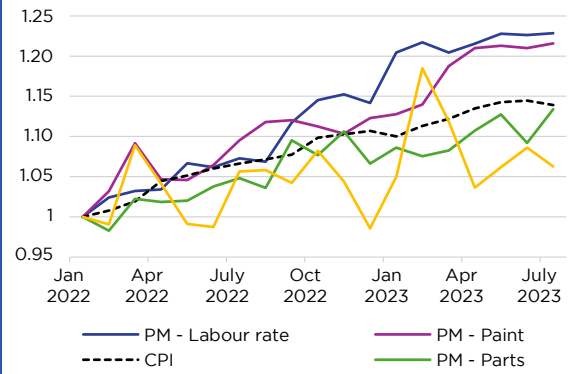


By taking this approach across each claim type, company B explicitly captures the key drivers of claims inflation across all areas of spend, as shown in the following table:

Line of Business	Types of Inflation Modelled
Motor (personal & commercial)	Used car prices, paint, labour, hire, general damages, legal costs, care costs, parts
Liability	Labour, third-party costs, own costs, general damages, special damages, care costs
Property (personal & commercial)	Material, labour, contents (e.g. jewellery), glazing, business interruption

The graph below shows the personal motor (PM) repair components as well as the component for Used Cars, and their deviations compared to CPI.

Figure 17 CPI vs PM Repair/Used Car inflation, monthly data (Indexed to Jan-'22)



CASE STUDY 4

Understanding the company’s Life specific inflation risk

The impact of inflation in Life business is typically associated within expenses, such as staff costs, real estate expenses and maintenance or IT costs, that must be considered until the natural end of the life contract. Typically, life insurance contract durations are very long especially when compared to P&C contracts.

Let us assume that Company C being in run off and has had no other changes to assumptions. We also assume that the expense cashflow projection has a time horizon of 10 years, with payments at the end of each year.

For the expense valuation as at start date of fiscal year, economic assumptions are assumed within in a relatively stable, low inflation.

What was to come was not generally predicted by the markets. Using swap rates to increase the expense cashflows for inflation and ESTR interest rate curves to apply discounting, we can see on table below the impact of the economic assumptions on the valuation of the expense cashflow. At the start date of fiscal year, the assumed inflation is 2.3%, the realised inflation is 4.8%. This leads to a loss of 2.5 units due to the change in the inflation expectation over fiscal year. When the PV of the full cashflow is considered, the lag between interest rates and inflation leads to a further increase in the valuation of the expense cashflow over the 10 yr. time horizon as at year end.

Cashflows	Start Date	End date	Loss realised for Inflation
Nominal	100		
Valuation year 1	102.3	104.84	2.53



3.2 Scenarios for inflation risk

By proactively anticipating shifts in the inflation landscape and considering various potential regimes outlined in chapter 1 through scenario analysis, (re)insurers can strategically position themselves to navigate diverse economic conditions effectively. In that regard, four main fundamental approaches for generating potential economic scenarios exist.

	Economic Forecasts from Financial Institutions
	Econometric Models
	Economic Scenario Generators
	Scenarios From Business Experts

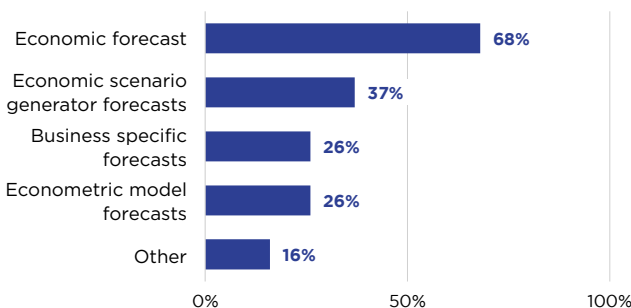
Although the most suitable approach to use for risk management purposes will vary according to exposure, they typically complement each other. Best practice involves employing multiple methods for different perspectives.

The survey conducted among CRO Forum members shows that diverse approaches, including all those mentioned earlier, are widely utilized. Additionally, respondents mentioned using other approaches, such as internally developed statistical methods.

Figure 18

Answers to the question:

What tools are used to build inflation scenarios (i.e., for ORSA purposes)?



Economic Forecasts from Financial Institutions - a collection of opinions

Insights from prominent financial institutions and experienced economists play a crucial role in shaping our understanding of potential economic developments. These insights are often shared through various channels, including annual reports and public statements, and serve as valuable resources for risk managers and industry professionals. A non-exhaustive list of examples of reports and communication platforms are found in the table below.

Table 8 Examples of reports and communication platforms for economic forecasts

	<p>FED's Economic Projections</p> <p>The Federal Reserve publishes the "Summary of Economic Projections" several times a year, providing projections for key economic indicators, including inflation, from Federal Open Market Committee (FOMC) members. The "Beige Book," a collection of economic anecdotes from various Federal Reserve districts, also offers insights into regional economic conditions.</p>
	<p>ECB Publications</p> <p>The ECB releases a range of publications, including the "Economic Bulletin" and "Monthly Bulletin," which provide analyses of economic developments, including inflation trends, within the eurozone. More quantitative projections are provided in the quarterly Eurosystem staff macroeconomic projections and projections by national Central Banks of the ECB.</p>
	<p>IMF World Economic Outlook</p> <p>The IMF's flagship publication offers comprehensive economic analysis and forecasts, including inflation projections, for countries around the world.</p>
	<p>Annual Economic Reports</p> <p>Prominent institutions, especially financial, often release annual reports that outline their economic forecasts and outlook. In these, their views on various economic factors, including inflation are detailed, and some companies compile economic survey results completed annually by several hundred economists worldwide.</p>

Public speeches and press conferences also offer valuable insights. Economists and leaders of financial institutions often engage in forums to communicate their perspectives on economic developments. Insights shared during such events may include assessments of economic indicators, policy decisions, and factors contributing to inflationary or deflationary pressures.

Econometric Models – A range of future outcomes

Econometric models are specialized computational tools that use historical data and mathematical methods to project potential economic trajectories. They are instrumental in predicting future inflation, and other macroeconomic variables, offering insights into a range of future outcomes. These models may include aspects of uncertainty to generate various outcomes or have inherent stochastic characteristics. While most models incorporate economic theory assumptions regarding the interplay of macroeconomic factors, some rely solely on observed statistical relationships which can be useful for company specific scenarios. Note that in its purest form, economic models tend to be focused on broader inflation trends rather than specific inflation dynamics which may be more relevant to certain sectors such as non-life (re) insurers.

Economic Scenario Generators – Robust but still macro

Economic Scenario Generators (ESGs) are sophisticated tools designed to construct diverse economic scenarios, often with a focus on modelling volatility. Unlike traditional econometric models, ESGs employ mathematically intricate models to produce a stochastic array of scenarios for financial risks, encompassing factors such as interest rates, equity returns, and currency rates. Moreover, they often generate detailed asset returns for specific assets.

In this approach, broader inflation trends, such as CPI, can be modelled as the difference between nominal and real interest rates. This approach aligns with established relationships between variables, as well as with other factors generated by the ESG, through correlation assumptions and/or structural relationships, enhancing scenario reliability.



Scenarios from Business Experts – Very company specific

Insights from seasoned business experts, who bring both vision and first-hand experience across different economic situations, can be a valuable tool for understanding inflation. These professionals often hold crucial roles in key business functions such as overseeing claims costs or monitoring product outcomes. With a natural interest in tracking and predicting inflation trends, they tailor their focus to suit the company's specifics.

For non-life insurance, this might involve detailed development of average claims costs rather than the broader inflation affecting society at large. Their forecasting typically includes multiple scenarios to capture uncertainty around the expected path, proving especially beneficial for (re)insurers with specific exposure to inflation in their business operations.

3.3 Including inflation risk in ORSA scenario analysis and stress-tests

Events are either envisioned as unfolding gradually over time, as seen in scenario analysis, or as immediate occurrences, as is typical in stress tests. A well-crafted scenario analysis and stress test often incorporates various methods⁴. For (re)insurers operating under Solvency II, incorporating scenarios and stress tests into the Own Risk and Solvency Assessment (ORSA) is a mandatory requirement to evaluate financial strength. Given the intensified attention and vulnerability to inflation risk within the insurance sector, it is also increasingly requested by stakeholders other than the regulators. Irrespective of regulations or market pressure, these tools naturally fit into the risk measurement and management process.

When defining scenarios and stress-test for inflation, it is particularly important to consider the balance between accuracy and complexity as well as potential resulting offsetting effects and how those are presented. Depending on the risk profile, assumptions on management actions could both be realistic to include and have a material impact, but the exact consideration thereof in defining scenarios and stress-tests should also be considered in the light of added complexity.

⁴ See ORSA Stress and Scenario Testing – CRO Forum publication February 10th, 2023

Scenario analysis in ORSA – Whether inflation should be the originator

Inflation scenario analysis should examine inflationary impacts over several years. It is typically conducted over the financial planning time horizon used as a basis for ORSA analysis. This is important because short- and longer-term effects will differ substantially, and there is a time-lag to consider between the impact of inflation and the effects of management actions taken to offset them.

A prudent approach consists in considering the effects that breach expected levels, whether in an inflationary or deflationary scenario. Various methods can be employed; a summary is provided in the table below.

Table 9 Examples of reports and communication platforms for economic forecasts

Inclusion as a macroeconomic parameter	Development of scenarios originated from inflation
<p>The macroeconomic environment used to define any scenario typically incorporates an expected path for inflation indices and various scenarios associated with either a weaker-than or a stronger-than anticipated development, especially when using econometric models or ESGs as outlined in sub-paragraph 3.2. These scenarios should encompass the impact on all key macroeconomic variables.</p> <p>Careful consideration and selection of the types of scenarios to utilise in the scenario analysis is important, to ensure instances of elevated inflation are addressed.</p> <p>Additionally, attention must be given to potential basis risk, which require thoughtful consideration in the analysis.</p> <p>The pros of this approach are:</p> <ul style="list-style-type: none"> • consistency with macroeconomic and financial variables also defined in the same scenarios and • often, depending on the method utilised, there is a specific narrative for the scenario. <p>The cons are that offsetting effects may not be straight forward to visualise or even calculate, i.e. the sensitivity to inflation in isolation is not highlighted.</p>	<p>An alternative way is to build an inflation scenario pivoting inflation rather than the macroeconomic environment.</p> <p>Again, basis risk needs to be carefully considered as well as company specific weaknesses (e.g. concentration in policyholder profiles) and strengths (e.g. strong control over distribution network) and how these should be reflected in the scenario.</p> <p>To highlight a sensitivity, a scenario could even be defined in terms of the more specific effects on the (re) insurance business only, such as claims inflation, and not include effects on broader macroeconomic variables. This approach is particularly useful to reduce complexity and can be used if the correlation between factors is deemed low (e.g. between motor claims inflation and non SLT health claims inflation).</p> <p>The pros of this approach are:</p> <ul style="list-style-type: none"> • the ability to isolate the effects of inflation, • the ability to incorporate more company specific claims inflation or similar. <p>The cons are:</p> <ul style="list-style-type: none"> • the potential lack of consistency • the calibration, or magnitude, of the scenarios may be harder to underpin when incorporating specific claims inflation or similar • the output of a more coherent model.

Adding the potential emerging risks described in chapter 2 to scenarios, such as effects on lapse rates in life insurance, churn rates in non-life insurance or new business volumes in general is a possibility. Their selection is likely to depend heavily on the (re)insurance company’s risk profile. Best practice encourages including risks with a lower impact together with the top drivers for a better view of the overall effects.

Inflation stress tests – Beware over engineering

When assessing the immediate effects of a severe shock in inflation levels and/or expectations, considering both assets and liabilities provides a holistic approach covering the whole balance sheet. However, it is important to consider boundaries for the sake of simplicity. There is often a link between adverse inflation development, Central Bank actions and direct and indirect effects on assets and liabilities. However, it is not reasonable to include all variables and cash flows which are not explicitly linked to broad inflation outcomes. The table on the next page further develops these concepts.

Table 10 Approaches to inflation stress tests

Single factor inflation stress test	Multi factor inflation stress tests
<p>In its simplest form, an inflation risk sensitivity or stress test to an immediate change in broad inflation levels provides insight on the (re)insurance company’s degree of vulnerability.</p> <p>Consider for instance a +100 bps stress test on CPI Index linked financial instruments with respect to the inflation curve. The same measure can be applied for liabilities.</p> <p>Broadly speaking, the difference between a parallel shift for asset and liabilities is the simplest measure of “inflation mismatch” for an (re)insurance company.</p> <p>Important considerations in a single risk factor sensitivity are naturally the size of the shock, i.e. the number of basis points to stress inflation with, but also whether it should include changes in more long-term inflation expectations and how the stress should be applied to liabilities that are sensitive to claims inflation rather than CPI.</p>	<p>A stress test for inflation risk can also be performed as a multiple risk factor scenario, i.e., include explicitly the effect also on other macroeconomic variables. A stress test for inflation risk can then include for instance a shift in inflation levels and inflation expectations, but also a simultaneous effect on interest rates, equity prices, real asset, and real estate prices or lapse risk as an example.</p> <p>Multi factors risk scenarios are more realistic than severe shifts in isolated variables which rarely happen, but on the other hand the impact is more complicated to interpret. There also lies the risk that offsetting impacts from different variables result in a low sensitivity overall where the sensitivity to individual factors could be high. This is a potential pitfall if for instance the event in a multi factor stress test occurs, but one significant variable develops differently in terms of magnitude or even direction than assumed.</p>

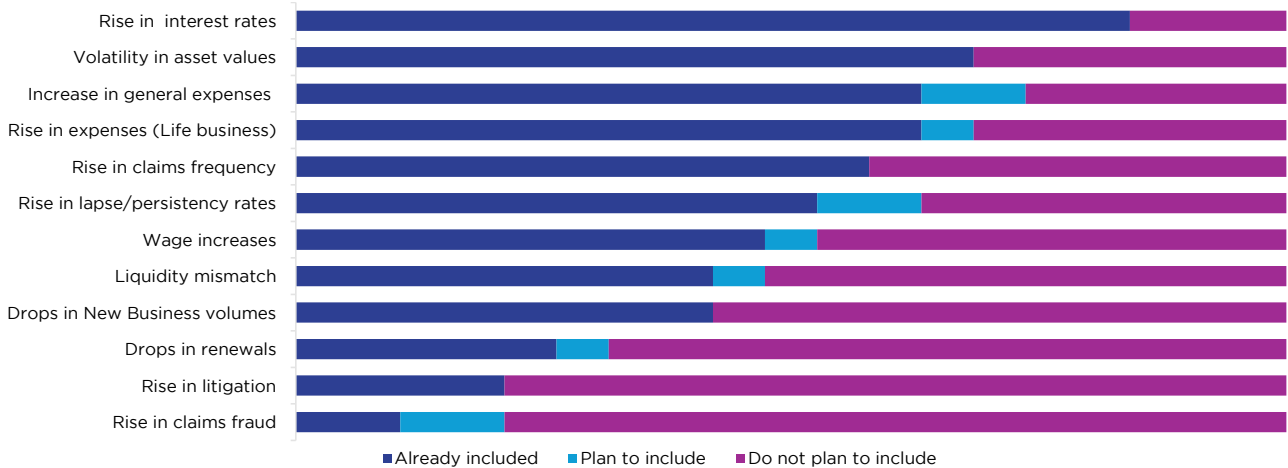
An inflation stress test could also include the effects on secondary variables in insurance operations; a significant share of CRO Forum members tend to include a range of secondary effects in their

scenarios as seen in the survey responses. Specific factors and scenarios included vary among members, in many cases directly influenced by the underlying risk profile of each member.

Figure 19

Answers to the question:

What other risk factors or secondary effects do you or would you stress/consider in your inflation scenarios?



30 Unmasking inflation – Best practices for (re)insurance Risk Managers

Among the secondary effects considered, those most commonly measured include a rise in interest rates, increased volatility in asset values, and an increase in expenses (general and life business). Longer term effects are less frequently included. Looking ahead, CROs are planning to enhance their measurement of secondary effects by specifically considering the increase in general expenses, a rise in lapse, and a surge in claims fraud. This strategic approach underscores the comprehensive effort to assess and mitigate various aspects of the risk falling within the remit of risk managers.

Designing inflation risk stress tests requires careful consideration of the effect on insurance liabilities. For example, a broad inflation-based stress test should consider whether to incorporate specific liabilities, particularly those sensitive to claims inflation or expense assumptions, and to what extent. When defining an inflation shock, the key challenge concerning liabilities lies in defining which cash flows to incorporate in the stress and how. In many cases, claims inflation serves as a primary driver when assessing what to stress. Stressing all liability cash flows with the same level of stress could be misleading. Employing multiple claims inflation stress tests, depending on the risk profile, is often necessary for a meaningful representation of risk. This entails balancing complexity in test definition, accuracy, and the ability to communicate results effectively to stakeholders.

A best practice approach should consider a holistic effect given the scenario: on solvency ratio, effects on the company profitability and including potential effects on the insurance markets that the company operates in. Reverse stress testing, i.e. a backward calculation where the needed magnitude of change in certain variable(s) to cross critical boundaries in terms of for instance the solvency ratio is identified, is a useful tool in this context where inflation should be included in the set of variables used.

3.4 Inclusion of inflation risk in risk models

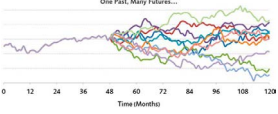
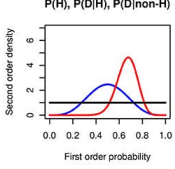

Incorporating inflation risk into risk management models, including capital requirement calculations, differs across firms. Certain organizations, especially operating in markets with high inflation volatility or possessing longer tailed liabilities, have well-established practices for modelling such risks, given their longstanding exposure. The recent increase in inflation levels and volatility has nevertheless raised the bar in terms of modelling inflation risk, driven by expectations from various stakeholders. Regulators in particular have increased their interest in inflation

risk modelling within the larger context of the management of this risk.

The practical steps involved in building an appropriate risk model for inflation risk are the following:

- **What to model:** Assuming there is already an overview of the risk profile related to inflation, the initial step is to decide which effects are practical to incorporate into the risk model. Factors influencing this decision include the sensitivity of the effects to inflation, the magnitude of their impact, the strategic nature of the business for which the model is intended, and the ability to influence the outcome once a deeper understanding is gained from the model. From a technical standpoint, considerations about the availability of historical data and expert judgment play a crucial role in this decision as well as cost and ease of implementation. An example of what to consider in this step is whether to include modelling of claims inflation explicitly and if so, how detailed that modelling should be.
- **How to model:** A review of the different existing methods and approaches, from simple to very complex will lead to questions around the appropriate balance between complexity of the model and ability to interpret or understand the outcome. Often this is an iterative process, where prototyping may lead to new insights about the risk profile, which in turn forms the basis of what effects or drivers should be included in the model. For instance, a model for claims inflation linking also into the effects on business volumes following price changes may lead to conclusion that such effects are immaterial for a specific company and hence may not be worth including, as shown in Table 11.
- **Implement the model:** As the final step of the process, the implementation has its own sets of challenges and often includes both technical and regulatory steps. In case of approved internal models, this step naturally involves a regulatory process for model approval, if classified as a major change under Solvency II. This naturally could be an iterative process in practice following regulatory feedback, where one may need to go back to steps above to reconsider certain assumptions or parameters.

Table 11 Considerations and approaches when modelling inflation risk

Type of approach	Considerations on Pros and Cons
 <p>Economic Scenarios Generators</p> <p>A general internal model setup is typically based on an ESG for modelling of macroeconomic variables and capturing the interplay between inflation risk and other macroeconomic variables in a consistent manner.</p>	<ul style="list-style-type: none"> ✓ Holistic understanding of the effects of inflation on the (re)insurance company. ✓ Useful to modelling broader inflation in society that can also be extended to cover more specific inflation such as claims inflation. ✗ Technically more complicated than other approaches.
 <p>Distributional approaches</p> <p>Another approach used where inflation is modelled based on historical inflation outcomes. Historical data in combination with expert judgement are used to determine the appropriate statistical distribution.</p>	<ul style="list-style-type: none"> ✓ More freedom to determine the marginal distribution for inflation risk, allowing for more detailed modelling of claims inflation. ✓ Relatively straight forward to implement. Likely to be more suited for companies where inflation exposure is specific to the firm. ✗ Potentially less appropriate for more advanced modelling of interdependencies, such as between inflation expectations for different maturities.
 <p>Implicit approaches</p> <p>A more simplistic approach for handling inflation risk, on liabilities primarily, is including the effects of inflation in the datasets used for modelling of other risk factors, i.e. including it through the historical data used to calibrating other insurance risks but not separating it.</p>	<ul style="list-style-type: none"> ✓ Keeps the model very simple, in cases where the risk profile is straightforward and historical data are believed to be representative and plausible. ✗ Unable to measure real claims inflation. ✗ Puts extra emphasis on historical data being representative of future inflation volatility.

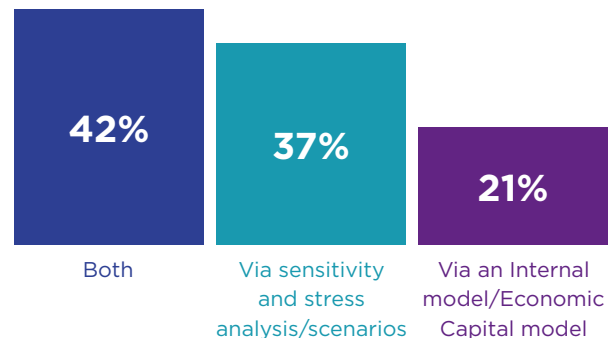
Irrespective of the modelling approach, including the effects of management actions related to inflation outcomes is also a modelling choice to be made. Important considerations relate to aspects such as materiality, plausibility, the modelling time horizon and complexity trade-offs.

The survey conducted among CRO Forum members shows respondents tend to include inflation risk in Internal Models/Economic Capital Models or via sensitivities, stress-tests, and scenarios but many also employ both practices.

Figure 20

Answers to the question:

How do you model inflation risk?



CASE STUDY 5

Non-life/Life inflation risk modelling

This case study describes the risk management practices of composite non-life/life (re)insurance company D in terms of modelling inflation risk in both business lines.

Non-life insurance inflation risk

Inflation is a significant risk within the company’s non-life business. Especially claims with long settlement periods are exposed to substantial inflationary risks between loss occurrence and loss settlement. High inflation in an extended period, will put pressure on the non-life profitability and solvency ratio. Due the company being exposed to lifelong annuities with CPI indexing stemming from the non-life business, i.e. relating to loss of income compensation, inflation risk has been viewed as a significant and important driver historically in the company also at times with lower inflation outcomes.

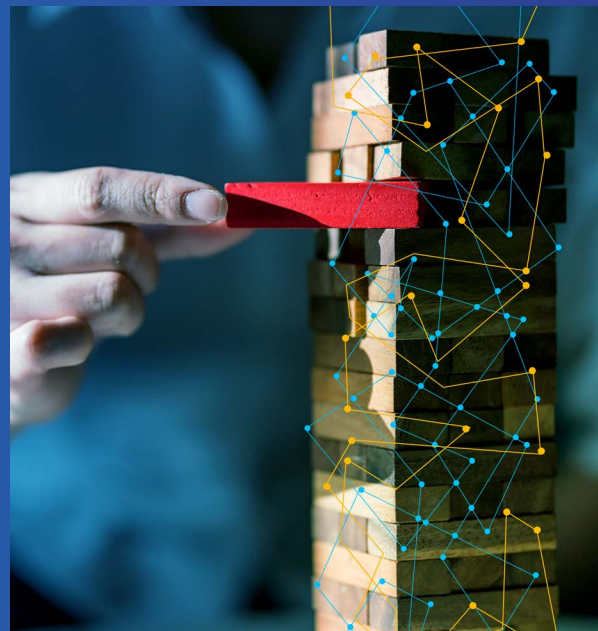
Life insurance inflation risk

Most life insurance products of company D have benefits that are fixed in nominal terms, hence, changes in inflation do not lead to large movements in life insurance liabilities. The company has however considered the secondary effects of higher inflation, especially the link to interest rates, as mentioned in chapter 2; higher interest rates could impact lapse and policyholder behaviour.

Company D is using an ESG to generate stochastic outcomes of realised inflation over the time horizon used as well as stochastic outcomes of expected inflation curves for cash flows beyond the time horizon used in the simulation. The inflation outcomes are then used to inflate the generated non-life insurance cash flows with respect to inflation. This allows for modelling of exposure both to more short-term realised inflation as well as changes to inflation

expectations, being inflation the primary source of risk in the medium/long term. The CPI inflation is used as a basis for the modelling of inflation risk, as a significant proportion of the insurance liabilities are directly sensitive to indexing using CPI in the various markets that the (re)insurer operates in. In terms of cash flows exposed to claims inflation specifically, company D has taken the approach to clean historical time series of CPI inflation in general, allowing for any claims inflation in excess of CPI to be implicitly contained in the parameterisation of insurance risk net of inflation risk related to CPI.

For the life business the ESG gives company D the possibility to model the secondary effects of inflation stochastic scenarios based on the same set of underlying economic scenarios. The combination of inflation scenarios with the interest rates scenarios, together with dependency assumptions in relation to lapse rates, gives a possibility to model variation in lapse rates and consequently the policyholder behaviour in a holistic manner.



Basis risk – Adds complexity if modelled explicitly

As a part of any model setup for inflation risk in insurance liabilities, it is important to consider basis risk as defined previously in chapter 2. The underlying question to consider is if it is appropriate to model inflation risk using broad inflation indices, as a simplification or model assumption. The table on the next page explores the pros and cons of some of the approaches to basis risk.

Table 12 Approaches to basis risks in inflation modelling

It can be modelled and handled explicitly	It can be embedded in other risk drivers
<p>As described earlier, basis risk can be handled through explicit incorporation in an Economic Scenario Generator or distributional approach. This would then lead to explicit quantification of inflation risk as a whole.</p> <p>The pros of this approach are that it eliminates or reduces basis risk from a modelling perspective if implemented appropriately and that it allows for more accurate consideration of basis risk between for example claims inflation and asset hedging programs. The cons are additional model complexity and hence model uncertainty.</p>	<p>Insurance cash flows could be stochastically indexed using broader inflation while any remaining claims inflation is included in the calibration of other risk drivers, such as frequency claims risk or reserve risk. In the calibration of the other insurance risk drivers, historical data is cleaned with respect to the effects of broad inflation only and hence specific inflation is covered implicitly.</p> <p>One of the disadvantages to this approach is the inability to separate the effects of specific inflation. Moreover, it requires the historical dataset to contain reasonable amounts of excess inflation that is representative of possible future outcomes.</p> <p>However, an advantage is that this model approach is less complex to execute.</p>

The complexity of inflation, for instance when different buckets of liabilities are linked to different CPI indices (potentially with floors and caps) as well as claims inflation, clearly adds challenges in terms of modelling and also in terms of understanding the resulting mismatch between asset and liabilities.

Basis risks can in certain cases be deemed immaterial, when:

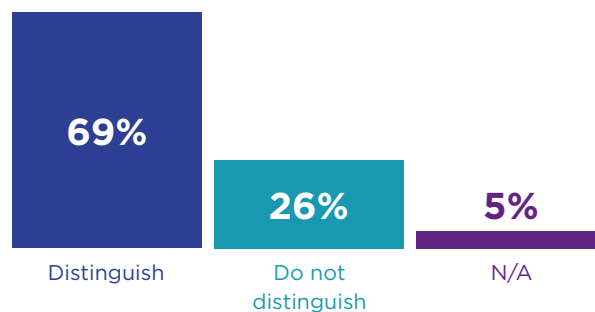
- Insurance cashflows are mainly sensitive to CPI Indices and not claims inflation;
- The specific company exposure to inflation shows a high correlation with broader historical inflation and there is no reason to assume different future projections;
- The volatility of the specific inflation risk is similar to the broader inflation risk and the exposure to the correlation between the specific inflation risk and other macroeconomic variables is not considered a material driver.

CRO Forum members tend to distinguish between CPI and claims inflation in their modelling, but the practices vary among members. Differences are linked to the underlying risk profile of members; non-life/non-SLT health-oriented companies tend to model inflation more specifically.

Figure 21

Answers to the question:

Do you distinguish between CPI and claims inflation in your modelling?



Realised and expected inflation – one or the other?

Internal models and risk models typically target a one-year time horizon. For inflation risk, this leads to questions around considering whether the (re) insurance company is mainly exposed to realized inflation outcomes during the simulation year, or rather changes in inflation expectations beyond the one-year time horizon, or both. Considering exposure to realized inflation during the simulation year often allows for a simpler approach, while modelling of future medium/long-term inflation expectation calls for more sophistication, particularly in scenarios where changes in inflation expectations influence other key macroeconomic variables. Also, realized inflation volatility is typically higher and of a different nature than that of inflation expectations implied by nominal and real rates and changes over time.

4. Inflation Risk Monitoring and Management Best Practices

Pursuing the classical steps in the risk management process, after identifying the risk and measuring it, next step is Monitoring and Managing the risk. Although its effects were felt throughout the industry, overall (re)insurance companies have successfully navigated the recent period of high inflation. This resilience is likely due to a mixture of factors, with better performing (re)insurers demonstrating maturity in their risk management processes through responsive monitoring practices and appropriate and timely management actions.

4.1 Inflation risk monitoring practices

Responsive monitoring practices play a crucial role in effective risk management. Incorporating robust and agile governance systems, appropriate tolerances, and proactive monitoring empower both Management and the Risk Function to respond to market changes swiftly and safely. By analysing appropriately granular and timely data and reporting regular Management Information (MI), organizations can ensure that their actions are precisely targeted to address the specific risks they face.

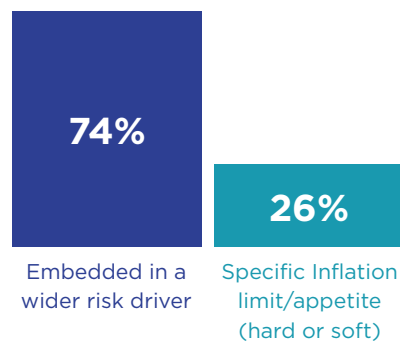
Monitoring of inflation risk practices across the industry are varied in terms of **What?** is being monitored, **How?** is it being monitored and **What next?** in terms of management actions (described in 4.2).

Chapter 3 explained in detail the **What?** in terms of inflation indicators and scenarios (re)insurance companies can monitor. Regarding the **How?**, the following chart highlights the approaches to capturing inflation risk within the risk management framework that are most common among the CRO Forum members.

Figure 22

Answers to the question:

What do you monitor inflation risk against?



The survey of the CRO Forum members highlighted that inflation risk is monitored most often as part of a wider quantitative market risk tolerance and/or a qualitative risk appetite statement. In a minority of cases, it is modelled as a separate risk with its own quantitative hard or soft risk limit.

Best practice for those where inflation risk has been material for some time is to monitor explicitly and quantitatively via a hard risk tolerance, which, upon breach, is escalated to the Board. As seen in chapter 3, this becomes possible when inflation is modelled separately. A “back into tolerance” plan to be approved by the Board will likely be produced with appropriate input by risk managers.

At present, standard practice is to implicitly monitor inflation within other risks and adjust existing tolerances accordingly. This occurs when inflation risk is a driver or a secondary effect of one or more of the other risk components. At this stage, the breakdown of inflation risk has not occurred, making inflation risk monitoring less effective. Other approaches may be either qualitative, describing at a high level the accepted exposure to the risk, or quantitative, adopting soft triggers. In these cases, a breach of thresholds would require senior management to hold conversations with different parts of the business, including risk teams, to reflect on possible actions but may not involve the Board.

Actionable tolerances and regular monitoring – Helping to ensure a quick response

The case study below shows how an inflation limit for the annuity portfolio of a life company worked during the recent spike in inflation. This limit, when monitored regularly, leads to actions taken in a timely manner to ensure that the impact of changing inflation expectations on the mismatch of assets and liabilities were reduced back to within appetite levels.

CASE STUDY 6

Monitoring the MA Portfolio against well-defined tolerances to minimise mismatch

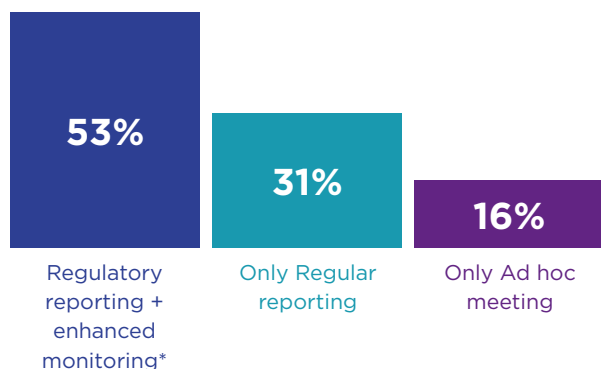
In company E, tolerances are set allowing for constraints on Matching Adjustment (MA) Portfolio rules and for the company’s risk appetite, which is to avoid inflation risk. Regular monitoring and review of exposure profiles is key, as exposure can move outside of tolerances quickly due to caps/floors biting. Together, tolerances and regular monitoring, ensure that the mismatch of assets to liabilities is at a level the company is comfortable with – with increased focus needed during high inflation such as experienced in 2022/2023.

The aim of risk monitoring is to lead to a meaningful consideration of necessary management actions by both Management and Risk, working together to decide on the **What next?** in terms of management actions. The following chart highlights how the CRO Forum members have brought inflation risk to their Board’s attention over the last year:

Figure 23

Answers to the question

How has inflation risk been discussed with the Board in the last year?



* e.g. deep dives, SST, ad hoc reports

Given the market context, it is not surprising that inflation has been the focus of attention with updates on its impacts provided by both financial and risk managers. In addition, many risk managers (70%) provided additional ad hoc deep dive analysis on inflation risk and/or participated in ad hoc meetings, confirming a high level of engagement with the Board. Over half (53%) of the CRO Forum members responded that monitoring over the past year of inflation risk was done as part of both regular reporting (CRO and CFO reports, including ORSA reports) and enhanced monitoring (e.g. deep dives, ad hoc meetings), confirming a high level of engagement with the Board. 31% of respondents have monitored inflation risk only through regular CRO and CFO reports, whereas a smaller proportion still (16%) have only held ad-hoc meetings.

Best practice sees risk managers considered proactive business partners, actively challenging the 1st line on inflation’s impact on solvency, liquidity and profitability early in the business planning process and throughout the year. This is where, independently of the ability to predict emerging trends, the strength of a risk management framework is measured by its ability to adapt to the unique situation and involve decision makers and challengers alike.

Risk managers should provide appropriate challenge both on the Capital frameworks used to assess Strategic Asset Allocation and performance and on the repricing process, thus ensuring that the measures used to monitor inflation risk are appropriate for the business (see case study 7 on the next page).

Monitoring of other risks

Given the links between inflation risk and interest rate risk, it is best practice to consider both in terms of monitoring and the actions taken. Furthermore, impacts on liquidity risk and profitability need to be monitored, in addition to solvency. Management actions will likely need to trade off these different impacts. For instance, reducing new business volumes may reduce future inflation risk from a solvency perspective, but this will likely come at the cost of reduced future profits.

4.2 Inflation risk management practices

Following on from the What next? question of risk monitoring, appropriate and timely management actions are in place, facilitated through various strategies. Innovative claims management, up-to-date pricing mechanisms, and a strong brand instill confidence, allowing for pricing adjustments

CASE STUDY 7

Giving management early sight and ensuring frequent oversight

For company E, due to the high inflationary environment, claims inflation started being monitored and reviewed against premiums on a weekly basis, with actuarial and claims teams working together and decisions being taken on repricing as frequently as needed. Core processes were linked via the actuarial mean estimate of ultimate claims costs, which provided a consistent base between IFRS and Solvency II reserves, claims, underwriting, pricing, capital modelling, reinsurance, performance monitoring and business planning.

On a monthly basis (fortnightly when inflation first started to rise), claims inflation was monitored against plan and an Oversight Committee, including the CRO, Managing Directors, Chief Actuary, Finance Directors, Chief Underwriting Officers met to provide top-down challenge, looking at own bottom-up metrics of each type of inflation vs. margins vs. profitability vs. market views. Further monitoring included understanding of key emerging macro risks, e.g. judicial review, whiplash report review, supplier contractual terms.



when necessary—especially significant for Non-Life companies. In the case of Life companies, dynamic Asset Liability Management proves instrumental in overcoming challenges related to modelling and mismatching.

In this section, the suite of management actions at the disposal of Non-Life and Life (re)insurance companies are examined in turn – and the likely impacts of those actions on solvency, liquidity, and

profitability. Linking back to the inflation scenarios described in previous chapters, most of the management actions presented below can be called upon in any scenario – e.g. costs reductions can be implemented, whether the inflation risk goes into a “soft landing” or “hard landing” scenario, while other management actions may be scenario specific – e.g. changes in hedging strategy will be impacted by the interest rate environment expected for the scenario considered.

The challenges to taking these actions are also considered together with the enablers that successful companies have in place to make the transition from theory to practice smoother.

The differences in management actions chosen by each individual company can be driven by type of business sold, by size of company, the markets in which it operates, including local regulator and peer considerations. This can mean that what may prove an effective management action for one company may be unachievable or even counterproductive for another. Therefore, the case studies below represent examples of best practice within specific contexts, not necessarily general recommendations.

4.2.1 Non-Life (re)insurance companies

The non-life sector is most exposed to inflation via claims and expenses and, as seen in chapter 2, more severely affected in the motor and property lines.

The dashboard below shows the range of possible management actions for non-life companies and highlights the results of the CRO Forum members survey on the most prevalent management actions used by non-life firms to manage inflation risk. Given the typical one-year term of the insurance contracts the most popular actions were underwriting and pricing adjustments.

High-level, directional impacts on the three dimensions of solvency, liquidity and profitability are also included, alongside considerations on ease of implementation (feasibility and cost) – noting these are highly sensitive to the size of the portfolio, the mix of risks and the regulatory regime, among other factors. The profitability directional impact can be influenced negatively by these factors; furthermore, profitability in particular is also sensitive to customers’ and peers’ responses, which can lead in the most extreme cases to reputational risks. Acknowledging these points, the likelihood of each of these management actions having potential adverse second order impacts has been highlighted, depending, among other considerations, on how widely expected they are by customers and the peers.

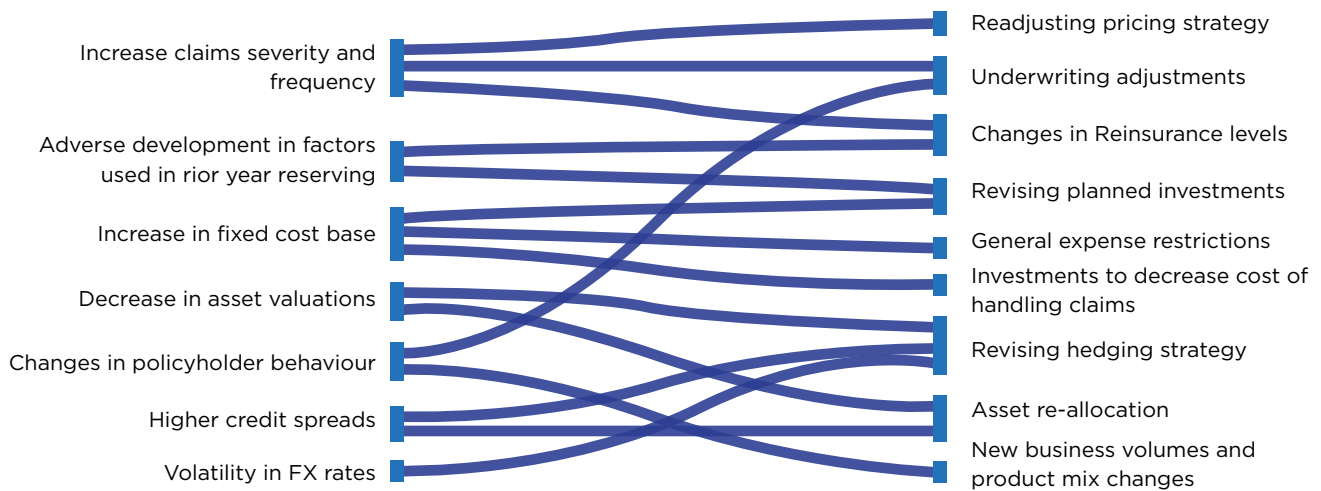
Table 13 Most common management actions for non-life business impacts and their characteristics in terms of speed and ease of implementation, and effect on capital, liquidity and profitability (see annex 3 for explanations to the dashboard content)

Non-Life Management Action (NL.M.A.)	Used by CROF members	Implementation		1 st order impacts			2 nd order impacts
		Speed	Ease	Solvency	Liquidity	Profitability	
1. Underwriting adjustments	12			Likely positive	Mixed/limited impact	Likely positive	<ul style="list-style-type: none"> Impact on market share due to customer migration - depends on behaviour of competitors and timing of their strategy. Impact on market share due to customer behaviour- propensity to decrease coverage or not insure. Reputational impact arising from a perception that the industry is profiteering from the context, especially where changes are more costly to the final consumer than the generally perceived inflation rates (i.e. CPI).
2. Readjusting pricing strategy	11			Likely positive	Mixed/limited impact	Likely positive	
3. General expense restrictions (impact on expense ratio)	4			Mixed/limited impact	Likely positive	Likely positive	<ul style="list-style-type: none"> Possible increase in operational risk as stress to increase efficiency may lead to more frequent losses/costs due to errors, omissions or IT dysfunctions. Reputational impact if expense restrictions lead to decrease in quality of services provided. Difficulty in hiring back skilled resources once growth has returned.
4. Change in Reinsurance levels	3			Mixed/limited impact	Mixed/limited impact	Mixed/limited impact	<ul style="list-style-type: none"> Some increase in the cost of insurance (assuming the reinsurance cost is passed onto the customer) – could generate similar second order impacts to NL.M.A. 1.
5. Revising hedging strategy	3			Likely positive	Likely negative	Mixed/limited impact	<ul style="list-style-type: none"> Other insurers likely to be considering similar switches and hedging which will reduce benefits/increase cost.
6. Asset re-allocation	3			Likely positive	Mixed/limited impact	Mixed/limited impact	<ul style="list-style-type: none"> Other insurers likely to be considering similar switches and which will reduce potential gains and potentially increase losses, especially if actions are not timed correctly.
7. Investments to decrease cost of handling claims	2			Likely positive	Mixed/limited impact	Mixed/limited impact	<ul style="list-style-type: none"> Possible positive reputational impact as most likely accompanied by more efficient claims management.
8. New Business volumes and product mix changes	2			Likely positive	Mixed/limited impact	Likely positive	<ul style="list-style-type: none"> Cutting volumes will push customers to other insurers. Possible impact on the future profit in case of cutting up-front volumes. Possible decrease in diversification effects if product mix changes.
9. Increase settlement speed	1			Likely positive	Mixed/limited impact	Mixed/limited impact	<ul style="list-style-type: none"> Possible positive reputational impact as most likely accompanied by more efficient claims management. Possible impact on strategic asset allocation given the need to keep highly liquid assets in the portfolio.
10. Revising planned investments (incl. capital allocation or M&A ops)	1			Mixed/limited impact	Mixed/limited impact	Likely positive	<ul style="list-style-type: none"> Cutting investments may push stakeholders other than customers to reconsider their own investments in the company (e.g. share and bondholders). Probable impact on future profits.

Legend

	Entirely new action, not discussed previously with management		Part of possible actions resulting from war gaming/ emerging risks scenarios		Part of agreed crisis process, 2 nd layer of actions		Part of agreed crisis process, 1 st layer of actions		Part of normal process / stress testing responses
1 Year+		1 Year		< 9 months		< 6 months		< 3 months	
Very Difficult		Difficult		Moderate		Easy		Very Easy	

Figure 24 Links between impacts and actions in the Non-Life business



Challenges

One of the main challenges that non-life companies face when trying to implement pricing and underwriting management actions is the lack of availability of good data, both internal and at an industry level, knowing that even local regulator data can be scarce or significantly lagging real time.

Another key challenge is market positioning, that is considering and anticipating the peers’ reactions. Being theoretically correct in terms of modelling and implementing price increases may simply result in reduced volume if you are first to move and peers don’t follow.

These challenges experienced by insurers are compounded at the reinsurers level, especially where the risks being reinsured are those in the tail of the distribution.

Enablers

The case studies below, from across the industry, bring out the enablers of key management actions, which distinguished those (re)insurers which came out of the inflationary period relatively unscathed.

Company intangibles in terms of customer confidence and brand recognition: The case study below describes how knowledge of and confidence in its customer base led to actions that took into consideration both the needs of the company and those of the customers, both of which have been crucial in staving off the second order impacts of inflation such as low renewal rates and high lapses.

CASE STUDY 8

Confidence to adjust pricing and propositions

Company F’s improvements in the handling of claims management, high customer confidence and strong brand gave the company the confidence to take management actions on underwriting practices and pricing, sometimes ahead of the competition, secure in the knowledge of a loyal customer base.

Company F’s pricing and underwriting actions included agreeing revised premium-payment schedules with selected customers and developing new affordable, essential-value products. Crucially, these actions were considered both from the company’s point of view (to maintain profitability, solvency, liquidity) and from the customer’s perspective regarding concerns of poor affordability of existing products and increased (uninsured) repair costs.



Pro-active interaction between 1st line and Risk:

The management action in the next case study was an increase in reserves, which led to a price increase. The implications of this action and the necessary follow-up decisions were the result of collaboration between 1st line and Risk.

CASE STUDY 9

Helping to finetune management decisions

For company G, following the rise in inflation, the actuarial team needed to increase reserves for the motor business line. This in turn would lead to a higher COR than previously expected and therefore the decision was taken to increase prices. Together the following decisions were made:

1. Improve the links between headline inflation and in-house indices specifically developed for motor claims inflation, allowing for better and quicker scenario impact testing.
2. Balance price increases with incentivisation schemes aimed at driving down the future cost of claims. These would take longer to have an effect but could hedge future inflation.

In the first decision Risk was front line; working together with the actuarial teams and head economists to build the model. On price rises, Risk involvement was in the form of Solvency sensitivity testing of an increase in headline inflation, helping to finetune aspects such as speed of implementation and test the sufficiency of the increases in an adverse scenario until the benefits from the incentivization schemes kicked in.



4.2.2 Life (and investments) (re)insurance companies

Chapter 2 explored the most common impacts of inflation on both the Life business, including changes in assumptions on future inflation (benefits linked to national indices, healthcare medical expense, etc.) and on policyholder behaviour, potentially leading to lapse rate spikes and/or decrease in savings levels. Correlations between interest rate movements and reductions in liquidity, balance sheet assets, and profitability are also analysed, and how companies should not consider these effects in isolation, as highlighted in the case study example on the Italian life sector (Case study 2).

The dashboard below shows the range of possible management actions for Life companies, highlighting the results of the CRO Forum members survey on the most prevalent management actions used by Life firms to manage inflation risk. These actions, more varied than in non-life insurance, are centred around the review of the Strategic Asset Allocation and the Hedging Strategy. Commercial management actions, such as changes to the product mix and underwriting and pricing adjustments, were also implemented to help offset the negative impacts on profitability and liquidity due to increased lapses as new business inflows or to prevent a rise in lapses in the first place. There is also a distinction to be made between tactical asset allocation decisions vs. strategic changes. The former are quick to implement and aimed at solving a problem over the short term (e.g. shifting into index-linked government bonds or putting in additional hedges/ swaptions in place), whereas the second looks at changes to be made longer term (e.g. change in interest rate strategy from hedging to IFRS reserves/ liquidity to hedging to Solvency II best estimate liabilities).

High-level, directional impacts on the three dimensions of solvency, liquidity and profitability are also included, alongside considerations on ease of implementation (feasibility and cost) - noting these are highly sensitive to the size of the portfolio, the mix of risks and the regulatory regime, among other factors. As per the non-life section, the table highlights the likelihood of each of these actions having potential adverse second order impacts, depending on how widely expected they are by customers and peers.

Table 14 Most common management actions for life business impacts and their characteristics in terms of speed and ease of implementation, and effect on capital, liquidity and profitability (see annex 4 for explanations to the dashboard content)

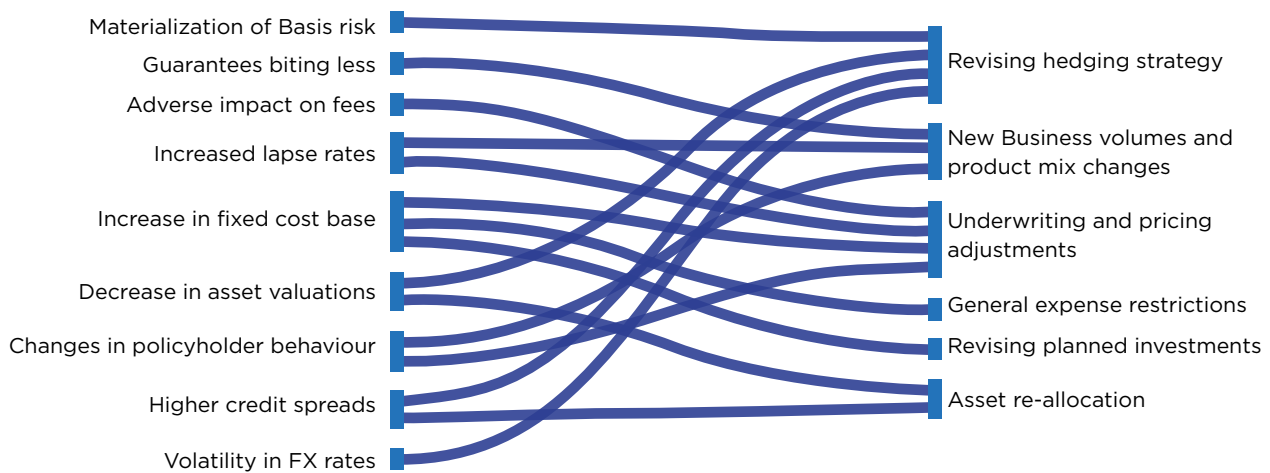
Life Management Action (L.M.A.)	Used by CROF members	Implementation		1 st order impacts			2 nd order impacts
		Speed	Ease	Solvency	Liquidity	Profitability	
1. Asset re-allocation	11			Likely positive	Mixed/limited impact	Mixed/limited impact	<ul style="list-style-type: none"> Other insurers likely to be considering similar switches which will reduce potential gains and potentially increase losses, especially if actions are not timed correctly. Probable beneficial effects on profitability and liquidity in the longer term.
2. Revising hedging strategy	8			Likely positive	Likely negative	Mixed/limited impact	<ul style="list-style-type: none"> Other insurers likely to be considering similar switches and hedging which will reduce benefits/increase cost.
3. New Business volumes and product mix changes	6			Mixed/limited impact	Likely positive	Likely positive	<ul style="list-style-type: none"> Cutting volumes will push customers to other insurers. Possible impact on the future profit in case of cutting up-front volumes. Possible decrease in diversification effects if product mix changes.
4. General expense restrictions	6			Likely positive	Mixed/limited impact	Mixed/limited impact	<ul style="list-style-type: none"> See Non-Life Management Actions given the importance of these actions on the Non-Life Business.
5. Underwriting and pricing adjustments	5			Likely positive	Mixed/limited impact	Likely positive	<ul style="list-style-type: none"> Impact on market share due to customer migration - depends on behaviour of competitors and timing of their strategy. Impact on market share due to customer behaviour- propensity to decrease coverage or not insure. Reputational impact arising from a perception that the industry is profiteering from the context, especially where changes are more costly to the final consumer than the generally perceived inflation rates (i.e. CPI).
6. Revising planned investments (incl. Capital allocation or M&A ops)	4			Mixed/limited impact	Mixed/limited impact	Likely negative	<ul style="list-style-type: none"> Cutting investments may push stakeholders other than customers to reconsider their own investments in the company (e.g. share and bondholders). Probable impact on future profits.

Legend

	Entirely new action, not discussed previously with management		Part of possible actions resulting from war gaming/ emerging risks scenarios		Part of agreed crisis process, 2 nd layer of actions		Part of agreed crisis process, 1 st layer of actions		Part of normal process / stress testing responses
1 Year+	1 Year	< 9 months	< 6 months	< 3 months					
Very Difficult	Difficult	Moderate	Easy	Very Easy					

Source: CRO Forum Survey and CRO Forum Working Group on Inflation

Figure 25 Links between impacts and actions in the Life business



Challenges

The survey results show that Life companies typically hedge inflation risk using index-linked bonds and inflation swaps. Asset Liability Management actions (such as asset reallocation or hedging strategy changes) are key to managing inflation risk, however they are not usually straightforward to implement. Challenges to these actions come from the lack of inflation-linked assets with required return profile in the market to match the indexation in the liabilities. A trade-off in terms of risk premium vs effectively hedging is often required.

This would be further exacerbated by high volatility in inflation and/ or interest rates. In fact, a hedging strategy suited to an inflationary period could result in a mismatch within a declining inflation environment, affecting liquidity risk, and forcing the company to post collateral. The contribution of inflation risk to liquidity risk could be assumed to diversify away if interest rates are largely falling or inflation falling more broadly leads to increased customer confidence.

In the long run higher interest rates are beneficial to the industry for several reasons. However, challenges faced by (re)insurers also consist in countering the immediate effect that surges in interest rates combined with inflation can have on policyholder behaviour. The erosion of disposable income on one hand, and the attractiveness of higher yield plain vanilla instruments (e.g. government bonds) on the other can contribute to a significant decrease in collections and an increase in lapse rates, translating in a. asset devaluations and liquidity stress.



Enablers

The case studies below, from across the industry, bring out the enablers of implementing some of these key management actions, despite the challenges presented above.

Dynamically hedging inflation risk: As already mentioned, the key management actions for Life (re)insurers are Asset Liability Management actions, which are enabled by having a dynamic or semi-dynamic hedging strategy. This allows for recalibration of the portfolio frequently enough so that mismatching of asset vs. liabilities is reduced to the extent possible.

CASE STUDY 10

Very dynamic Asset Liability Management

For company H liabilities are linked to the Retail Price Index (RPI) subject to caps and floors (referred to as Limited Price indexation (LPI)). Most of the hedging assets are RPI-linked. The company operates a semi-dynamic hedging strategy to maintain an appropriate level of matching of RPI assets to LPI liabilities within agreed tolerances. This matching is achieved using a portfolio consisting predominantly of inflation-linked gilts and RPI inflation swaps.

When the level of RPI increased to the extent the caps were exceeded (most caps are set at 5%), the company reduced its RPI exposure by selling inflation-linked gilts and/or entering into ‘pay inflation receive fixed’ inflation swaps. Conversely, when market rates on RPI swaps fell below 5%, the company increased exposure by buying inflation linked gilts and/or entering into ‘pay fixed receive inflation’ swaps.

In company H, the role of the CRO is to work with 1st line to assess/challenge whether:

- the current ALM strategy is fit for the current environment (e.g., high inflationary environment) and to assess the reaction time to adjust to a potentially changing environment (e.g., to a potential deflationary environment).
- the volume and mix of business proposed in the business plan impact the challenges faced in managing inflation, e.g., via altering the asset-liability duration gap or via altering the proportion of liabilities linked to an inflation index for which few matching assets exist in the market.
- the current modelling is appropriate, flexible, and fast enough to enable quick action on inflation changes.

Asset reallocation / Underwriting and pricing management actions/ New Business volumes and product mix: about a third of CRO Forum members indicated that changes were made to underwriting conditions and pricing as well as adapting to the new interest rate environment by creating or adjusting products with the target of enhancing collections and possibly, limiting lapse risk.

CASE STUDY 11

Italian Life business adapting to a new environment

Short term management actions of the Italian companies in 2023 were geared towards managing liquidity risk, on one hand within the portfolio and on the other by developing a commercial offering that helped compensate euro outflows with inflows.

Management Actions implemented within portfolios: In response to early indications of rising inflation, enhancing portfolio liquidity by elevating credit quality has been an observed practice, partially covered by the CRO Forum survey on Life management actions that placed asset reallocation as the predominant action taken by CRO Forum members. This involves actively reducing exposure to companies and sectors that are particularly susceptible to worsening costs of debt and restricted access to credit.

Management Actions developed to enhance commercial offering: Adapting to the evolving inflationary landscape by introducing appealing new products that align with the emerging scenario or by launching marketing incentives to boost collection on already existing products has also been observed. This includes developing offerings that are linked to inflation or commodities or reducing commissions. New products have been strategically offered alongside traditional ones to counterbalance any negative effects from the expiration of existing products. Simultaneously, incentivizing distribution networks to encourage proactive client engagement also has helped to mitigate lapse risk, particularly in the retail sector.

Pro-active interaction between 1st line and Risk:

The results of the survey showed that, for about half the companies, the monitoring of hedge effectiveness is performed within Risk; while, for the other half, 1st line performs the monitoring, with Risk still involved in reviewing or setting KPIs. This would imply that in most cases Risk would have a good level of involvement in the review of the effectiveness and cost of inflation-related hedges.

5. Conclusion and food for thought

Our exploration into the realm of inflation risk has illustrated significant changes in how risk managers should approach this persistent challenge. We've observed how responses to inflation by public institutions have evolved, necessitating a comprehensive understanding of policy ramifications and potential future scenarios. Key indicators have been highlighted to aid in assessing the performance trajectory of western economies.

Moreover, our examination of the observed impacts of inflation on profitability, capital, and liquidity underscores the importance of vigilance and adaptability. These effects ripple across various risk categories, particularly affecting situations with asset-liability mismatches. As we move forward, the robustness of risk management processes and the availability of data to determine action plans will emerge as key factors in mitigating the impacts of inflation risk.

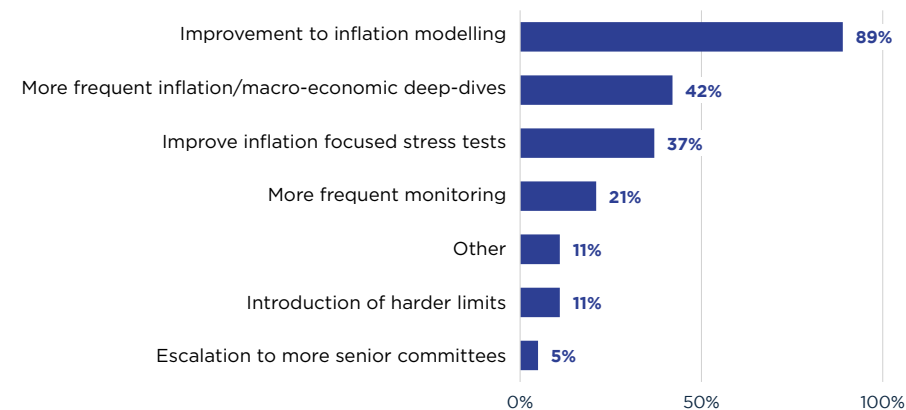
In navigating this landscape, the insurance industry has exemplified the agility required to confront high inflation periods. Yet, there remains a collective recognition that improvements in inflation risk modelling and stress testing are imperative. The evolution towards proactive risk management is evident, with a focus on enhancing monitoring capabilities and the related frequency of updates and addressing emerging risks resulting from inflation dynamics.

Figure 26

Answers to the question:

What areas of inflation risk management would you change to drive better performance?

Note: Select up to 3 most significant



The persistence of inflation as a significant risk necessitates a strategic shift towards embedding inflation risk management into the fabric of business operations. It's clear that comprehensive risk management strategies will be paramount. By embracing the nuances of inflation and interest rate dynamics, insurance firms can not only mitigate

challenges but also capitalize on opportunities, optimizing their overall financial positions. Thus, our journey concludes with a call for proactive adaptation and strategic alignment to navigate the enduring presence of inflation risk effectively.

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Annex 1:

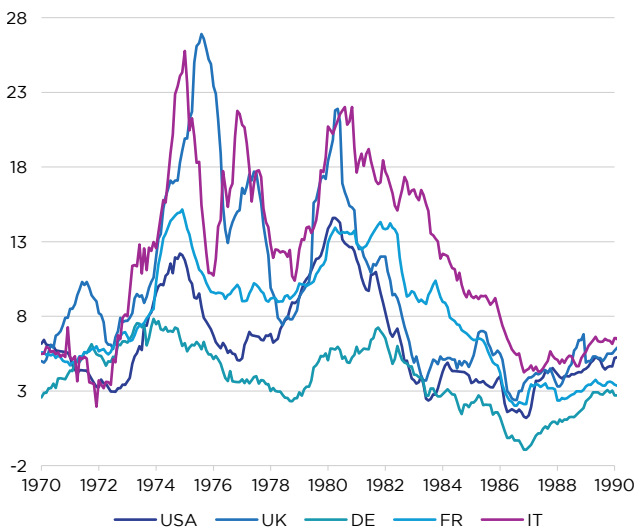
1970s versus 2021 inflation rising: Similarities and differences

The current surge in inflation finds a parallel in history with the oil shocks of 1973 and 1979-80, impacting countries such as the United Kingdom, Italy, France, and the United States (see Figure 27). A comparative analysis reveals both similarities and differences between the two episodes, with energy price shocks as a common factor but varying magnitudes (Kose et al., 2022).

Contrary to the 1970s when oil prices quadrupled in 1973-74 and doubled again in 1979-80, today's oil prices stand at approximately two-thirds of the levels observed in 1980 or 2008 when adjusted for real terms (see Figure 28). Another difference is wage indexation, which was more common and has become less prevalent across countries. This shift reduces the risk of setting off a wage-inflation spiral that could intensify inflationary trends.

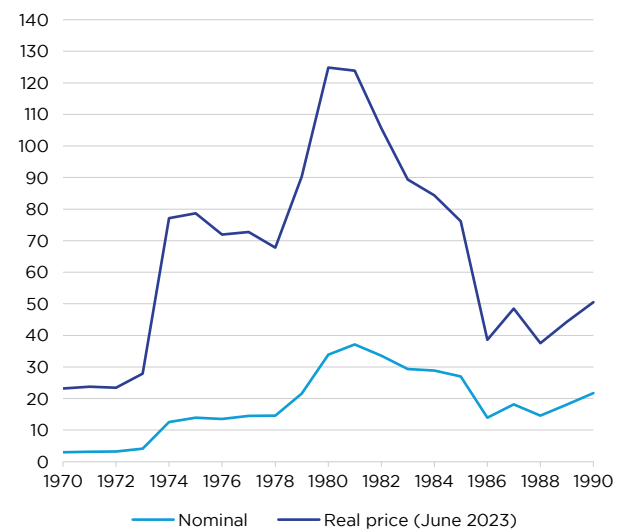
Similarly, however, both inflationary periods were marked by expansionary fiscal policies, leading to structural fiscal imbalances and a significant rise in public debt. Public debt in the United States increased from 30% to 50% of Gross Domestic Product (GDP) from 1970 to 1990. European countries like Italy also saw a jump in public debt from 40% to 100% of GDP during the same timeframe. More recently, during the acute phase of the Covid-19 pandemic, expansionary fiscal measures elevated the U.S. public debt-to-GDP ratio to over 120% in 2020-21, while the euro area witnessed a ratio just below 100% in the same period. Also, during both periods of inflation, many economies adopted a noticeably accommodating monetary policy stance, as noted by Visco (2023).

Figure 27 Inflation 1970 - 1990 (monthly data; annual percentage change)



Source: CROF elaboration on LSEG Datastream

Figure 28 Oil price 1970 - 1990 (yearly; \$ per barrel)



Source: CROF elaboration on LSEG Datastream

Notes: Nominal and real crude oil prices (averages of Dubai, Brent and WTI prices). Real oil prices are deflated by US CPI Index (June 2023 = 100)

US versus Europe: Similarities and differences.

In the same way there are differences between historical periods, the root causes for the current surge in inflation also vary among countries. A notable example is the comparison between the United States (see Figure 29), where demand factors have played a crucial role in driving price acceleration, and the Euro area (see Figure 30), which has predominantly experienced the impact of a supply shock.

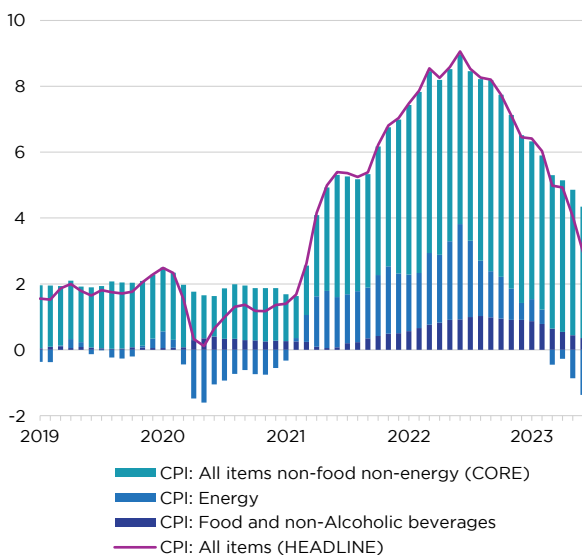
In the U.S., expansive fiscal policies increased public debt, and significant support to households led to a surge in demand and consumer spending, especially in the goods sector. Supply chain issues and rising intermediate goods prices worsened the situation. The tight labour market (unemployment at 3.5%) put upward pressure on wages.

In contrast, the Euro area faced inflation influenced by supply-side factors, notably an energy shock. The Ukraine invasion highlighted Europe’s reliance on Russian gas and Ukrainian food imports, causing a severe energy crisis and trade challenges.

Although euro area fiscal policies were somewhat expansionary, it was less pronounced than in the U.S., resulting in a modest increase in the public debt-to-GDP ratio. Wage growth in the Euro area remained moderate at around 3%, without signs of a wage-price spiral.

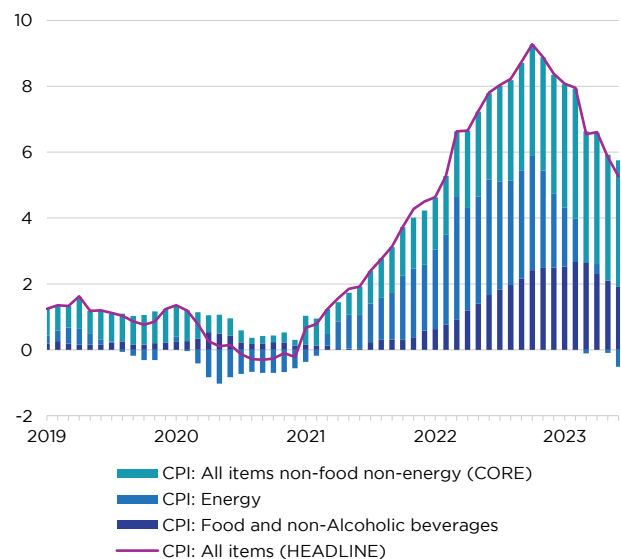
This contrast is evident in Core, Food, and Energy inflation contributions. Demand factors, especially Core inflation, played a central role in U.S. inflation. Conversely, the Euro area saw extreme volatility in natural gas prices due to supply uncertainties, followed by a sharp fall, adding complexity to the inflationary landscape.

Figure 29 US CPI 2019-2023 (monthly data; annual percentage change)



Source: CROF elaboration on OECD data. Last observation reported June 2023

Figure 30 EU CPI 2019-2023 (monthly data; annual percentage change)



Source: CROF elaboration on OECD data. Last observation reported June 2023

Annex 2:

1970s Volcker disinflation process: Applied again in 2021

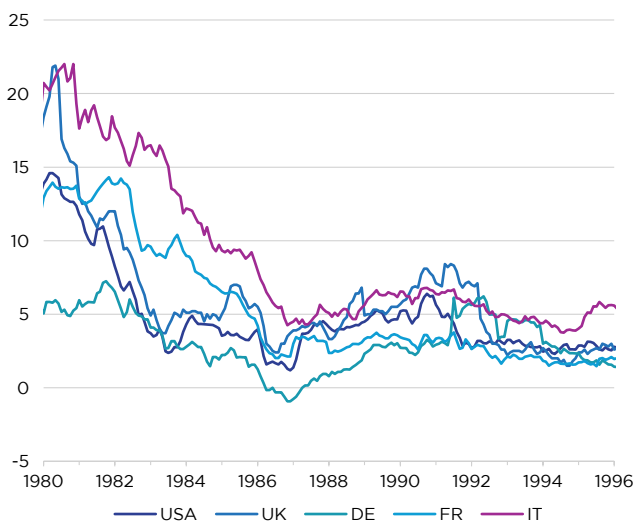
Currently, a restrictive Central Bank monetary policy, highlighted by the Bank for International Settlements (BIS, 2023), is steering the disinflation process. A prominent historical instance of this approach is the U.S. disinflation of the 1980s, famously termed Volcker’s disinflation period.

In 1980, U.S. inflation surpassed 15%, averaging close to 9% over the next decade (see Figure 31). In response, the Federal Reserve drastically increased the federal funds rate from late 1979 to early 1980, reaching 15%, and later to 17.5% in mid-1981 (see Figure 32). This strict monetary policy caused a 1981-1983 economic slowdown, a double-dip recession, higher unemployment, and weakened demand, known as ‘chemotherapy for the economy.’

Despite challenges, the Federal Reserve effectively countered high inflation, resulting in an average rate of about 3.5% from Q1 1983 to Q3 1996.

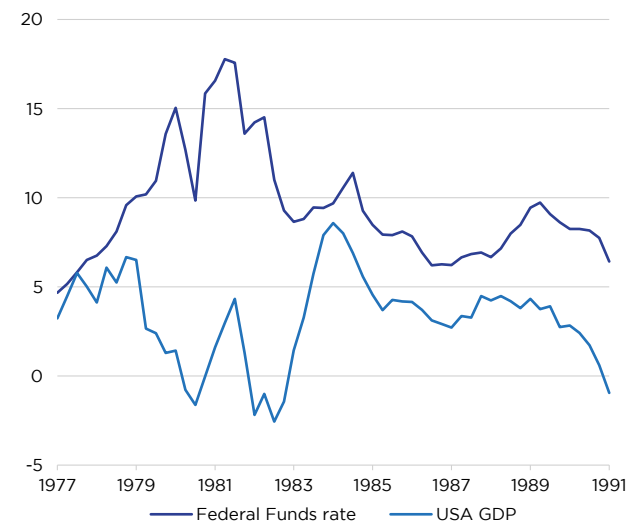
Following the Volcker disinflation, a key lesson emerged: credibility is crucial in monetary policy (Goodfriend and King, 2005). Monetary policies must be credible to counter rising inflation expectations, and Central Banks should maintain autonomy for sustained tightening when necessary. Since the 1970s, this has been largely the case, where Central Bank independence has taken a central role, enhancing their credibility in achieving inflation objectives. A notable example is the Bundesbank, already independent in the 70s, that has kept German CPI inflation at 5%.

Figure 31 Inflation 1980-1996 (monthly data; annual percentage change)



Source: CROF elaboration on LSEG Datastream

Figure 32 USA Federal Reserve Funds rate (monthly data; annual percentage change)



Source: CROF elaboration on LSEG Datastream

Annex 3:

Explanations to the Non-Life management actions Dashboard

Non-Life Management Action (NL.M.A)	Speed and Ease of implementation	Solvency, Liquidity, Profitability	Second order impacts
<p>1. Underwriting adjustments</p>	<ul style="list-style-type: none"> Will be required to go through internal governance and review. Although U/W terms will be regular reviewed so a well-known path. Crisis actions may have been considered as part of SST work/ recovery plans. Impacts will take time to work through as policies on new terms roll-over. 	<ul style="list-style-type: none"> Improves solvency as more risk is passed onto the policyholder. Profitability - will depend on how the changes are reflected in pricing but likely to be positive especially compared to not taking the action. Impact on liquidity likely to be more limited as adjustments attempt to limit outflows. 	<ul style="list-style-type: none"> Impact on market share due to customer migration - depends on behaviour of competitors and timing of their strategy. Impact on market share due to customer behaviour- propensity to decrease coverage or not insure. Reputational impact arising from a perception that the industry is profiteering from the context, especially where changes are more costly to the final consumer than the generally perceived inflation rates (i.e. CPI).
<p>2. Readjusting pricing strategy</p>		<ul style="list-style-type: none"> Lower expenses improves profitability albeit small. Impact on Solvency likely limited. Some benefits to liquidity. 	
<p>3. General expense restrictions (impact on expense ratio)</p>	<ul style="list-style-type: none"> Given expenses are inherently internal, speed to implement likely quicker than the above (albeit similar governance may apply). Cost savings (people) easy to identify but harder to deliver. 	<ul style="list-style-type: none"> Lower expenses improves profitability albeit small. Impact on Solvency likely limited. Some benefits to liquidity. 	<ul style="list-style-type: none"> Possible increase in operational risk as stress to increase efficiency may lead to more frequent losses/costs due to errors, omissions or IT dysfunctions. Reputational impact if expense restrictions lead to decrease in quality of services provided. Difficulty in hiring back skilled resources once growth has returned.
<p>4. Change in Reinsurance levels</p>	<ul style="list-style-type: none"> Renewals generally at defined times of the year so slower to implement. 	<ul style="list-style-type: none"> Main purpose of using this management action is to arbitrage between improvement to solvency position and cost of reinsurance. Effect on Solvency and profitability work in opposite directions. Mixed impact on liquidity, depending on the type of reinsurance cover purchased and how the reinsurance treaty cash flows are settled (i.e. up-front premium payment). 	<ul style="list-style-type: none"> Some increase in the cost of insurance (assuming the reinsurance cost is passed onto the customer) – could generate similar second order impacts to NL.M.A. 1.
<p>5. Revising hedging strategy</p>	<ul style="list-style-type: none"> Large changes to hedging strategy likely to take place a maximum of once a year (with associated board level governance). Tactical hedging more timely. 	<ul style="list-style-type: none"> Depending on the different interest rate dynamics, likely an opposite impact between Solvency and Profitability. Use of derivatives to hedge introduces increased liquidity risk. 	<ul style="list-style-type: none"> Other insurers likely to be considering similar switches and hedging which will reduce benefits/increase cost.

49 Unmasking inflation – Best practices for (re)insurance Risk Managers

Non-Life Management Action (NL.M.A)	Speed and Ease of implementation	Solvency, Liquidity, Profitability	Second order impacts
6. Asset re-allocation	<ul style="list-style-type: none"> Tactical changes to asset allocation timely but level of impact depends on the ability to move outside of any strategic asset allocation. Benefits of moving to inflation sensitivity assets likely crowded out by other insurers doing the same. 	<ul style="list-style-type: none"> Asset allocation can either be to improve yields (Profitability impact) or reduce risk via switching to more inflation linked assets and improve solvency. Impact on profitability could be positive due to higher yields but this might be offset by unrealised losses materialising (see chapter 2). 	<ul style="list-style-type: none"> Other insurers likely to be considering similar switches which will reduce potential gains and potentially increase losses, especially if actions are not timed correctly.
7. Investments to decrease cost of handling claims	<ul style="list-style-type: none"> Tactically can improve via pushing resources into claims handling to improve turnaround – strategic solutions costly and lengthy to implement. 	<ul style="list-style-type: none"> In the short term, it could improve profitability by reducing claims costs via resolving claims more promptly. This will come at higher implementation costs. Solvency impact will be positive on the BEL, related to claims cost reduction. 	<ul style="list-style-type: none"> Possible positive reputational impact as most likely accompanied by more efficient claims management.
8. New Business volumes and product mix changes	<ul style="list-style-type: none"> Cutting volumes can be enacted quickly, but the effect could take longer depending on contract duration. 	<ul style="list-style-type: none"> May reduce risk and improve profitability with mixed effects on liquidity, as initially implies less premiums volume up-front. 	<ul style="list-style-type: none"> Cutting volumes will push customers to other insurers. Possible impact on the future profit in case of cutting up-front volumes. Possible decrease in diversification effects if product mix changes.
9. Increase settlement speed	<ul style="list-style-type: none"> Increase settlement speed can be enacted quickly, but the effect could take longer depending on business. 	<ul style="list-style-type: none"> Mixed impacts both on liquidity and profitability, depending on the availability of liquid assets already at disposal or to be sold, impacting the portfolio yield. Solvency impact will be positive on the BEL, related to claims cost reduction. 	<ul style="list-style-type: none"> Possible positive reputational impact as most likely accompanied by more efficient claims management. Possible impact on strategic asset allocation given the need to keep highly liquid assets in the portfolio.
10. Revising planned investments (incl. capital allocation or M&A operations)	<ul style="list-style-type: none"> Some investment cuts can be enacted quickly, however, depending on circumstances deciding on the best course of action could take time. 	<ul style="list-style-type: none"> May improve short-term profitability but will come at the expense of future profits. Solvency impact will depend on the nature of the planned investment. Impact on liquidity most likely limited, given resources are reoriented towards absorbing inflation impacts. 	<ul style="list-style-type: none"> Cutting investments may push stakeholders other than customers to reconsider their own investments in the company (e.g. share and bondholders). Probable impact on future profits.

Annex 4:

Explanations to the Life management actions Dashboard

Life Management Action (L.M.A)	Speed and Ease of implementation	Solvency, Liquidity, Profitability	Second order impacts
1. Asset re-allocation	<ul style="list-style-type: none"> Tactical changes to asset allocation timely but level of impact depends on the ability to move outside of any strategic asset allocation. Benefits of moving to inflation sensitive assets likely crowded out by other insurers doing the same. 	<ul style="list-style-type: none"> Asset re-allocation in this context will be conducted to rebalance the portfolio by de-risking it (e.g. improving its creditworthiness or moving towards inflation linked bonds) and/or enhancing the liquid nature of its instruments and/or improving its yield by adopting an opportunistic approach on higher interest rates. All these actions will likely have a positive impact on Solvency. Impact on profitability and liquidity is more nuanced as potentially higher yields could be offset by unrealised losses materialising (see chapter 2) especially in the short term and especially where lapses have increased due to changes in policyholder behaviour. 	<ul style="list-style-type: none"> Other insurers likely to be considering similar switches which will reduce potential gains and potentially increase losses, especially if actions are not timed correctly. Probable beneficial effects on profitability and liquidity in the longer term.
2. Revising hedging strategy	<ul style="list-style-type: none"> Large changes to hedging strategy likely to take place a maximum of once a year (with associated board level governance). Tactical hedging more timely. 	<ul style="list-style-type: none"> Depending on the different interest rate dynamics, likely an opposite impact between Solvency and Profitability. Use of derivatives to hedge introduces increased liquidity risk. 	<ul style="list-style-type: none"> Other insurers likely to be considering similar switches and hedging which will reduce benefits/increase cost.
3. New Business volumes and product mix changes	<ul style="list-style-type: none"> Implementing new products or changing features to existing products could take some time to implement but relatively quick to enact. Cutting volumes as per Non-Life actions less likely. 	<ul style="list-style-type: none"> May improve liquidity as inflows increase, even where possibly offset by increased outflows due to higher lapse rates. Impact on Solvency likely negative as company takes on new business but could be heavily offset by the increase in lapse rates where observed. Impact on profitability likely positive in the short term but depends on changes implemented. Longer term profitability depends on NBV variations. 	<ul style="list-style-type: none"> Cutting volumes will push customers to other insurers. Possible impact on the future profit in case of cutting up-front volumes. Possible decrease in diversification effects if product mix changes.
4. General expense restrictions (impact on expense ratio)	See Non-Life Management Actions given the importance of these actions on the Non-Life Business.		

Life Management Action (L.M.A)	Speed and Ease of implementation	Solvency, Liquidity, Profitability	Second order impacts
<p>5. Underwriting and pricing adjustments</p>	<ul style="list-style-type: none"> • Will be required to go through internal governance and review. Although U/W terms will be regular reviewed so a well-known path. • Crisis actions may have been considered as part of SST work/ recovery plans. • Impacts will take time to work through as policies on new terms roll-over. • Policies may be multi-year so changes take longer to take effect. 	<ul style="list-style-type: none"> • Improves solvency where changes to underwriting conditions passes on more risk to the policyholder or further limits conditions for lapse. • Profitability - will depend on how the changes are reflected in pricing and contracts but likely to be positive especially compared to not taking the action. • Impact on liquidity likely to be more limited as adjustments attempt to limit outflows, or compensate outflows with inflows. 	<ul style="list-style-type: none"> • Impact on market share due to customer migration - depends on behaviour of competitors and timing of their strategy. • Impact on market share due to customer behaviour-propensity to decrease coverage or not insure. • Reputational impact arising from a perception that the industry is profiteering from the context, especially where changes are more costly to the final consumer than the generally perceived inflation rates (i.e. CPI).
<p>6. Revising planned investments (ind. Capital allocation or M&A operations)</p>	<ul style="list-style-type: none"> • Some investment cuts can be enacted quickly, however, depending on circumstances deciding on the best course of action could take time. 	<ul style="list-style-type: none"> • May improve short-term profitability but will come at the expense of future profits. • Solvency impact will depend on the nature of the planned investment. • Impact on liquidity most likely limited, given resources are reoriented towards absorbing inflation impacts. 	<ul style="list-style-type: none"> • Cutting investments may push stakeholders other than customers to reconsider their own investments in the company (e.g. share and bondholders). • Probable impact on future profits.



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The CRO Forum is supported by a Secretariat that is run by KPMG Advisory N.V.
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