

Portfolio Insights

Asset Allocation: Finding the Right Balance for Your Portfolio

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Table of contents.

Table of contents.

Executive Summary **03**

Introduction: Which allocation, and when? **05**

I. Performance in various economic regimes **06**

A. A static allocation is not an optimal solution **07**

B. Rising inflation **09**

C. Falling inflation **11**

D. Rising Fed Fund rates **13**

E. During the two years preceding the onset of a recession **15**

F. Equity/ bond correlation regimes **17**

II. Optimising portfolio diversification in the various regimes **19**

A. Inflation regimes **20**

B. Rising Fed Funds rates **25**

C. Recession periods **27**

D. Equity/bond correlation regimes **29**

Conclusion : A matter of agility **31**

Notes and references **32**

Appendices **33**

Periods of rising Fed Fund rates **33**

Periods of recession **34**

Executive Summary.

This white paper explores the performance of several balanced portfolio allocations in various economic environments and provides insights into the impact of asset allocation on portfolio performance.

In the first part of the article, we analyze the performance of two portfolios over a long period: the Balanced Portfolio (50% equities, 50% bonds) and the All-Weather Portfolio (25% equities, 25% bonds, 25% gold, 25% cash).

We make the following observations:

- The performance of both portfolios fluctuates significantly over time, making it difficult to determine which portfolio performs better.
- The All-Weather Portfolio tends to outperform during periods of rising inflation, while the Balanced Portfolio outperforms during periods of decreasing inflation.
- When interest rates increase sharply, the real performance of the Balanced Portfolio tends to be negative.
- The performance of the Balanced Portfolio tends to be relatively weak during the two years prior to an economic recession, and to improve significantly in the subsequent period when economic stimulus measures are implemented.
- Correlations between assets also affect portfolio performance. The Balanced Portfolio's performance is better when the equity/ bond correlation is positive, while the All-Weather Portfolio seems to be less sensitive to this correlation effect.

We conclude that maintaining a static allocation over a long period of time is not an optimal solution to navigate the various environments.

In the second part of the article, the focus shifts to regime-based optimal allocations. We introduce additional asset classes such as international equities and bonds, equity sectors and styles, alternative assets and real assets. The analysis aims to construct better-diversified portfolios to navigate the different economic regimes of the past 50 years.

We observe that:

- Introducing alternative assets, and particularly quantitative strategies (CTAs), systematically improves the performance of equity/ bond portfolios.
- Different asset classes contribute to enhancing portfolio returns and risk diversification during specific occasions. Therefore, it is interesting to:
 - overweight equities in falling inflation periods;
 - overweight the equity exposure to energy and utilities in periods of rising Fed Fund rates, and invest in international equities (Japan, emerging markets);
 - invest in real assets and international equities, and overweight exposure to defensive sectors, in the two years before the start of a recession.

While past performance is not indicative of future returns, the past can provide insights to define the optimal allocation in different macroeconomic regimes. **Overall, our study emphasizes the impact of economic environments, inflation regimes, interest rate changes, asset correlations, and diversification on building optimal portfolios.** Its findings provide valuable insights for investors seeking to optimize portfolio performance and navigate various market conditions.



Introduction:

Which allocation, and when?

Asset allocation is a paramount step in portfolio construction. The investor, faced with a multitude of possible asset classes and investment strategies, must answer several questions:

- which asset will produce the best return?
- what is the best allocation for the portfolio?
- what is the optimal level of diversification within each asset class?

Any investor, even a beginner, quickly understands, sometimes in an unpleasant way, that **no fixed optimal allocation can offer the best returns in all market phases, or in all economic regimes**. Our study aims to illustrate this clearly and factually with long-term data (since 1950).

The first part of our study compares the performance of two portfolios in different economic regimes: the All-Weather portfolio (25% equities, 25% bonds, 25% gold, 25% cash) and the Balanced Portfolio (50% equities, 50% bonds).

Besides, the number 1 rule of any investor is to diversify. **Improving a portfolio's return/ risk profile over a long time period requires to diversify its sources of return by introducing new asset classes** (international equities and bonds, credit, real and alternative assets) **or under/overweighting certain styles** (growth vs value) **and/or sectors** (defensive or cyclical).

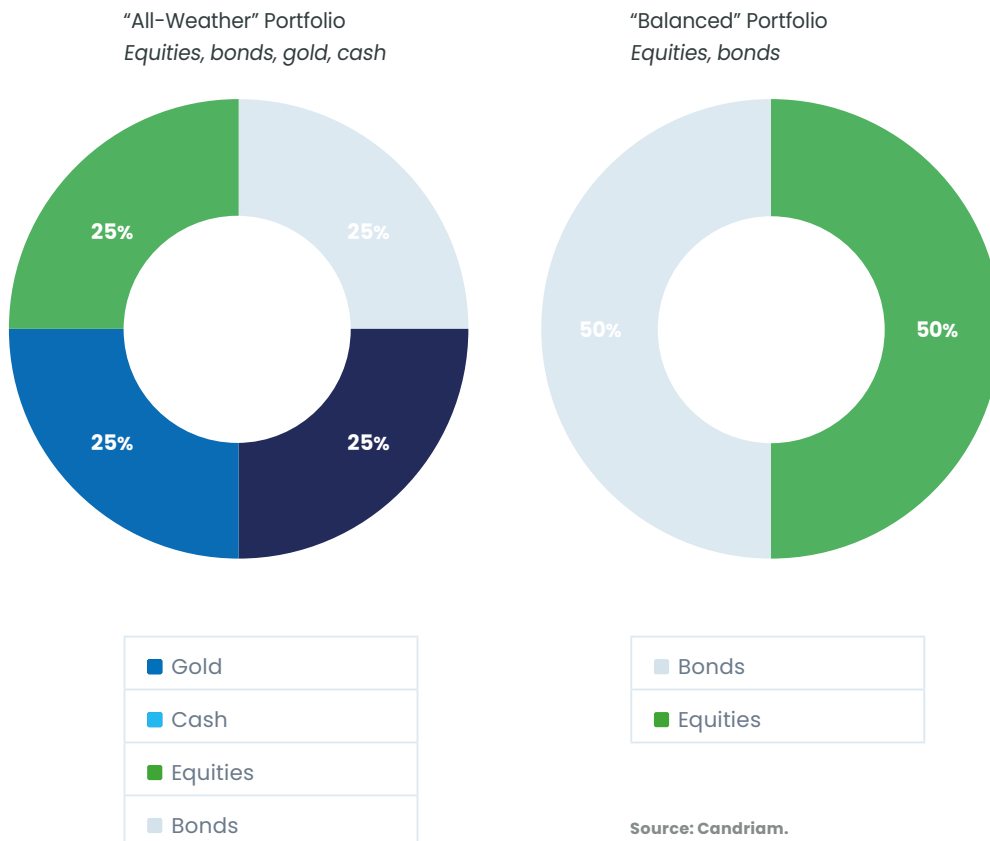
In the second part of our study, we compute ex-post the optimal allocations in Markowitz¹ theory in particular macroeconomic regimes (inflation, recession) or in certain market phases (such as significant increases in key interest rates), in order to quantify how allocations vary from one period to the other, and to exhibit the added value of introducing new asset classes, one at a time, on portfolio returns or risk diversification.

¹ Harry Markowitz developed the Modern Portfolio Theory in 1952, an investment theory whose key component is diversification (source : Investopedia).

I. Performance in various economic regimes

The performance of a multi-asset portfolio depends not only on the performance of its components, but also on the amount of capital allocated to each asset. It seems rather intuitive that a portfolio maintaining a static allocation over time will not consistently deliver optimal performance in the various market situations. We will illustrate this in the first part of the paper. To show the impact of the various regimes on the performance of a multi-asset portfolio, we analyze two portfolios:

- 1: The **“All-Weather” Portfolio**, consisting of 25% equities, 25% bonds, 25% gold and 25% cash;
- 2: The **“Balanced” Portfolio**, consisting of 50% stocks and 50% bonds.



Besides, for each profile we have built two portfolios: one invested in US assets, the other in European assets, allowing to account for a « regional » effect in our analysis.

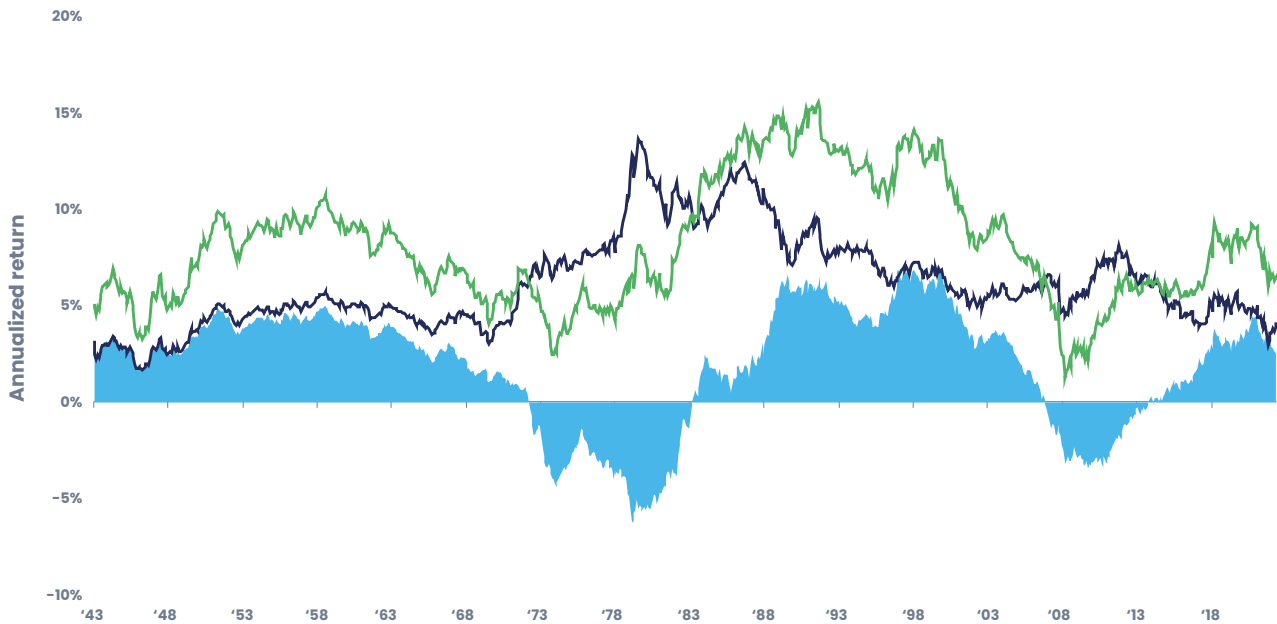
A. A static allocation is not an optimal solution

The following two graphs show that the 10-year returns of both portfolios (All-Weather and Balanced) fluctuate significantly over time. It is even difficult to determine whether the return of one portfolio is better than the other, as the performance of the Balanced Portfolio is sometimes higher and sometimes lower than that of the All-Weather Portfolio. These findings hold true for both regions.

Figure 1:

10-year rolling returns of the All-Weather and Balanced Portfolios, US and Europe

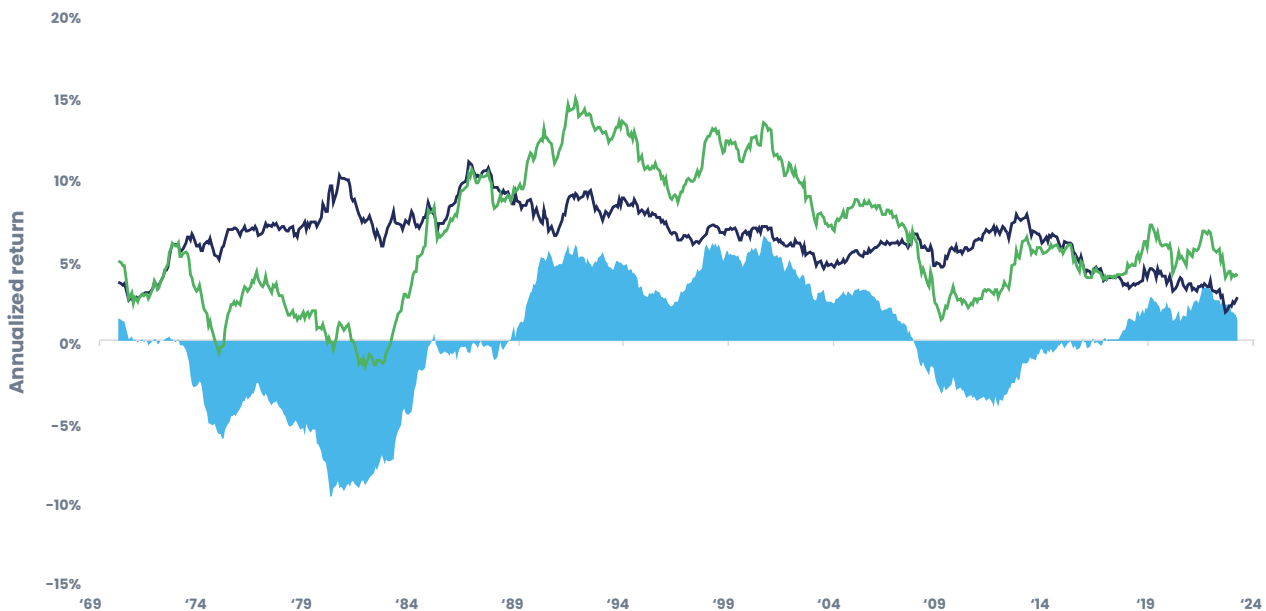
US



■ US 50/50
■ All-Weather (US)
■ Diff



Europe



■	EU 50/50
■	All-Weather (EU)
■	Diff

Past performance of a given financial instrument or index or an investment service or strategy, or simulations of past performance, or forecasts of future performance does not predict future returns.

Source: Candriam.

The performance of the All-Weather and the Balanced Portfolios vary over time. Depending on the period, one is better than the other. A static portfolio is thus not the best solution over a long period of time.

If the portfolio allocation needs to be adjusted over time, how does the portfolio react in particular environments, such as inflation regimes, Equity/ bond correlation regimes, rising interest rates, recessions? Let's analyze the behavior of the two portfolios in these situations.

B. Rising inflation

We have identified three major periods of time in the US and Europe, during which inflation behaved very differently:

- 1) A period of strong rise in inflation (rising inflation) in the 1970s,
- 2) A period of significant decline in inflation (falling inflation) in the 1980s,
- 3) A period of low inflation (lowflation) from the late 1990s to 2019.

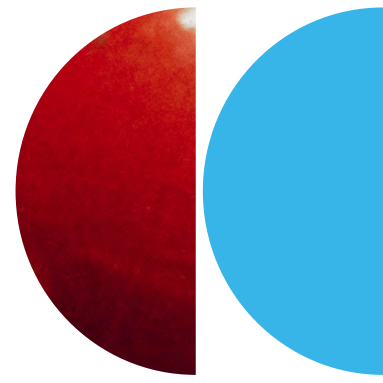
In the following charts, we observe that the performance of the All-Weather Portfolios improves when inflation increases and, conversely, deteriorates when inflation decreases, notably in the US. This can be explained by the strong relationship between the All-Weather Portfolio and inflation, which is quantified by the coefficient of determination (R^2) of the linear regression displayed on the two graphs, 79% for the US and 71% for the EU region. The closer this coefficient is to 100%, the better the quality of the regression.

Figure 2:

5-year rolling returns of the All-Weather Portfolio in the various inflation periods, US and Europe

US





Europe



Past performance of a given financial instrument or index or an investment service or strategy, or simulations of past performance, or forecasts of future performance does not predict future returns.

Source: Candriam.

The All-Weather Portfolio tends to perform better during periods of rising inflation.

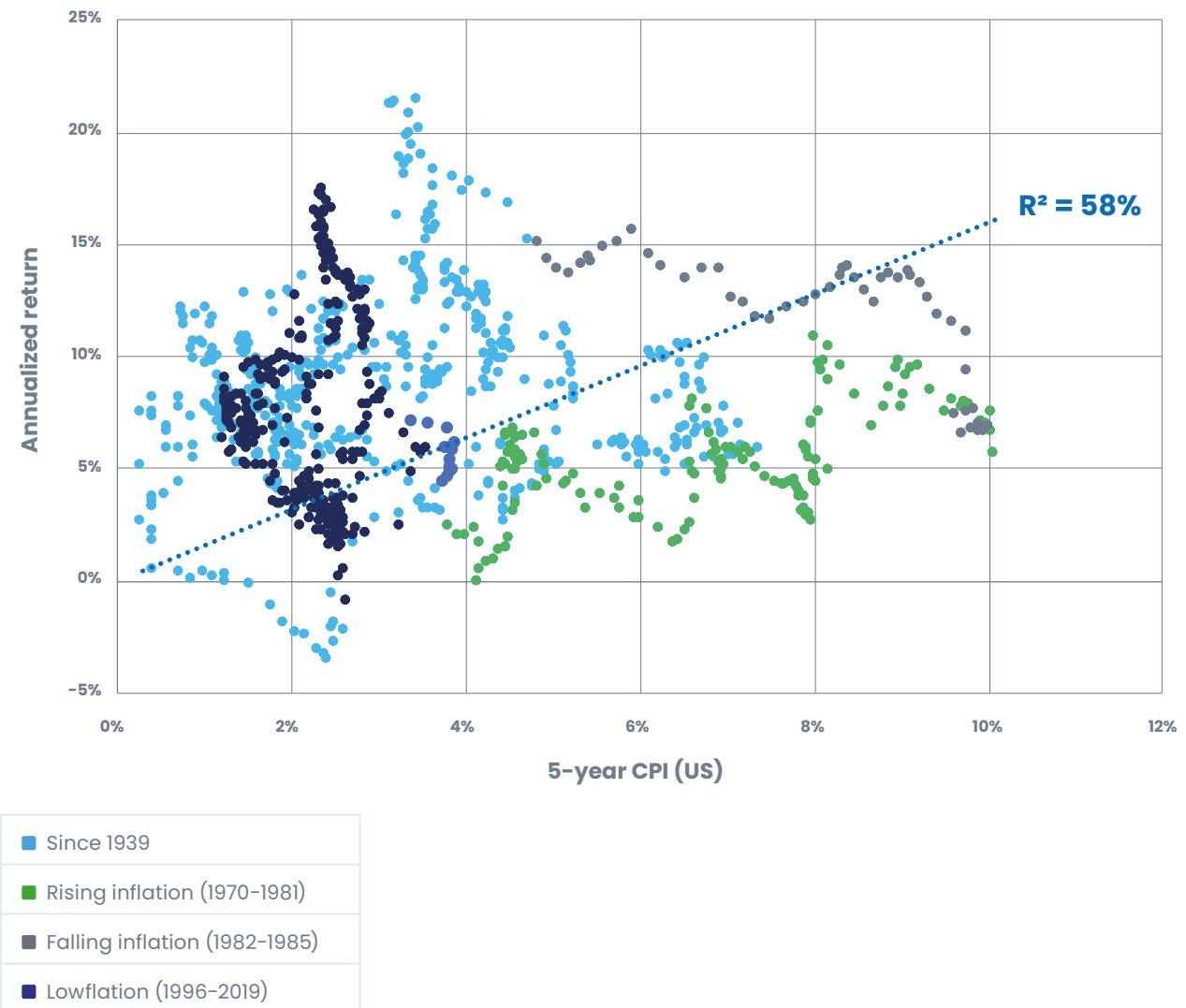
C. Falling inflation

After a similar analysis on the balanced portfolios, we observe that the relationship with inflation is statistically less significant, as we obtain a coefficient of determination (R^2) of 58% for the US and only 24% for the EU region. However, the performance of the two Balanced Portfolios is much better than that of the All-Weather Portfolios when inflation decreases.

Figure 3:

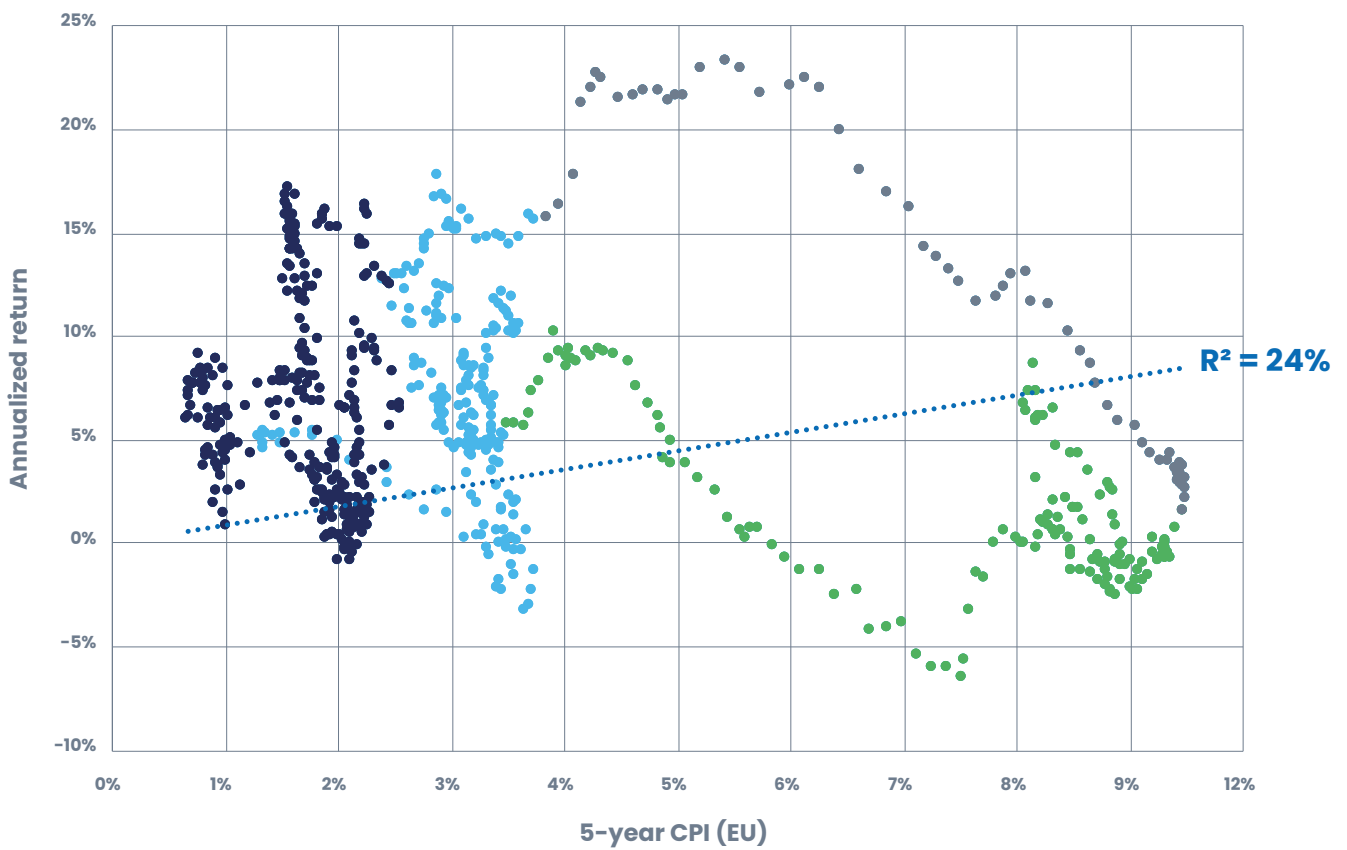
5-year rolling returns of the Balanced Portfolio in the various inflation periods, US and Europe

US





Europe



■ Since 1965
■ Lowflation (1997-2019)
■ Rising inflation (1971-1982)
■ Falling inflation (1983-1987)

Past performance of a given financial instrument or index or an investment service or strategy, or simulations of past performance, or forecasts of future performance does not predict future returns.

Source: Candriam.

The Balanced Portfolio tends to perform better in periods of falling inflation

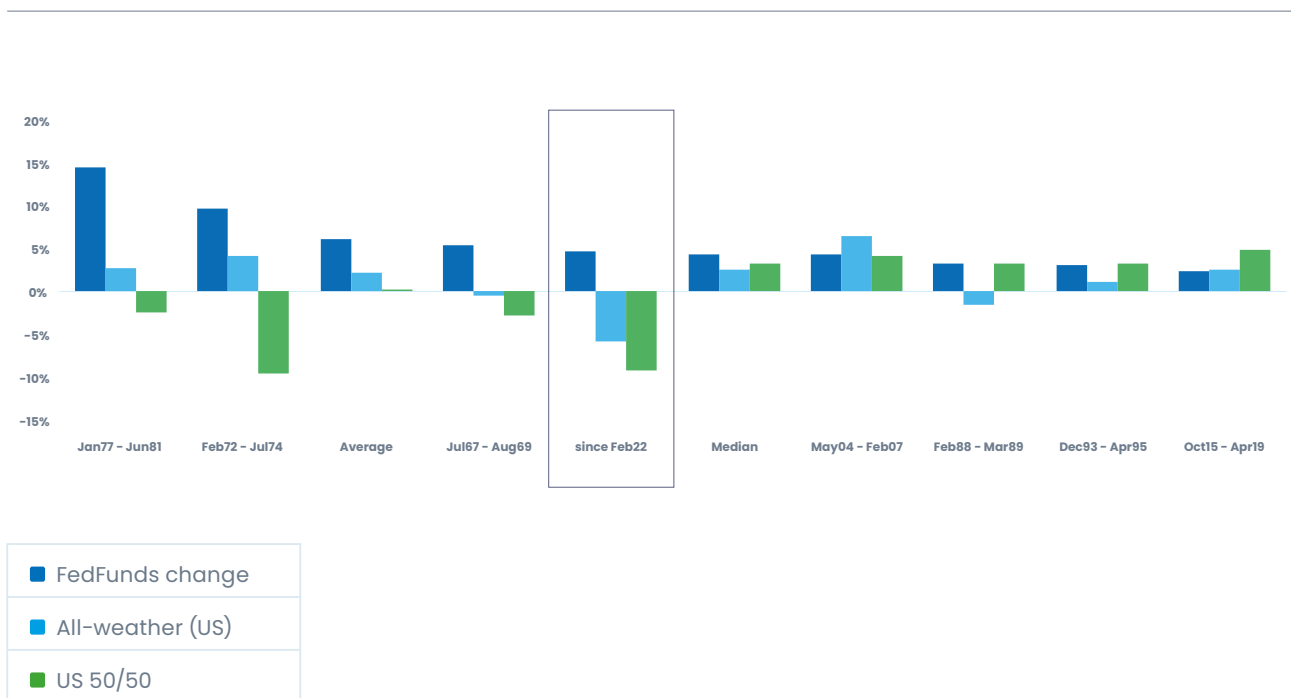
D. Rising Fed Fund rates

One way to measure the performance of an asset or a portfolio relative to inflation is by calculating its real return. This involves subtracting the observed inflation performance over the same period from the nominal performance. In the current context of high inflation and central banks' interest rate hikes, it is interesting to see how the All-Weather and Balanced Portfolios have performed in such an environment in the past.

Figure 4 below displays periods characterized by significant increases in US Fed Funds rates, ranked from the strongest increase to the weakest. When the increase over the period remains below 4.3%, the real return of the All-Weather and Balanced Portfolios are almost always positive. Conversely, when the rate hikes exceed 4.3%, only the All-Weather Portfolio exhibits positive to slightly negative real returns, while the real returns of the Balanced Portfolio are negative to highly negative.

Figure 4:

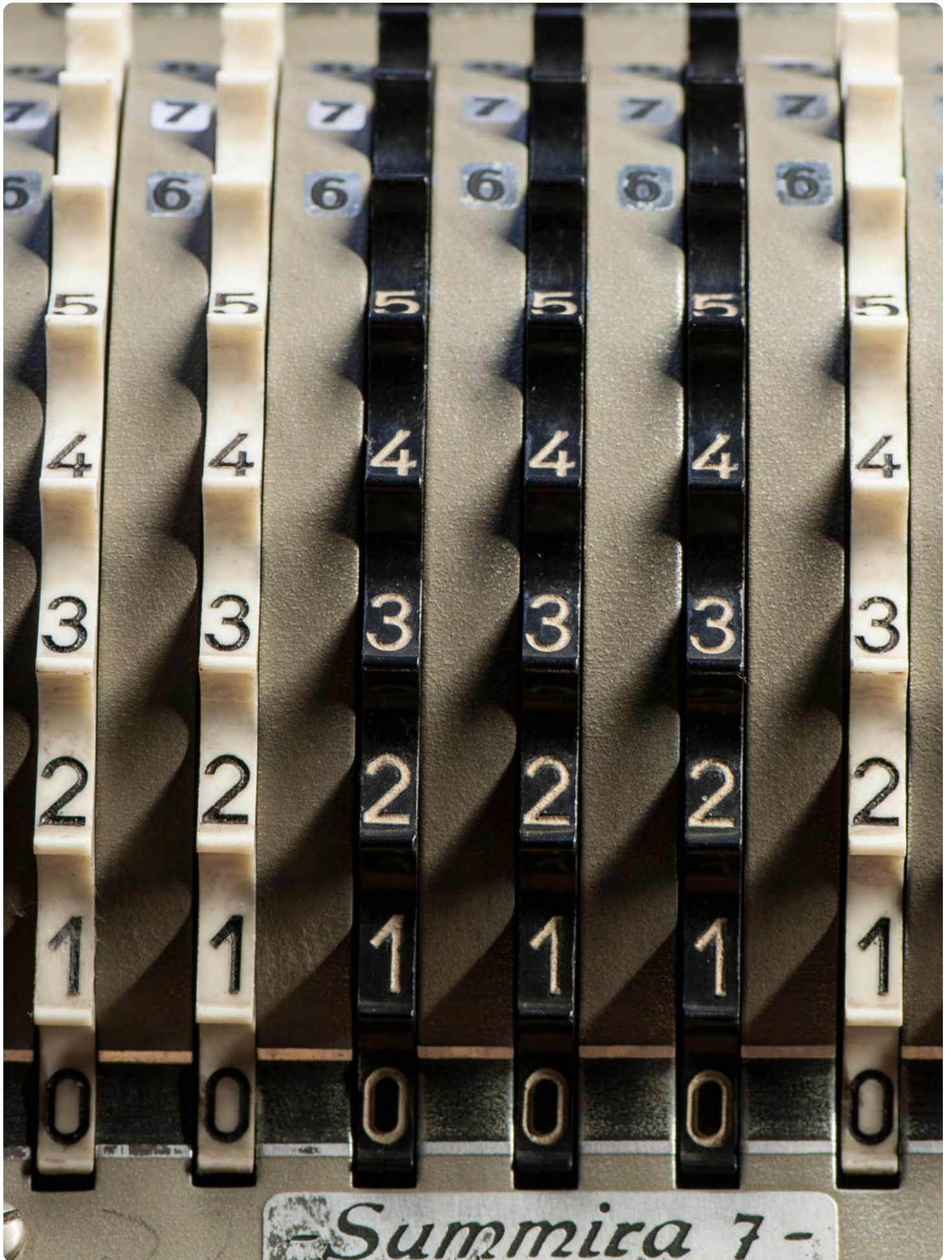
Annualized returns of the US All-Weather and Balanced Portfolios in the periods of rising Fed Fund rates since 1960



Past performance of a given financial instrument or index or an investment service or strategy, or simulations of past performance, or forecasts of future performance does not predict future returns.

Source: Candriam.

In case of a sharp increase in interest rates, the Balanced Portfolio tends to have negative real returns.



E. Two years prior to the start of a recession

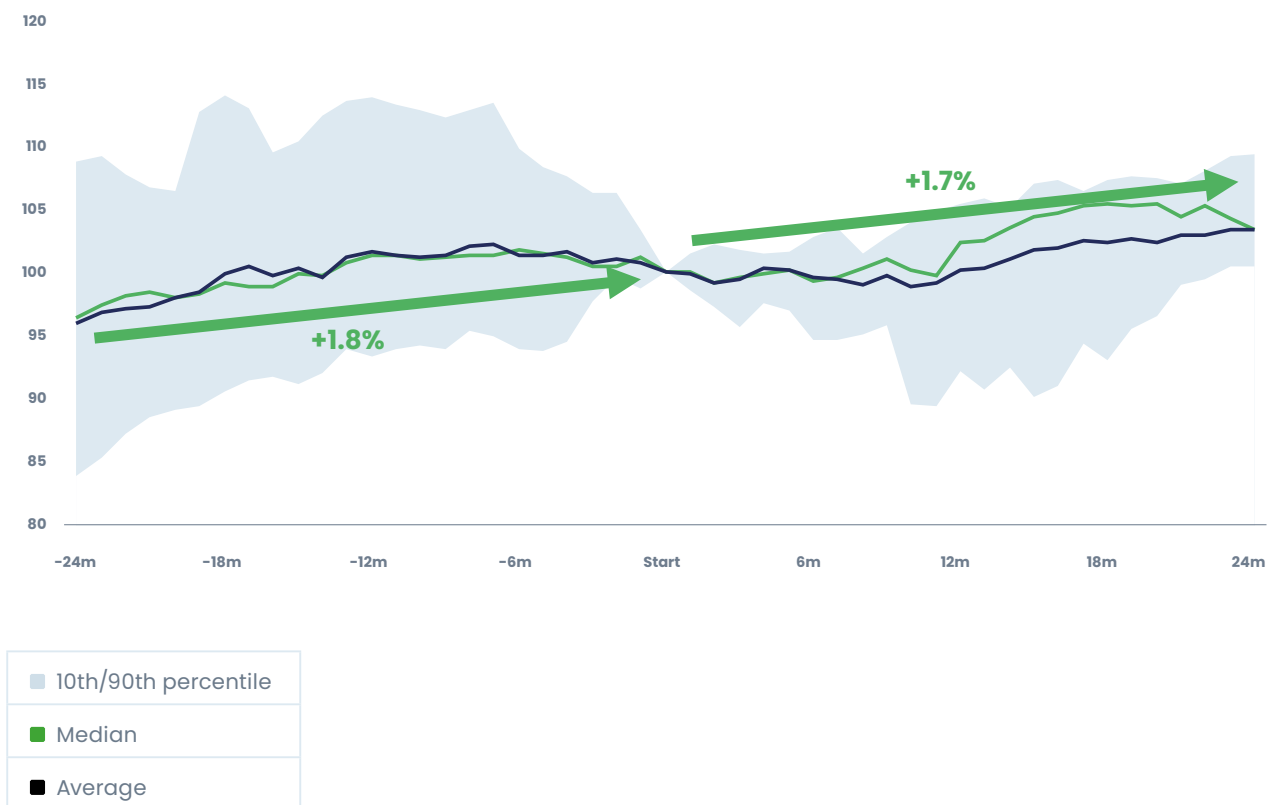
Economic recessions generally impact portfolio performance significantly. When studying the economic recessions in the United States documented by the NBER (totaling 11 since 1950), we observe that the excess return over the risk-free rate of the Balanced Portfolio is slightly positive (+0.8%) over the two years preceding the start of the recession (median annualized return excluding the 2020 recession).

Furthermore, while the excess return over the risk-free rate of both portfolios is almost zero during the 6 to 12 months following the onset of the recession, as economic stimulus measures are being put in place (for example a significant reduction in short-term interest rates), the excess return over the risk-free rate improves significantly thereafter, with a +6.8% return for the Balanced Portfolio (median annualized return calculated over the two years following the start of the recession, excluding the 2020 recession).

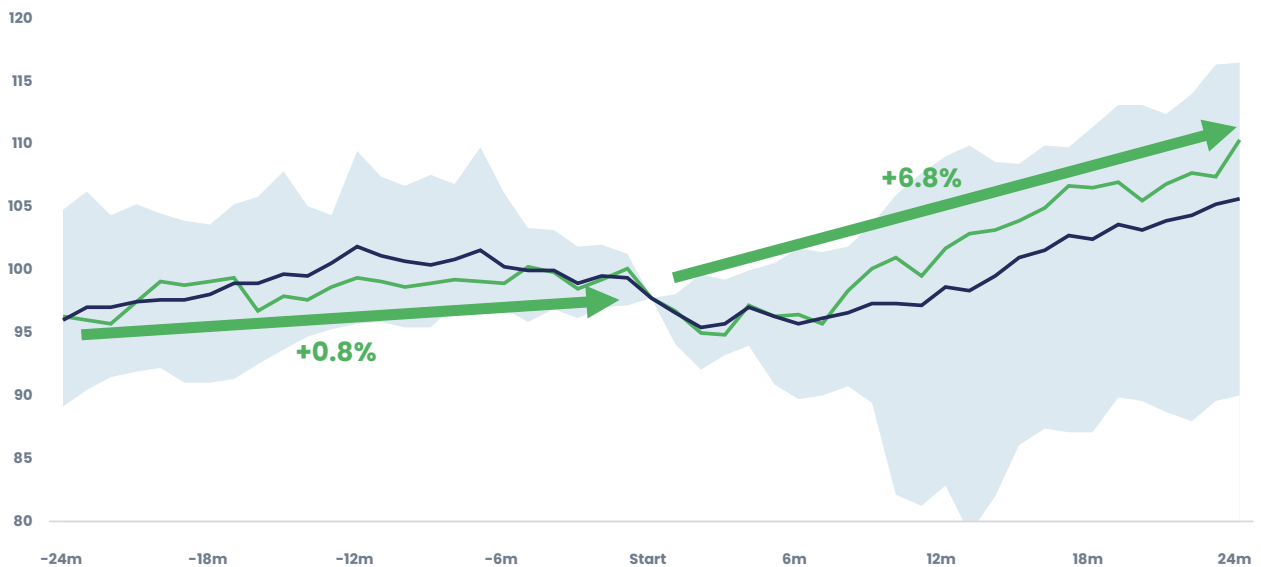
Figure 5:

Annualized excess returns over the risk-free rate of the US All-Weather and Balanced Portfolios, two years before and after the onset of recessions

'US All-Weather' Portfolio



'US 50/50' Portfolio



■ 10th/90th percentile
■ Median
■ Average

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Source: Candriam.

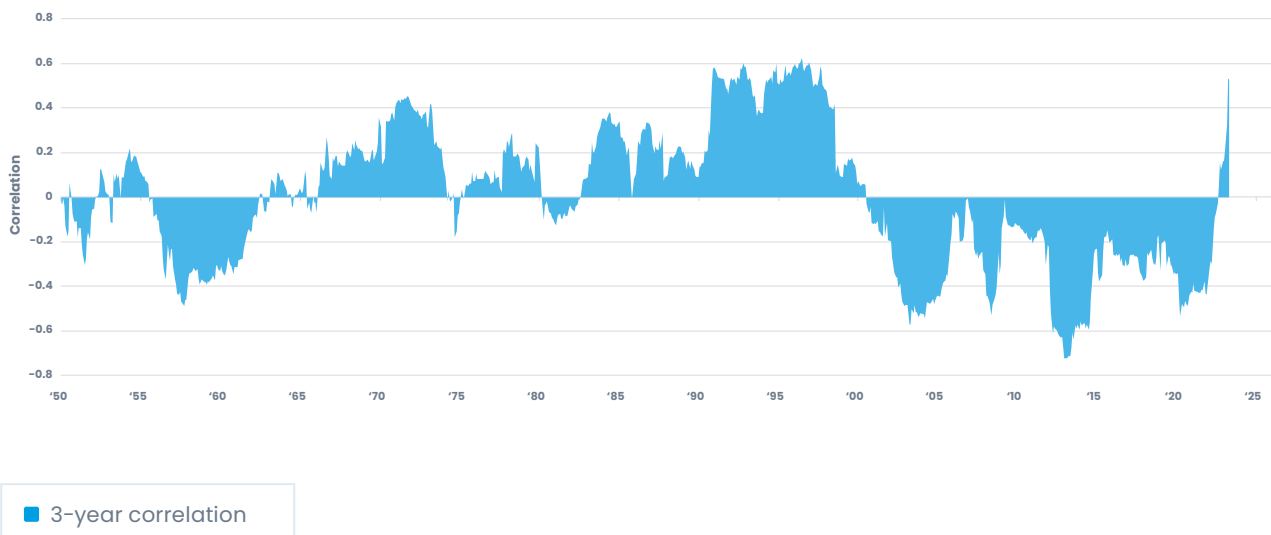
During the two years preceding the onset of a recession, the performance of the Balanced Portfolio tends to be very low.

F. Equity/ bond correlation regimes

The performance of a multi-asset portfolio can also be sensitive to "less visible" factors such as the correlation between assets. The graph below shows the correlation between US equities and bonds, calculated over a rolling 3-year period. We observe that this correlation is not stable over time: it was positive from the mid-1960s to the late 1990s (with rare periods of slight negativity), before turning negative until a few months ago (August 2022). This correlation can also reach very high positive (above 50%) or negative (below -50%) levels.

Figure 6:

Evolution of the 3-year rolling US equity/ bond correlation



Source: Candriam.



When calculating the nominal and real returns of the All-Weather and Balanced Portfolios based on the sign of the correlation, we observe that the distribution of 3-year returns of the All-Weather Portfolio does not appear to be very sensitive to the sign of the equity/ bond correlation: the median nominal return (resp. real) is 5.1% (resp. 2.8%) when the correlation is negative, versus 6.4% (resp. 2.7%) when it is positive. In contrast, the distribution of returns of the Balanced Portfolio is much more impacted by the sign of this correlation: the median nominal (resp. real) return is +7.3% (resp. +4.5%) in negative correlation periods, and +9.7% (resp. +6.0%) when the correlation is positive.

Figure 7:

3-year nominal and real returns of the All-Weather and Balanced Portfolios in periods of positive and negative correlation

All-Weather Portfolio

3-year nominal return		
All-Weather (US)	3-year correlation	
	Negative	Positive
10th percentile	2.3%	3.5%
90th percentile	10.7%	11.6%
Median	5.1%	6.4%
Average	6.0%	6.9%

3-year real return		
All-Weather (US)	3-year correlation	
	Negative	Positive
10th percentile	-0.1%	-1.3%
90th percentile	6.8%	6.7%
Median	2.8%	2.7%
Average	3.0%	2.7%

Balanced Portfolio

3-year nominal return		
US 50/50	3-year correlation	
	Negative	Positive
10th percentile	0.2%	3.5%
90th percentile	11.3%	17.3%
Median	7.3%	9.7%
Average	6.7%	9.9%

3-year real return		
US 50/50	3-year correlation	
	Negative	Positive
10th percentile	-3.0%	-2.6%
90th percentile	8.9%	14.1%
Median	4.5%	6.0%
Average	3.8%	5.6%

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Source: Candriam.

The performance of the Balanced Portfolio tends to be higher when the equity/ bond correlation is positive.

The distribution of 3-year returns of the All-Weather Portfolio seems not to be very sensitive to the sign of equity/bond correlation. The returns of the Balanced Portfolio are much more impacted by the sign of this correlation.

II. Optimising portfolio diversification in the various regimes

In the previous section, we discussed how some environments and/or economic factors may significantly affect the nominal and real performance of a multi-asset portfolio – which confirms the necessity to adjust the portfolio allocation according to the regime.

In this second section, we consider the benefits of diversifying a basic equity/ bond portfolios by introducing other asset classes (commodities, international equities, equity styles and sectors) with the aim to better navigate the various crises of the past 50 years. For each of the environments presented in the first section, we calculate ex-post the optimal allocation in the Markowitz sense, with the aim of quantifying the changes in allocation from one period to another, and to highlight the added value of each new asset class in terms of new sources of returns or risk diversification.

While some allocations may not be practically implemented, as we have not imposed diversification constraints and can have an optimal allocation with 100% invested in a single asset, the purpose of this exercise is twofold: to show the evolution of the portfolio based on macroeconomic regimes, and to see if certain assets are specifically allocated in some particular regimes.

We tested the contribution of the following asset classes (we used historical data since 1950 unless explicitly mentioned):

- **Real assets:** gold, commodities (1960), real estate stocks, infrastructure;
- **International equities:** Japan (Topix), emerging markets, Germany (DAX - 1959), UK (FTSE 100 - 1962);
- **International bonds:** German government bonds (1960), UK government bonds (1960), and Japanese government bonds (1974);
- **Credit bonds:** US corporate bonds, US high-yield bonds (1983), emerging market bonds (1994);
- **US equity styles:** *value, growth, cyclical, defensive*;
- **US sector equities;**
- **Alternative assets:** CTAs, hedge fund strategies (1990), listed Private Equity (1994).

A. Inflation regimes

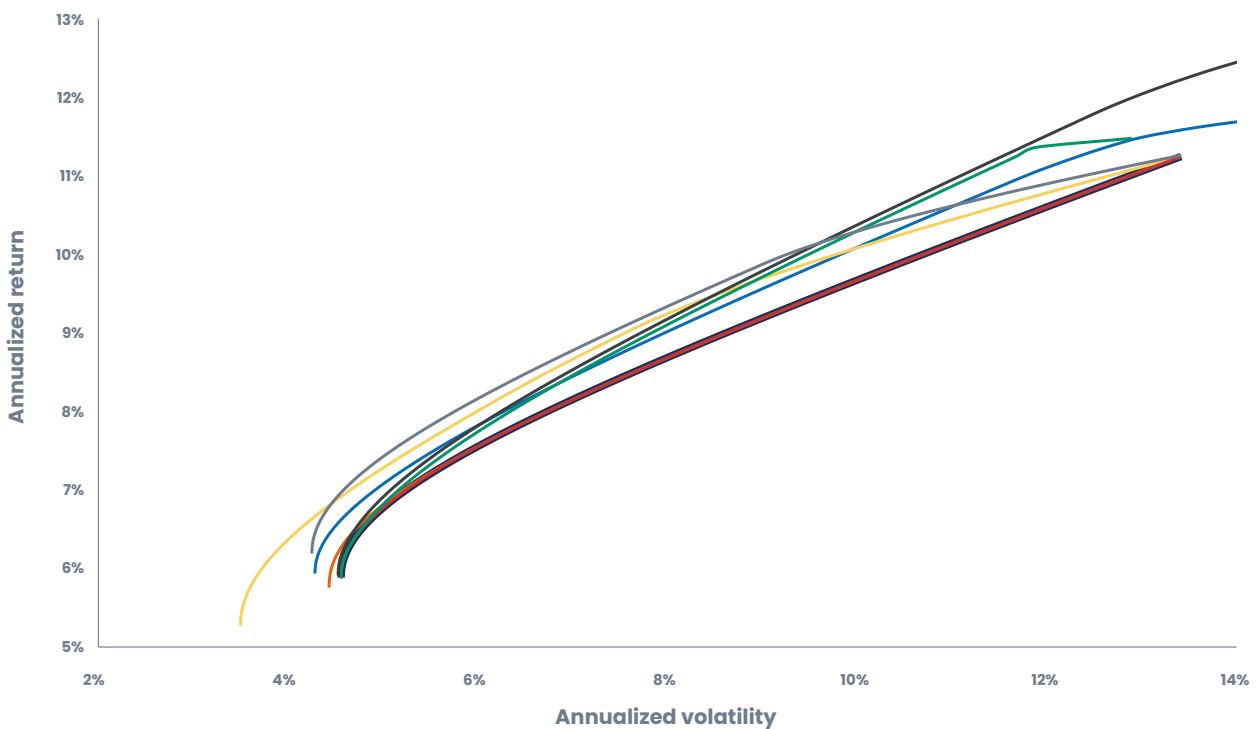
We consider the case of an investor aiming to maximize the portfolio return above the inflation observed in the USA. The optimal allocations are calculated using the Markowitz method, by maximizing the portfolio's real rate of return while minimizing its real volatility. All the data for the various optimizations (returns, volatility, correlation matrices) are calculated based on historical monthly returns.

Before examining the various inflation regimes in detail, we used the entire history of data to calculate efficient frontiers resulting from the addition of each new asset class to the initial US equity/ bond portfolio (50/50). Figure 8 shows that the majority of new asset classes contribute to improving the nominal performance of the initial equity/ bond portfolio: the efficient frontiers are all positioned above that of the "US Equity & Bond" portfolio.

In particular, it can be observed that for a portfolio volatility below 10%, the efficient frontier with alternative assets is positioned above the other lines, while for a portfolio volatility superior to 10%, it is the efficient frontier with equity sectors that is above the others.

Figure 8:

Efficient frontiers, initial equity/ bond portfolio with introduction of various asset classes, 1950-2022



■ US Equity & Bond	■ + Credit
■ + Real Assets	■ + Equity Style
■ + International Equities	■ + Equity Sectors
■ + International Bonds	■ + AlternativeAssets

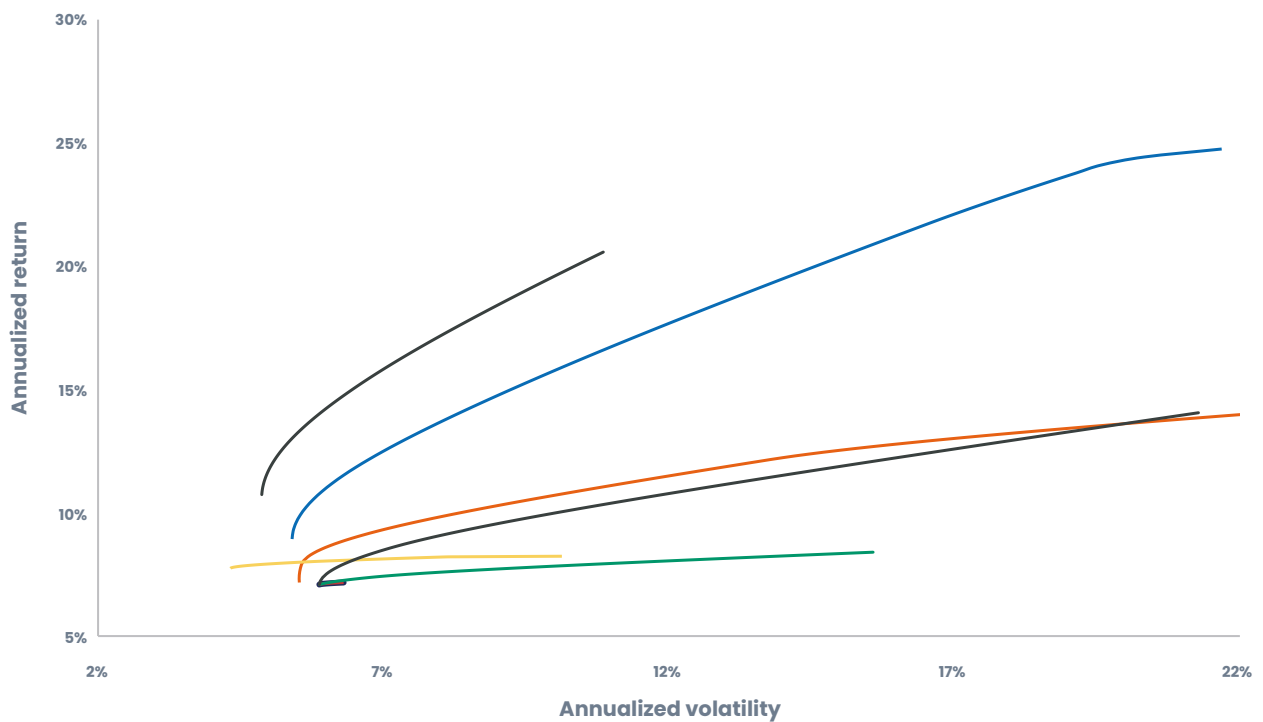
Past performance of a given financial instrument or index or an investment service or strategy, or simulations of past performance, or forecasts of future performance does not predict future returns.

Source: Candriam.

Introducing alternative assets improves the equity/ bond portfolio performance.

Zooming in on the period 1970–1981, a period of rising inflation, we observe that the introduction of real and alternative assets into an equity/ bond portfolio significantly improves its nominal performance. In figure 9, the efficient frontiers including alternative assets and real assets are positioned well above the other curves.

Figure 9:
Efficient frontiers, rising inflation period, 1970–1981



■ US Equity & Bond	■ + Credit
■ + Real Assets	■ + Equity Style
■ + International Equities	■ + Equity Sectors
■ + International Bonds	■ + AlternativeAssets

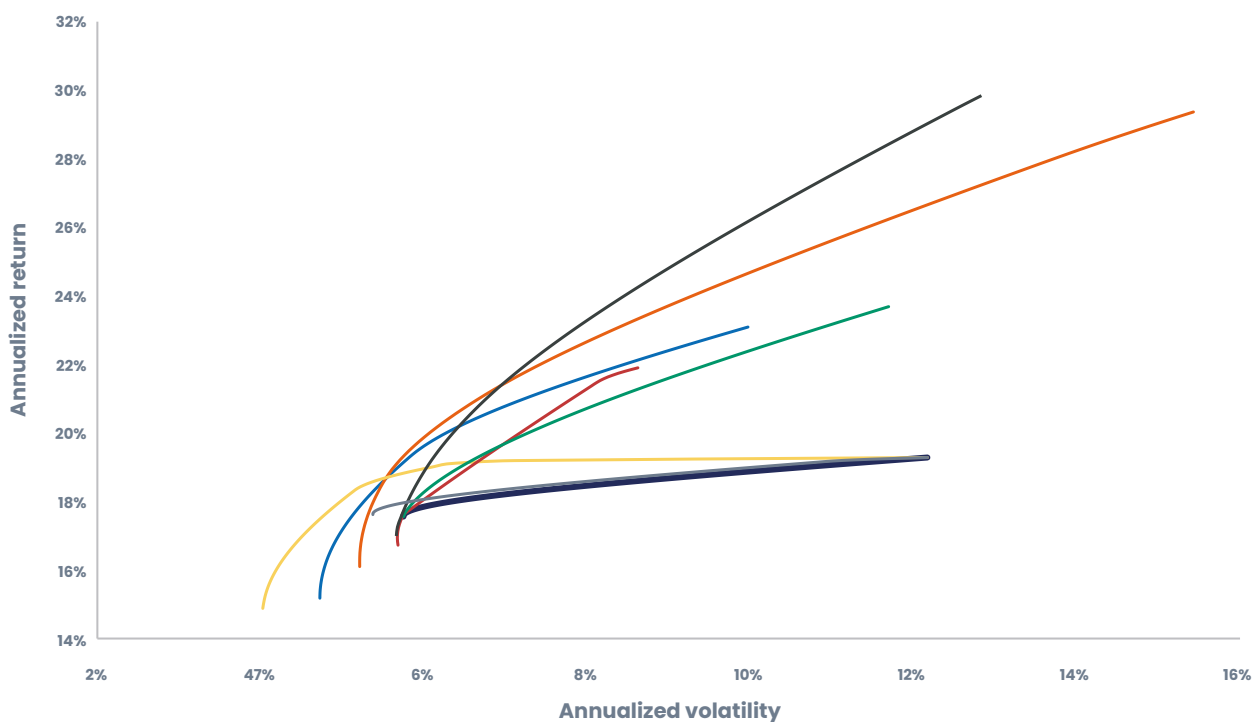
Past performance of a given financial instrument or index or an investment service or strategy, or simulations of past performance, or forecasts of future performance does not predict future returns.

Source: Candriam.

In a context of rising inflation, it may be interesting to invest in real and alternative assets.

During the period between 1982 and 1985, as inflation sharply declined (from +10% to +3% year on year), US equities and bonds delivered a nominal annualized return of more than 10%. However, our analysis shows that it was still possible to improve this performance by overweighting equities, particularly by investing in consumer staples sector or international equities.

Figure 10:
Efficient frontiers, falling inflation, 1982-1985



■ US Equity & Bond	■ + Credit
■ + Real Assets	■ + Equity Style
■ + International Equities	■ + Equity Sectors
■ + International Bonds	■ + AlternativeAssets

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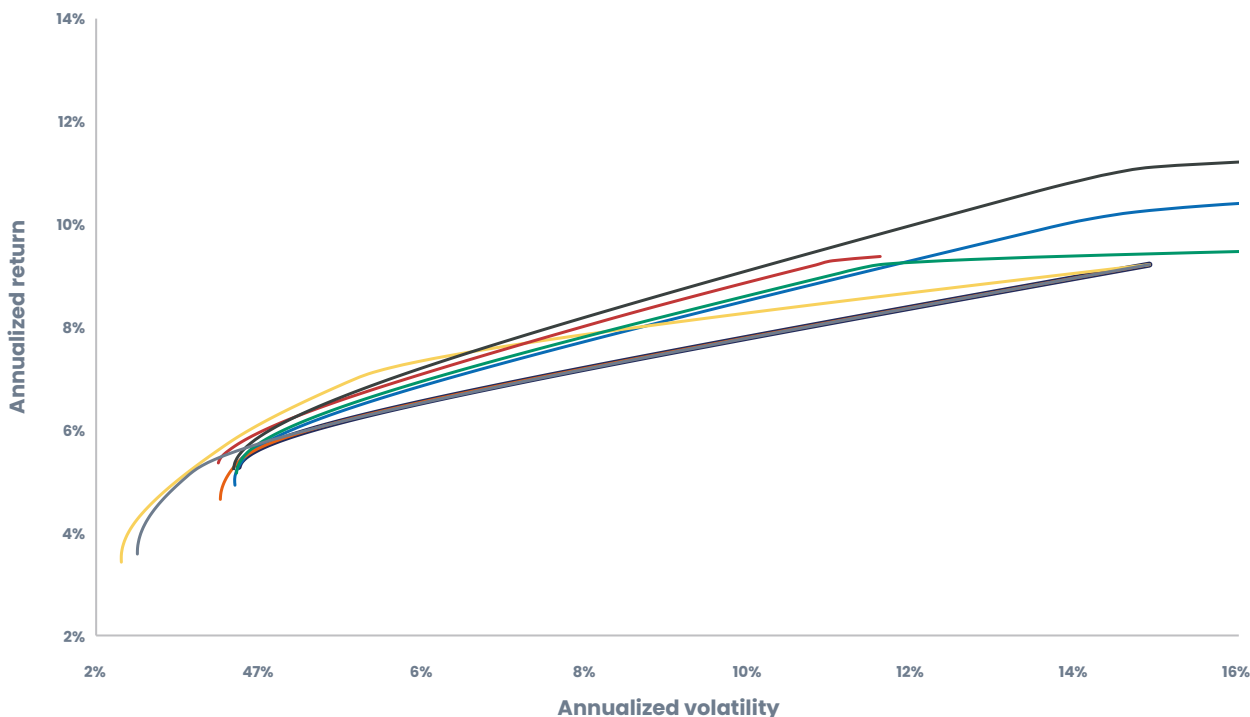
Source: Candriam.

In a period of falling inflation, it may be good to overweight equities.

In a period of low inflation (below 3% year on year), in an environment of low nominal interest rates as experienced from the late 1990s to 2020, it is observed that the nominal return of the various asset classes decreases significantly, necessitating investors to diversify their portfolios to capture new sources of return. In particular, an allocation overweighting certain sectors such as Health Care, IT Technology or Consumer Discretionary has allowed to significantly improve portfolio returns, as illustrated in the following graph.

Figure 11:

Efficient frontiers, low inflation period, 1996-2019



■ US Equity & Bond	■ + Credit
■ + Real Assets	■ + Equity Style
■ + International Equities	■ + Equity Sectors
■ + International Bonds	■ + AlternativeAssets

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Source: Candriam.

Sector allocation seems to be particularly important in a low inflation environment.

Finally, the following graphs show how useful it is, if not necessary, to adjust the portfolio allocation to the macroeconomic regimes and available asset classes - or those authorized by the investment policy.

Here, we calculated the optimal allocation of a portfolio aiming to maximize risk-adjusted real returns, in the four inflation periods we have identified. For each asset class that we introduce, the allocation of the optimal portfolio varies significantly according to the inflation regime.

Figure 12:

Optimal allocation of a portfolio aiming to maximize the risk-adjusted real return, in four different inflation regimes



This variability of the allocation confirms that it is useful, if not necessary, to adjust the allocation to the macroeconomic regime.

We have led similar research on Europe, over a period starting in 1960, for an investor in European equities and bonds willing to maximize its portfolio return above inflation in Europe. The results are similar to those reached on the United States region.

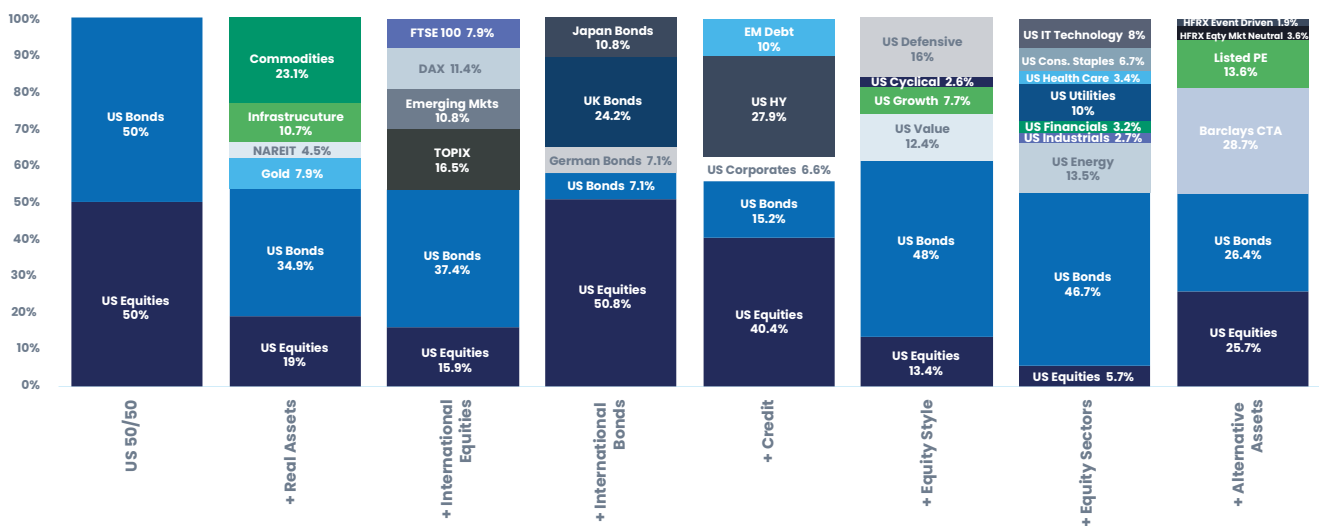
B. Rising Fed Funds rates

We study hereafter the optimal allocations observed during periods of rises in US Fed Funds rates. We identified seven periods since the 1960s where the Fed Funds rates increased by at least 230 basis points over periods ranging from one to three years (these periods are detailed in Appendix). The optimization aimed to calculate the allocation that maximizes the real return for a volatility equal to that of the 'US 50/50' portfolio.

Figure 13 below shows the average of the optimal allocations for each period when adding different asset classes separately.

Figure 13:

Optimal allocations maximizing the risk-adjusted real return for a volatility equal to that of the 50/50 portfolio



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Source: Candriam.

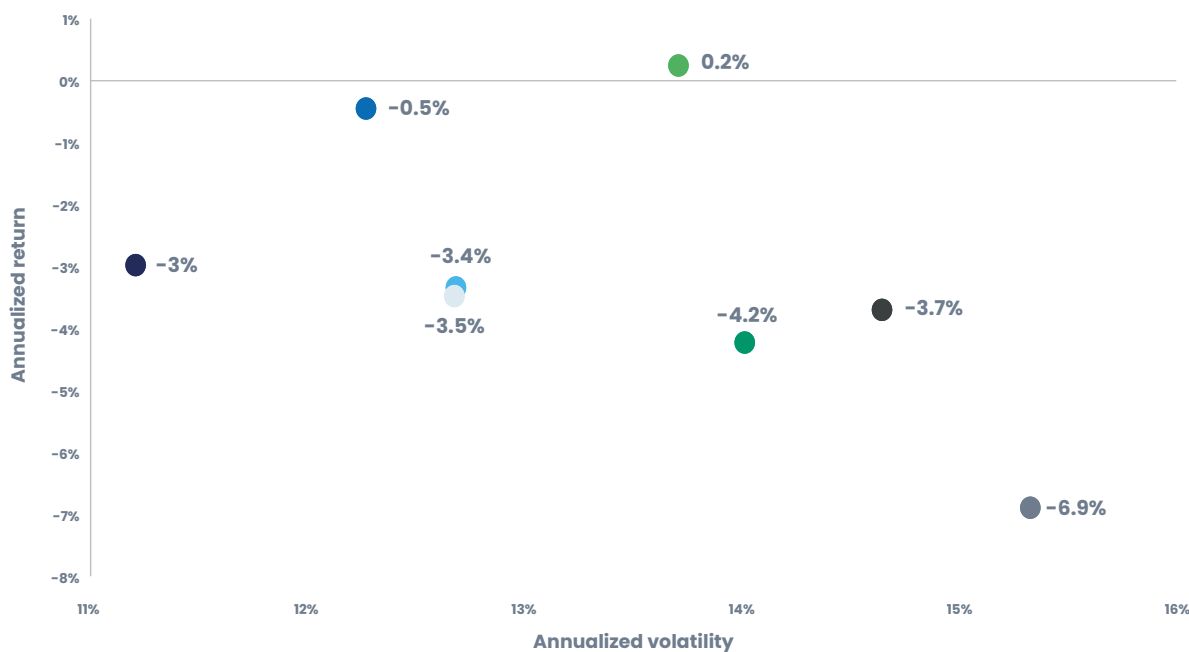
In periods of rising Fed Funds rates, sector allocation is a significant contributor to portfolio performance.

On this graph, it is noticeable that the allocation to US equities is generally significantly reduced, to the benefit of specific sectors or styles (overweighting utilities and energy sectors, or the value style over growth). It is also observed that the optimal allocation favors international equities over US equities. Furthermore, alternative assets replace half of the US equities and bonds allocation, with a preference for listed Private Equity and quantitative strategies (CTAs).

Finally, to assess the relevance of these results, we calculated the performance of these optimal allocations using data observed since March 2022, which marked the beginning of successive US Fed Funds rate hikes. The graph below displays the annualized returns and volatilities of the various portfolios. With the exception of the allocation to international bonds, all other allocations improve the return of a “US 50/50” portfolio.

Figure 14:

Optimal allocations maximizing the real return for a volatility equal to that of the 50/50 portfolio



■ + Equity Sectors	■ + Equity Style	■ US 50/50
■ + International Equities	■ + Real Assets	■ + International Bonds
■ + Alternative Assets	■ + Credit	

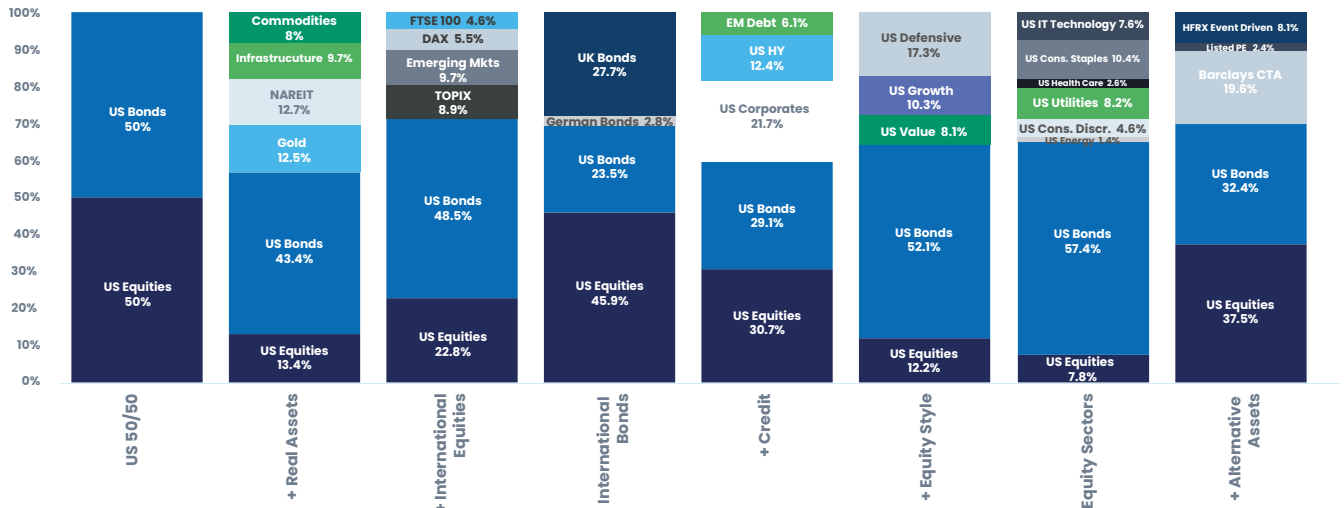
Past performance of a given financial instrument or index or an investment service or strategy, or simulations of past performance, or forecasts of future performance does not predict future returns.

Source: Candriam.

In times of rising Fed Funds rates, any diversification seems to improve the return/ risk profile, apart from the introduction of international bonds.

Similarly, we calculated the optimal allocations for the two-year periods following the start of a recession.

Figure 16:
Optimal allocations during the two years following the start of a recession



Past performance of a given financial instrument or index or an investment service or strategy, or simulations of past performance, or forecasts of future performance does not predict future returns.

Source: Candriam.

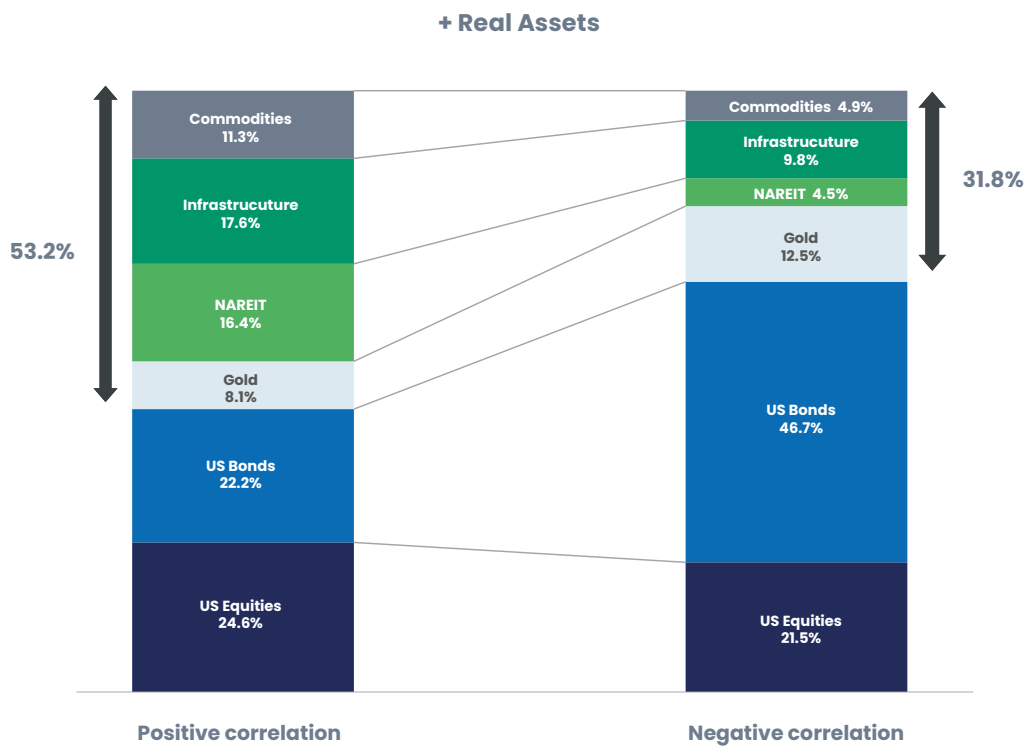
While results indicate that we should maintain the allocation in the same proportions for real and alternative assets, it is nevertheless necessary to readjust the weights within these asset classes. Regarding real assets, the portion invested in commodities should be significantly reduced in favor of infrastructure and real estate equities. As for alternative assets, one will largely maintain the allocation to CTAs but replace Equity Hedge strategies with Event Driven and some listed Private Equity. Lastly, the allocation to defensive sectors should be significantly reduced, while overweighting growth sectors vs value, and reinvesting in high-yield credit.

When the recession begins, it is time to adjust the sector allocation and modify the allocation within the alternative pocket.

D. Equity/bond correlation regimes

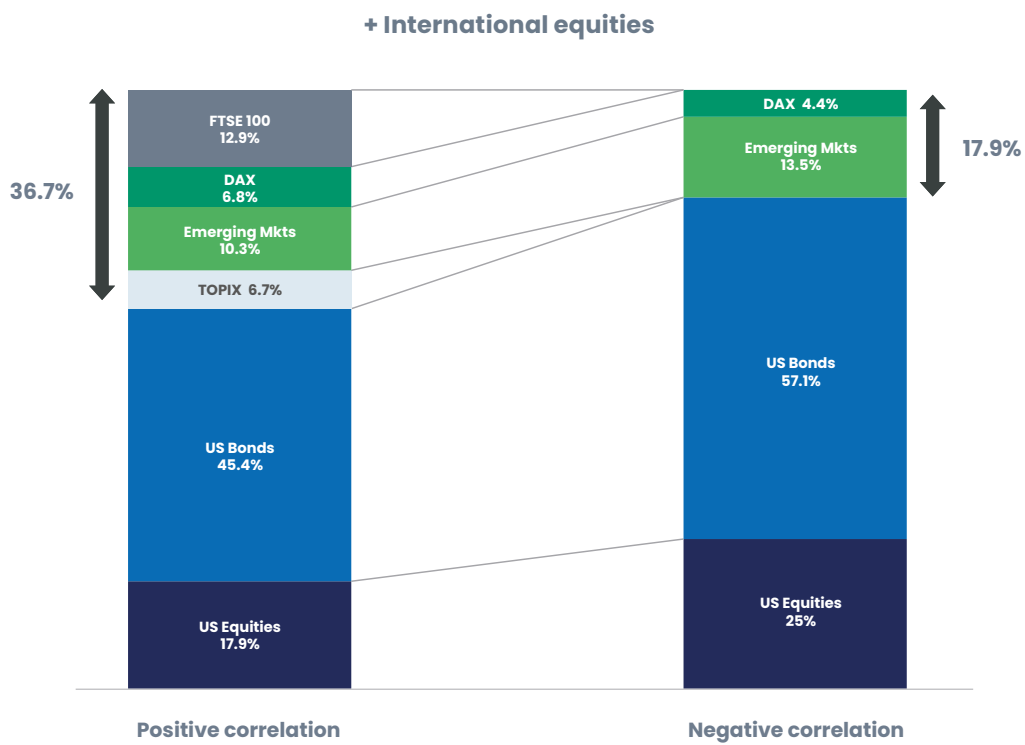
In this final section of our study, we calculate the optimal allocations over three-year periods during which the realized equity/bond correlation was either positive or negative. We analyzed six three-year periods between 1982 and 1999 when the correlation was positive, and six three-year periods between 2002 and 2019 with a negative correlation. The following graphs show the impact of a change in the sign of the equity/bond correlation on allocations to real assets and international equities.

Figure 17:
Optimal allocations in function of the equity / bond correlation regime



Past performance of a given financial instrument or index or an investment service or strategy, or simulations of past performance, or forecasts of future performance does not predict future returns.

Source: Candriam.



The main take-away here is that the investor should significantly increase the diversification of the performance sources when the equity/ bond correlation is positive, compared to the periods when this correlation is negative.

The point when the equity/ bond correlation turns positive is a good time to increase allocation to real assets.

Conclusion : A matter of agility.

“

Intelligence is the ability to adapt to change.

Stephen Hawking

While past performance is no indicator of future results, we may nevertheless extract some stylized facts, or patterns, that provide insights into the optimal allocation in different macroeconomic regimes.

Keeping a balance requires constant adjustments

Maintaining a static domestic equity/ bond allocation (US or Europe-based) over time is sub-optimal. Portfolio construction must take into account the macroeconomic environment, the inflation regimes, the evolution of interest rates and cross-asset correlations.

Furthermore, in order to improve the return/risk profile of a portfolio, its performance drivers should be diversified, by introducing new asset classes (international equities and bonds, credit, real and alternative assets) and/or over- or under-weighting certain equity styles (growth vs value) and sectors (defensive vs cyclicals), in a dynamic fashion, according to macroeconomic regimes.

Our research showed the positive impact of diversification on the performance of the Balanced portfolio, either in a systematic way (in the case of alternative assets) or in particular macroeconomic regimes (inflation, recession), or in certain market phases (rising interest rates). We hope this research provides useful leads for the investor willing to address this highly complex and ever-renewed task of allocating assets in a constantly changing environment.

Based on these observations, the investor will then need to examine macroeconomic cycles, in an attempt to anticipate regime changes and adjust the portfolio allocation with the most appropriate timing. But that is another story.

Learn more...

Readers interested in learning more about alternative asset allocation can refer to our previous research notes on this topic.

Links

[How should I determine my allocation to illiquids? | Candriam](#)

[Interest rates go up: a threat or an opportunity for Commodity Trading Advisor \(CTA\) strategies? | Candriam](#)

[CTAs throughout the business cycle : a form of economic rationality? | Candriam](#)

Notes

Notes and references.

[1] R. G. Ibbotson and R. A. Sinquefeld, «Stocks, Bonds, Bills, and Inflation: Historical Returns (1926-1987) », 1989

[2] H. Markowitz, «Portfolio selection», 1952

[3] R. Michaud, «Efficient Asset Management: A practical guide to Stock Portfolio Optimization and Asset Allocation», 1998



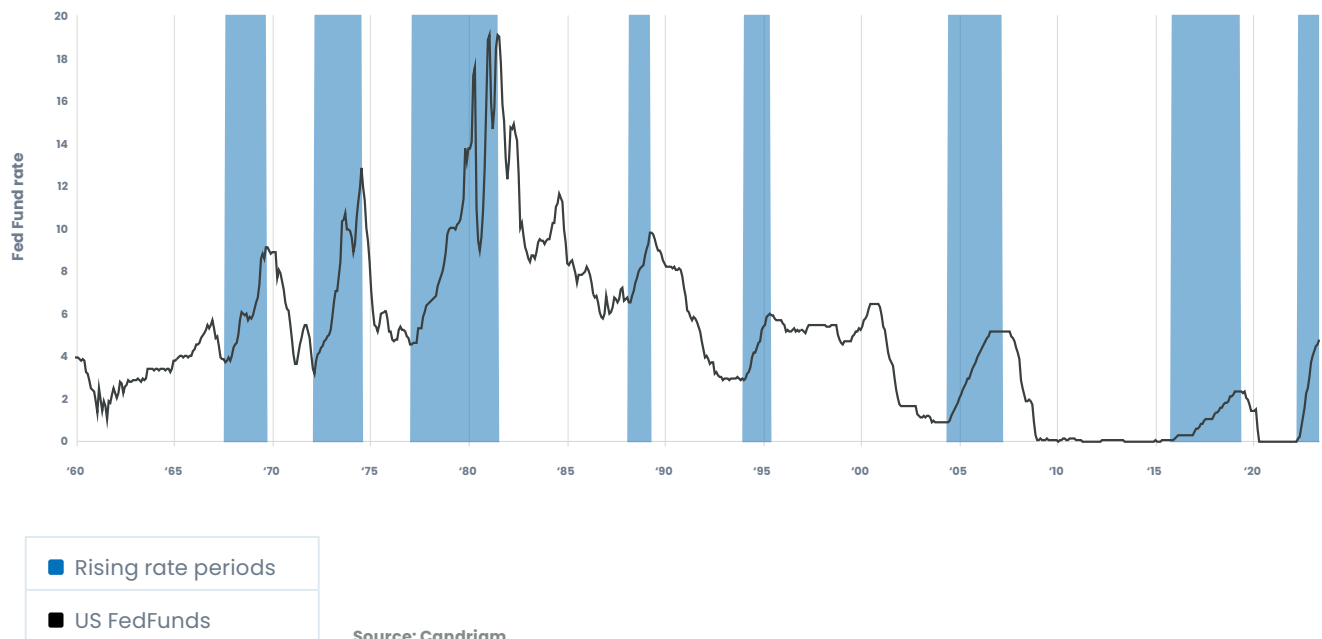
Appendices.

Periods of rising Fed Fund rates

Since the 1960s, we have identified several periods of sharp Fed Fund rate hikes, as shown in the graph below.

Figure 18:

Periods of sharp Fed Fund rate hikes

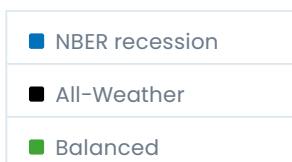
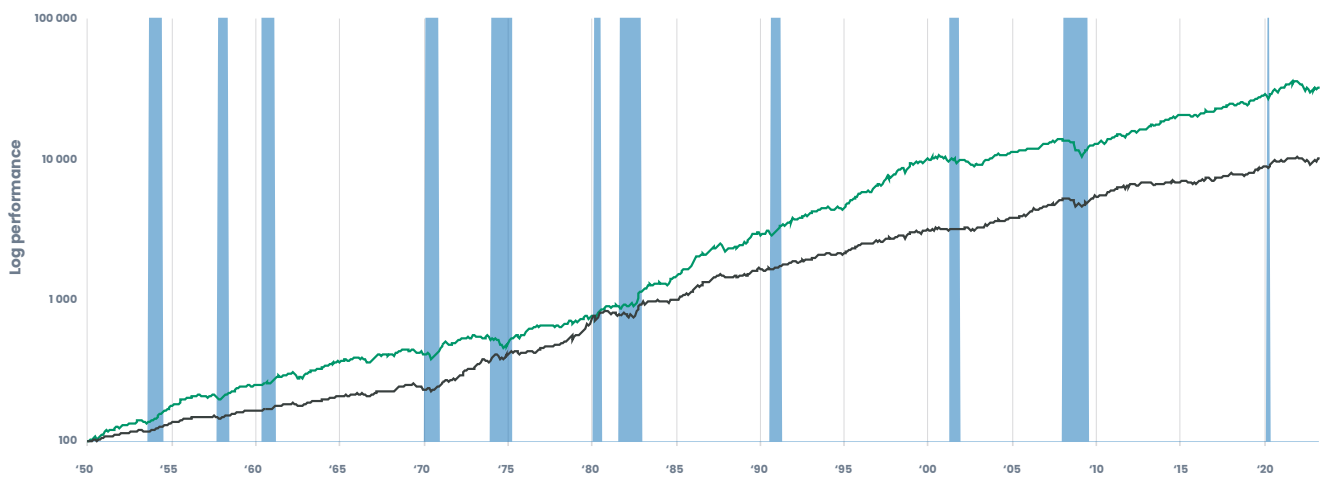


Recession periods

We have used the recession periods as identified by the NBER (National Bureau of Economic Research). These periods are the grey areas in the following graph, in which we also displayed the nominal performance of the All-Weather and Balanced Portfolios.

Figure 19:

Recessions and nominal returns of the All-Weather and the Balanced portfolios



Past performance of a given financial instrument or index or an investment service or strategy, or simulations of past performance, or forecasts of future performance does not predict future returns.

Source: Candriam.



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*As of 31/12/2022, Candriam changed the Assets Under Management (AUM) calculation methodology, and AUM now includes certain assets, such as nondiscretionary AUM, external fund selection, overlay services, including ESG screening services, [advisory consulting] services, white labeling services, and model portfolio delivery services that do not qualify as Regulatory Assets Under Management, as defined in the SEC's Form ADV. AUM is reported in USD. AUM not denominated in USD is converted at the spot rate as of 31/12/2022.



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