

MILLIMAN REPORT

History repeating itself?

The return of high inflation and its implications
(including modelling) for life insurers

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Introduction

Inflation is a well-known economic concept. In very broad terms it represents the rate of increase in some measure of prices.¹ Variations in the constituents and construction of inflation measures can lead to a bewildering range of results and there are long running debates around the strengths and weaknesses of different approaches. The authors make no excuse for side-stepping this technical area as, across many geographies, we can say that whichever measure you consider current inflation rates are likely to be the highest seen for a generation or more.

The change in the inflationary regime has been rapid and rather brutal. Economies that have grown used to inflation rates in the 1% to 2% per annum range are now looking at rates approaching (or in) double digits. The implications of this depend significantly on the path of inflation rates from here, a rapid return to previous low levels and perhaps the inflation of the early 2020s becomes just an interesting period for academic study. On the other hand, if current experience presages a more general and persistent increase in inflation rates coordinated across multiple economies, then the ensuing changes could be wide ranging and more profound. The scope for research around this is vast, but given our particular field of interest we have focused this paper on the possible implications for life insurers should higher inflation prove persistent.

The remainder of this paper is structured as follows:

- A brief review of the current inflation situation and latest² forecasts across:
 - The UK
 - The US
 - The Eurozone
- Discussion of the specific implications for insurers of persistently high inflation rates
- Consideration of how elevated inflation risks might be modelled and managed
- In the appendix, further considerations around current and prospective inflation conditions

The current inflation situation is a global issue. In this paper we cover in particular the UK, the Eurozone, and the US. We also make reference to specific studies and specific data from particular countries where this is helpful in considering the wider issues.

Inflation: Where are we now?

In this section, we discuss current and past inflation levels and look at the available inflation statistics in a number of important life company markets.

In the table³ below, we set out inflation data for the UK, USA, and Eurozone. Specifically, the table presents average inflation rates between 2000–2019, the year-end (YE) 2020 rate, the half-year (HY) 2021 rate, the YE 2021 rate, and the latest annual rate at the time of writing (July 2022).

FIGURE 1: INFLATION DATA FOR THE UK, USA, AND EUROZONE (% PER ANNUM)

	Average Rate 2000-2019	Rate YE 2020	Rate HY 2021	Rate YE 2021	Rate Latest
UK	1.7	1.5	1.8	4.4	5.9
US	2.2	1.4	5.4	7.0	8.6
EUROZONE	1.7	-0.3	1.9	5.0	8.1

¹ A rate of decline in prices is typically referred to as 'deflation.'

² At the time of writing (July 2022).

³ For generating this table, details of the indices and descriptions are: for UK, GBCPY=ECI (Consumer Prices, Core CPI (YoY)); for USA, USCPNY=ECI (All Urban Samples, all items); for EUROZONE, EUHICF=ECI (Consumer Prices, all items).

Figure 1 shows clearly that the increase in inflation rates has:

- a) Occurred over a relatively short period, starting in 2021
- b) Seen significant rises in relation to typical rates experienced post 2000
- c) Has been a feature of multiple geographies

Given the recent economic data, it is quite sensible to assume that high inflation is back, at least for the next few years and potentially (and of more concern) for the medium term.

Impacts on life insurance companies

ASSET SIDE IMPLICATIONS

A significant change in the expectation of future inflation could have a material impact on the value of assets invested by insurers. The level of impact can only be assessed on a case-by-case basis. For the purpose of this paper, assets invested by insurers to match liabilities can be broadly split into two groups, i.e., assets having a linkage to inflation (with various degrees), or assets having no linkage. For example, assets invested into fixed coupon payments will have their cash flow fixed in the future regardless of how inflation may change. The value of those assets, in both real and nominal terms, can be materially negatively impacted by rising inflation. However, some of an insurer's other assets may have their cash flow profile linked to inflation, such as index-linked bonds, which are used to match liabilities in real terms.

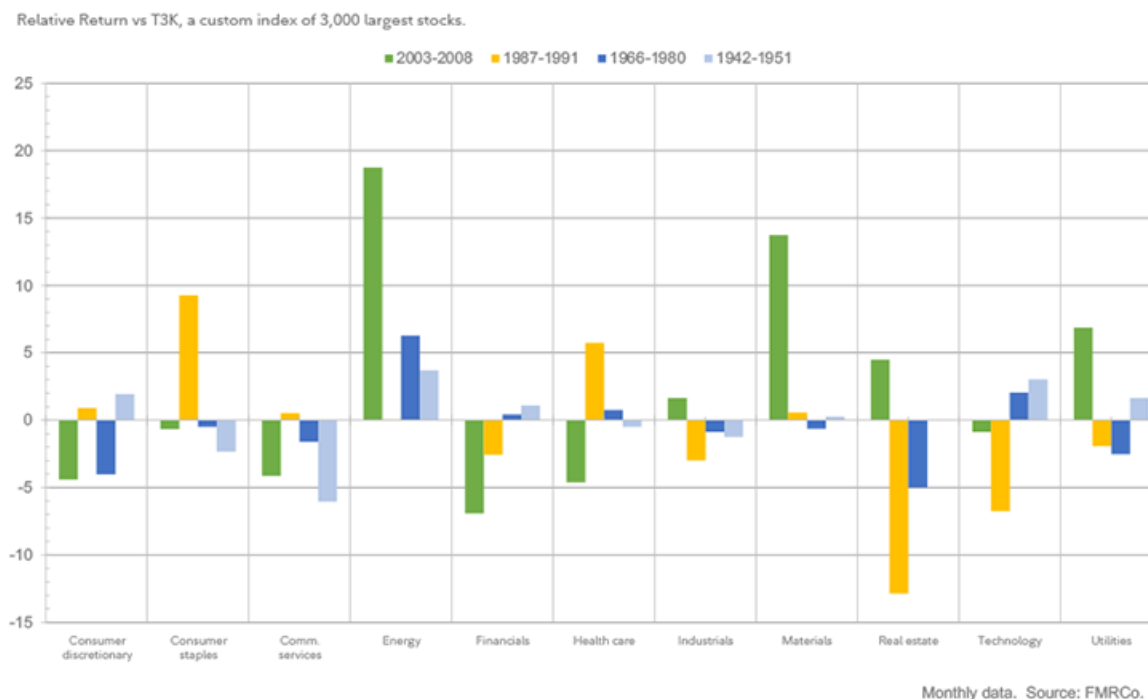
Some insurers may also invest into certain real assets (such as equities, real estate, and commodities), the return on which may be expected to have a positive correlation with the change in market inflation according to historical performance. Those assets could produce a positive real return over the long term. For assets used to back with-profits/participating or unit-linked liabilities, some assets might have been invested in equities with the expectation that the revenue of the underlying companies is (at least partially) linked to inflation, thus providing some protection of future profits from inflation if demand is sustained and costs are controlled. This would in turn help protect the value of the companies' shares.

Benchmark interest rates have increased significantly across a number of developed markets, as some central banks have increased official rates a few times now since late 2021. Some other central banks are set ready to do the same. As one of the side effects of rises in inflation, a significant raising in nominal interest rates, could also impact asset valuations in a negative way, as the present value of expected future asset returns is reduced due to higher discounting.

Derivatives used to protect insurers from high inflation scenarios can appreciate in value as inflation becomes higher. However, derivatives used to hedge against low interest rates could see their value decreased as benchmark rates are higher. The valuation of both types of derivatives can also be materially affected by rises in interest rates.

In the context of asset management, the underlying credit risk profile of insurers' counterparties could change during a period of high inflation, in particular if this is associated with economic weakness or recession. This risk will vary from industry to industry and company to company, but insurers are likely to have some exposure. For example, the profitability of some companies operating within industries such as manufacturing can be sensitive to input cost inflation jeopardising their ability to continue servicing their debts. The risk may be particularly high for companies financed mainly by short-term debt instruments and who may be struggling to pass on inflated costs to their customers, i.e., the relationship between the price of their products and demand is highly negative. This can be further exacerbated by rising nominal interest rates, and/or falling investor demand for fixed-rate debt making it difficult and expensive for them to refinance.

FIGURE 2: STOCK PERFORMANCE BY SECTOR AGAINST INFLATION



Source: Fidelity.

While stock performance is not a proxy for an industry's pricing power (that is, the ability of firms to increase prices without losing market share), it is helpful for understanding which industries tend to do better in inflationary environments. On balance, over the last four inflationary cycles in the US, energy tends to do best, followed by minerals, utilities, and consumer staples (as shown in Figure 2). The financial sector, however, appears to have a slightly negative-to-zero correlation with inflation, suggesting some ability to pass increased costs onto consumers. This suggests that inflation is a risk to the financial sector, and insurers are relatively insensitive to this risk, especially given their exposure to the broader economy through their diverse investment portfolios.

However, insurers generally hold very well diversified investment asset portfolios with high quality assets, and operating reinsurance programmes only exposed to a portfolio of selected reinsurers passing stringent criteria, including financial strength criteria, thereby mitigating increased risks isolated in certain counterparties or industries.

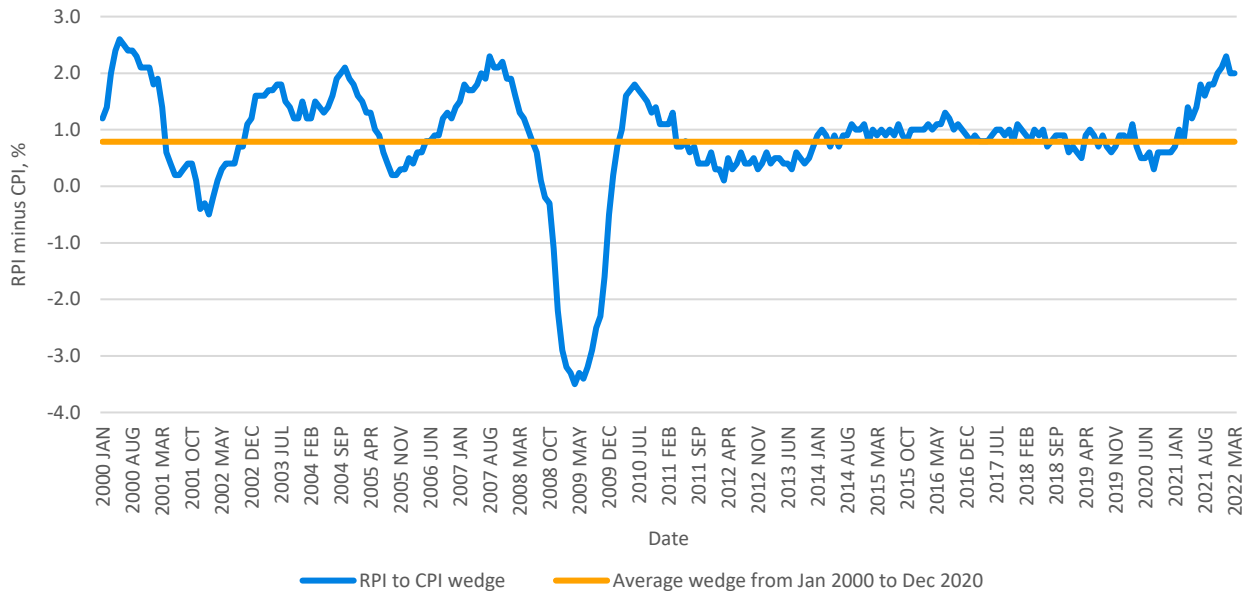
If central banks fail to contain inflation, and also are reluctant to increase interest rates much further due to concerns of triggering economic recession, the gap between nominal interest rates and inflation can further increase, pushing the expected future real asset return to be even more negative than it is now. In this scenario, insurers may be forced to seek improved nominal returns by investing into assets with higher risk to pick up a higher spread above risk free. For example, fixed interest assets with lowering credit ratings (elevated credit risk) and/or those not traded on public markets (elevated liquidity risk).

For some insurers, it is important that certain assets invested by them, such as inflation-linked debts or derivatives, can provide the right level of inflation protection in market scenarios like the current one. For those assets, there could be a basis risk to be considered potentially affecting the protection benefit to be received, if the inflation linkage provided by the assets is not the same as that which drives the value of liabilities or expenses. For example, the chart below shows the so-called 'wedge' between the UK Retail Price Index (RPI) and the Consumer Price Index (CPI). If the inflation exposure in liabilities is driven by RPI but asset proceeds respond to CPI, then Figure 3 shows clearly that gaps can open up between the two measures, e.g., recent experience since January 2021. For insurers, it is important to understand such basis risks and their implications for hedge effectiveness⁴ and residual risk.⁵

⁴ The extent to which the change in the value of the asset instrument used to provide the hedging protection offsets the adverse change in the value of hedged liability.

⁵ The risk that cannot be eliminated.

FIGURE 3: HISTORICAL WEDGE OF UK RPI AND CPI



Source: Milliman analysis of inflation data from Office for National Statistics.

LIABILITY-SIDE IMPLICATIONS

Impact on policyholder benefits

Taking the UK as an example, life insurers with annuity books are directly affected by inflation through annuities where payments have an inflation linkage. For benefits accrued in UK defined benefit (DB) pension schemes, approximately 50% of those accrued before 1997 are linked to inflation, whereas about 90% are expected to be linked to inflation for those accrued post 1997.⁶ Most of these linkages have a cap of 5% per annum, however about 10% of pension benefits in the UK are potentially uncapped.

Taking the Netherlands as another example, we observe similar DB pension products where the annuity payment is linked to (a certain amount of) inflation. The inflation linkage has shifted over time from Dutch wage inflation to European harmonised inflation, as the former could not be readily matched with market instruments resulting in a basis risk that was considered too large. Next to the pension products, we know that Dutch disability products typically have an inflation-linked component. Note that these products are actually managed on non-life insurance balance sheets. We find some evidence that Dutch insurers have taken inflation effects on their balance sheet into account. Nationale Nederlanden, a larger insurer, has indicated in their 2021 Annual Report that their 'Life [division] fully hedges its inflation-linked liabilities on an economic basis.'⁷ Clearly, some Dutch insurers are using hedging as a tool in order to manage inflation risks.

Policyholders with insurance protection contracts providing fixed benefits, such as a fixed sum assured on a term assurance or on an endowment, will see the value of benefits being eroded if inflation is high. Some protection contracts have benefit indexation, with premiums increasing accordingly. If inflation is high, then it is likely that more policyholders will be unable to afford the indexation increases, and once increases are suspended, they usually cannot be restarted (at least not without re-underwriting to avoid anti-selection). As a result, an increasing number of policyholders may experience a devaluation of benefits in real terms, and life companies themselves may receive reduced premium income due to lower premiums and an increase in lapses.

⁶ UK Pension Protection Fund Purple Book 2021.

⁷ See <https://www.nn-group.com/nn-group/file?uuid=fe0ed772-850a-4697-95e5-06a1fe376e0f&owner=84c25534-c28a-4a64-9c78-5cc1388e4766&contentid=11805>.

Impact on policyholder behaviour

Insurers only offering insurance products with fixed benefits may see their customers start looking for alternative products offering index-linked benefits, if the withdrawal option is available. For insurers offering both index-linked and non-linked versions of the same product, they may find their policyholders looking to switch from one to another. For insurers offering multiple investment saving funds, they may see policyholders switching between cash, bond, and equity investments, or taking up income or partial withdrawal features for new savings, or exercising other conversion options.

For unit-linked business, existing policyholders could leave to find an indexed version of the same product reducing the size of asset under management (AuM), and the expected charges to be collected from in-force policies. There may exist provision in those policies to allow for charges to increase with inflation. However, there are limitations to these provisions; for fixed contributions the increase of charges will diminish account values built up. Therefore, there may be value for money challenges when increasing charges for smaller policies. For business with contributions that automatically increase (for example auto-enrolment pensions in the UK where contributions are defined as a percentage of pay), then the risk of inflating charges eroding account values is reduced.

Furthermore, should interest rates increase to a level that existing policyholders with guarantees find better deals elsewhere in the market, lapses for those products could start to rise significantly and quickly.

Such lapse experience is, however, expected to be different depending on the range of insurance products being offered. For insurers also offering policyholder loans, they may find customers are willing to stay as their loan interest rate charge may be considerably cheaper than the alternatives.

Increases in lapse rate may not always be negative for insurers. For example, insurers offering high financial guarantees may see their solvency position improving with more existing policyholders voluntarily leaving them.

In Europe, insurers are realigning their expectations on lapse rates due to the impacts of high inflation. For example, Swiss RE has indicated that they 'expect higher inflation to erode consumers' disposable incomes and the value proposition of (in-force) saving policy benefits, resulting in higher rates of lapse and surrender.'⁸ The effects of inflation on lapse rates are already being seen in Europe.

Impact on insurer expenses

High inflation is likely to result in increasing expenses, which will most likely have a direct adverse effect on the balance sheet of life insurance companies. The costs of renting office space and of staff wages are both linked to inflation, and they could increase at a higher rate than average inflation, as suggested by an index, which has happened in some periods in the past.⁹ There may also be an increase in the amount to be paid for unexpected or exceptional costs that may arise in the future, e.g., as a result of higher fees charged by external third parties.

For unit-linked business, annual management charges are normally expressed as a fixed percentage of the value of AuM. The ability of such charges to match inflationary increases in an insurer's expenses is not guaranteed as there is some dependence on the underlying unit-linked assets delivering a positive real return. In a high inflation environment, delivering a positive real return can be a significant challenge in particular, given that the asset mix is often driven by policyholder fund choice and is thus outside the direct control of the insurer.

In terms of financing for some insurers, high inflation will erode the real value of an insurer's fixed coupon payments on conventional debt. On the other hand, some insurers that may have issued inflation-linked debt will see their nominal outgo increase.

⁸ See <https://www.swissre.com/institute/research/sigma-research/sigma-2022-02.html>.

⁹ Wage increase outpaced inflation for some periods in the past, e.g., a comparison of weekly earnings in the UK with CPI inflation between 2001 and 2022 can be found here.

Impact on insurer capital

There is the potential for correlations¹⁰ to change in future, and this needs to be considered. For example, consider the negative correlation between equities and bonds, where if there was an increase in the value of equities then, generally speaking, the value of bonds decreased—and vice versa. This has been true for many years. However, in recent times, this has moved to become a (small) positive correlation, i.e., the value of equities and bonds have both moved together in the same direction. This positive correlation between equities and bonds has occurred primarily due to uncertainty around inflation and inflationary pressures, and it may continue if inflation rises and the uncertainty continues. This change in relationship between asset classes can have a significant impact on an insurer's capital position. For example, the value of embedded guarantees in insurance products can increase in value significantly, and hence so can the capital required to back those guarantees. This effect is compounded if high inflation results in higher market volatility.

Capital requirements of insurers using internal models¹¹ can also be significantly impacted if the positive correlation between equities and bonds and higher volatility are carried into the process of periodically updating the insurer's capital models. However, for standard formula firms, the correlation matrices used for the capital requirement calculation are prescribed and static for years between regulatory reviews. This could put standard formula firms at a temporary competitive advantage.

FUTURE NEW BUSINESS

In a high inflation environment, living costs significantly increase and people may cut back non-essential spending, such as discontinuing their private insurance saving policies, or reducing the level of cover for existing life policies. This will have a negative impact on the demand for life insurance policies.¹²

There may also be second order effects from government and central bank efforts to contain the inflation rate by increasing interest rates, for example, and this may also have an impact on equity performance and on the demand for unit-linked and similar savings products.

From the perspective of insurers, the price set for new business will likely have to increase, if the inflation impact on expenses outweigh the impact of higher discount rates, for example. However, the customers' ability to pay is likely to reduce, as nominal wage increases may for some time lag behind price increases, resulting in falling real incomes, albeit it is expected that eventually nominal wage increases should catch up. Reduction in real incomes and market volatility are overall likely to have a negative impact on new business volumes. In other cases, sales may simply be deferred, for example, pensioners waiting for further increases to interest rates before purchasing an annuity.

Insurance products offering index-linked benefits can become more attractive in such an environment, and less so for products offering fixed benefits. The same applies for insurance products operating on fixed insurance charges, rather than those that would give insurers the right to review policyholder charges when inflation changes.

A high inflation and high interest rate environment may also open more 'wholesale' opportunities. For example, pension schemes may be in a much better position to consider a buy-in and/or buy-out of their liabilities if the effect of higher interest rates prevails over higher inflation.

CONCLUSION OF IMPACT ON LIFE INSURERS

The overall impact of high inflation on an insurer's balance sheet is complex to predict. Assets producing fixed cash flows may be adversely affected due to a reduction in real return. Inflation-linked assets should be able to keep pace with inflation and increases in inflation-linked policyholder benefits, subject to there being a close match to the underlying index. Higher interest rates will, in general, have a negative impact on the valuation of assets.

¹⁰ Correlation refers to the relationship between two things, where a positive correlation implies the two things move in the same direction, i.e., they both increase or decrease together, and a negative correlation implies that when one increases the other decreases, and vice versa.

¹¹ Internal model as referred in Solvency II regulation in the European Union (EU).

¹² Empirical evidence has been documented in Li, Moshirian, Nguyen, and Wee, 2007, 'The Demand for Life Insurance in OECD Countries.' *Journal of Risk and Insurance* 74(3), 637-652.

On the liability side, insurers would see their index-linked policyholder benefits increase due to high inflation, as well as their operational expenses and other costs. Lapse rates are expected to increase. There is a risk that account values for unit-linked policies will fall as a high inflation environment may depress investment returns—the reduction in value of charges linked to account values will, other things being equal, increase reserves for the insurer. However, an increase in interest rates is generally viewed as positive for life insurers as it may reduce the value of insurance liabilities, including the cost of providing financial guarantees to policyholders, e.g., for with-profit business, and the capital requirements to be held.

Should the reduction in the present value of liabilities, including capital requirements, be a larger effect than that of the value of the reduction in assets, there could be a positive effect to an insurer's balance sheet, including the solvency capital and IFRS profits. However, this may vary from market to market, due to ability to match liability durations with domestic assets, and/or company to company, due to the term of liabilities in focus.

If the correlations between different market risks change adversely, then asset diversification yields a lower benefit and capital requirements may increase.

Higher interest rates may also be viewed as positive from an IFRS perspective as the expected profit that can be generated from future new business can be larger. However, the overall IFRS position of an insurer could be either positively or negatively impacted depending on the weights of back book and future new business.

Insurance business acquisitions are often heavily funded by debt, and cash generation is a big focus for the consolidators. As a result, a high inflation environment could increase debt financing costs and therefore reduce the levels of acquisition activity in the market.

The table below summarises a number of key inflation impacts.

FIGURE 4: SUMMARY OF IMPACT OF INFLATION

NEGATIVE IMPACTS	POSITIVE IMPACTS
<ul style="list-style-type: none"> ▪ Lower real returns from assets generating fixed nominal return ▪ Higher policyholder benefits ▪ Higher operational expenses ▪ Accelerated lapses/PUPs ▪ Lower future management charges ▪ Higher debt servicing/refinancing costs ▪ More volatile economical and market conditions going forward ▪ Higher discount rates for asset valuation ▪ Changes in the risk profile of asset/reinsurance counterparties ▪ Larger basis risks ▪ Lower new business volumes (for products without indexation) ▪ Higher capital requirements resulting from change in asset correlations 	<ul style="list-style-type: none"> ▪ Higher returns from index-linked or real assets, such as equities, properties ▪ Appreciation in value of inflation hedges protecting high inflation ▪ Higher discount rates for liability valuations ▪ Higher profitability of new business ▪ Higher new business volumes (for products with indexation)

Modelling and managing inflation

In this chapter, we will discuss how inflation can be measured or modelled using different methods and provide a quantitative analysis. Due to higher levels of inflation and increased uncertainty, the modelling of inflation would be more challenging, and hence a review of the current modelling approaches may be valuable for insurers.

MODELLING

Capital Requirements (Solvency Capital Requirement,¹³ or equivalent)

Higher levels of inflation and increased uncertainty makes it timely for insurers to reconsider their inflation modelling approaches. In this section we present different ways insurers can incorporate inflation modelling in their SCR calculations. SCR can be calculated through means of a standard formula or an internal model. The standard formula approach models expense risk associated with inflation. Specifically, the expense risk is calculated assuming a 10% increase in expenses and a 1% increase in inflation rates. However, under the standard formula approach, assets, benefits, and premiums are not shocked—even though sensitive towards inflation. Similarly, we see a mixed landscape of insurers that adopt their own internal model for purposes of calculating SCR (or other equivalent capital measures). The mixture is between modelling only expense risk or including shocks on assets, benefits, and premiums as well.

Considering the current high inflation environment, we also believe it is important for insurers to consider whether the inflation scenarios modelled in their ORSA are still appropriate. In the next section, we describe various approaches to model inflation scenarios. Noting that one-year changes in inflation are likely now to be beyond a 1 in 200 event in the standard formula, we believe modelling inflation will become increasingly important for insurers.

Although our comments above are in relation to capital requirements, similar considerations apply when considering best estimate liabilities which are sensitive to future inflation assumptions.

Scenarios

In this section we describe how insurers can model inflation in real-world and risk-neutral scenarios for SCR calculation purpose. There are two main approaches to generate inflation scenarios.

1. Indirect approach

In the first approach, one simulates real and nominal interest rates and inflation is obtained as the difference between these two rates. Many choices are possible for the nominal and real interest rates models and the simulated inflation may strongly depend on this choice. A widespread model is the Principal Component Analysis – Vasicek (PCA-Vasicek) model¹⁴ which allows us to model the full interest rates term structure. In any case, the nominal and real rates models are calibrated on the historical nominal and real yield curves in order to capture the key statistical properties observed on historical data. The advantage of this indirect approach is to allow reuse of the nominal and real interest rates scenarios that may already be used in the internal model. However, since inflation is derived from real and nominal rates, which are themselves derived from swap rates, the obtained inflation is rather a market expectation on future inflation than an effective inflation. In order to address this, it is possible to add an additional (exogenous) source of noise to the difference of nominal and real interest rates. The volatility of this noise is calibrated on the log-returns of the discounted CPI (the discounting factor being the quotient of the nominal and real deflators). This additional volatility component allows us to obtain a model that better replicates the historical evolution of the effective inflation while keeping a consistency with the nominal and real interest rates. This approach is halfway between the indirect and the direct approach.

2. Direct approach

The second approach consists of modelling directly the evolution of the inflation rate. Commonly used models are the Black-Scholes model and Time-Series models, which are calibrated on historical inflation time series. By working directly on inflation, this approach allows us to replicate some specific properties like auto-correlation or delay effects. Auto-correlation in inflation time series corresponds to the presence of a dependency of the inflation at some date to its values at previous dates. It can be modelled using autoregressive terms in Time-Series models. It is generally observed when working with monthly data and can be significant in inflation data as there is some inertia (low inflation is generally followed by low inflation and high inflation is generally by high inflation). Delay effects designate the fact that a shock on

¹³ Solvency Capital Requirement as in Solvency II. The equivalent also applies in the US and elsewhere.

¹⁴ This is available within Milliman CHESS™.

inflation at some date can affect the inflation at future dates. It can be modelled using moving-average terms in Time-Series models. Setting the calibration data window can be particularly tricky for inflation due to marked differences in behaviour between 1970s / early 1980s vs. 1990s and beyond. Many countries experienced very high inflation during this decade in comparison to the inflation experienced during the last decades. A possible solution is to consider a regime-switching model allowing us to model low and high inflation regimes.

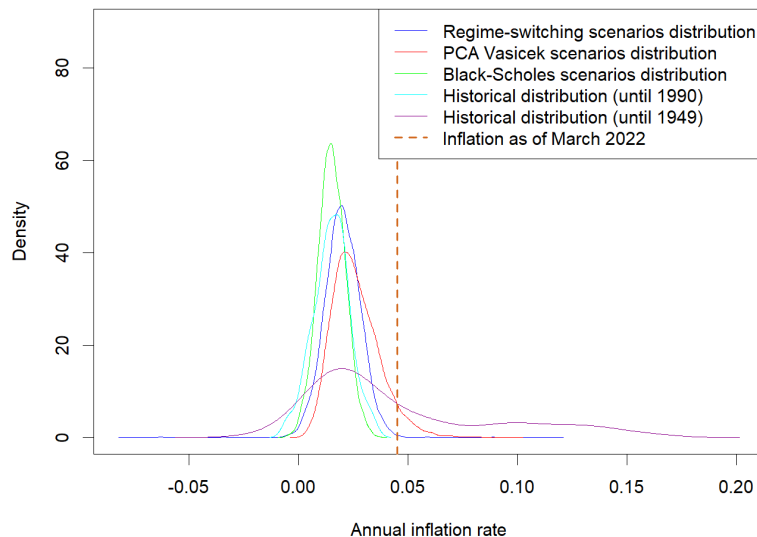
Note that in both approaches, it is common to include long-term targets in the models (for example a long-term inflation target of 2% corresponding to the objective of the European Central Bank [ECB]) in order to add expert judgement about the future evolution of the inflation.

However, we point out that the magnitude of scenarios currently being observed is often way beyond expectation and modelling assumptions. The recent change in inflation may be sufficiently close to, if not having already exceeded, the most severe modelled change over a one-year time horizon for some insurers. In the past, Milliman has performed a quantitative analysis to compare model results with real observed inflation levels in France. Specifically, the historical distribution of one-year inflation rates was compared to the inflation outcomes generated by several models, as explained further in the analysis below.

Quantitative Analysis – a French case study

The figure below illustrates the one-year distribution of the inflation rate in several models compared to the historical distribution and the inflation observed in March 2022.

FIGURE 5: COMPARISON OF THE ONE-YEAR DISTRIBUTION OF THE INFLATION RATE FROM DIFFERENT MODELS TO THE HISTORY



Source: Analysis is an internal production by Milliman consultants

Calibration

All models have been calibrated as of 30 September 2021, but only the regime-switching model is calibrated on data dating before the 1990s. Moreover, a 2% target has been included in the regime-switching model. The Black-Scholes model and the regime-switching model have been calibrated on French inflation data while the PCA-Vasicek model has been calibrated on historical swap rates and break-even inflation rates (BEIR), respectively, for nominal and real rates.

Analysis

The Black-Scholes model is the simplest but also the less conservative model as it produces a thinner right tail distribution than the historical distribution, and even the maximal generated value is below the value observed as of March 2022. We can consider this further by utilising some research we have done in relation to this issue for French insurers, as the distribution produced by this model is very close to what is generally used by French insurers in practice. On the contrary, the PCA-Vasicek model is the more conservative model, which is a consequence of:

1. The fact that the model is calibrated on European data (on average, the inflation at the European level is higher than the inflation at the French level).
2. The fact that it is calibrated on BEIR historical data that exhibit much more volatility and dispersion than the CPI on the same period, leading to more adverse inflation scenarios. Moreover, we observe that the BEIR rate already increased significantly during 2020 and 2021, while the nominal rates remained at a low level, which indicates that the market was already anticipating higher inflation, so the generated scenarios already start from a more adverse level of inflation.

Finally, the regime-switching model achieves a balance between the two previous models by providing adverse but credible inflation rate scenarios. In particular, the 99.5% quantile is 4.24%, which is close to the value observed as of March 2022 (4.5%). This results from the fact that the model is calibrated on older data containing high inflation rates (above 10%).

The results of the French case study trigger a discussion on the appropriateness of existing modelling. The uncertainty created by the current high inflation environment makes it important for insurers to reconsider the adequacy of their inflation modelling. Specifically, models and calibrations should be reviewed to enable results to reflect a wider range of outcomes, as illustrated by the analysis set out here.

MANAGEMENT RESPONSES

Potential management actions

As discussed in the early section, the impact of high inflation on an insurer can be very complex to understand and assess.

The list below is not exhaustive but sets out some possible management actions that might be considered by insurers:

- For insurers using inflation-linked assets to match inflation-linked liabilities, remove basis risk where possible by refining hedges to use instruments that reference more appropriate indices and ensuring new business liabilities reference inflation indices for which hedging instruments are readily available.
- If not already in place, use inflation-linked bonds to match inflation-exposed expenses and other costs, such as debt payments. However, the availability of such types of assets in the same currency as expense outgoings, for example, may limit an insurer's ability to do so.
- Insurers currently investing into equity could introduce/extend equity risk hedges so that charges expressed as a percentage of AuM can maintain its level if the equity portfolio was negatively affected by inflation and/or interest rates movements. This would be possible if the insurer has the relevant investment powers based, for example, on policyholder literature and other governance documentation.
- Reviewing investment portfolios to increase the exposure to assets invested into companies whose revenue is positively linked to inflation (subject to maintaining adequate diversification).
- For matching inflation-exposed liabilities/costs, using assets that can also be considered as substitutes to index-linked bonds, from a long-term, forward-looking perspective, including floating rate notes that are linked to increases in interest rates, infrastructure assets with underlying revenues linked to inflation, or real assets including properties and commodities. For example, an insurer that currently rents an office may (at least in theory) consider acquiring the office to improve the certainty of its operational cash outflow in the future, while investing into real assets, the return of which is expected to increase with inflation.

- Increasing inflation hedges, for example, by extending the hedging coverage to incorporate inflation risk arising from maintenance and exceptional expenses. See more considerations about inflation hedges below.
- Insurers can further automate operational processes, including the process of acquiring new business to reduce maintenance and acquisition expenses. This may put some insurers which are able to cut expenses through digital transformation, for example, into a more competitive position in the market.
- For products with benefits and premiums linked to inflation, insurers can consider offering a temporary ‘freeze’ on indexation when inflation is above, say, 5% per annum, with a maximum period of, say, two years. This may help policyholders keep their index-linked policies without the need for lapsing/paid-up, but also not exposing insurers to too much selection risk given that the limited suspension period applies to all policyholders.
- For future new business, insurers can choose to update terms and conditions of insurance contracts to increase minimum premiums. However, this may reduce customer demand as a potential side effect.

In the rest of this section, we will focus on considerations that can be given by insurers on inflation hedging.

Hedging

Given recent inflation experience and the potential for a prolonged shift to a regime of higher inflation, it is important for an insurer which used to put the inflation risk in the bottom part of the risk register table to reassess the situation. This reassessment would usefully consider inflation exposure across the full range of its operations, particularly using different inflation scenarios and combining both direct and indirect consequences. This approach enables the insurer to reassess the expected scope and effectiveness of its existing hedges and determine whether additional protection is desirable.

Optionality through product design

Inflation protection can be undertaken directly as part of the product design, or indirectly through management actions on the insurer’s balance sheet. Some possible design features that insurers may consider in this regard are:

- Premium indexation. This feature links premiums to price or wage inflation to help ensure revenue flows keep pace, and headroom to ensure expenses are not gradually eroded. A linkage to wage inflation is likely to be ideal given the typical heavy exposure to this in an insurer’s cost base -> contracts where premiums are expressed as a percentage of income.
- Inflation benefit constraints. As the risk from inflation increases, one approach is to place limits (caps) on the inflationary increase in customer benefits. A good example is UK DB pension annuity benefits where inflationary increases in payment are often capped at 5% per annum. This is relevant to life insurers as many pension schemes insure these benefits.
- Hedging inside policyholder funds. As already described, a high inflation environment may well depress returns on the assets backing unit-linked funds thereby reducing charge income to the insurer at the exact time expenses are rising. To provide some mitigation of the risk, the insurer could consider offering fund options to policyholders that embed hedging approaches to reduce the risk of significant and sustained falls in fund value. This is not likely to be a direct inflation hedge but can provide some protection for the insurer’s stream of charge revenue.

Hedging with cash instruments

Traditionally, inflation risk within insurance liabilities is often directly hedged using high quality assets that generate inflation-linked cash flows, such as index-linked gilts in the UK, or treasury inflation protected securities (TIPS) in the US. This is the most cost-effective way to hedge inflation risk, assuming the underlying risk exposure is the same. Inflation-linked corporate bonds and privately traded senior debt instruments are alternatives to government bonds. However, because it can be difficult and costly for some insurers to obtain access to some of these thinly traded assets, government inflation-linked bonds are still the prime asset class used to mitigate inflation risk. Following the Global Financial Crisis (GFC), nominal and real interest rates plummeted, making hedging inflation using high quality inflation-linked government bonds less favourable to insurers requiring higher investment returns.

The supply of inflation-linked government bonds varies by country and can also vary over time depending on the government’s appetite for inflation risk. In the UK, the share of government borrowing funded via index-linked gilts has been relatively high at around 25%. However, this has recently been deemed too high and the UK Debt Management Office (DMO) has been reducing the index-linked share of new issuance with the aim of bringing the overall share down to around 15% of the in-force debt—a level more typical of other developed countries. Thus, absent further significant rises in the overall funding requirement, the supply of index-linked gilts into the market will reduce.

Index-linked corporate bonds may not be a sustainable source of inflation-protected income either. As inflation continues to rise and to persist, public corporate issuers may reassess their views on offering debts with interest payments linked to inflation, which could increase their P&L volatility going forward. It is not out of the question that some issuers will reduce their appetite for this type of finance. So the overall size of inflation protection offered by the public listed corporate bond sector may reduce.

Demand from insurers in getting access to privately traded financial instruments may increase significantly due to inflation, in particular for those debt instruments linked to projects delivering index-linked cash flows, but this requires insurers to have special skillsets. Despite that, the use of non-publicly traded assets to mitigate inflation risk may reduce insurers' capabilities to rebalance portfolios where required, i.e., illiquidity risk, unless the inflation exposure arises from similarly illiquid liabilities.

In the past, bank cash deposits have provided some short-term protection from inflation as rates have tended to be increased during inflationary periods. This has also happened in the US and UK during the latest bout of high inflation but, so far at least, the inflationary offset has been very weak. For example, in the UK, the bank base rate has increased from 0.1% to 1.25% since December 2021. However, CPI inflation now stands at 9%.

High inflation may generate hedging profits for insurers as the inflation exposure on the asset side is normally not capped, but the exposure on the liability side can be capped, e.g., caps applied for pension liabilities. We note that other side effects of high inflation may swamp any benefit from having inflation caps on liabilities.

There is, however, an issue with using cash instruments to hedge the inflation risk—it can be a challenge to undertake precise ALM, e.g., minimise the duration mismatch, etc. Derivatives can be used to supplement cash hedges and may see increased use to help fill any gap left by a possibly reduced supply of inflation-linked cash assets.

Hedging with derivatives

Static hedging strategy

Derivatives, such as inflation swaps, are now commonly used by life insurers to hedge inflation risk, either as a top-up layer, e.g., to fine tune ALM, or as a main technique. There may be more in demand for them in the future if cash instruments (as referred to above) are not sufficiently well supplied to meet the increasing demand.

For most life insurers, inflation-up is the more adverse scenario that is to be hedged. Assuming this is the case, static hedging using vanilla inflation swaps should work well for insurance products without any material optionalities, such as caps and/or floors, as those derivatives are designed to provide the required protection in such a scenario.

Generally speaking, the durations of most inflation swaps may not change along with inflation, as there exists only one change of cash flow at the maturity dates. However, the duration of the inflation exposure of insurance liabilities can change with the inflation level, if there are any intermediate cash flows. Should this be the case, management actions will be required, with triggers set to carry out close monitoring, in order to ensure that the duration is matched again following a significant change in the underlying inflation rate.

Dynamic hedging strategy

Option-type inflation derivatives are extremely illiquid and costly. As a result, for hedging insurance liabilities where an inflation 'cap' applies, a dynamic hedging strategy is normally implemented—whereby more liquid, and cheaper-to-trade, versions of inflation-related derivatives, such as inflation swaps or futures, are bought and sold from time to time to maintain the desired hedging position. Take pension liabilities with a cap of 5% increase per annum as an example. The annuity payment will increase with inflation when the measure (such as RPI) is below 5% per annum, and when the inflation measure is above 5% per annum, the increase will be a constant 5% per annum. In the past, when inflation was low and stable, a dynamic hedging strategy worked reasonably well. Going forward, if inflation becomes much more volatile from year-to-year, insurers may need to constantly rebalance their overall hedging position by:

- Switching on/off the dynamic hedging operation depending on whether annual inflation is below/above 5%
- Frequently adjusting the dynamic hedging position if the annual inflation moves significantly between 0% and 5%

This can become too operationally intensive for some insurers using such a hedging strategy and who desire a simpler process for day-to-day management. Therefore, option-type inflation derivatives, though more expensive, can help insurers achieve that simplicity while still providing the desired inflation protection.

Basis risk

A specific example of basis risk can be seen in the UK. For index-linked insurance products, the underlying referencing index used to revalue claim benefits can be either RPI or CPI. In terms of cash and derivative hedging instruments though, availability for the RPI linkage is far better. Given this, the pragmatic response often adopted is to use RPI-linked swaps as proxies to hedge CPI-linked risk. However, RPI and CPI differ in both their constituents and calculation. Looking back to Figure 3, we can see that RPI, on average, is a little under 1% per annum higher than CPI. However, there have been periods where the difference has moved significantly away from the average level, thus introducing a source of basis risk.

FIGURE 6: BASIS RISK – UK RPI VS CPI



Additionally, we can see from Figure 6 that the RPI index tends to be more volatile than the CPI index. This would mean that the RPI-linked derivatives may appreciate in value quicker, and by slightly more, than the value of liabilities linked to CPI, generating a mismatching profit to insurers. However, when the market reversed, this feature seems to introduce a significantly larger basis risk. For example, during the period after the 2008 GFC (in the red circle above), insurers might see the value of RPI-linked derivatives falling a lot faster, and by significantly more, than the reduction in the value of CPI-linked liabilities. Depending on how long this type of period may last, insurers may see those RPI-linked hedges becoming a drag on their P&L. As a consequence, insurers must move quickly to constantly rebalance their portfolios in order to make sure this basis risk does not become a material source of loss, particularly in an unexpected inflation-falling market following a number of years of running high inflation.

Supply of traditional hedge assets

For index-linked cash instruments, such as bonds, we noted earlier that issuing index-linked bonds in a high inflation environment can significantly increase the risk of servicing debts. Therefore, bond issuers may choose to reduce debt financing through index-linked bonds. The price of index-linked bonds may also increase due to fall in supply.

A market with a high and volatile inflation could create more activates in the derivative market. For example, companies from industries, such as utilities or agriculture, may have an increased appetite to entering into the market to protect themselves from inflation-down scenarios. And this should be able to provide the market with a line of liquidity, even though the cost of implementing inflation hedging strategies could increase significantly going forward for hedging new business. Therefore, we expect the supply of inflation derivatives can be sustained in the current high inflation market subject to the capital position of banks, who act mainly as brokers, can still be well protected.

Summary

As the news continues to reveal, inflation has very quickly moved from being a rather dull technical topic to a significant driver of current economic conditions. Given the backdrop of a prolonged period of low nominal interest rates and high levels of debt, it is unclear how effective the typical policy responses will be. In short, the funnel of doubt around the future path of inflation across many countries is now wide indeed. In this environment of uncertainty, it makes good sense for life insurers to focus more on their exposures to inflation and reflect on the range and effectiveness of the tools and techniques they employ to measure and manage the impact on their businesses. We hope this paper has provided an interesting summary of recent inflationary developments and some helpful food for thought around its implications for life insurers and how they might respond.



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Appendix: Further considerations around current and prospective inflation conditions

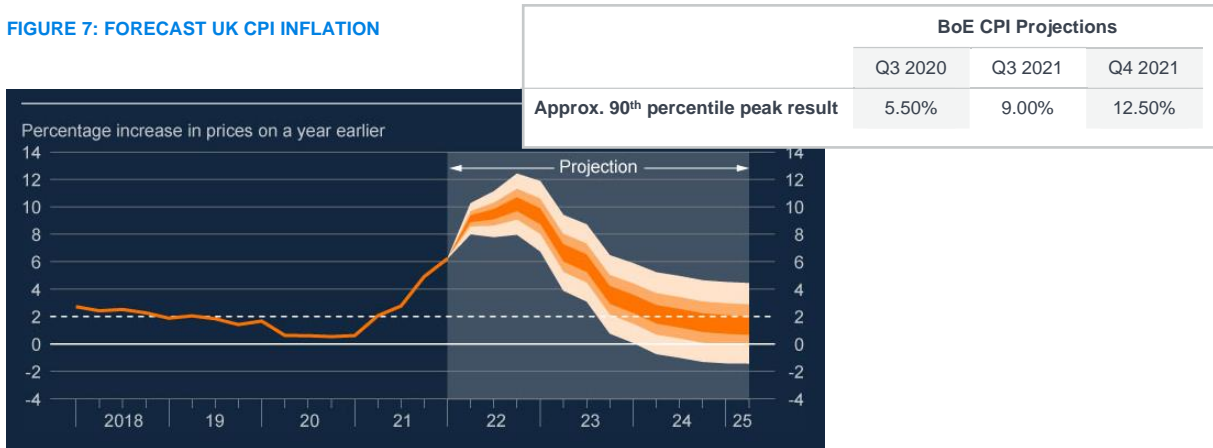
INFLATION FORECAST

Looking ahead, we now consider recent inflation forecasts from the UK, US, and European central banks.

UK

In its May Monetary Policy Report (MPR), the UK Bank of England (BoE) provided its latest view on the prospects for UK CPI.

FIGURE 7: FORECAST UK CPI INFLATION



Source: Bank of England – <https://www.bankofengland.co.uk/monetary-policy-report/2022/may-2022>.

The chart indicates that UK CPI is now expected to peak at over 10% late in 2022, and then fall rapidly back towards the BoE 2% target level during 2023. We note the latest CPI figure at the time of writing was 9% released by the UK Office for National Statistics (ONS) on 18 May 2022. It is also interesting to note that the rise in inflation has continually wrong-footed forecasters over recent months. In the BoE work, the peak of the fan of inflation projections (90th percentile estimate) has been adjusted upwards from around 5.5% in the Q3 2020 forecast to about 9% a year later, and then 12.5% (per Figure 7) one quarter after that.

US

For the US, the Federal Reserve (Fed) produces a forecast for CPI. The results in Figure 8 show a similar pattern to the UK. In particular, inflation rose very quickly during 2021, is expected to peak in 2022 before declining significantly but remaining above the levels typically experienced during the 21st century so far.

FIGURE 8: INFLATION FORECAST FOR US



Source: Milliman analysis of –Organisation for Economic Co-operation and Development (OECD) data.

Other European countries

Figure 9 below shows annual percentage changes in inflation from the year 2014 until 2024 for the European Union (EU). Clearly, the data supports that inflation is projected to continue to increase in the near term. The rate of increase is estimated to peak in 2022.

FIGURE 9: HARMONISED INDEX OF CONSUMER PRICES¹⁵ (HICP) INFLATION FORECASTS FOR EU UNTIL 2024



Source: ECB Europa – https://www.ecb.europa.eu/pub/projections/html/ecb.projections202203_ecbstaff-44f998dfd7.en.html.

A detailed exploration of the possible paths for future inflation rates is beyond the scope of this paper. However, all inflation that we investigated forecast across three regions showed that the inflation was expected to peak around late 2022, and then fall back quickly to a more benign level around early 2023. The exact path of travelling remains to be seen. Next, we will consider some evidence around a selection of inflationary drivers to help us understand some of the forces behind future inflation expectation.

TRADE AND EXCHANGE RATES

In Figure 10, we can see the path of world trade as a percentage of gross domestic product (GDP) provided by the World Bank. The chart clearly shows the rapid expansion of world trade during the first 10 years or so of the millennium as globalisation advanced. However, from around 2010, the trajectory has been downward, implying the peak of globalisation has passed. The marked fall in 2020 occurred as a result of economic shutdowns in response to the COVID-19 pandemic, and indications are that some degree of recovery will be seen for most economies. Nevertheless, the legacy of measures taken to control COVID-19 and the associated supply-side disruption (which continues with China in pursuit of its zero-COVID policy) now combined with further supply-side shocks from the Russia-Ukraine conflict, have revealed the fragility of complex international supply chains and ‘just-in-time’ delivery. Where once the talk was of off-shoring to maximise efficiency, now, supply chain resilience weighs more heavily and ‘re-shoring’ is the new mantra, a trend that is likely to be inflationary.

¹⁵ An indicator of inflation and price stability used by European Central Bank (ECB). Slightly different versions of inflation indicators are used by different countries or regions, but all are used similarly to measure the price stability in the local society.

FIGURE 10: WORLD TRADE AS A PERCENTAGE OF GDP



Source: World Bank – <https://data.worldbank.org/indicator/NE.TRD.GNFS.ZS?end=2020&locations=GB&start=2000&view=chart>.

Note: Arrows added by Milliman.

As the world's reserve currency, the US Dollar (USD) is seen as a safe-haven in times of market uncertainty. The Russia-Ukraine conflict has ushered in such a period of uncertainty and perhaps, not surprisingly, the USD has been in demand and appreciated markedly against other currencies, gaining around 15% against both the British pound sterling (GBP) and the Euro (EUR) over the year to May 2022. As both the UK and EU import significant volumes of goods and services from the US, and given that oil is usually priced in USD, this is inflationary for those economies while the reverse is true for the US, where the strong currency makes imports cheaper. It remains to be seen how long the USD's strength persists but it may well exacerbate inflationary pressures in the UK and EU.

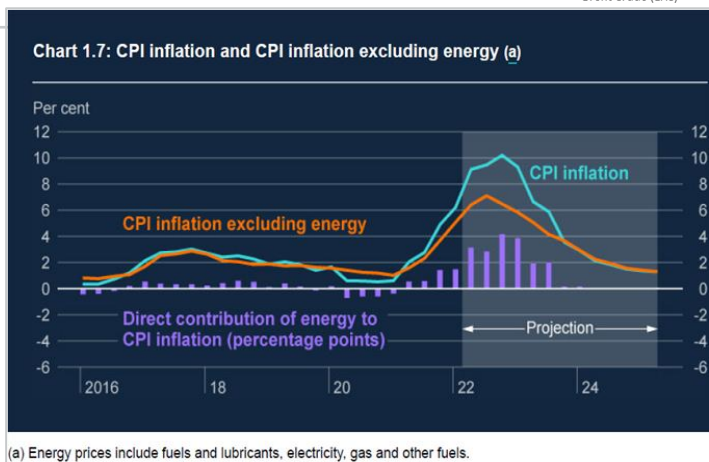
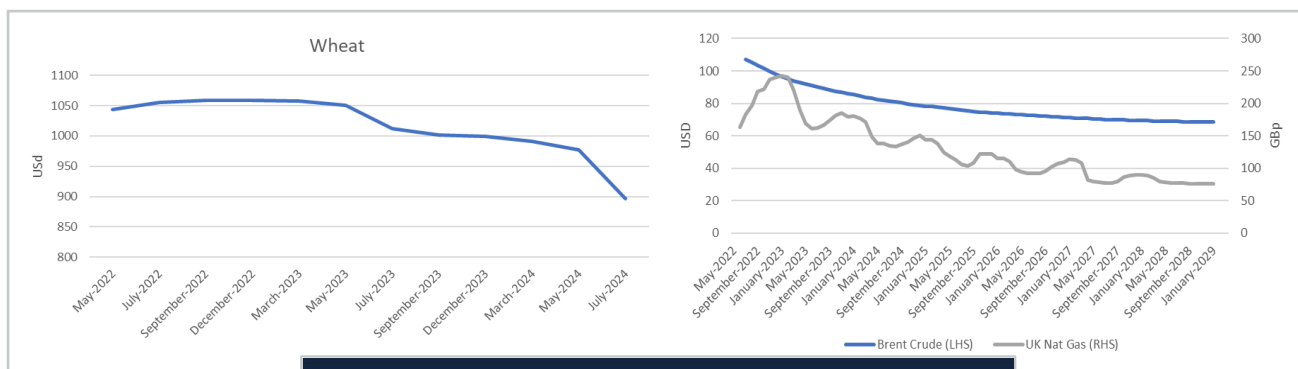
COMMODITY PRICES

The rapid increase in commodity prices and particularly for energy has been a striking feature of 2022 so far. The supply-demand imbalances already a feature post COVID-19 shock, being stoked from February 2022 due to Russia's invasion of Ukraine (both parties being major commodity producers), and the ensuing disruption of trade and imposition of international sanctions against Russia.

In

Figure 11 we observe that, as of May 2022, futures markets were expecting oil prices to fall gradually from current levels. Conversely, prices of natural gas were expected to rise further for the remainder of the year before falling quickly in the first half of 2023. This pattern is consistent with the shape of the contribution of energy to inflation (CPI) in the BoE's May MPR forecast.

FIGURE 11: COMMODITY PRICES AND INFLATION



Sources:

Top charts: Milliman analysis with data from Bloomberg.

Bottom chart: Bank of England – <https://www.bankofengland.co.uk/monetary-policy-report/2022/may-2022>.

While energy prices fall quickly, the decline in wheat prices does not begin until 2023. There is currently no indication of when hostilities between Russia and Ukraine will cease but even after this occurs, there will be lead time required to restore wheat production. Indeed, supply shocks continue to push prices higher in the short term as India, the world’s second largest wheat producer, announced on 13 May¹⁶ that it would cease exports of wheat to protect domestic supplies.

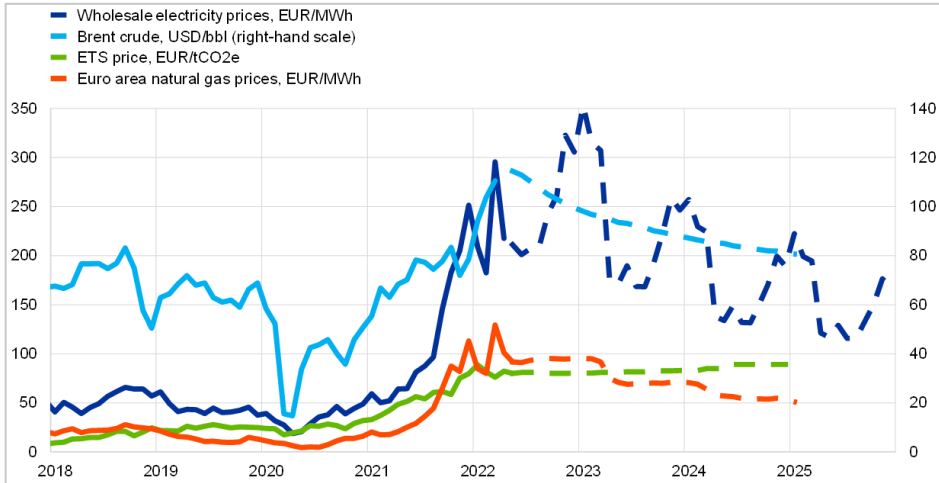
While individual countries have their own particular exposures, elevated commodity prices are a widespread challenge at present. Figure 12 shows a forecast of energy prices produced by the ECB in its paper ‘Energy price developments in and out of the COVID-19 pandemic – from commodity prices to consumer prices.’ The expectations of a gradual fall in the prices of oil and natural gas align with the results in

¹⁶ See <https://www.cnbc.com/2022/05/14/india-blocks-all-wheat-exports-with-immediate-effect.html>.

Figure 11.

An interesting addition is the carbon price for which a gradual rise is expected over the period to 2025. This is not surprising given the drive towards low carbon economies but does indicate that this transition is likely to have some inflationary implications.

FIGURE 12: ENERGY PRICES FORECASTS FOR THE EURO AREA



Source: ECB Europa – https://www.ecb.europa.eu/pub/economic-bulletin/articles/2022/html/ecb.ebart202204_01~7b32d31b29.en.html.

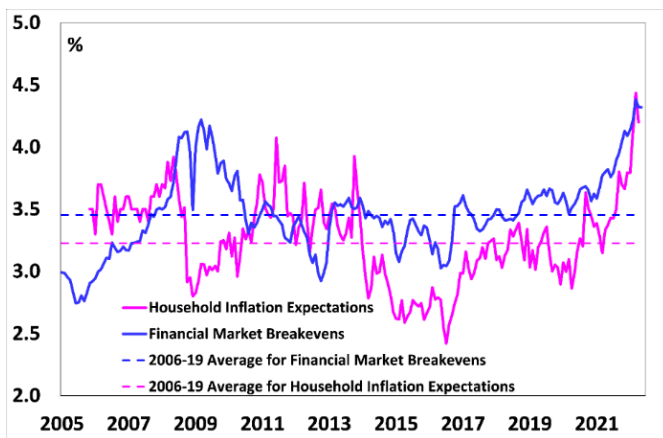
In summary, while recent rapid price rises in some commodities are expected to reverse quickly, it may take some time for inflation rates to benefit from moderation in others and, in particular, scope for shocks to the upside appear significant.

WAGES AND CONSUMPTION

An area of concern for policymakers relates to wage growth and the possibility of a so-called ‘wage price spiral’ becoming entrenched. The problem being that once inflationary expectations move away from central bank target levels it can take some time to re-anchor them, therefore, above-target inflation rates could persist for a prolonged period.

Unfortunately, there is some evidence that this may be starting to happen. Figure 13 is taken from a recent speech from a member of the UK BoE’s monetary policy committee and indicates that longer-term expectations of UK inflation have increased rapidly of late and are now well above typical levels for recent history. To add to the pressure, union membership has been increasing in the UK, though this seems to be mainly in the public sector for now. Finally, the UK labour market remains tight with unemployment rates currently very low. Both these factors, other things being equal, should increase the bargaining power of workers to push for higher wage settlements.

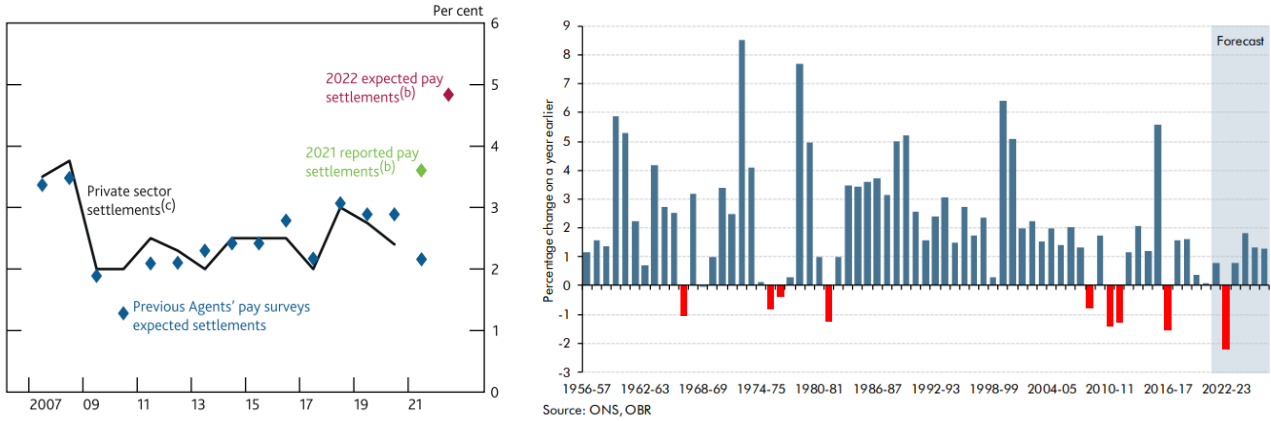
FIGURE 13: LONGER-TERM INFLATION EXPECTATIONS IN THE UK



Source: Bank of England – <https://www.bankofengland.co.uk/speech/2022/may/michael-saunders-speech-at-the-resolution-foundation-event>.

Turning to the impact on wages, we observe in Figure 14 (left chart) that pay rises are starting to factor in higher inflation rates. Nevertheless, the expectation of many forecasters including the UK BoE and Office for Budgetary Responsibility (OBR) is that wages will fail to keep pace with price inflation during 2022 and, as a result, real disposable incomes will experience a sharp fall greater than any recorded since the mid-1950s. Finally, Figure 15 presents some results for Germany, which is part of the EU and the Eurozone and shows a similar picture.

FIGURE 14: WAGE INFLATION AND REAL INCOMES



Sources:

Left chart: Bank of England – <https://www.bankofengland.co.uk/-/media/boe/files/monetary-policy-report/2022/february/monetary-policy-report-february-2022.pdf>.

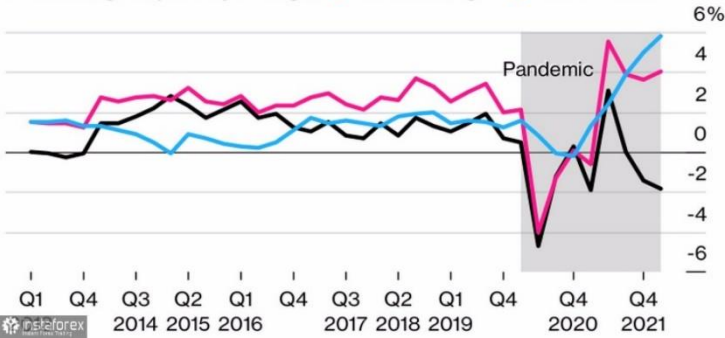
Right chart: OBR – https://obr.uk/docs/dlm/uploads/CCS0222366764-001_OBR-EFO-March-2022_Web-Accessible-2.pdf.

FIGURE 15: REAL AND NOMINAL WAGE PERCENTAGE INCREASES IN GERMANY PLOTTED AGAINST INFLATION

Income Squeeze

German nominal wages aren't keeping pace with surging inflation

Real wages (quarterly average) / Nominal wages / Inflation rate



Source: Fx – <https://www.fx.co/en/analysis/312383>.

How significant the fall in real incomes will be for aggregate demand and thus its disinflationary impact will be influenced by the ability of households to support consumption through either:

- Increased borrowing – While there was some de-leveraging in the wake of the GFC there is some evidence that levels of private sector debt as a percentage of GDP have increased again over the last couple of years and overall levels of indebtedness remain very high by historical standards. This may constrain the ability of households to take on more debt to underpin consumption levels.
- Reduced savings – Household savings as a percentage of disposable income (savings ratio) rose markedly during 2020–2021 as COVID-19-induced shutdowns constrained opportunities to spend. Forecasters now expect households to draw down these additional savings to help maintain consumption with the savings ratio expected to fall during 2022 to a very low level of c3% before recovering back towards 5% by 2027.¹⁷

Overall, the current position is perhaps neatly summed up by the following quote from the BoE's May 2022 MPR (page 67):

'The near-term outlook for inflation is unusually uncertain.'

WHAT ABOUT MONETARY POLICY?

What is clear from Figure 1, is that we must reach further back into history to find periods when inflation rates were as high as those we are experiencing now in 2022. In Figure 16 below, we consider this for the UK:

FIGURE 16: UK INFLATION AND INTEREST RATES SINCE 1960



Source: Milliman analysis using data from Bloomberg.

Following the GFC of 2008, central banks around the world cut policy rates to very low levels and significantly expanded the money supply through programmes of Quantitative Easing (QE)¹⁸ or direct yield curve control.¹⁹ The result has been a period of around 15 years during which both short- and long-term interest rates have been extremely low. Fortunately, this period has also seen inflation remain low and relatively stable, remaining close to typical central bank target levels of 2% per annum. This period has thus been characterised by extremely loose monetary policy.

¹⁷ See Chart 2.19 in https://obr.uk/docs/dlm_uploads/CCS0222366764-001_OBR-EFO-March-2022_Web-Accessible-2.pdf.

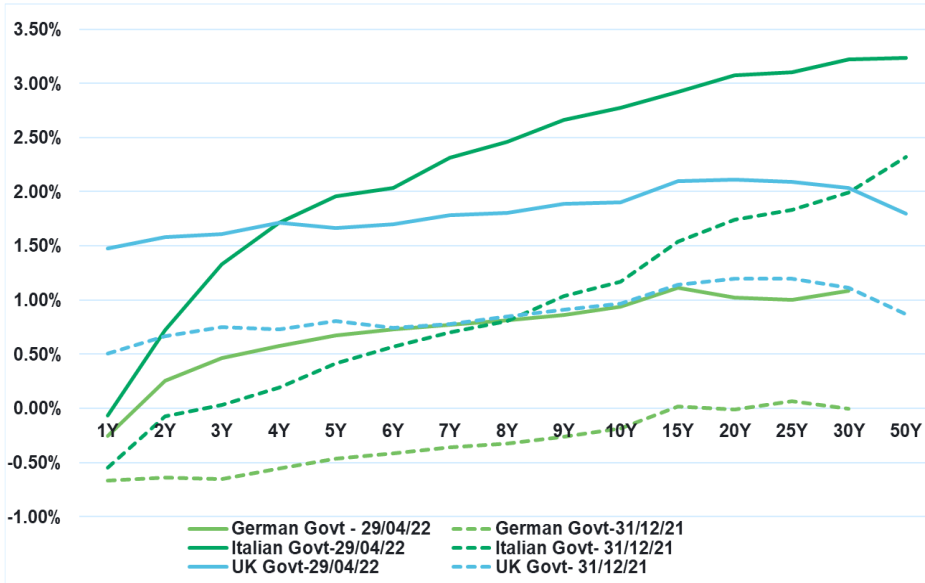
¹⁸ Investopedia: 'Quantitative easing (QE) is a form of unconventional monetary policy in which a central bank purchases longer-term securities from the open market in order to increase the money supply and encourage lending and investment. Buying these securities adds new money to the economy, and also serves to lower interest rates by bidding up fixed-income securities. It also expands the central bank's balance sheet.'

¹⁹ Yield curve control differs from QE in that the quantity of securities purchased is not pre-determined but driven by the desire to maintain a specific interest rate within a specified target range.

Recently though, in response to continuing rises in inflation, the stance of many central banks has changed towards a tightening of monetary policy via a combination of increases in policy rates and some degree of unwinding of previous QE.

Looking back however we can see the scale of change is very different. The last time UK CPI inflation was as high as 7% (March 2022 figure) was the early 1990s at which time both short- and long-term interest rates were around 10%. To place that into context, the May 2022 MPR from the BoE notes that market expectations are for UK policy rates to increase further and peak at around 2.5% in 2023. At the same time, the stock of assets accumulated through the various rounds of QE is beginning to be unwound which should increase longer-term rates. Indeed, nominal interest rates across the term structure have seen material increases since the end of 2021 (see Figure 17).

FIGURE 17: MOVEMENT IN NOMINAL YIELD CURVES 31/12/21 TO 29/04/22

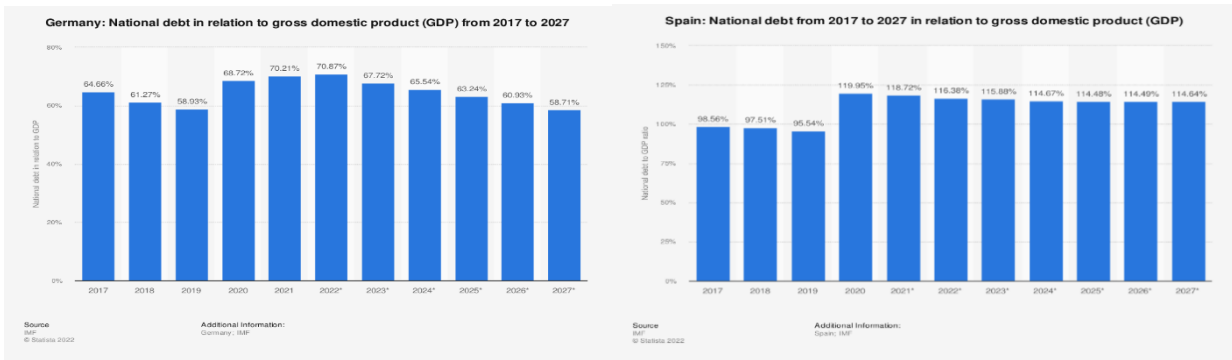
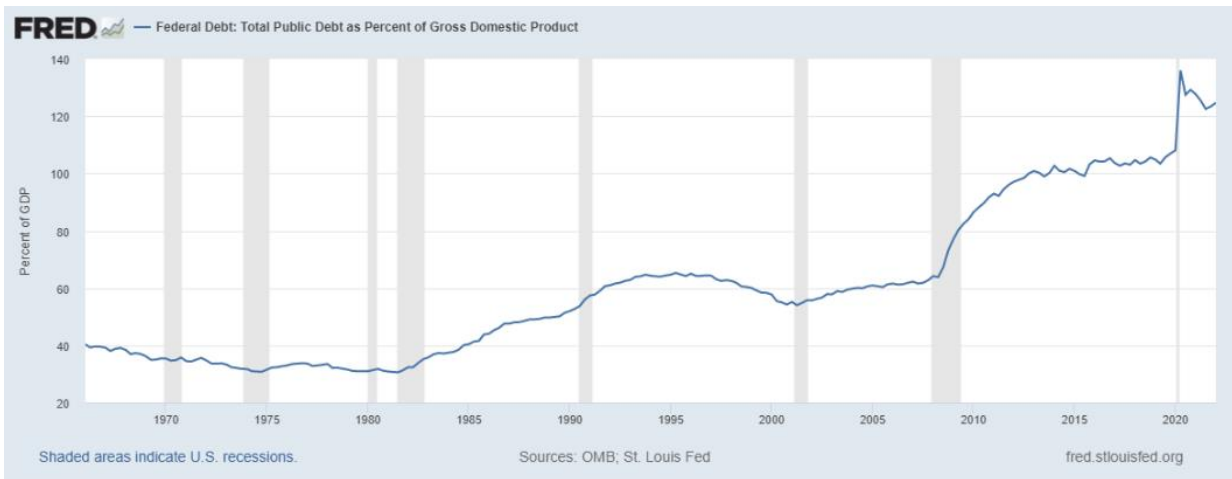


Source: Milliman analysis using data from Bloomberg.

The contrast with the 1990s is perhaps clearest if we consider real interest rates as even inflation rose, real rates remained positive back then, as can be observed from Figure 16. However, should rates peak at around 2.5% next year then similarly positive real rates would require inflation to have fallen back to around zero. This feels rather optimistic from where we stand at the time of writing, thus implying that real rates are likely to remain negative. So this begs the question as to what is different this time around?

A clear difference is that levels of debt, be it public, private, or corporate, are considerably higher today than was the case during the previous high inflation periods in the 1970s, 1980s, and early 1990s. As an example we consider some statistics for public sector debt in the US and Europe in Figure 18.

FIGURE 18: TRENDS IN PUBLIC SECTOR DEBT



Sources:

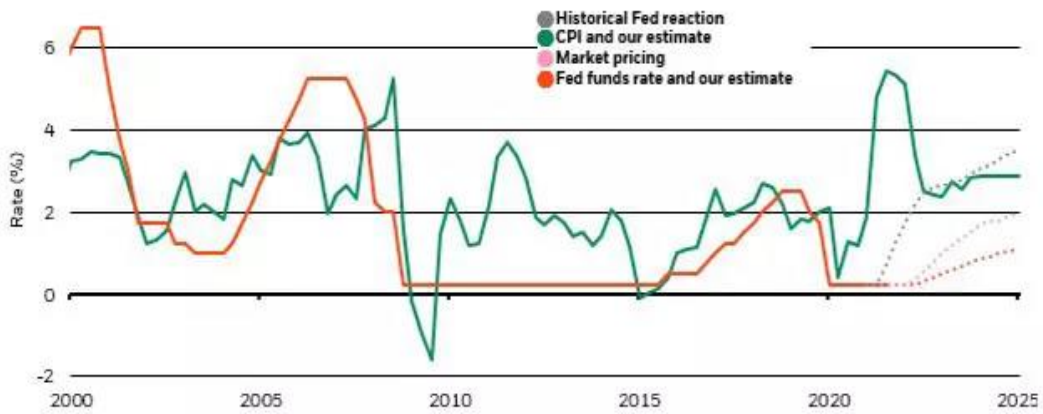
- Top: Fred – <https://fred.stlouisfed.org/series/GFDEGDQ188S>.
- Bottom left: Statista – <https://www.statista.com/statistics/624193/national-debt-of-germany-in-relation-to-gross-domestic-product-gdp/>.
- Bottom right: Statista – <https://www.statista.com/statistics/270416/national-debt-of-spain-in-relation-to-gross-domestic-product-gdp/>.

In the US, while the national debt is near its historical highest, net servicing costs are still well below the peak level seen in the late 1980s to early 1990s. Low interest rates on US government securities are, not surprisingly, the driving cause of this trend. However, government debt yields are now rising quite rapidly, as well. If this trend continues, national debt servicing costs are likely to begin increasing quite substantially, which will put even more budgetary pressure on the US.

The figures for Germany and Spain illustrate that the Debt:GDP positions of Eurozone countries can differ markedly. This presents a significant challenge for the ECB in terms of the varying latitude it has to tighten monetary policy in pursuit of controlling inflation.

Outside Europe, particularly in the US, we are seeing similar developments in central banks’ monetary policies. The figure below shows the US nominal federal funds rate (red) and CPI (green). Blackrock provides its own estimates for CPI and the Fed funds rates. In addition, the chart shows two other forecasts for the Fed funds rate based on market pricing (pink) and historical Fed reactions (grey). The chart shows that CPI is expected to decline and then stabilise around 3% between 2022 and 2025. All forecast methods for the Fed funds rate show an increase between 2022 and 2025. The highest increase is forecasted using the method based on historical Fed reactions. This is followed by the method based on market pricing and finally Blackrock’s own method. Regardless of the methodology, the expectation is that the Fed funds rate will continue to increase in the near term.

FIGURE 19: THE CHART SHOWS FED FUNDS RATE AND CPI IN THE US FROM 2000 UNTIL 2025



Source: BlackRock – <https://www.blackrock.com/institutions/en-us/insights/sizing-up-inflation>.

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