CANDRIAM
A NEW YORK LIFE INVESTMENTS COMPANY

Inflation and Pensions: What to Expect?

OCTOBER 2022

Marketing communication

Executive Summary.

"Inflation is like toothpaste. Once it's out, you can hardly get it back in again. So the best thing is not to squeeze too hard on the tube."

Karl-Otto Pöhl, head of the German Bundesbank from 1980 to 1991, underscores that inflation was something hard to control, including when central banks attempt to inflate away high levels of government debt.

The ongoing rise in inflation is already proving challenging for the economies worldwide, as well as for individuals, companies and institutions.

Pensioners are among the most vulnerable to the effects of inflation as prices of goods and services become increasingly unaffordable relative to the level of their pensions, which often lag rising inflation. The increases of pension payments often lag the increases in prices of goods and services, while the price indexation of benefits to inflation can put pension funds under pressure.

Potential solutions

However, there are several types of investments that can specifically mitigate the overall impact of inflation on an individual or institutional portfolio. Inflation-linked bonds aim to provide a hedge against unexpected rises of inflation. Income-generating assets, such as property and infrastructure, can to at least some degree mitigate the effects of inflation over the short term, and more than compensate over the long term. When it comes to equities, historically inflation has not always been detrimental to the long-term performance of equities when it was not too high.

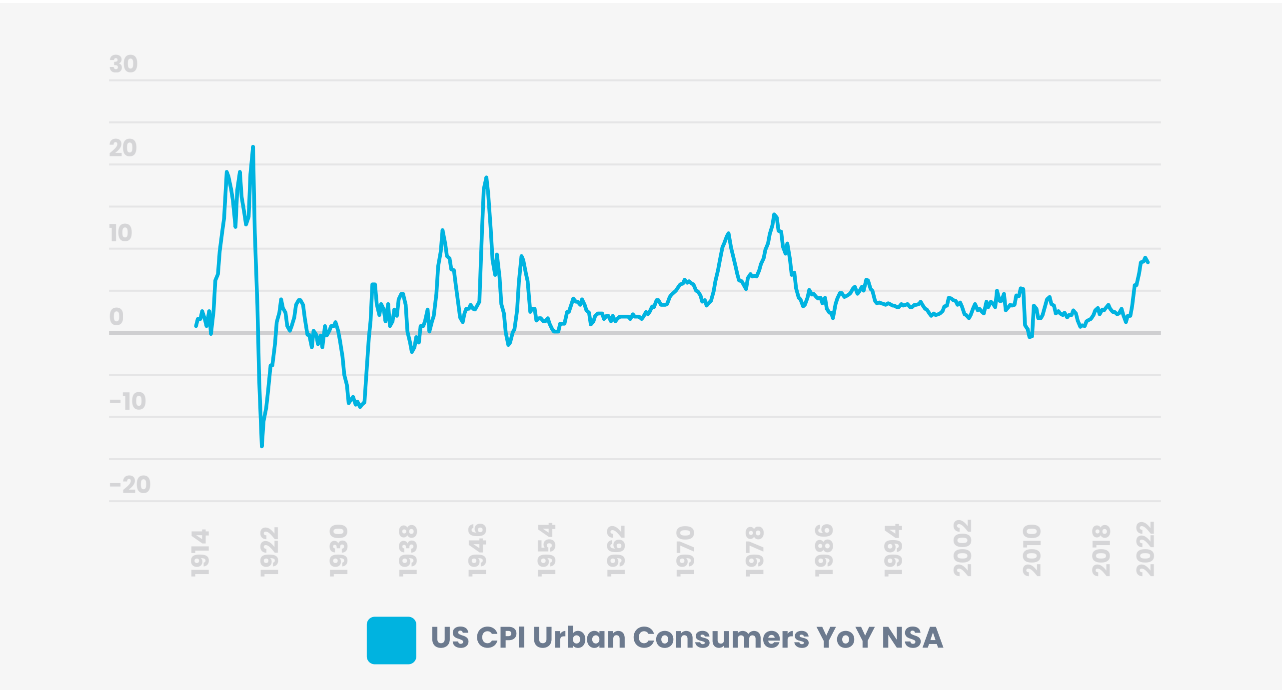
All in all, in this market environment, a cautious and long-term approach should be pursued with pension financing.

Global rise in Inflation.

The highest inflation for 40 years

By the middle of 2022, price inflation has reached a level not seen for over 40 years. Even when considered over a period that included the First and the Second World Wars, the scale of the recent inflation rise looks significant (see Figure 1).

Figure 1: US CPI Urban Consumers, year on year, Non Seasonably Adjusted.



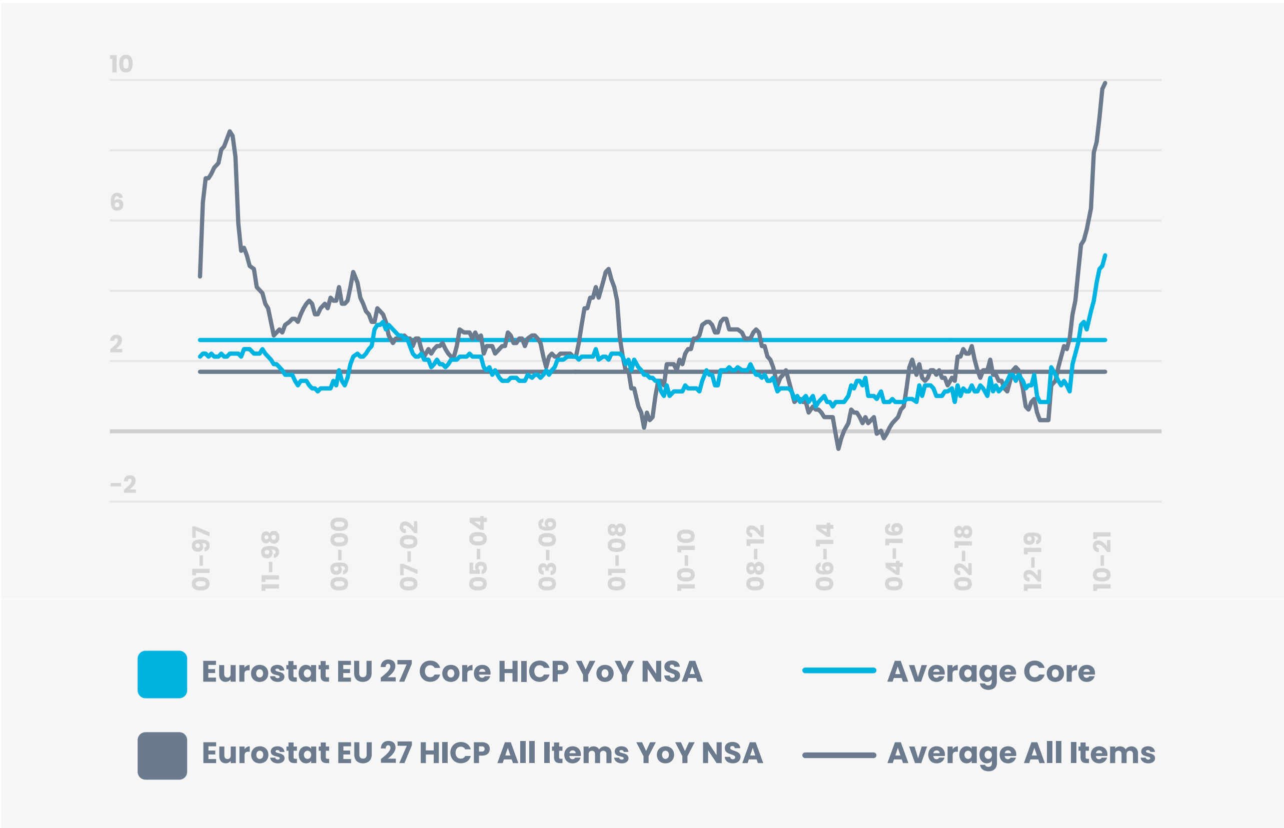
Source: Bloomberg, Bureau of Labour Statistics as at 09.09.2022

This worldwide rise is driven chiefly by the increases in the prices of energy and food, most of which, in turn, have been caused by:

- Fiscal and monetary stimuli that poured enormous quantities of liquidity in economies
- Tensions in the supply chain linked to de-globalisation trends, accelerated by the COVID crisis, the Russian invasion of Ukraine and the Zero-COVID policy in China.

By the middle of 2022, inflationary pressures have spread to the sectors which, early in the year, were affected very little or not at all. Now both headline inflation and core inflation (inflation excluding energy, food, alcohol and tobacco) have exceeded their historical average levels, while wage increases are also accelerating in some countries. All in all, inflationary tensions could remain for some time.

Figure 2: Energy and food drive price increases. Core inflation is up too.



Source: Candriam, Bloomberg and Eurostat as at 09.09.2022

So, what is the most likely inflation scenario? Current market expectations do not point to inflation spiralling out of control, but rather staying elevated above the recent highs for some time. Coming from a pre-COVID level of between 1% and 1.5% in the Eurozone, the market is pricing in inflation stabilising slightly above 2% in the medium to long term.

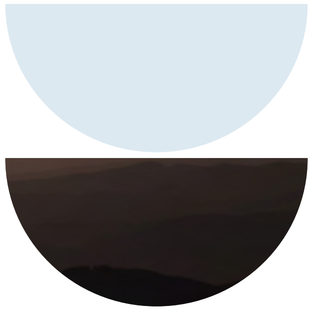
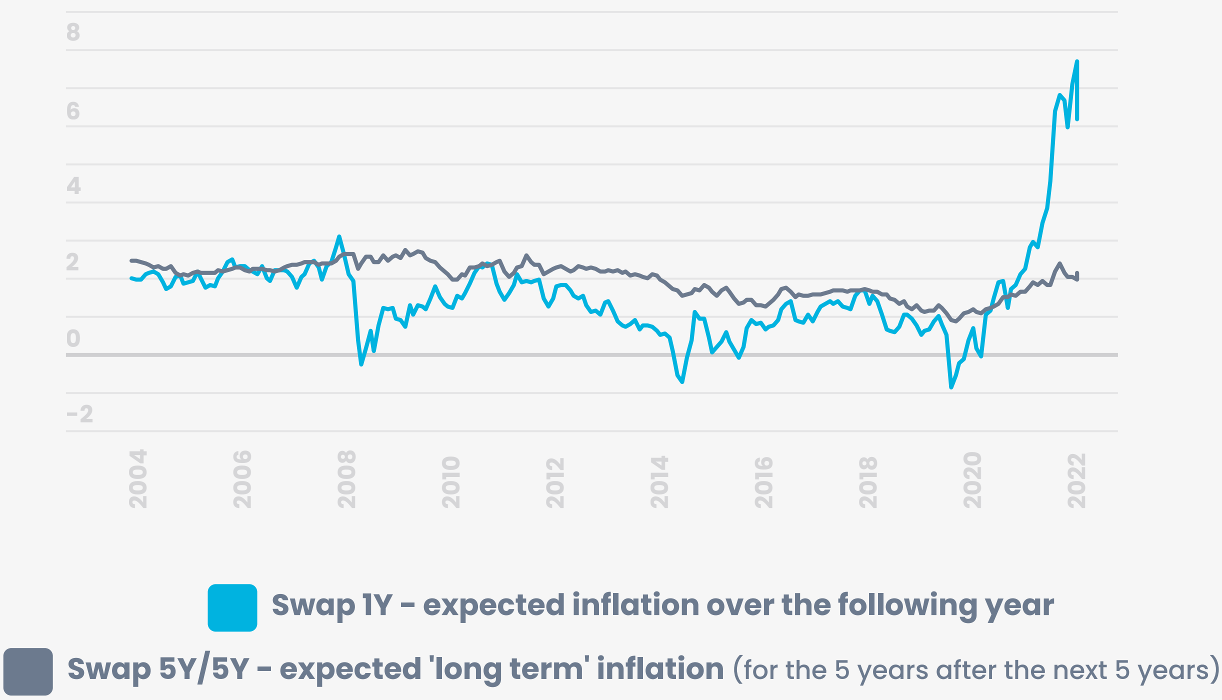


Figure 3: How high will inflation go?



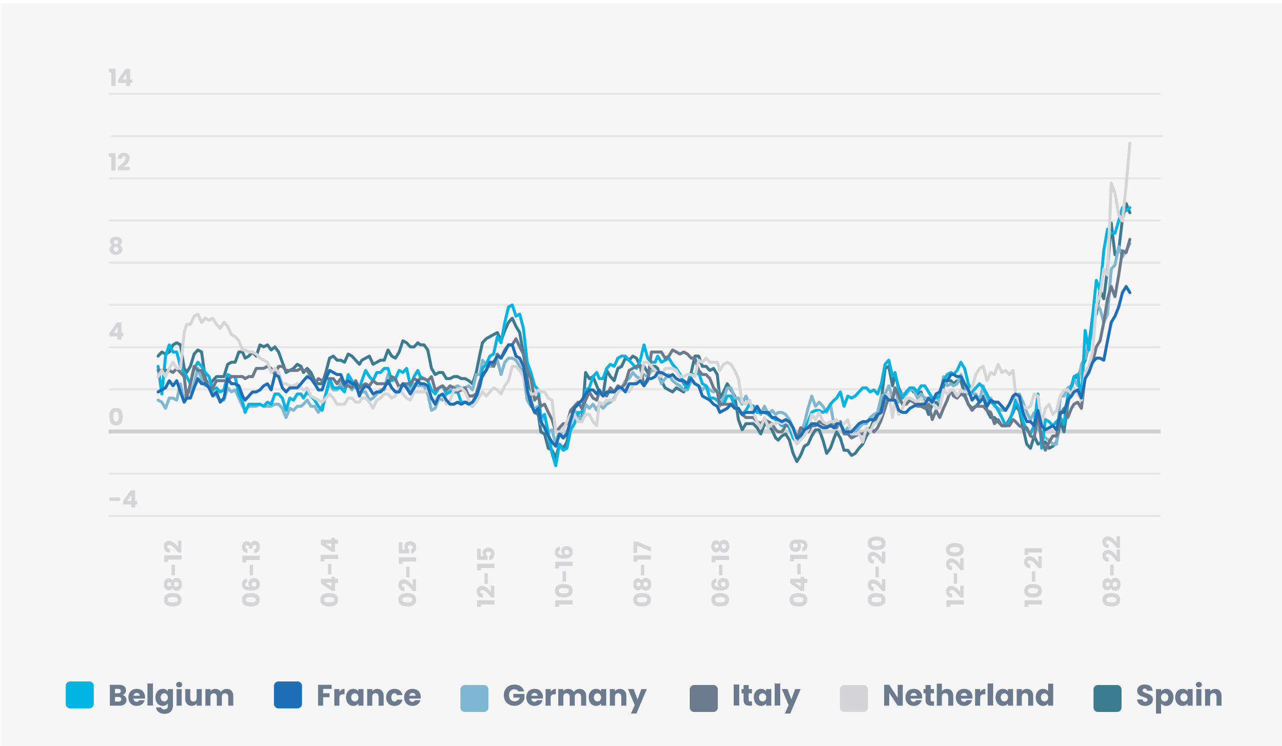
Sources: Bloomberg, Candriam - expectations based on Eurozone's zero coupon inflation swaps as at 09.09.2022.

Eurozone:
not a level inflation playing field

Rising inflation is already making its effect felt on people across the world, but some will be impacted more than others. This will depend on the level of inflation in the country of residence and whether it has an effective social safety net.

The level of price inflation varies quite significantly across the Eurozone countries, running at over 12% in the Netherlands, while in France it still remains around 6%. The main reason for this divergence is the high dependency of some European countries on foreign (Russian) energy and imported food.

Figure 4: High inflation affecting the Eurozone… worse in countries highly dependent on imported energy and food



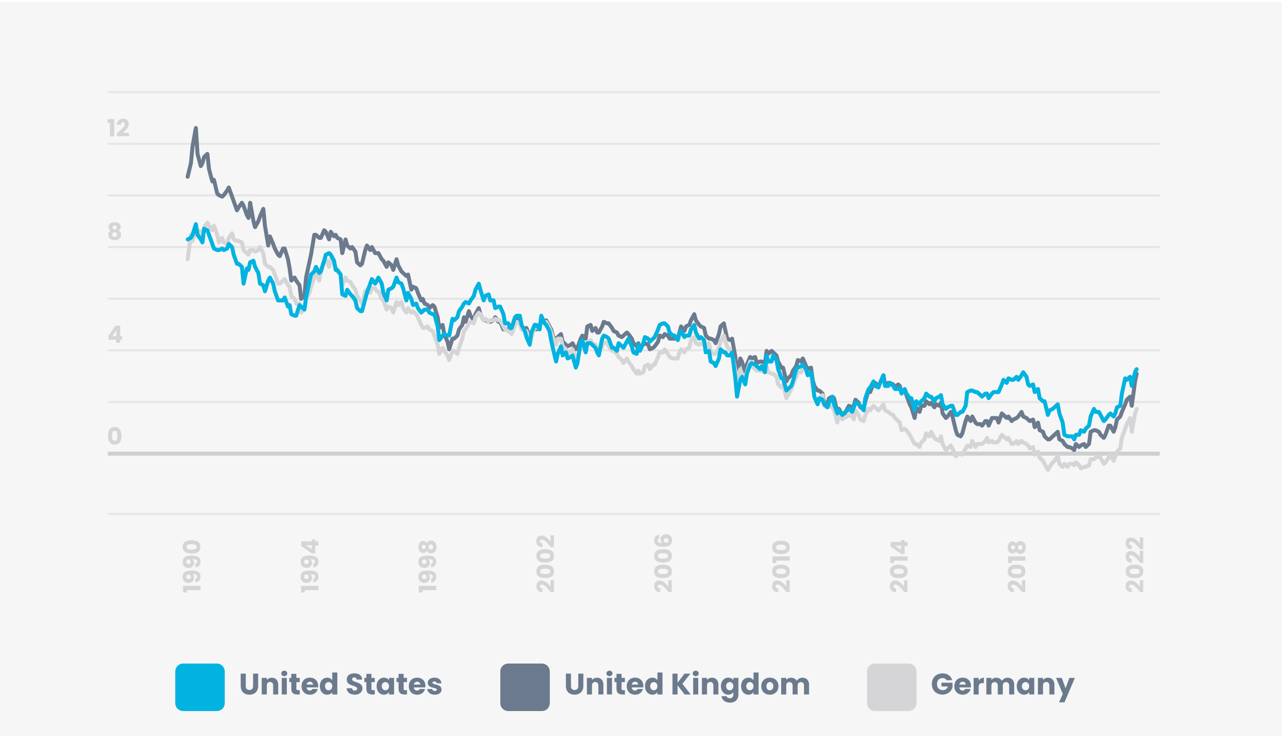
Sources: Candriam, Bloomberg, Eurostat, as at 09.09.2022

Impact on **financial markets**

The spike in inflation has led most central banks to tighten their monetary policies, which included first in a series of interest rate rises. Interest rates have risen sharply across the globe, reaching the highest levels for at least 10 years.

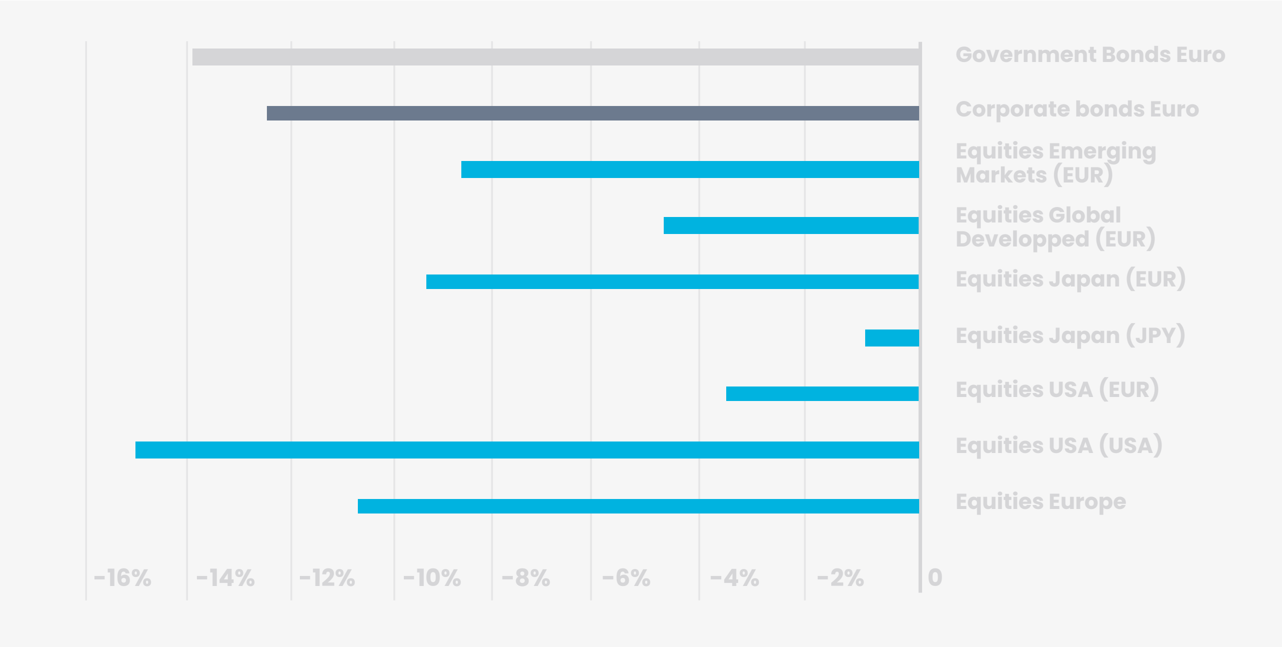
To so much uncertainty, financial markets' response has been resolutely negative, with all asset classes suffering declines in the first half of 2022.

Figure 5: Yields are up: 10-year Bunds, gilts and Treasuries.



Source: Candriam and Bloomberg, as at 09.09.2022. Past performance is not a guide to future performance.

Figure 6: Asset performance in 2022



Source: Candriam, Bloomberg, MSCI Indexes for Equities, JP Morgan Government Bond EMU Index, Iboxx Euro Corporate Bond Index, Net Total return performances from 31.12.2021 to 09.09.202. Past performance is not a guide to future performance.

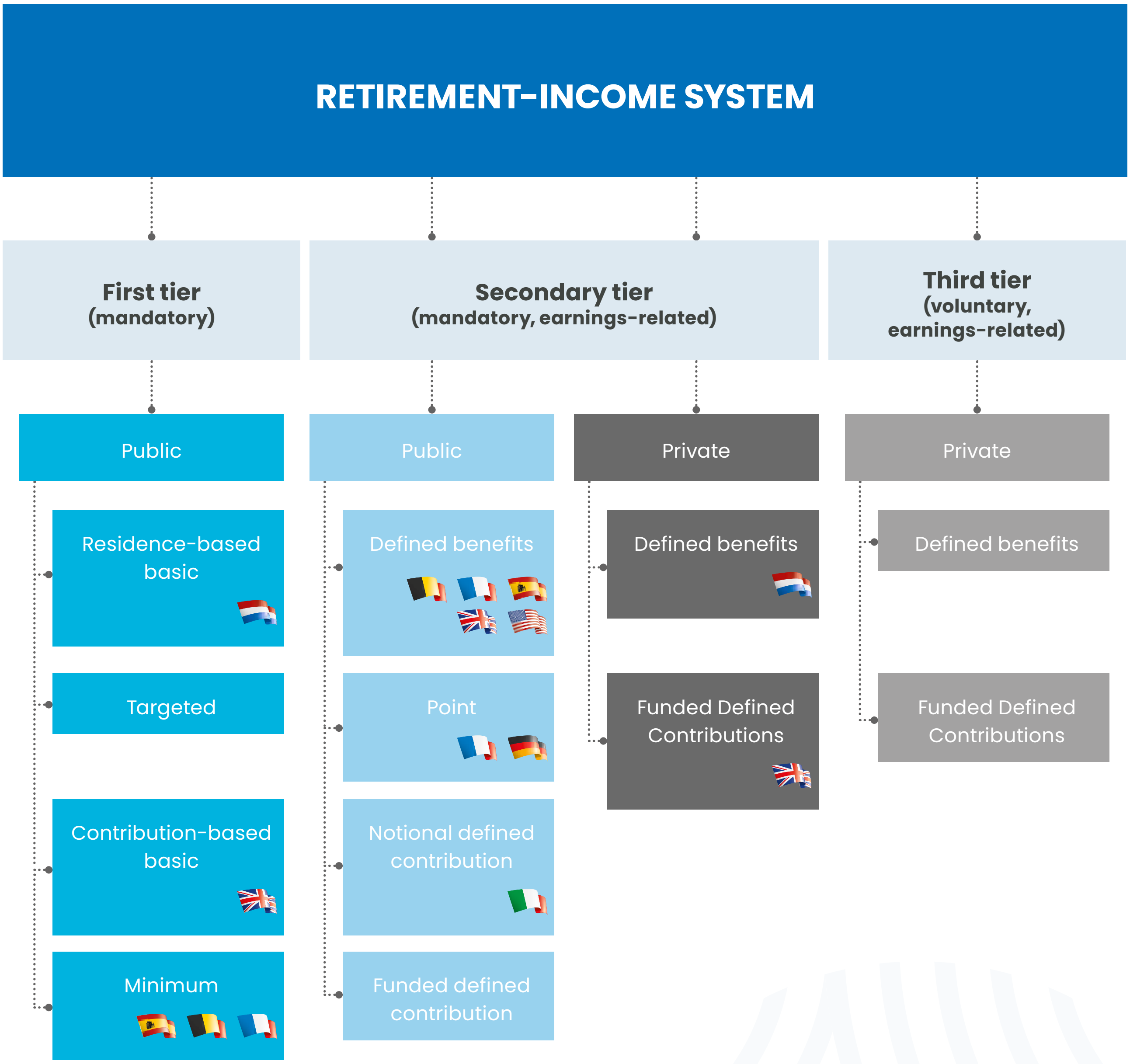
All these elements are challenging financial markets and the society, having widespread impacts on pensions at various levels.

Impact on pensions and pension schemes.

The design of pension systems varies widely between different countries/jurisdictions. All of them carry their own imprint of national/regional history, culture and traditions, and have been continuously modified by successive governments to fulfil their political, economic and demographic objectives. Some types of pension funds, predominantly state pensions, are paid for by contributions from people currently working. On the other hand, private (corporate) pension benefits are usually based on contributions paid into the fund before retirement, and how well this fund is invested.

In almost every case, however, retiring causes the person's income to drop, and with it their standard of living. This impact can be critical for lower income pensioners, given that this group is the least likely to have additional savings that can be relied on to help with living costs.

Figure 7: OECD Taxonomy on pension provision



Source: OECD[1].

1 https://www.oecd-ilibrary.org/finance-and-investment/oecd-pensions-at-a-glance_19991363

Pension replacement rates and inflation protection by country

Both in the US and the UK, state pensions cover a minimum income level to make sure that pensioners do not live in poverty. That income is then typically complemented by private pensions or individual savings. In the UK, the full rate of the state pension was GBP185 per week in mid-2022. In the US, the level of state pensions depends on the level of income before retirement. For example, someone earning USD1,250 per month would receive a state pension of USD 731, USD 3,000 would get USD 1,179 and those on USD 6,000 would get USD 1,805. In the UK, the employees benefit from the automatic enrolment in an occupational pension scheme, while in the US, private employers have no obligation to provide additional pensions.

In France, Germany, Italy and Spain, most of the retirees' income is provided by state pensions. In some countries, employers can set up additional pensions for their employees. For example, such has been the case historically with large employers in Germany.

In the Netherlands, the level of the state pension AOW[2] was € 1271 per month before tax in July 2020, which, like in the UK, is the flat level regardless of the level of income when employed but most of the population is covered by a corporate or sectorial private pension scheme.

Figure 8: Pension replacement rates to earnings (in %) by country

	Gross replacement (mandatory pensions)			Net replacement (mandatory pensions)			Net replacement (mandatory + voluntary)		
% Individual earnings to average	**50%**	**100%**	**200%**	**50%**	**100%**	**200%**	**50%**	**100%**	**200%**
Belgium	67.5	43.4	29.2	70.9	52.2	51.9	86.8	74.2	81.3
France	60.2	60.2	51.9	71.3	74.4	64.5			
Germany	46.5	41.5	33.0	57.9	52.9	41.9	75.0	70.2	58.3
Italy	74.6	74.6	74.6	78.4	81.7	84.6			
Netherlands	73.1	69.7	68.0	84.7	85.3	81.0			
Spain	73.9	73.9	67.0	80.1	80.3	74.7			
UK	70.6	49.0	38.2	79.2	58.1	47.7			
US	49.6	39.2	27.9	61.0	50.5	39.0	111.7	95.8	83.2

Source: Pensions at a glance 2021, OECD

How to read this table (figures in blue): In the US, the pension replacement rate (net of tax) linked to mandatory pensions for workers on average incomes (100% of the average income level in the country) is 50.5% of their salary, while it is 74.4% in France. The pension replacement rate gross of tax linked to the mandatory schemes for someone earning 50% of the average income in the Netherlands (people on lower incomes) is 73.1% of his salary.

2 The AOW pension is a basic state pension provided by the Dutch government to people who have reached AOW pension age. AOW is short for Algemene Ouderdomswet, the National Old Age Pensions Act. You will receive it if you have been insured under the Dutch AOW pension scheme. https://www.netherlandsworldwide.nl/aow-pension-abroad/what-is-aow

Decreasing real value/purchasing power: who are at risk?

Public pensions

Most of the protection from the effects of inflation (inflation linkage) comes from state pensions. Subsequently, the vulnerable pensioners are those who live in countries where state pensions are small, such as Belgium, Germany, United Kingdom and United States, and where they are expected to supplement state pension benefits with corporate pension income to cover living costs in retirement.

In those countries where mandatory state pensions, on average, account for the main part of pensioners revenues, the linkage with inflation is also subject to other considerations related to the current or future pension deficits. For example, in France since 2013, state pension payments (on the gross basis) have lagged inflation, both for the general pension scheme (CNAV) and complementary occupational schemes (AGIRC, ARRCO).

Inflation is a major threat to pensioners' revenue when their benefits are not indexed to inflation. However, as we mentioned, mandatory pensions usually provide some form of inflation protection, as shown in the next table.

Figure 9: Public and mandatory defined benefits pensions

	Indexation of state pensions (and occupation pensions in the Netherlands)
Belgium	Prices
France	Prices for general pensions (CNAV), prices and wages adjusted for sustainability of the pension system from 2023 for complementary pensions (AGIRC ARRCO) From 1948 to 1987, pensions were indexed to the average wage. Since then, on several occasions, the executive had chosen to de-index pensions to save money.
Germany	Wages adjusted for sustainability of the pension system
Italy	Prices
Netherlands	AOW (state pension): indexed to the minimum wage Occupational pensions target price indexation, but full indexation depends on the asset liability ratio.
Spain	[0.25%; price +0.5%], depending on the scheme's financial health
UK	Triple Lock mechanism[3]: Max(prices, wages, 2.5%) for basic pension
US	Prices

Source: Pensions at a glance 2021, OECD; Panorama des systemes de retraites en France et à l'étranger, 2020, Conseil d'Orientation des Retraites

Private pensions

The occupational pension schemes that were set up in the last few decades offer a considerably lower level of benefits than had been the case before. Moreover, the shift from defined benefits to defined contributions is now well advanced and the future pensioners' revenues are more linked to market performance than to the changes in the cost of living.

Even outside defined contributions schemes, inflation protection is not 100% perfect. Most of Dutch pension schemes have been allowed to freeze benefits indexation to prices to help them remain solvent and, apparently, assist with intergenerational fairness in the context of low rates and demographic changes. UK defined benefits schemes usually index pensions to the Retail Price Index (RPI) capped at 5% per year or less. It means that pension fund assets would depreciate by 6% over a year when the RPI increases by 11%.

3 A triple lock was introduced to the UK state pension in 2010. It was a guarantee that the state pension would not lose value in real terms, and that it would increase at least in line with inflation. It included three separate measures of inflation ('triple lock').

Impact on pension schemes sponsors.

Public pensions

As we mentioned, state pension schemes are typically funded by contributions from people currently working. Contributions being proportional to wages, increases in contributions could offset increase in benefit payments if wage increases follow inflation, everything else being equal. However, several mechanisms can harm this 'natural' hedging:

- Wage adjustments to inflation can take time to materialise
- Pension contributions are not always calculated on the full salary
- Inflation shocks can negatively impact the labour market, affecting the overall amount of pension contributions raised
- Companies' contributions can be frozen by a political decision in case of an economic downturn to relieve the pressure on enterprises
- State pensions' reserves are invested the asset classes which do not generate enough return to offset inflation

Private pension schemes

The inflation protection offered by defined benefits pension funds must be financed either through a successful investment strategy or by the scheme sponsor(s), which can take two forms:

- Additional contributions to the pension fund to offset the effect of increased liabilities
- Increased net liability of the sponsor to the pension fund, possibly secured by company's assets

Increasing cash contributions is not the preferred option as companies generally want to use the cash for their operations. We do not expect this to change in the context of 2022 when their cost base has also become badly affected by high inflation. Contributions are also spread over time and do not translate immediately to a compensation of the increased liability of the pension fund to its members.

The net liability of the pension fund sponsor is the difference between assets available for the pension fund and its liabilities to plan holders (payments). Using IAS 19 principles[4], the value of this sponsor net liability might have decreased because of the overwhelming importance of discount rates, which have jumped by around 2% between the end of December 2021 and the end of June 2022.

4 The standard establishes the principle that the cost of providing employee benefits should be recognised in the period in which the benefit is earned by the employee, rather than when it is paid or payable, and outlines how each category of employee benefits are measured, providing detailed guidance in particular about post-employment benefits. https://www.iasplus.com/en/standards/ias/ias19_1998

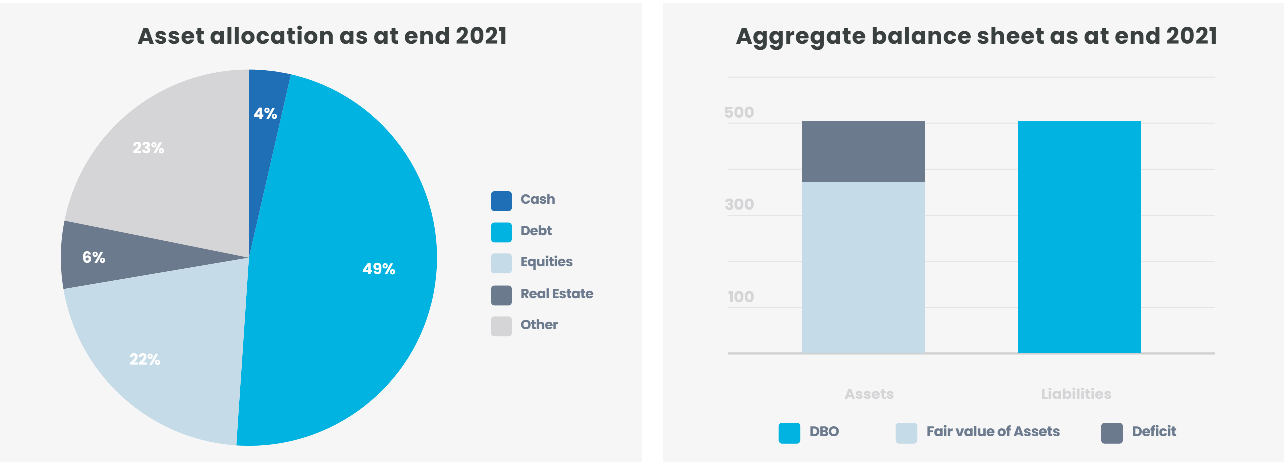
European corporate pensions: How have defined benefit pension liabilities changed? *(From the Fiscal Year 2021 to mid-2022)*

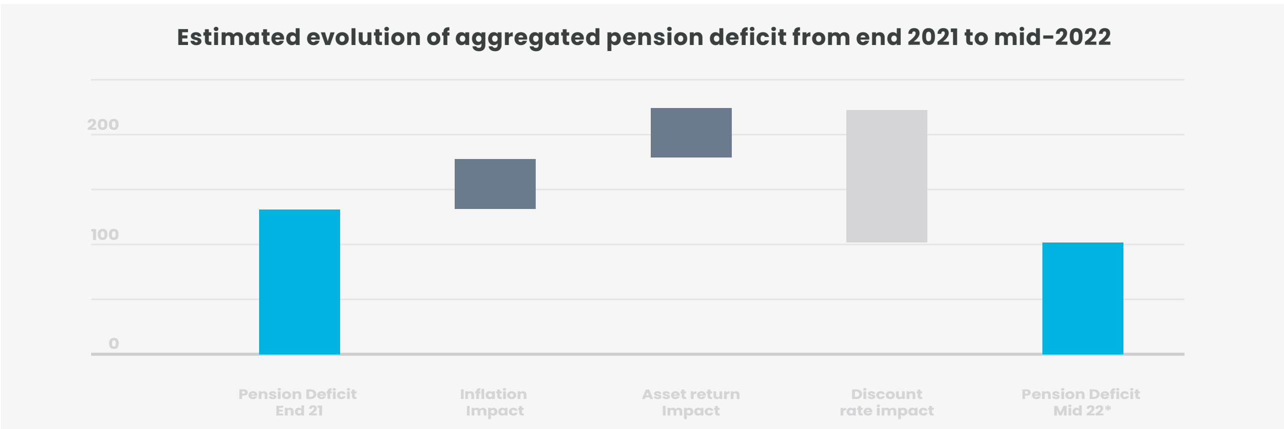
Here we wanted to size up the potential problem for European corporate pension schemes. Let's consider the total aggregate value of IAS 19 post-employment benefits deficit of all companies in the Eurostoxx 50™ index. As per fiscal year 2021, it amounted to around € 130 bn, split between an aggregate Defined Benefits Obligation (DBO) of € 500 bn and an aggregate asset value of € 370 bn.

Based on the corporate annual reports of the constituents of the Eurostoxx50 Index, the average assumptions of long-term inflation currently stand at 1.8% for the Eurozone, 2.3% for the US and 3.3% for the UK RPI in 2021. If we assume a scenario, currently regarded as highly unlikely by market participants, that inflation in fact will rise by 75 basis points for each of these three markets, triggering a shock on realised inflation and asset performance, the aggregate deficit increases by € 90 bn.

However, if we also adjust the liabilities discount rate (funding versus value), the deficit will decrease by € 120 bn. In the end, the positive impact of higher interest rates could offset all the other negative factors. That said, this can vary significantly depending on national pension rules and regulations across countries and individual plan rules.

Figure 10: Eurostoxx 50 occupational pension plans: aggregate view





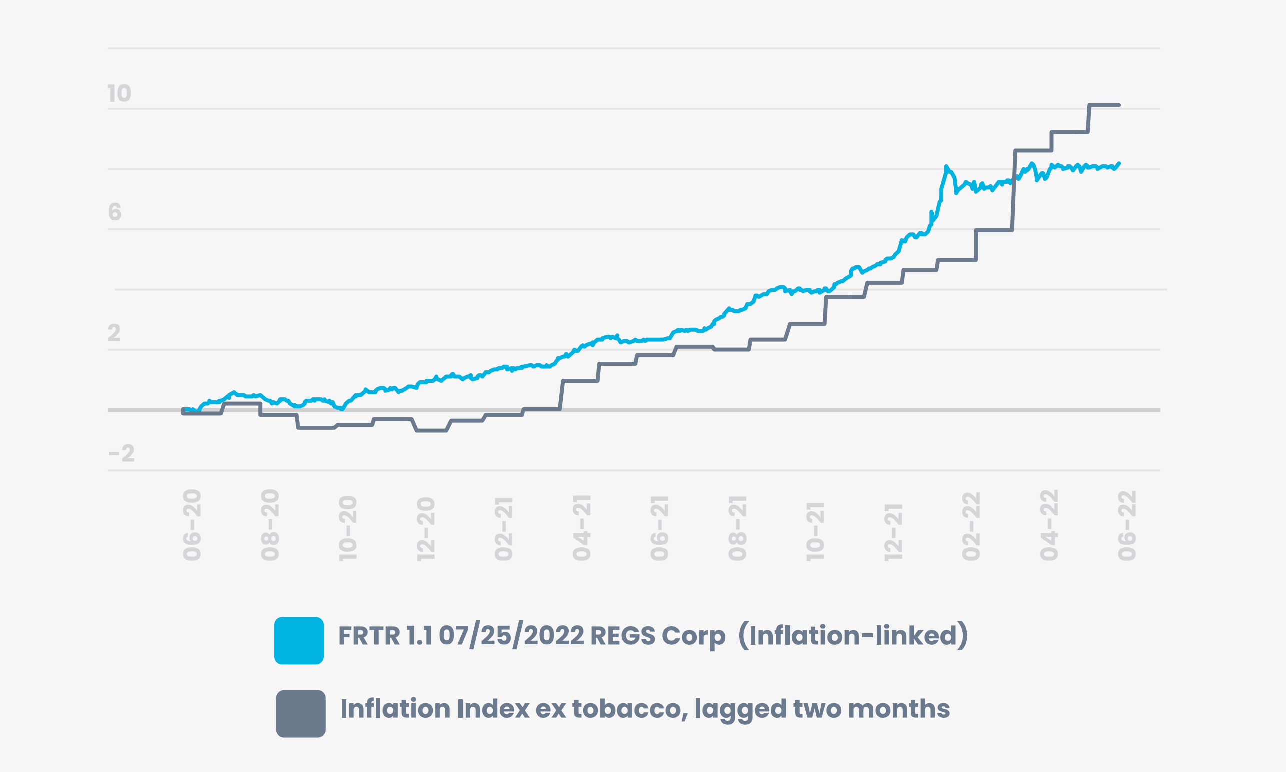
* Excluding service cost, net interest cost and asset ceiling
Source: Candriam, Bloomberg, aggregate of the company's annual reports as at 09.09.2022

Investment solutions for an era of higher inflation.

Inflation-linked bonds and swaps: mitigating inflation risk

We believe that in the current market environment, the best hedge against unexpected inflation increases is inflation-linked bonds, preferably at the short end of the curve. Their coupons and nominal value are adjusted over time in line with a reference inflation index, thus aiming to protect invested assets against inflation rises when they exceed market expectations. Most of these bonds are highly rated sovereign issues, which bear little risk of default. Inflation swaps provide the same type of protection by leveraging the exposure of an investment portfolio to inflation. All in all, we believe these investments can be used as an effective tool against sudden rises in inflation, though they offer a limited excess return potential.

Figure 11: Short term inflation-linked French sovereign bonds: tracking the inflation index



Sources. Candriam, Bloomberg, Eurostat, as at 09.09.2022. Past performance is not a guide to future performance.

Although these types of financial instruments are by far the most effective and 'purest' way to mitigate inflation risk, they also have their limitations. First, **usually it is too late (too costly) to buy inflation hedge when the market had already priced in high inflation expectations, and the subsequent demand for inflation-linked bonds and swaps is already reflected in their (high) prices. In addition, this type of hedge can be far less efficient if the widely expected level of inflation turns out to be higher than the realised inflation in a few years' time.** Second, it is their sensitivity to other risk factors, which may result in a mismatch between investors' domestic inflation exposure and the lower market depth. In the short term, the performance of inflation-linked bonds also can strongly deviate from inflation.

Inflation-linked bonds

Inflation-linked bonds are usually issued by governments. In Europe and in the United States, they represent a small part of the total government debt outstanding, but that still represents a large amount of money in absolute terms.

		Outstanding inflation-linked bonds issuance, in local currency as of June 2022	% Inflation-linked to total sovereign issues as of June 2022	Retirement Savings plan Assets as end 2020
Eurozone € bn	Germany	57	4.5%	
	Spain	61	5.9%	
	France	200	10.8%	
	Italy	137	8.2%	
	Others			
	Total	456	6.2%	3,051
United Kingdom £ bn		367	19.4%	2,679
United states USD bn		1,356	8.3%	35,491

Source: [Source: Candriam, Bloomberg and OECD

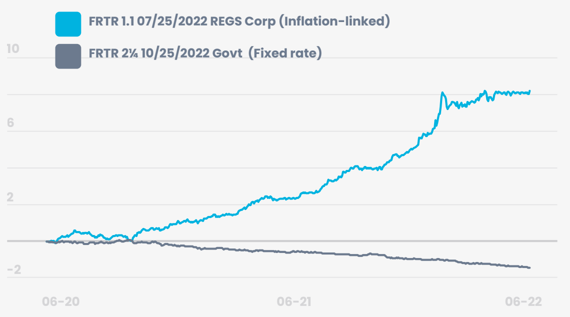
An important remark at this point is that the current size of the inflation-linked bonds is not large enough to hedge all pensions' rights exposure to inflation. In the UK, the de-risking appetite of Defined Benefits pension funds was often described as a source of price and liquidity distortion for the inflation-linked bonds, making them more expensive because of their hedging characteristics.

Mathematically, the price of an inflation linked bond on date t, maturing in year t_N and real coupon c can be represented like follows $B^{IL}(t, t_N) = I(t) \times B^r(t, t_N)$, with

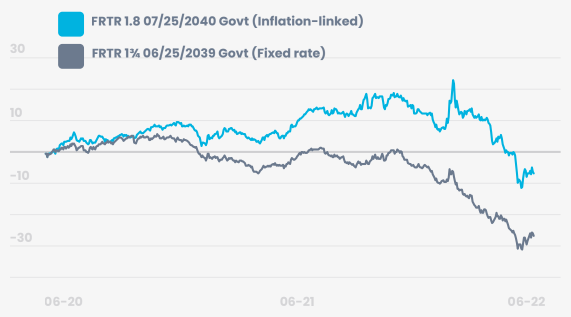
- $I(t)$ is the inflation ratio i.e. the ratio between the inflation index value on date t and the index value at date of issuance
- $B^r(t, t_N) = \sum_{i=1}^{N} \frac{c}{(1+r(t,t_i))^{t_i - t}} + \frac{1}{(1+r(t,t_N))^{t_N - t}}$ the sum of future real coupons and principal discounted at real rate curve on date t, $\{r(t, t_i); i = 1, \dots, N\}$

We see here that the price of inflation-linked bonds is also sensitive to other performance drivers other than inflation, namely real interest rates and spreads for Eurozone government bonds. A quick rise in inflation would also impact these drivers, which could trigger shock price fluctuations of these fixed income securities over short term, more so than a change in the level of inflation. It is possible to improve correlation with realised inflation by investing in shorter maturity bonds, but it is then more complex to set-up of an asset liability matching both inflation sensitivity and cash-flows by maturity.

Performance of short term bonds



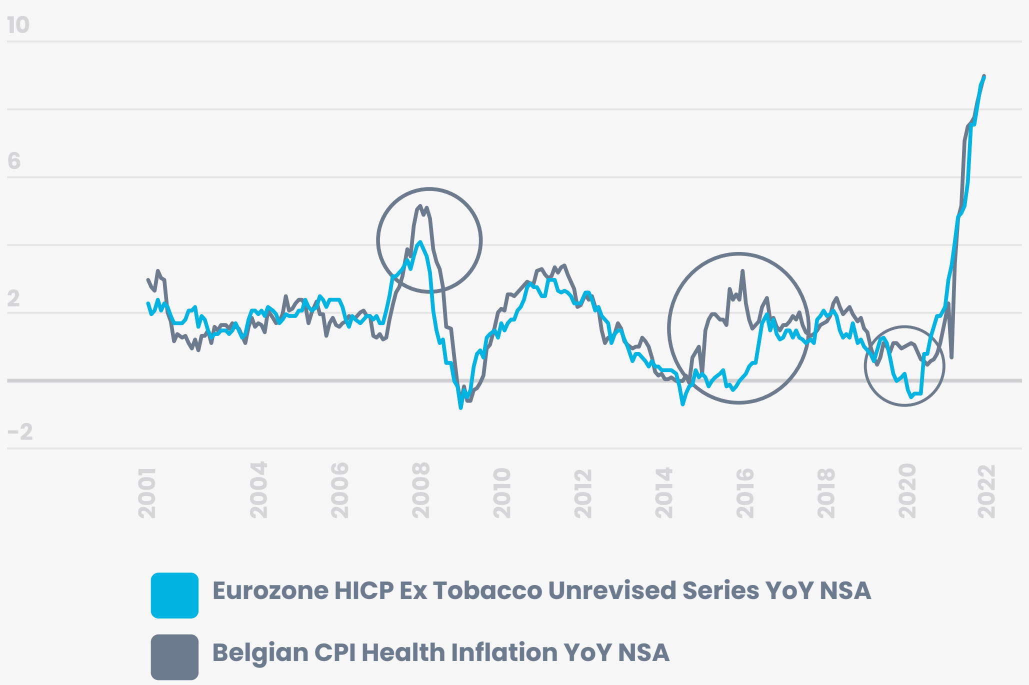
Performance of long term bonds



Source: Bloomberg, July 2022. Past performance is not a guide to future performance.

In addition, there is the basis risk (of mismatch) between the inflation index to which these fixed income instruments are linked and pension funds' inflation exposure.

For example, in the UK, inflation-linked instruments are linked to the Retail Price Index (RPI) while some pensions are now indexed to the Consumer Price Index (CPI). In the Eurozone, they are mostly linked to the Euro HICP ex Tobacco and some French and Italian bonds are to their domestic CPI. Moreover, in Belgium all wages and some pensions are linked to the Belgian Health Inflation Index, which has sometimes strongly differed from the Euro HICP. Therefore, while the hedge offered by inflation-linked bonds remains effective, it is imperfect due to the differences in the measurements of inflation used by different governments.



Source: Bloomberg, Eurostat, Belgian Institute of National Statistics as at 09.09.2022. Past performance is not a guide to future performance

Real assets: inflation linked income

Real assets, in particular property and infrastructure, offer a partial hedge against inflation because some of their revenues are directly or indirectly linked to inflation. However, the pricing of these assets is also affected by other factors such as interest rates, which can offset the increase in revenues due to inflation. But all in all, these assets are expected to provide excess return above inflation through the economic cycle.

Property

In most European markets, inflation indexation is a feature of lease agreements. This way, any increase in inflation is normally automatically gets reflected in the size of rents and net operating income, in most cases on an annual basis, providing a direct hedge.

In addition, the nature of the Core Plus[5] investment style is well adapted to cope with inflation as:

- It allows to focus the risk on leasing up vacancy and extending leases – this gives operating leverage and the ability to rapidly mark-up rents when these increases are driven by inflation. This improves the efficacy of inflation 'hedge'.
- This approach seeks assets with small leasing impairments that are priced to reflect a level of uncertainty around leasing. Therefore, it focuses on properties yielding more than those with stable rents. These yields go up when the managers lease up space and mark rents to market. The combined effect of a higher entry yield and increased Net Operating Income (NOI)[6] then allows the investment manager a significant 'margin of safety' relative to core yield and provides for greater levels of interest coverage. This often offers mitigation against adverse increases in yields, as well as inflation risk.

Infrastructure

Infrastructure covers a range of investments including energy, transportation and utilities, which are characterised by, in many cases, regulated and predictable income streams and high barriers to entry. Such investments can offer a protection against inflation.

For example, in many countries, road tolls are linked to inflation in some way. The revenues of regulated water and energy utilities are often linked to inflation by law. However, not all infrastructure equipment benefits from these conditions. In some cases, the infrastructure operators have a sufficient pricing power to pass the inflation to their consumers, but some prices can also be frozen by a political decision. Other sub-sectors have very little link to inflation.

5 Core Plus is an investment management style that permits managers to augment a core base of holdings with instruments that offer greater risk but greater potential return.
6 a formula those in real estate use to quickly calculate profitability of a particular investment. It determines the revenue and profitability of invested real estate property after subtracting necessary operating expenses.

Equity investments: what can mitigate inflation and generate additional return?

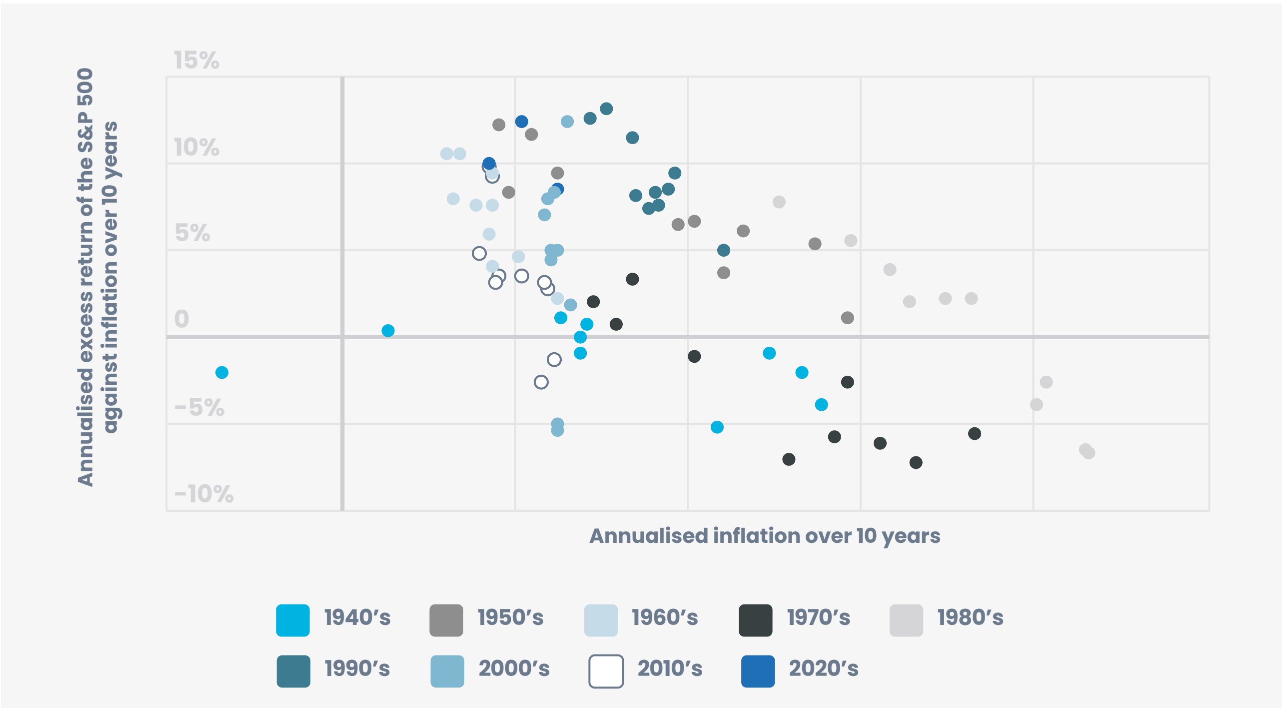
Although the high inflation regime between the second half of 2021 and 2022 was accompanied by falls in the equity markets, we believe that a moderate inflation would not necessarily harm equity returns if it does not exceed current expectations.

We have to note first that the balance between contributions, benefits and investment returns must be achieved over the long term, meaning planning over an average human lifespan.

Having such a long-term view lets plan holders take some risks and invest in «risk assets», such as equities. Over the last century, the S&P 500 index has returned on average about 6% per year, without taking into account distributed dividends. During the same time period, inflation averaged around 3%. Over the long term, equity returns should be higher than price inflation, because companies adjust their own prices to remain profitable and benefit from productivity gains and innovation.

However, due to their short term volatility, the out-performance of equities over inflation is not constant over time and across inflation regimes, as shown in the next graph. When inflation goes above exceeds 4% on average on a decade, the relative performance of equities over inflation declines strongly. However, when inflation remains under 4% annual inflation, equities' relative performance remains strong.

Figure 12: Annualised equity performance net of inflation over 10 years (vertical axis) plotted against annualised inflation. 10 points per decade, each point representing one year end in the decade



Source: Bloomberg, S&P, US Bureau of Labor Statistics, Candriam as at 09.09.2022. https://bondvigilantes.com/

As long as the current inflation regime does not derail like in the 1970s and 1980s[7], we believe equities should continue to offer attractive returns when adjusted to inflation. And during these two decades, the performance of bonds and equities were roughly comparable, so that no generic standard asset class was able to generate a significant return above inflation.

7 https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1109.pdf

There is no standard solution. But we have the tools.

Inflation and interest rates have risen to levels not seen in 40 years. Therefore, it is pointless to search for ready-made solutions in recent past – there are none.

That is why pension funds are now faced with an urgent task of determining a prudent, diversified and flexible investment strategy, which can be easily adjusted according to market conditions and their funding levels. Many investors with large exposures to bonds in their pension portfolios may also need to review their asset and liability matching in terms of duration and inflation sensitivity.

However, we must add a word of caution. Even with the most brilliant choice of investments, the most important aspect of reliable pension provision is the long-term funding strategy, based on assumptions reflecting a reasonable degree of prudence. Good investment performance is important but it can rarely compensate for insufficient pension contributions relative to expected benefits.

€143 B

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