

The effectiveness of different asset types as a hedge against inflation

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Rationale

The current period of high inflation makes it difficult for investors to maintain their profitability targets in real terms. Against this background, it is important to analyse the returns on different types of assets recorded in this and past inflationary episodes.

Takeaways

- In the past, both commodities and inflation-linked bonds have generated positive real returns during inflationary periods, while conventional sovereign bonds and general stock market indices have yielded negative real returns.
- In the current inflationary episode energy-related assets have generated the highest returns, while in the United States residential real estate has also performed well.
- In the recent period, both in the euro area and the United States investors have increased their holdings in investment funds specialising in inflation-linked bonds, and have reduced their holdings in conventional bond and equity funds.

Keywords

Inflation hedge, real returns, inflation-linked bonds, commodities, asset allocation.

JEL classification

G11, G13, G15, E31, E44.

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Introduction

The current high inflation environment makes it difficult for investors to maintain their profitability targets in real terms. In particular, portfolios may suffer real value losses as a result of unexpected inflation. Many investors would like to protect themselves against such losses. The impact of inflation on real returns depends on the characteristics of each asset, meaning some assets are better placed to act as a hedge against these risks than others. This article reviews this issue by analysing both the historical evidence and evidence from the current inflationary episode.

The following section discusses, from a conceptual standpoint, how inflation affects the real return on different types of assets. The third section examines the effectiveness of these assets in historical terms as a hedge against rising prices based on the results obtained in Neville et al. (2021). The last section analyses the available evidence from the current inflationary episode on the behaviour of asset prices and of investment flows both in the United States and the euro area.

Relationship between return on assets and inflation

This section discusses how unexpected inflation affects real returns and asset prices. First, real returns on any asset are affected by price level rises as shown below, with the effects being more marked during high inflation periods.

$$\text{Real Return} = \frac{1 + \text{Nominal Return}}{1 + \text{Inflation Rate}} - 1 \quad [1]$$

The nominal return comprises both capital gains or losses as a result of changes in the price of the asset and income obtained during the period under analysis (dividends in the case of shares, coupons in the case of bonds and rent in the case of residential real estate).

$$\text{Nominal Return} = \frac{P_F + \text{Income} - P_I}{P_I} \quad [2]$$

In this equation, P_F is the price of the asset at the end of the period and P_I is its initial price.

The effect of inflation on the real return on assets can be analysed using the conceptual framework of discounted future cash flow models.

The market price of conventional bonds (i.e. most sovereign or corporate bond issues) is equal to the discounted present value of future coupons and the principal.

$$P_0 = \sum_{t=1}^T \frac{\text{Future coupons}_t}{(1+i)^t} + \frac{\text{Principal}}{(1+i)^T} \quad [3]$$

Here, i is the bond's nominal yield and T is its maturity. In these assets, both the coupons and the principal are fixed in nominal terms, which means that these flows decrease in real terms when inflation rises, leading to lower real returns for bondholders. In addition, the nominal price could decline. This also has a negative impact on real returns stemming from nominal capital losses, through an increase in the nominal yield. Indeed, in the case of risk-free bonds, such as higher-rated sovereign debt, the nominal yield includes two components: future expectations of short-term interest rates and the term premium. In an inflationary context the former component will tend to increase, as central banks will normally tighten monetary policy to stabilise inflation. The term premium could also rise if uncertainty about future interest rate and inflation developments heightens.

An unexpected increase in inflation would also have an adverse effect on real returns for holders of corporate bonds. The impact could be magnified if this shock translates into a rise in the corporate risk premium as a result of a possible deterioration in issuers' debt repayment capacity (linked, for example, to an increase in their costs or narrowing profit margins).

In contrast to conventional bonds, inflation-linked bonds' future flows (coupons and principal) are fixed in real terms, which provides a hedge against inflationary surprises. Therefore, the ex post real return on these assets is less sensitive to unanticipated changes in the general price level. Nevertheless, the ex post real return on these assets could still decline if inflation leads to an increase in ex ante real interest rates due to, for instance, central banks having to tighten monetary policy to contain inflation. Ex post real returns would decrease because higher real yields would entail a fall in the price of inflation-linked bonds (PILB). This can be seen in equation [4],¹ where r is the real yield, RFC is the future coupon in real terms and RP is the principal also in real terms.

$$\text{PILB}_0 = \sum_{t=1}^T \frac{\text{RFC}_t}{(1+r)^t} + \frac{\text{RP}_T}{(1+r)^T} \quad [4]$$

In the case of shares, their price according to the dividend discount model is equal to the discounted present value of future dividends.

$$P_0 = \sum_{t=1}^{\infty} \frac{D_t}{(1+i)^t} \quad [5]$$

¹ For more details on the valuation of inflation-linked bonds, see Laatsch and Klein (2005).

In this equation, i is the discount rate, which in this case includes both the risk-free interest rate and a risk premium, and D_t are the dividends. These dividends are not fixed in nominal terms but vary in line with corporate profits. The impact of inflation on the real value of dividends will therefore depend on how this shock affects firms' real profits. If the prices of all goods and wages increase without the economy being adversely affected in real terms, profits and dividends can reasonably be expected to remain virtually unchanged in real terms. However, the inflationary surprise could have negative effects on corporate profits through different channels. First, if inflation drives up production costs and firms are unable to pass this increase through to selling prices, profit margins – and, presumably, dividends – will contract. Second, if inflation reduces household disposable income, firms' turnover could decline. Lastly, if the central bank responds to the shock by raising interest rates, the most indebted firms will see an increase in their financial costs. What's more, the value of shares will fall if the discount rate increases due to an increase in interest rates and/or the risk premium.

Turning to residential real estate, property prices can be expressed as the discounted present value of rents, which are also not fixed in nominal terms, and whose behaviour likewise depends on the performance of the economy. Therefore, the effect of this shock on real house prices will depend on how the economy and, particularly, supply and demand for rental housing are affected.

There is a direct link between commodities and inflation, as in most instances rising commodity prices are one of the main drivers of inflation. Therefore, commodities could, in principle, be a useful asset to hedge against inflation.

As for gold, most studies suggest that this metal is not useful as a hedge against inflation. For example, Erb and Harvey (2013) conclude that gold could be useful for inflation hedging in the very long term, but not for typical investment horizons.

Historical evidence on the return on assets in inflationary periods

In a recent paper, Neville et al. (2021) analysed how real returns on different assets have behaved historically during inflationary periods. Specifically, eight inflationary periods were analysed for the United States between 1926-2020. These periods are defined as those in which the inflation rate was equal to or above 5%. The main findings are presented in Table 1. In particular, real returns² are shown for inflationary and non-inflationary periods, as well as for the sample as a whole, and those periods and assets with positive real returns in inflationary periods are marked in green. In addition, the variable “success rate” and the “t-statistic” are included. The former represents the percentage of inflationary periods with positive real returns and the latter analyses whether the difference in the return on the different assets in real terms significantly varies between inflationary and non-inflationary periods. The oil crisis period in the 1970s is singled out, since it shares some similarities with the current inflationary context.

2 In the case of debt securities and equities the returns include coupons and dividends in addition to capital gains. For residential property, the returns include capital gains only.

Table 1
Returns on different assets in inflationary periods (a)

%

| Asset type | Annualised real returns by period | | | | Success rate | t-statistic |
|-------------------------|-----------------------------------|-----------|--------------|-----|--------------|-------------|
| | 1970s oil crisis | Inflation | No inflation | All | | |
| Equities | -46 | -7 | 10 | 7 | 25 | -4.8 * |
| Energy | -19 | 1 | 8 | 6 | 50 | -1.4 |
| Health | -42 | -1 | 11 | 9 | 38 | -2.2 * |
| Conventional bonds | -12 | -5 | 4 | 2 | 25 | -5.1 * |
| Inflation-linked bonds | 13 | 2 | 3 | 3 | 60 | -0.6 |
| Commodities | 85 | 14 | 1 | 4 | 100 | 3.1 * |
| Energy | 264 | 41 | -1 | 3 | 100 | 1.7 |
| Precious metals | 29 | 11 | -2 | 1 | 80 | 1.7 |
| Industrial | 38 | 19 | 4 | 7 | 80 | 1.7 |
| Residential real estate | -7 | -2 | 2 | 1 | 25 | -5.1 * |

SOURCE: Neville et al. (2021).

a Inflationary periods are defined as those in which the inflation rate was equal to or above 5%, for a sample spanning from 1926 to 2020. The success rate is defined as the percentage of inflationary periods with positive real returns. The t-statistic is calculated for a test analysing whether the returns obtained in inflationary periods are different from those obtained in non-inflationary periods, with asterisks denoting a significance of 90%. Cells in green indicate positive returns in inflationary periods and a success rate greater than or equal to 50%.

The findings show that conventional financial assets, such as ordinary sovereign debt and shares, generated negative real returns in inflationary periods. This is consistent with the analysis in the previous section, which found that unexpected inflation can adversely affect real returns on such assets.

In the case of shares, a sectoral analysis has also been conducted. The table shows the results for the best-performing sectors during inflationary periods (energy and health).³ The energy sector was the only one to obtain positive returns during these periods. However, during the oil crisis of the 1970s the stock market indices for both sectors also recorded very negative real returns. This may be due to operational issues, such as the increase in wage costs, or to firms' hedging strategies, which may have hindered the direct pass-through of the increase in commodity prices to energy companies' corporate profits.

In the case of inflation-linked bonds, the results show that these assets can be useful as a hedge against inflation, as they provide positive real returns during inflationary periods, with a success rate of 60%. During the 1970s oil crisis real returns reached 13%, which could be due to a decline in real yields during that period.

Turning to commodities, as might also be expected these have recorded positive real returns during inflationary episodes, with even higher returns and success rates than those of inflation-

3 The health sector might be less affected by inflation because of its ability to pass cost increases through their product prices thanks, among other reasons, to patents. See "War, Inflation Have Lighter Impact on Healthcare Stocks", Morningstar. <https://www.morningstar.com/articles/1087280/war-inflation-have-lighter-impact-on-healthcare-stocks>

linked bonds. Of these, energy commodities,⁴ industrial commodities⁵ and precious metals⁶ have yielded the highest returns during periods of high inflation.

Lastly, residential real estate has presented negative real returns of around 2% during spells of inflation. This indicates that residential real estate is less suitable as a hedge against inflation than commodities or inflation-linked bonds, although in the past the real returns on these assets have moved less adversely than those on conventional bonds or equities.

In short, the results set out in Table 1 suggest that inflation-linked bonds and commodities are the assets whose returns perform the most favourably during episodes of high inflation.⁷ Nevertheless, investment in commodities involves storage expenses, meaning lower returns net of these costs.

Evidence from the current inflationary episode

Real returns on different assets

Tables 2 and 3 show the real returns⁸ on different assets during the current inflationary episode to date for the United States and the euro area, respectively. In line with Neville et al. (2021), inflationary periods are deemed to begin from the month in which the year-on-year inflation rate reaches 5% or higher. That period begins in May 2021 for the United States and in December 2021 for the euro area. It should be noted that the current period of high inflation is ongoing, and therefore caution is required when comparing these results with those in the previous section, where up to eight full inflationary episodes are analysed.

As the tables show, conventional sovereign bonds have been among the worst-performing asset classes in terms of real returns during the recent period. Meanwhile, equities have also generated highly negative real returns, particularly in the euro area.⁹ In the United States, the health sector stock market index has yielded less negative real returns than the overall index, while in the euro area the opposite is true, with health stocks recording even more negative returns than the overall index.¹⁰

For their part, both energy commodities and energy stocks have generated very high returns, as expected given the soaring energy prices that have characterised this inflationary episode. This

4 These include WTI, Brent and heating oil.

5 These include copper.

6 Gold, silver and platinum.

7 Collectables such as art, wine and stamps also generate positive real returns during inflationary periods, but their low trading volumes rule them out as a viable hedging strategy for institutional investors. In the case of inflation-linked bonds, there is no statistical difference in their real returns between inflationary and non-inflationary periods. This contrasts with other assets such as conventional bonds and shares, whose real returns are lower during inflationary episodes.

8 As in the previous section, returns on fixed income and equity include coupon and dividend payments in addition to capital gains. For residential real estate, the returns comprise capital gains only.

9 This worse performance of euro area equity may partly owe to the analysis timeframe, which for the euro area begins in December 2021, just before the sharp global stock market declines seen in 2022.

10 Possibly related to the greater market power enjoyed by health sector firms in the United States compared with Europe.

Table 2

Returns on different assets in the recent inflationary period: United States

| Index | Asset type | Annualised real returns from May 2021 to September 2022 (%) |
|---|-----------------------------|---|
| S&P 500 TR | Equities | -15.46 |
| S&P 500 Energy TR | Energy | 28.49 |
| S&P 500 Health Care TR | Health | -5.75 |
| Bloomberg US Government 7-10 Year | Conventional bonds | -21.42 |
| IBoxx Treasury Inflation-Linked Index (TRR) | Inflation-linked bonds | -13.96 |
| S&P GS Commodity Index TR | Commodities | 17.16 |
| S&P GS Commodity Energy Index TR | Energy | 35.93 |
| S&P GS Precious Metals Index TR | Precious metals | -21.11 |
| S&P GS Copper Index TR | Industrial | -21.20 |
| US House Prices - S&P Case-Shiller Index | Residential real estate (a) | 8.63 |

SOURCE: Refinitiv Datastream.

a Returns in the residential real estate segment are calculated to July 2022.

Table 3

Returns on different assets in the recent inflationary period: euro area

| Index | Asset type | Annualised real returns from December 2021 to September 2022 (%) |
|---|-----------------------------|--|
| EURO STOXX (TR) | Equities | -23.49 |
| EURO STOXX Energy TR | Energy | 3.99 |
| EURO STOXX Health Care TR | Health | -28.70 |
| Bloomberg Euro-Aggregate Government - 7-10 Year | Sovereign bonds | -38.33 |
| IBoxx Euro Inflation-Linked Index (TRR) | Inflation-linked bonds | -21.07 |
| S&P GS Commodity Index Euro TR | Commodities | 48.08 |
| S&P GS Commodity Energy Index Euro TR | Energy | 80.37 |
| S&P GS Precious Metals Index Euro TR | Precious metals | -11.42 |
| S&P GSCI Industrial Metals Index Euro TR | Industrial | -2.75 |
| Euro area House Price Index (Eurostat) | Residential real estate (a) | -3.06 |

SOURCE: Refinitiv Datastream.

a Returns in the residential real estate segment are calculated to June 2022.

increase in returns is even sharper in Europe, probably due to the price of some energy products (e.g. gas) rising more steeply in European markets and to the appreciation of the US dollar, which appears to have driven up the euro-denominated returns of commodities that are traded globally in dollars. The returns on inflation-linked bonds are negative, albeit far less so than those on conventional bonds. This might be explained both by the fact that the real yields¹¹ on these assets

¹¹ The real yield of an inflation-linked bond is the expected real return for investors who hold these securities until maturity.

were already negative at the outset, particularly in the euro area, and by the increase in these bonds' yields during the period, which has led to a fall in their price.

Precious metals and industrial commodities (copper) have also performed worse than expected, generating negative real returns. In the case of precious metals, one of the factors behind these developments could be the rise in interest rates, which would curb demand for these assets given that they do not generate interest. As for industrial metals, the lower returns may stem from reduced demand owing to concerns regarding economic growth – including the possibility of an economic recession in several areas –, and from the COVID-19 restrictions in China. Lastly, residential real estate in the United States has generated positive real returns in recent times, while in the euro area these returns have been negative, albeit higher than those in other segments (except energy).

In conclusion, the results for the current inflationary period show that the assets yielding the highest real returns are energy commodities, which was also true during the 1970s oil crisis. However, despite outperforming conventional bonds and shares, inflation-linked bonds have generated negative real returns. This was not the case in past inflationary episodes.

Evidence from investment flows

This final section assesses the extent to which the rise in inflation rates in the main developed areas since 2021 (and which in 2022 has resulted in some countries recording their highest levels of inflation since the 1980s) has prompted investors to seek out assets that serve as a hedge against inflation. Specifically, this is done using information on net flows into investment funds that have different investment profiles.

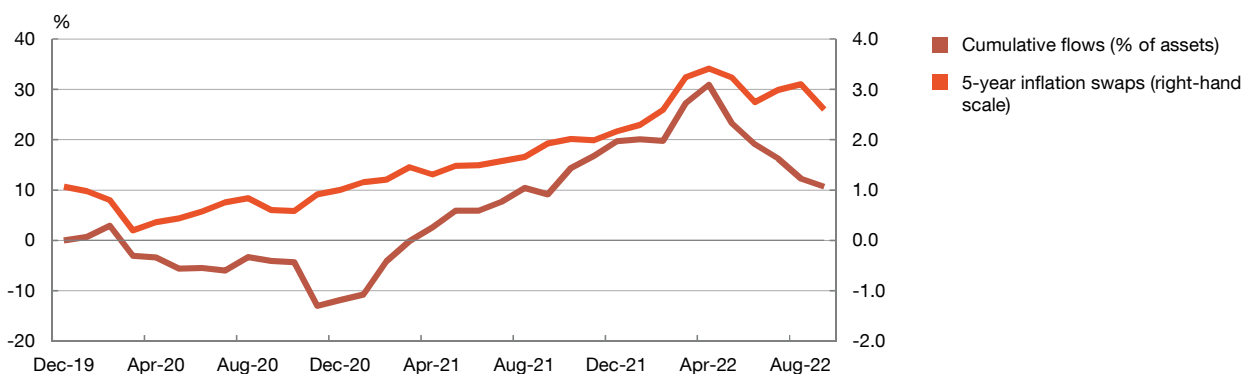
Chart 1 shows cumulative net flows into funds domiciled in any jurisdiction that invest in euro- and dollar-denominated inflation-linked bonds, together with a measure of inflation compensation based on 5-year inflation swap rates. In the case of funds investing in euro area inflation-linked bonds (see Chart 1.1), the flows began to trend upwards in early 2021 and continued to do so until April 2022. These cumulative flows performed similarly to euro area inflation swaps, with investors increasing their holdings of assets that provide inflation hedging as inflation expectations and concerns about upside risks rose. From April 2022, the decline in inflation compensation coincides with capital outflows from these funds.

As Chart 1.2 shows, in the United States investors have also increased their positions in funds that invest in dollar-denominated inflation-linked bonds, again with a strong correlation between the cumulative flows and inflation compensation. Notably, flows began to recover sooner in the United States (starting in May 2020), possibly because inflation became a concern in the United States earlier than in the euro area, which also makes sense given the different inflation dynamics and expectations in the two areas. As in the euro area, outflows are observed from April 2022, which would be in line with a drop in long-term inflation compensation due to the monetary policy tightening and expectations of a downturn in activity.

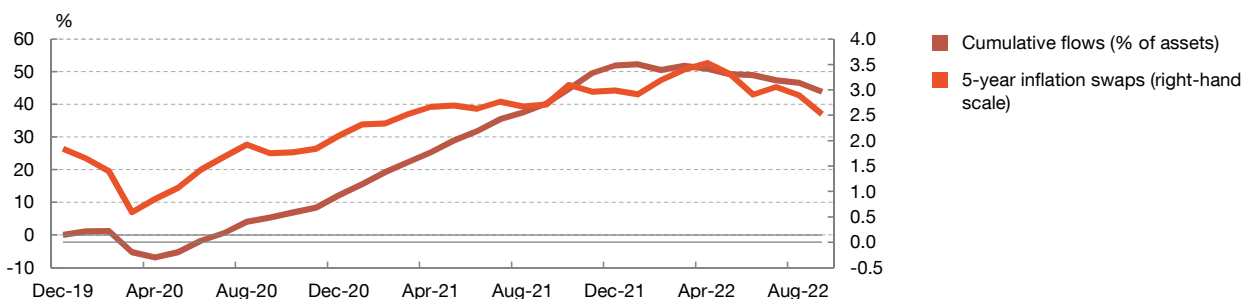
Chart 1

Investors have increased their holdings in inflation-linked bond funds

1.a Euro area: euro-denominated inflation-linked bond funds vs inflation swap



1.b United States: dollar-denominated inflation-linked bond funds vs inflation swap



SOURCE: Refinitiv Datastream.



Chart 2 sets out the cumulative flows into investment funds domiciled in the euro area and in the United States that have portfolios specialising in energy sector assets,¹² precious metals, shares and conventional bonds. The aim is to determine whether investors have increased their holdings in other funds that might also serve as assets to hedge against inflation, and to compare these movements with flows into funds that, in principle, are more exposed to inflation risk (shares and conventional bonds).

Chart 2.1 sets out the cumulative flows into euro area-domiciled funds, showing that these have increased somewhat since early 2022 for funds specialising in energy and in precious metals. However, in both cases this trend extends back to 2020, when upside inflation risk was not a matter of concern.

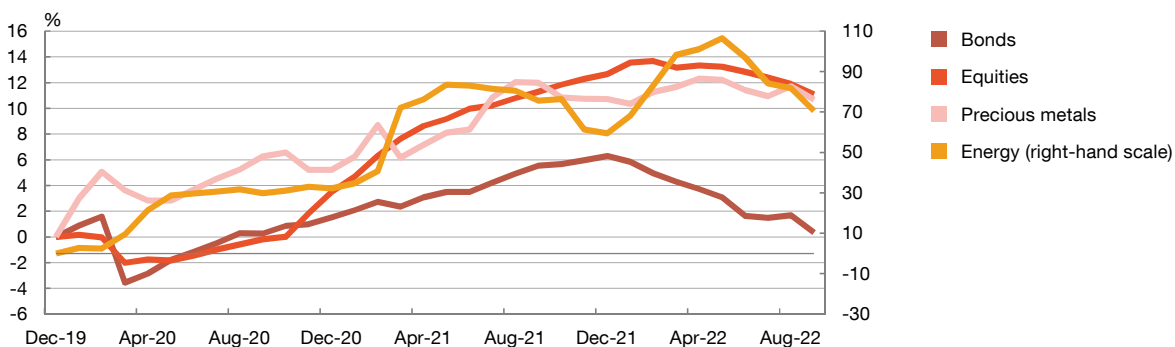
In the case of funds specialising in conventional bonds, outflows are observed from early 2022, which would be consistent with the expectations of a faster withdrawal of central banks' monetary

¹² The funds analysed include those that invest directly in this type of commodity, and those that invest in the shares of firms in these sectors.

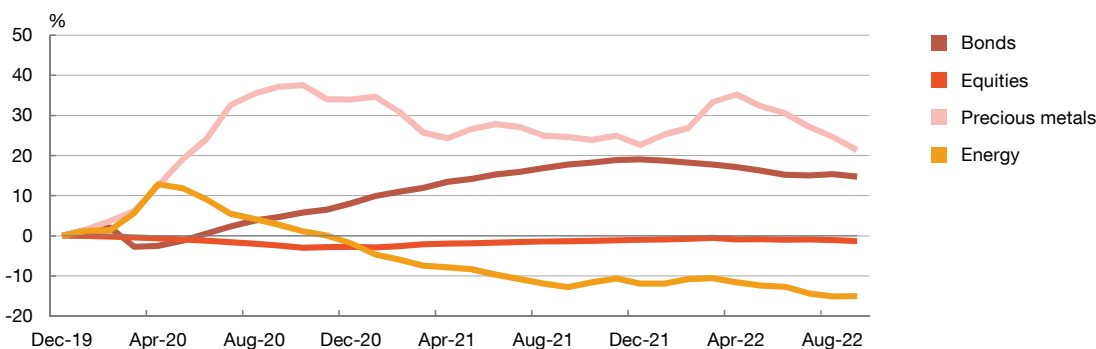
Chart 2

Recent capital outflows from fixed-income and equity investment funds

2.a Funds domiciled in the euro area. Cumulative flows



2.b Funds domiciled in the United States. Cumulative flows



SOURCE: Refinitiv Datastream.



stimuli and with the inflationary risks, which reduce the real returns on these assets. Funds that invest in equity securities have also shown negative flows in recent months, although for a far more moderate amount relative to the value of the portfolio. This would be consistent with the less favourable environment for investing in shares, amid a tightening of monetary policy and heightened economic uncertainty due to factors such as the war in Ukraine, the COVID-19 restrictions in China and high inflation rates.

Chart 2.2. sets out the same information for funds domiciled in the United States. In the recent period, funds investing in conventional bonds and shares have performed similarly to their euro area counterparts, recording outflows in 2022 (very small in the case of equity funds). For their part, investment funds specialising in energy assets show that net flows have been trending downwards since May 2020. Meanwhile, inflows into precious metal funds were up considerably between end-2021 and May 2022, although it is difficult to determine whether this owes to risk aversion or to the search for hedging against inflation. In fact, these funds received very significant inflows during the COVID-19 crisis in what represents a clear flight to safety. The same appears to have happened up to May of this year. Thus, the outflows in recent months may be due to lower

demand for inflation hedges, in line with the pattern observed for inflation-linked bonds, or by the lower risk aversion observed in the financial markets during much of the summer period, particularly in July.

In short, the evidence from net capital flows into investment funds indicates that inflation-linked bond funds have been used as a hedge against inflation, while conventional bond funds have experienced net outflows due to monetary policy tightening and inflationary risks. However, there is no evidence to suggest that the net flows recorded by the other fund classes have been conditioned by the increase in price levels.

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