

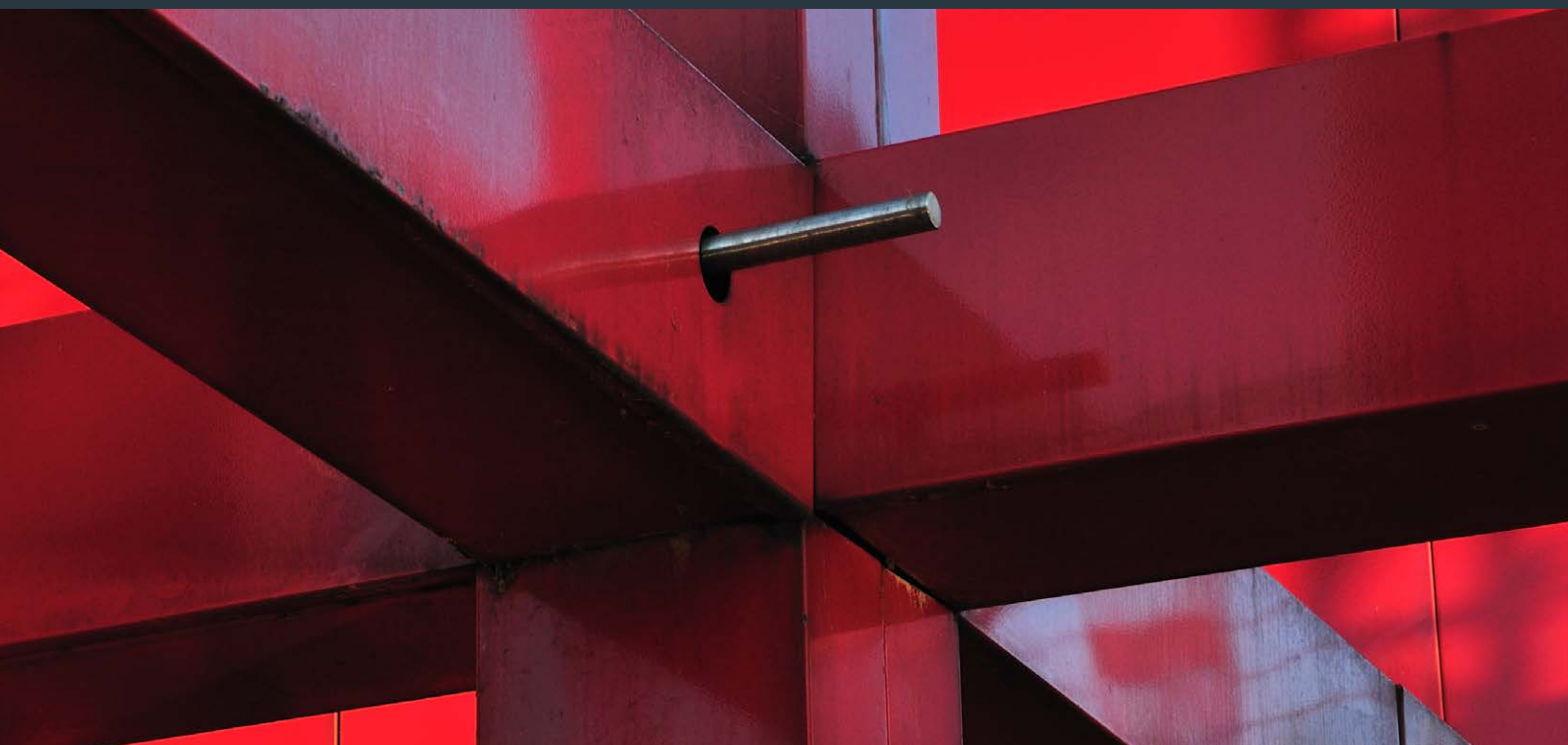
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WHITEPAPER

No time for heroes

How portfolio construction can help investors navigate unfamiliar economic and market regimes

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Introduction

Once upon a time, we lived in an era where the phrase “lower-for-longer” was not spoken. Inflation over two per cent was common in the developed world, stocks were correlated to bond returns, and markets functioned without a constant dependence on central bank stimulation. Each economic correction cleaned up the excesses of previous years.

This era ended around the time of the dot-com bubble and we have had low inflation with loose policy ever since. Fast forward to today and we have re-entered a market regime that is not exceptional by historical standards but is unfamiliar territory to many in the industry. Recognition of a regime shift arguably happened when the US Federal Reserve dropped the word “transitory”; when central banks now talk about inflation, it is deemed “normal”. The fact is that inflation is normal; it exists in most countries, but many developed market economies haven’t had much of a taste of it for some time.

The positive spin is that thanks to unprecedented global monetary and fiscal policy, nominal growth can benefit from a virtuous, self-reinforcing feedback loop. And we may stay in this self-reinforcing growth cycle if interest rates remain low enough to continue propelling credit creation. In short, more nominal growth can lead to more nominal growth in a recursive manner, which could mean strong returns for all types of risk assets.

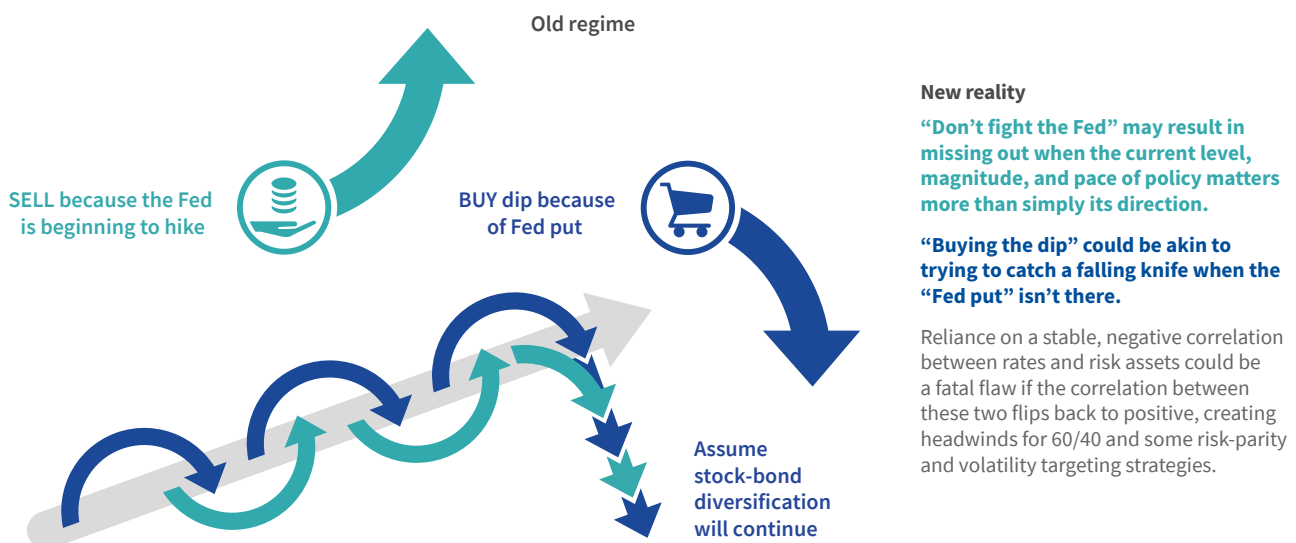
At the same time, we could also be entering an environment that comes with the potential risk of its cousin, a vicious, self-reinforcing feedback loop of inflation; once everyone becomes accustomed to price increases, price increases become the custom.

Central banks are by far the largest driver of equilibrium between these opposing forces. Their role is to balance unemployment with inflation, to limit either from spiralling out of control. Their balancing reaction functions are designed to create an equilibrium that acts as a “negative feedback loop”, supporting growth and employment when they are weak and moderating inflation when it becomes too strong. But this balancing act is much easier when the inflation side of the equation is tame, as it has been for most of the past 40 years.

Inflation has returned over the last 18 months in much of the developed world. Consequently, the job of central banks has become acutely more difficult and it is naïve to assume their reaction will stay the same. Thus, predicting the direction of markets will be much tougher, and simple playbooks that work well in stable price regimes may no longer be so effective. Investors should be open-minded enough to at least acknowledge this (see Figure 1).

Predicting the direction of markets will be much tougher, and simple playbooks that work well in stable price regimes may no longer be so effective.

Figure 1. Investment playbook in a benign inflationary world vs new reality



Source: Aviva Investors, March 2022.

Question time: Forget what you think you know

This raises critical questions. Since an unquantifiable number of investors globally have been using these same strategic and tactical allocation moves time after time, what happens if the Federal Reserve and other central banks start operating by a new set of rules, and the defence mechanisms for these strategies falter at the same time?

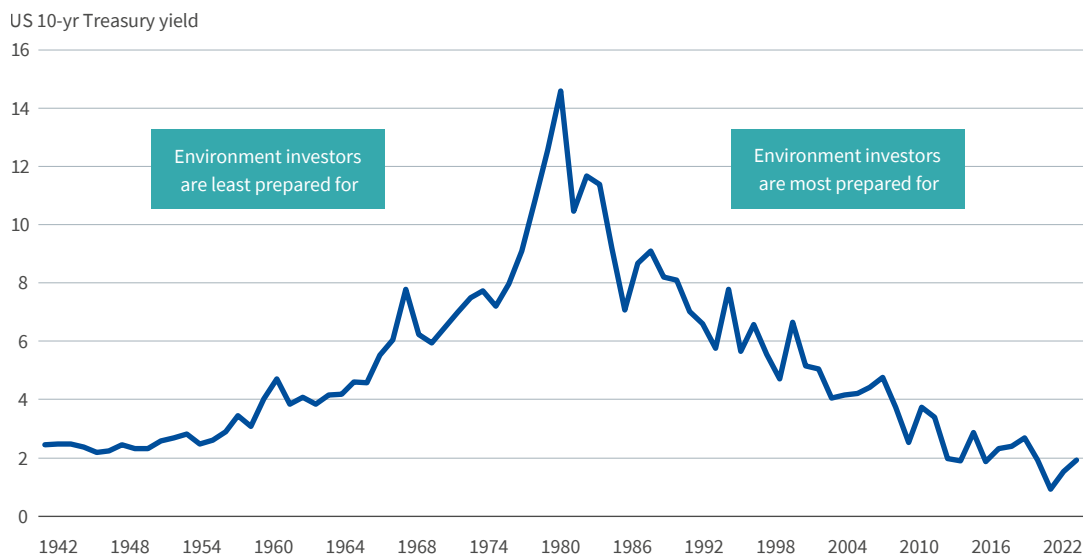
Investors have latched onto these types of strategies because they are simple and have worked – so far. You could say they have a high “Sharpe ratio per unit of complexity”. But if you are an investor who cares about creating a portfolio that performs well in the next rather than the last 40 years, perhaps it makes sense to consider the following: What happens if inflation throws a wrench into the returns, risk-free rate, volatility, and underpinning basis for the simplicity of these strategies simultaneously? What if the balance we have seen in these strategies in recent decades has been based on a perception of reality that doesn’t factor in inflation, instead of the current reality which does? This is what George Soros calls reflexivity.

Portfolio managers and chief investment officers are now in the toughest macro environment since the 1970s.

$$\text{Perception of simple but works} = \frac{(\text{Past returns} - \text{risk-free rate}) / \text{volatility}}{\text{Complexity}}$$

We don’t have a crystal ball. There is a good chance large, structural, deflationary changes have resulted from the efficiency gains created over the last 20 years, and these gains may oppose current inflationary forces. In addition, many companies are using this experience to develop better supply-chain mitigation strategies. The Federal Reserve is also telling us its own playbook will be different this time – changing from an inflation target to an average-inflation target, which now allows an overshoot. And, in early 2022, the Russian invasion of Ukraine has added a new source of complexity and volatility to financial markets, as well as further inflationary pressure through spikes in energy prices. It has also highlighted how fragile market sentiment is in the face of unexpected and unpredictable geopolitical events.

Figure 2. Portfolios should be prepared for all environments (per cent)



Source: St Louis Federal Reserve, as of February 11, 2022.¹

1. St Louis Fed. Data from Robert Schiller, as of February 11, 2022.

But this is where investors need to pay close attention. To many, the incredible and long-running bull run in risk assets may have created a sense of comfort, but one thing should be clear: portfolio managers and chief investment officers are now in the toughest macro environment since the 1970s.

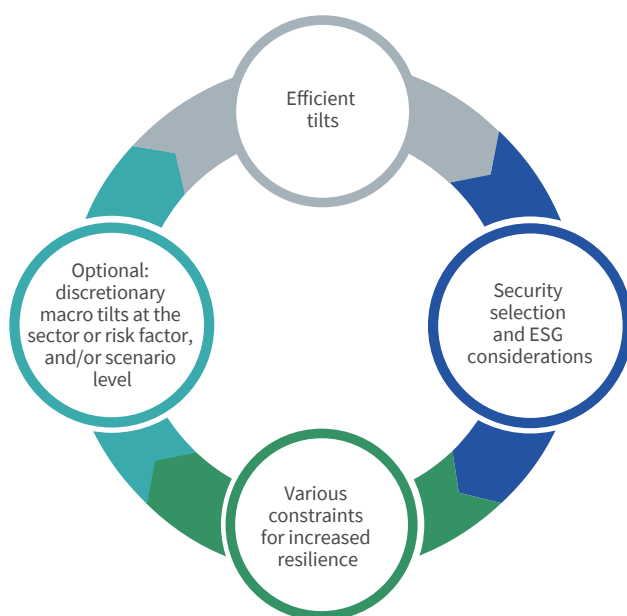
Simultaneous integration of knowledge = Being prepared

It will be tempting for portfolio managers to make bold directional market calls in this environment – and there will be winners and losers among those that do.

But given these conditions will be new to many in the markets, now is not the time to be bold. What if there is a better way than trying to be a hero? Rather than being afraid of the current market or trying to predict what will happen, wouldn't it be preferable to build a portfolio with the efficiency and resilience to cope with multiple possible outcomes? For investors with the goal of resilient outperformance, portfolio construction is an invaluable tool that can help prepare for such uncertainty.

For investors seeking resilient outperformance, portfolio construction is an invaluable tool.

Figure 3. Synergistic components of portfolio construction¹



Source: Aviva Investors, February 2022.²

It is enticing to simply overweight riskier assets to generate performance when market moves are large. But without the right tools, even small ideas or tilts that don't show up in top-line risk measures may favour a similar underlying market theme and unintentionally expose a portfolio to adverse events.

The effective use of portfolio construction tools should allow investment teams to simultaneously tilt portfolios towards efficient parts of their asset class while integrating views and constraints on multiple scenarios, sectors, risk, security selection and ESG analysis. And although this integration allows for macro tilts, it reduces the need to increase these exposures to express views. Often it is possible to construct a portfolio that is capable of performing well in multiple binary scenarios at once. This can help reduce the allure of the difficult task of predicting market direction, interest rate moves, or inflation.

We believe using a combination of advanced techniques is the level of portfolio construction required to even attempt outperformance in all environments, particularly unfamiliar ones.

2. Cinderella science? Why portfolio construction holds the key to resilient investment outcomes¹, Aviva Investors, June 9, 2020.

Figure 4. Simplified build-up of portfolio construction models

	Expected return	Volatility	Correlations	Forecasts	Alt factors	Benchmark constraints	Additional data science	When it is additive to use	Model creator, nickname or examples
Equal weight								When one has zero predictive power in any way	1/n
Inverse Vol		Y						When volatility can reasonably be predicted	1/volatility
Max Sharpe	Y	Y						When yield or trailing returns can reasonably be predicted	Expected return/volatility
Risk parity		Y	Y					When volatility and correlations can reasonably be predicted	Edward Qian's Risk Parity (1/risk contribution), Meucci's Maximum Effective Number of Uncorrelated Bets (ENB), Minimal Linear Torsion (MLT)
Mean variance	Y	Y	Y					When return distributions are elliptical and the three inputs are reasonably predictable	Markowitz's 1952 Modern Portfolio Theory (return/portfolio volatility)
User forecasts	Y	Y	Y	Y				When a better method for forecasting expected returns is additive, including subjective views	Black-Litterman or Bayesian Optimization
Alternative factors	Y	Y	Y		Y			When alt factors are economically intuitive, historically persistent, and expected to be accretive via higher returns and/or diversification	Roll yield, fx carry/hedging, value, quality, momentum, crowding, skew, etc.
Benchmark constrained	Y	Y	Y			Y		When needing to manage against a benchmark	Volatility targeting, duration, KRDS, DxS, tracking error, factor sensitivities, stress tests etc.
Robustness of measures	Y	Y	Y				Y	When one can use data-science techniques to reduce noise and/or boost signal out-of-sample	Shrinking covariance matrices, Michaud's Resampled Efficient Frontier, Lopez de Prado's Nested Cluster Optimization (NCO), Hierarchical Risk Parity (HRP)
Combination of advanced techniques	Y	Y	Y	Y	Y	Y	Y	When one can construct a portfolio using multiple models/factors/techniques that advance the Markowitz/Black-Litterman framework	All-weather ensemble (AWE)

Source: Aviva Investors, March 2022.

Efficient exposure tilts

Efficient exposure is created by tilting a portfolio's weighting towards assets with attractive characteristics while simultaneously tilting away from those without them. An off-the-shelf mean-variance optimisation model tilts a portfolio towards higher yields, and away from higher volatility and cross-correlated assets. Depending on the asset class, this may be a sufficient combination to outperform.

However, data science and portfolio construction techniques have evolved since Markowitz's 1952 model. These include adding scenario constraints to incorporate possible macro regimes and reducing out-of-sample error through various forms of biasing existing inputs. Any additional input worth considering must have an economically intuitive reason as to why it works, and its return characteristics should be consistent across different time horizons. If these boxes are checked and the team believe the input can be accretive while adding diversification, it could merit inclusion alongside the three original mean-variance inputs. This may vary by asset class, but examples of alternative inputs include roll yield, FX carry/hedging costs, value, momentum, crowding, or skew.

For instance, using roll yield can be sensible in investment-grade credit portfolios because sovereign and option-adjusted spread curves tend to be upward sloping for every credit rating in the asset class. However, our research has found momentum is a stronger driver of returns in high yield, which, being riskier, is more sensitive to illiquidity, refinancing costs, fewer market participants, and market sentiment.

It may also make sense to alter some of the inputs to make them more robust – in some asset classes, it may be worth shrinking covariance matrices, which pull extreme values towards a central tendency. This type of biasing away from the sample covariance reduces estimation error and the tendency to over-favour credits with abnormally low cross-correlations.

Another simple example would be penalising the expected yield based on expectations of defaults and recovery rates, which will create a natural tendency to decrease risk when yields are low and take advantage of yields when one is more than compensated for the risk.

Figure 5 shows autocorrelation across ratings, which is the correlation of one period to the subsequent day, week, month. This helps us understand whether an asset tends to mean-revert or trend. The table perfectly highlights the stark contrast between investment-grade and high-yield corporate bonds.

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Figure 5. US corporate bonds autocorrelation across ratings

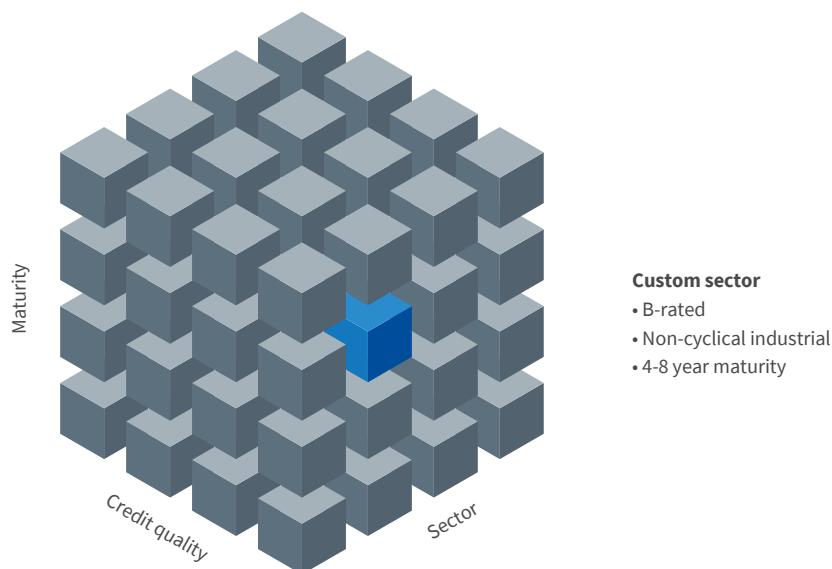
	AAA	AA	A	BBB	BB	B	CCC
Daily	0.05	0.04	0.06	0.09	0.38	0.42	0.42
Weekly	-0.06	-0.04	0.02	0.11	0.37	0.39	0.43
Monthly	-0.06	-0.03	-0.01	-0.03	0.05	0.03	0.25
2 months	-0.31	-0.16	-0.17	0.05	0.07	0.16	0.19
3 months	-0.08	-0.06	-0.01	0.18	0.21	0.26	0.32
4 months	-0.02	0.06	0.03	0.09	0.06	0.09	0.16
5 months	-0.03	0.10	0.07	0.07	-0.05	-0.05	0.07
6 months	0.00	0.03	0.01	0.09	-0.08	-0.06	0.07

■ Tendency for reversion ■ Tendency for momentum

Source: Aviva Investors, February 2022. Data from ICE BofA, as of January 31, 2022.

Time and decision efficiency

Figure 6. Custom sector dimensions



Source: Aviva Investors, March 2022.

Portfolio construction methods that use custom sectors divide up the universe based on how security groups are expected to perform. Within each custom sector, securities should be as similar as possible, but each sector should be as different from other sectors as possible.

This exercise should increase the robustness of outcomes by reducing the influence of noise. It also allows models to incorporate multiple dimensions of knowledge into the process all at once and compartmentalises the task at hand.

This same technique is analogous to how some passive funds create a benchmark-mimicking portfolio, called “stratified sampling”. However, we are not trying to mimic an inefficient benchmark. Instead, we want to mimic an efficient set of exposures that are resilient to various regimes and want security selection to be a driver of outperformance within each custom sector.

This approach of simultaneous integration cuts down the need for on-the-fly, iterative decision making or mentally balancing multiple sources of risk. By freeing up time thinking about macro risks, managers can focus more time and effort on adding value through security selection. As a nice bonus, every time an optimisation is run, it generates new ideas that can be used to kick out stale holdings at or above their intrinsic value, allowing for more of the portfolio to actively serve a purpose.

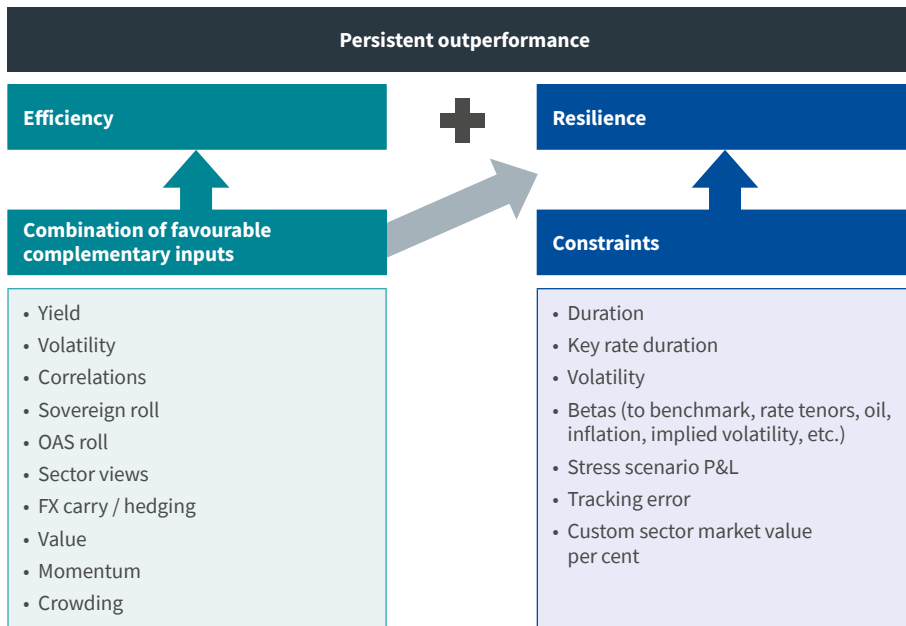
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Building upon resilience

Combining multiple inputs, models, factors, or lookback windows can add further strength. Intuitively, tilting towards only higher-yielding or low-volatility assets in isolation would result in opposite, yet fragile, outcomes because they would both depend almost entirely on market direction.

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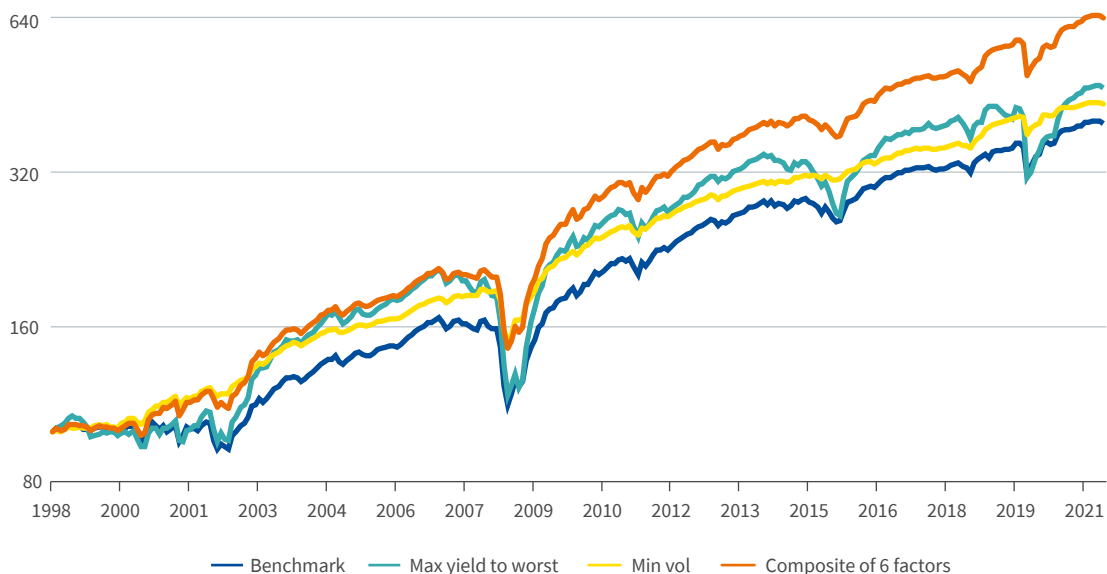
Figure 7. Combining factors and constraints boosts efficiency and resilience



Source: Aviva Investors, March 2022.

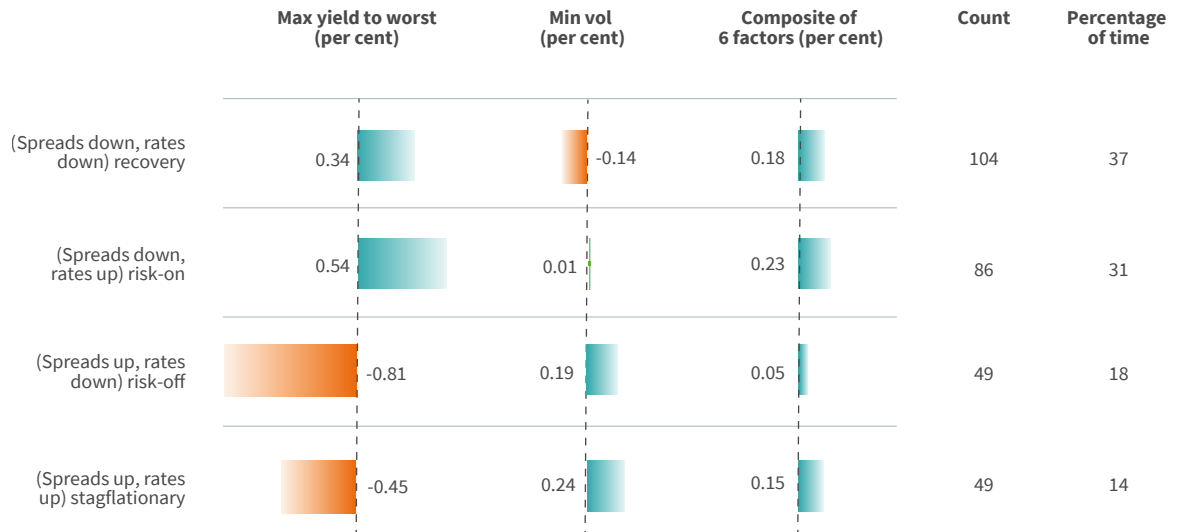
Instead, combining multiple favourable and complementary tilts can help create a portfolio more resilient to changes in environments that are risk-on, risk-off or stagflationary, among others (see Figures 8 and 9).

Figure 8. Simple ideas that work are more resilient when combined



Source: Aviva Investors, February 2022. Data from ICE, as of October 31, 2021.

Figure 9. Average monthly excess returns per environment



Source: Aviva Investors, February 2022. Data from ICE, as of January 31, 2022.

Portfolio resilience can be further bolstered by limiting or eliminating expected losses in various scenarios or constraining items such as volatility, beta, duration, key-rates duration or duration-times-spread. A manager can also examine the effect these constraints have on expected returns in different scenarios to identify the best risk-reward allocations.³

Thanks to the asymmetry of fixed income and its return drivers, it is often possible to gain a meaningful advantage in downside risk protection with only a small reduction in base-case expected returns. When used with a combination of inputs, these portfolio construction methods can deliver returns that are nearly identical to the average returns of each of the individual inputs used, but with a significant drop in volatility and drawdowns.

Overdependence on getting risky macro calls correct is unlikely to lead to success. We believe a robust portfolio construction approach that incorporates efficiency and resilience will stand the test of time, even as we go through unfamiliar conditions.

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Key takeaways

- Central banks are no longer treating inflation as transitory, and their reaction will likely be different from what most market participants have been accustomed to
- Simple investment playbooks based on inflation-free assumptions can no longer be relied on, meaning outsized and binary calls on market direction now come with far higher risk
- Managing portfolios capable of weathering all types of macro regimes is more important than ever
- For investors looking to achieve strong and stable returns, portfolio construction is an invaluable tool. It can help deliver persistent outperformance through various forms of efficiency and resilience

³ 'Cinderella science? Why portfolio construction holds the key to resilient investment outcomes', Aviva Investors, June 9, 2020.

Key risks

Investment risk

The value of an investment and any income from it can go down as well as up. Investors may not get back the original amount invested.

Credit risk

Bond values are affected by changes in interest rates and the bond issuer's creditworthiness. Bonds that offer the potential for a higher income typically have a greater risk of default.

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