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ENHANCED PASSIVE — A BETTER WAY TO CURRENCY HEDGE

JANUARY 2024





Institutional investors often have large foreign currency exposures hedged passively using static hedges. While this is a valid strategy, its implementation relies on regularly adjusting hedges through time to account for the changes in the valuations of underlying securities. Although this sounds simple, there are several quite subtle details that not only make benchmarking passive hedging more difficult than it first appears but can completely hide the true performance, and therefore cost, of a passive hedging programme.

On the surface, passive hedging is simple, easy, and cheap. But when we lift the hood and shine some light onto the inner workings of a passive currency hedging strategy things can become more complex. We outline the issues that face those undertaking a passive currency hedging strategy and why we believe an Enhanced Passive solution is a better option.

EXECUTIVE SUMMARY

- For many investors with an international asset allocation, passive currency hedging offers a useful way of reducing currency risk arising from international portfolio exposures
- In reality however, a perfect 100% currency hedge is impossible to implement and to overcome this, most traditional passive hedging investors accept a tolerance drift band around a 100% hedge, which if exceeded is adjusted back to benchmark
- This approach however can often result in unintended risks and performance drag to the underlying portfolio due to:
 - Hedging slippage as the hedge drifts
 - Transaction costs
 - Drift delivering persistent negative performance due to a correlation between the underlying assets and the base currency (currency cyclical)
- An alternative Enhanced Passive Hedging framework has the potential to overcome these challenges by removing some of the random and structural effects which, if left unchecked, can have a sizeable impact to the performance of a traditional passive currency hedging programme

BENCHMARK SLIPPAGE IS A PROBLEM FOR PASSIVE HEDGING STRATEGIES

It is not uncommon for currency performance to be benchmarked versus simplistic benchmarks that do not reflect the true costs and mechanics of passively currency hedging underlying asset exposures. In the real world the implementation of any passive currency hedging programme leads to implementation 'slippage', which can result in unexpected and unwanted currency outcomes that are mostly hidden by typical reporting infrastructure and conventions. Slippage can come from a variety of factors, including unrealistic benchmark assumptions which assume zero transaction costs, price and timing mismatches between the prices used to calculate index returns and actual prices available in the market, and the inability of a manager to maintain a 100% hedge at all times (hedging drift).

To assess the impact of these factors, we can construct two benchmarks which we summarise in Figure 1 and evaluate their performance over time. For simplicity we will call them 'Benchmark #1' and 'Benchmark #2':

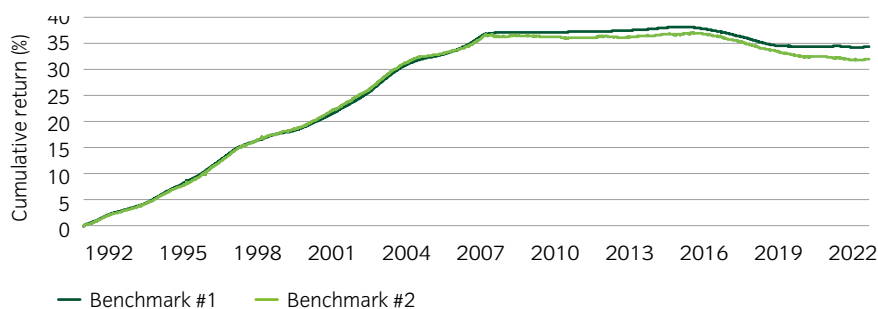
- **Benchmark #1** – Ideal benchmark that assumes perfect hedging, zero transaction costs and does not account for evolution of underlying asset prices. This has the advantage that it is simple to calculate and can be used for every client.
- **Benchmark #2** – Realistic benchmark that accounts for underlying asset price changes, allows hedge ratio drift, and assumes transaction costs. This has the advantage that it reflects the real world and the gap between it and live performance should be reduced compared with Benchmark #1, but the disadvantage is that it will be unique for every client and not independent.

Figure 1: Passive Hedging Benchmark Summary¹

	Source	Deviation from 100% hedge ratio	Drift to BM	Carry	Transaction costs	Evolution of the underlying	Sync between underlying and FX rates	P&L contribution
Benchmark 1 (ideal)	MSCI Hedged / Internal	No	N/A	Yes	No	No	N/A	Carry only
Benchmark 2 (real-world)	Internal	Yes	up to 5%	Yes	Yes (low or high)	Yes	Underlying equities daily close, FX 4pm fix	Carry, drift, transaction costs

In Figure 2, we simulate the returns of these two benchmarks for a UK investor with equity exposures based on the MSCI World Index. The slippage between the 'real-world' and ideal index is clear, and the net cumulative difference over time is on the same scale as the typical fees paid for a passive hedging programme.

Figure 2: Real-world benchmark slippage is clear and cumulates over time²



¹ Source: Insight, for illustrative purposes only.

² Source: Data calculated by Insight between 31 December 1992 and 30 September 2023.

DRIFT CAN BE A KEY DRIVER OF SLIPPAGE

When we examine the performance variance between Benchmark #1 and Benchmark #2, we find that although transaction costs are important, hedging drift can be a key driver of slippage for certain currencies. This is where the size of the hedge and underlying assets drift away from each other, resulting in an over or under hedge. Drift effects generally come from one of two distinct causes:

1 Hedging drift as the prices of underlying assets move³

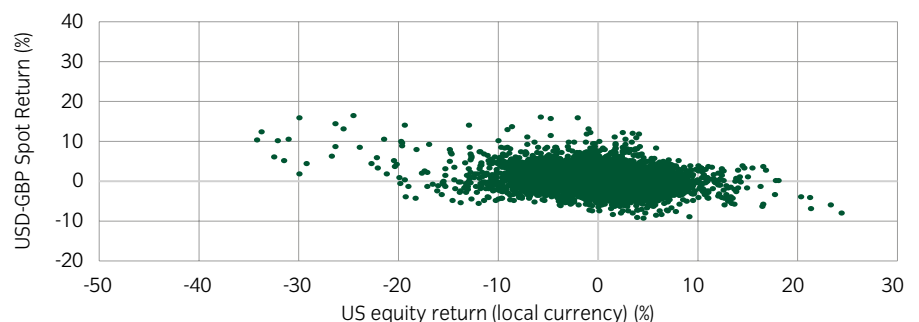
When a currency hedge is put in place it is directly linked to the dollar value of the asset in question. As the value of that asset gradually changes over time the result is the hedge becomes either too small or too large. This divergence can grow over time if left unadjusted, and the larger it becomes the greater the currency exposure that is being embedded in total returns. This is why it is common for a passive manager to apply drift bands or time-based rules to periodically rebalance portfolios. However, each time an adjustment is made to the hedge it locks in a profit or loss and transaction costs apply.

2 Drift delivering persistent negative performance due to a correlation between the underlying assets and the base currency (currency cyclicalty)

When there is a risk-off event, some currencies demonstrate greater cyclicalty and fall along with risk assets as foreign investors repatriate assets and de-risk their portfolios (i.e. the currency and underlying assets become highly correlated). This generally means that passive hedges on overseas assets end up being too large, i.e., the portfolio is holding too much of the base currency exposure when the base currency falls, and this results in a negative return from the hedge. **Sterling is a good example of a cyclical currency that exhibits these attributes.**

In Figure 3 we show the scatter of rolling monthly equity and currency returns for a UK investor invested in the MSCI US Index and can see a strongly negative correlation of approximately -50%. It is not uncommon for UK investors to leave their international currency exposure unhedged because they believe that sterling will decline in risk-off events. Figure 3 not only corroborates this belief, but it shows that it holds most of the time and not only when risk is high.

Figure 3: Correlation of US equity returns and sterling monthly returns (1992 to 2023)⁴



³ See Appendix 1 for calculation methodology.

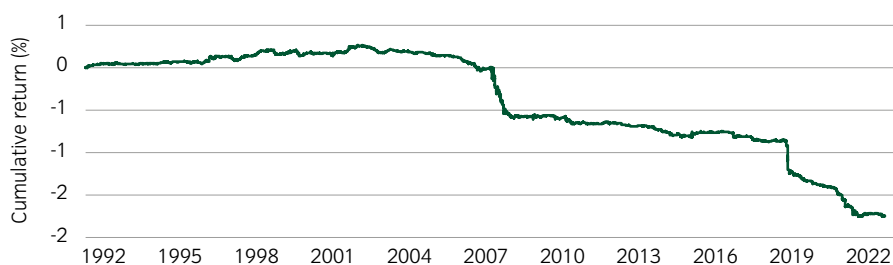
⁴ Source: Data calculated by Insight between 31 December 1992 and 30 September 2023. Shows GBP spot vs S&P 500 Index returns..

CYCLICALITY CAN MEANINGFULLY IMPACT HEDGE RETURNS

Our analysis would suggest that the cyclicity of currencies can be explained by a common set of key factors that change only very slowly through time. In the case of sterling, the UK's rising debt to GDP has been a key driver of the correlation. As such, we consider the link between sterling and cyclical assets as structural and unlikely to disappear in the foreseeable future.

The drift derived performance stemming from this pro-cyclicality can be meaningful. We outline this in Figure 4 where we see that this negative impact accumulates over time, with the 'tail-risk' properties of sterling becoming especially problematic during crisis periods such as the global financial crisis in 2008 and COVID in 2020. **This effect is very clearly non-random, it is a structural relationship that we can refer to as 'bias'.**

Figure 4: Drift return of sterling over time⁵



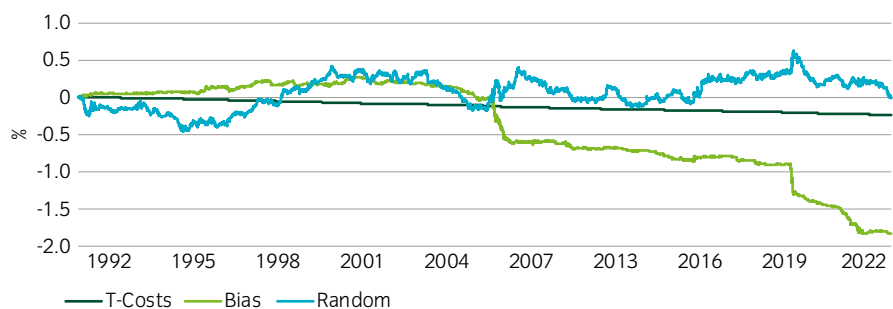
BIAS DOMINATES OTHER REAL-WORLD ISSUES

Thinking back to Figure 2, the difference between Benchmark #2 and Benchmark #1 is the simulated return of all the real-world effects, one of which is the bias. Taking this one step further we can break down the real-world effects into three key elements:

1. Bias
2. Transaction costs
3. Random effects

The attribution of real-world effects (Benchmark #2 minus Benchmark #1) for a UK investor is shown in Figure 5. The question is which of these components are predictable? We expect to see a negative cost through time from transaction costs. We expect to see small random effects wash out. What is of most interest here, and perhaps surprising to some, is the persistent non-random behaviour of the so-called Bias, who's contribution is so strong that we can only assume it is structural.

Figure 5: Attribution of passive hedging effects for a UK investor in the MSCI World Index⁶



^{5,6} Source: Data calculated by Insight between 31 December 1992 and 31 December 2023.

ASSESSING THE IMPACT ON INVESTORS WITH OTHER BASE CURRENCIES

Since this exercise is easily repeated for any currency, the obvious progression is to examine whether the structural bias we see for UK investors is replicated for other investors with other base currencies. We show the impact of bias and randomness in Figures 6 and 7 and summarise the data in Figure 8. A few observations stand out:

- As expected, the random effects are similar across all countries analysed;
- The impact of bias does vary slowly over time but is remarkably persistent and negative for the currencies that exhibit the greatest pro-cyclicality such as the Australian dollar (AUD), Canadian dollar (CAD) and the British pound (GBP). It is notable that the extent of the negative bias has actually increased over time;
- The negative bias is non-existent for the US dollar (USD) and statistically insignificant for the euro (EUR);
- The bias appears to be most unstable for the Japanese yen as it has fluctuated between negative and positive. Interestingly, after a decade of positive bias, the yen's bias has notably become negative in recent years.

Figure 6: Impact of bias for investors with different base currencies⁷

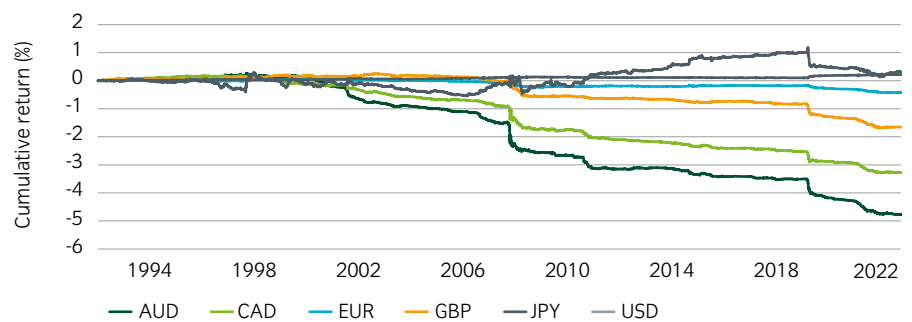


Figure 7: Impact of randomness for investors with different base currencies⁸

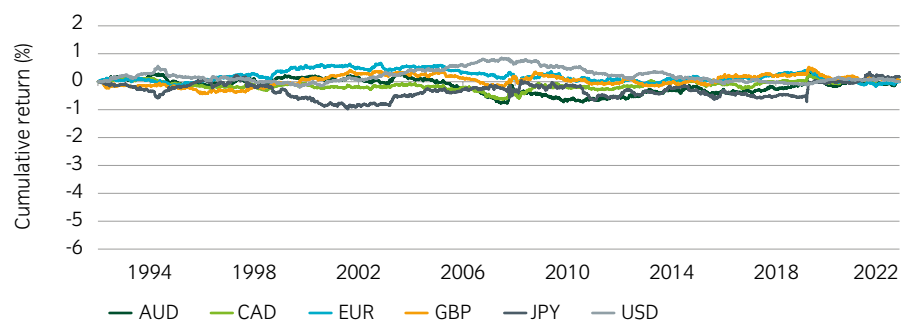


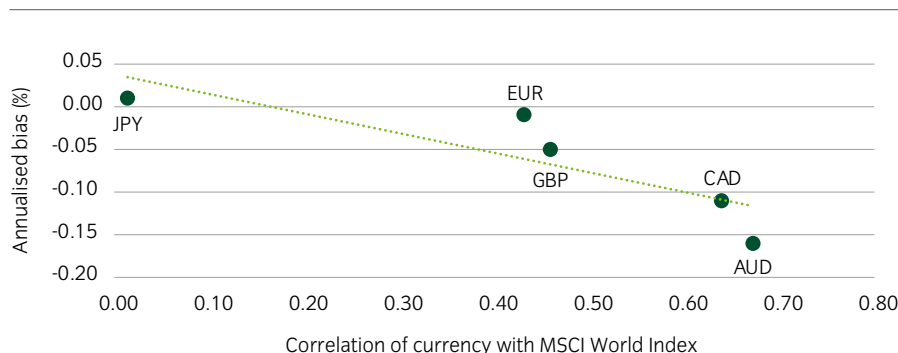
Figure 8: Summary of annualised impacts⁹

	AUD	CAD	EUR	GBP	JPY	USD
Passive	-0.17%	-0.11%	-0.02%	-0.06%	0.01%	0.00%
Bias	-0.16%	-0.11%	-0.01%	-0.05%	0.01%	0.01%
T-Costs	-0.01%	-0.01%	-0.01%	-0.01%	-0.01%	-0.01%
Random	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%

^{7, 8, 9} Source: Data calculated by Insight between 31 December 1992 and 30 September 2023.

We can illustrate this clear link between bias (and specifically whether the bias is positive or negative) and cyclicity in Figure 9: the more pro-cyclical the base currency, the larger the structural negative bias an investor with a passive hedge will experience.

Figure 9: Size of bias versus correlation of base currency and MSCI World Index¹⁰



MODELLING CURRENCY CYCLICALITY

Given the importance of cyclicity to bias, it is important to understand what drives cyclicity in currency markets.

To do this, we examined the relationship between cyclicity across different currencies and a number of key macroeconomic variables. Our aim was to highlight the main fundamental drivers which determine whether a country will experience a net appreciation in its exchange rate in good times (when either its own domestic growth profile increases and/or when the underlying financial risk environment improves), and vice versa. Our measure of currency cyclicity was the correlation between the country's exchange rate versus the S&P 500 Index. Our universe was a set of developed countries, namely the Australian dollar, Canadian dollar, British pound, euro and yen, using a dataset between 1995 and 2023.

Our study used a panel regression and the results suggested that the macro-economic variables outlined in Figure 10 were the most statistically significant in explaining the degree of cyclicity within our currency universe.

Figure 10: Factors driving cyclicity¹¹

Positive contributors of cyclicity	Negative contributors to cyclicity
Rate differentials versus the US	Current account relative to GDP and Fiscal Balance to GDP
Terms of Trade	
Openness Index (imports + exports over GDP)	
Debt to GDP	

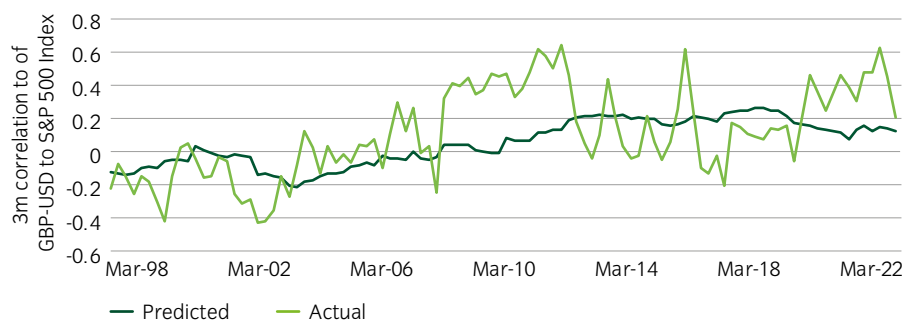
¹⁰ Source: Data calculated by Insight between 31 December 1992 and 30 September 2023. Correlation data is between GBP spot and MSCI World Index.

¹¹ Source: Insight investment.



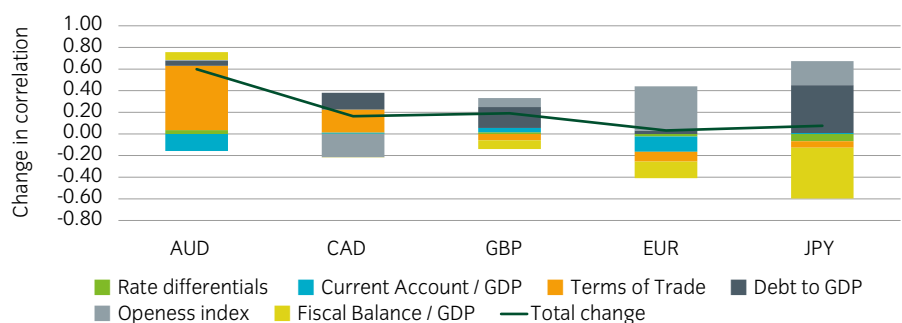
This framework allows us to effectively capture what drives the cyclical behaviour of each currency cross and predict how it will change over time. We outline this in Figure 11 for sterling. There has been a relatively steady increase in the cyclical behaviour of sterling since the 1990s, which is predicted reasonably well by our regression variables.

Figure 11: Actual and predicted three month rolling correlation between GBP/USD and the S&P 500 Index¹²



This analysis allows us to decompose the fundamental variables most likely connected to the correlation between exchange rates and the S&P 500 Index between any two periods. For the five currencies in our universe, we outline in Figure 12 how each of the significant fundamental variables identified by our analysis contributed to this change in correlation between Dec-1999 and Jun-2023.

Figure 12: Total predicted change for correlation between GBP-USD and S&P 500 Index between 1999 and 2023¹³



We can see that the largest and most significant contribution to the net increase in currency cyclical behaviour for sterling has been due to an increase in the country's debt/GDP. The cyclical behaviour for all of the currencies in our universe versus the US dollar has increased over this period – but the change has been driven by different macro variables. For the Australian and Canadian dollar, terms of trade have been key, for the British pound and Japanese yen it has been debt/GDP and for the euro it has been the Openness Index.

The ability to decompose this relationship over time for any given currency could prove useful for investors trying to understand the likely change in the cyclical dynamics of a given currency.

¹² Source: Insight and Bloomberg. Data between December 1999 and June 2023.

¹³ Source: Data calculated by Insight between 31 December 1992 and 30 September 2023.

AN ENHANCED PASSIVE SOLUTION WORKS TO TURN NEGATIVE BIAS INTO ALPHA

USE YOUR RISK BUDGET WISELY

Having established the link between a currency's cyclicality and bias, the key question is what can be done by an investor to mitigate the potential negative impact when undertaking a hedging strategy.

To avoid overtrading, most passive hedging strategies apply a hedge re-balancing protocol that is normally based on either an agreed hedge ratio drift band, a set time horizon, or a combination of the two. Whatever the approach, investors effectively assign a risk budget when they implement a passive currency hedging strategy. We believe it is worth considering a programme that utilises this risk budget with the aim of producing a positive return, even during adverse market conditions when slippage risk is magnified.

Our Enhanced Passive approach aims to manage the outcome of real-world slippage rather than leave it to chance, or worse, locking in the structurally negative bias. Under this approach, we utilise market risk information from our factor models to actively adjust and direct the rebalancing of hedge ratio drift that results from underlying asset returns and currency changes.

REMOVING THE RANDOMNESS FROM HEDGING DRIFT...

Taking COVID as an example of a disrupted market, we can observe a clear difference in hedge ratio drift between normal passive and Enhanced Passive strategies by comparing Figures 13 and 14. Normal passive drift appears unsurprisingly random whereas the drift in an Enhanced Passive strategy is targeted, as it is managed to reflect the risk premia driving currency markets at the time.

Figure 13: Normal Passive GBP-USD drift during COVID¹⁴

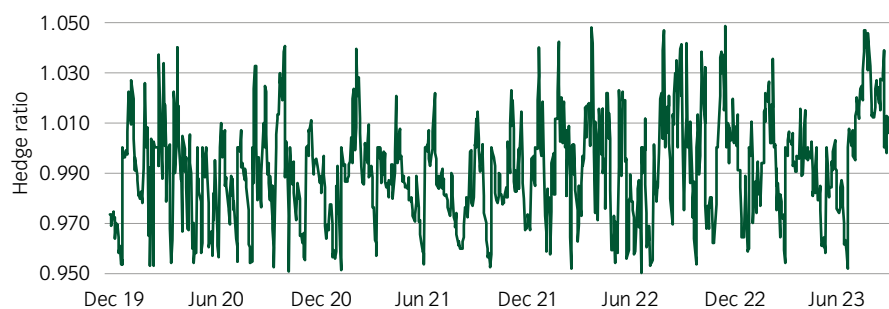
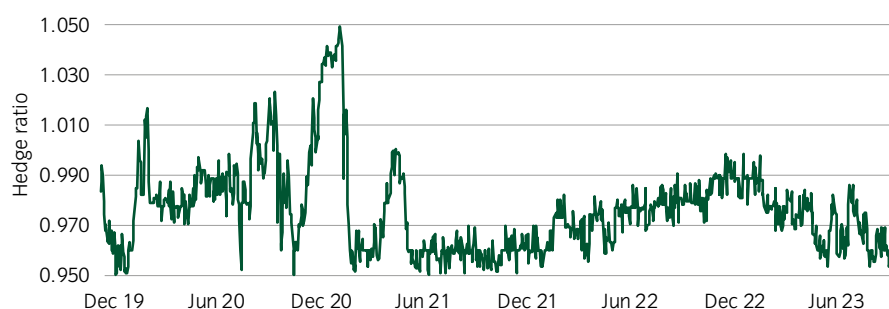


Figure 14: Enhanced Passive GBP-USD drift during COVID¹⁵

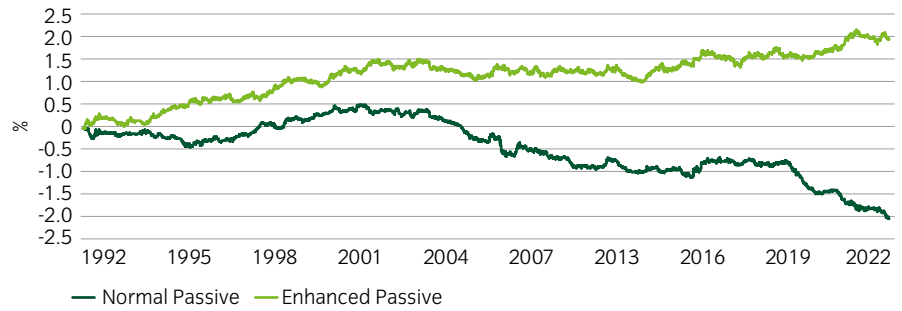


^{14, 15} Source: Data calculated by Insight between 31 December 1992 and 30 September 2023.

...HAS THE POTENTIAL TO SIGNIFICANTLY ENHANCE RETURNS

By managing the drift outcome, our aim is to switch the impact from being negative to one that targets alpha. We outline a back-tested simulation of this approach in Figure 15.

Figure 15: An Enhanced Passive strategy for a UK investor in the MSCI World Index¹⁶

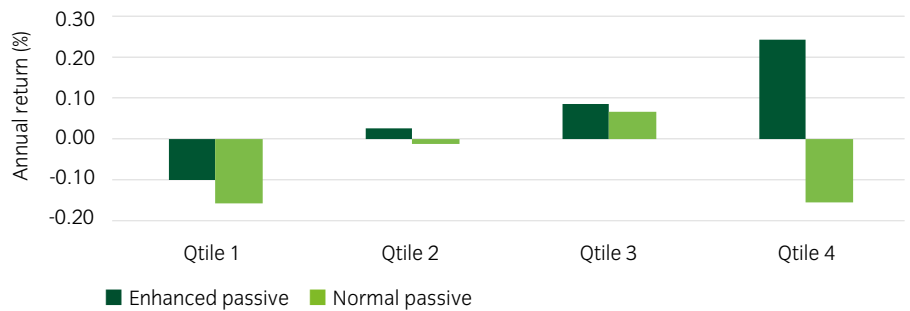


An Enhanced Passive solution does not require any change in hedge ratio settings, nor any variation in underlying securities or currencies used. It purely addresses the drift allowed from the targeted hedge by trading around that target with the intent of delivering a better return without taking additional risk. **The approach aims to manage the existing risk and target a positive return where drift volatility would have otherwise been left to chance.**

PROVIDING A COUNTERCYCLICAL BOOST TO RETURNS

In addition to managing the 'slippage' risk more effectively, our Enhanced Passive solution is constructed with the aim of delivering positive returns during challenging market conditions. In Figure 16 we can outline how the strategy has performed during different environments for equity returns, as measured by the returns of the MSCI World Index. When we rank equity performance into quartiles, we can observe a consistent outperformance of a normal passive hedging strategy in all environments, but the Enhanced Passive solution works best when equity market returns are experiencing their largest declines (i.e. returns are in the fourth quartile).

Figure 16: Impact of strategies for a UK Investor in different return quartiles for the MSCI World Index¹⁷



The differences in long-term expected performance between an Enhanced Passive strategy and a normal passive hedging strategy can be seen in Figure 17. It is notable that the Enhanced Passive strategy has a similar tracking error (Standard Deviation) but superior return and significantly reduced drawdowns.

Figure 17: Hedging performance summary for a UK investor¹⁸

	Return	Std	IR	Turnover	Ave DD	Max DD
Normal passive	-0.06%	0.16%	-0.42	4.5	-0.15%	-0.66%
Enhanced passive	0.06%	0.16%	0.39	5.4	-0.10%	-0.38%

¹⁶ Source: Data calculated by Insight between 31 December 1992 and 31 December 2023.

^{17, 18} Source: Data calculated by Insight between 31 December 1992 and 30 September 2023.

ENHANCED PASSIVE HAS BEEN PARTICULARLY EFFECTIVE WHEN TRADING THROUGH THE DOLLAR

We have undertaken simulations for an Enhanced Passive strategy across all of the major investor base currencies and outline the results in Figure 18. We then outline the summary return, volatility and the 'GAP' between the Enhanced Passive strategy and a normal passive hedging strategy in Figure 19. An interesting observation, a result that we have observed repeatedly, is the greater the US dollar is involved (either as underlying exposure or as the base currency) the more effective our risk models are in positioning for future spot movements. In Figure 18 this is represented by the USD based enhanced passive performance outperforming all other currency bases.

Figure 18: Enhanced Passive Performance for different base currencies¹⁹

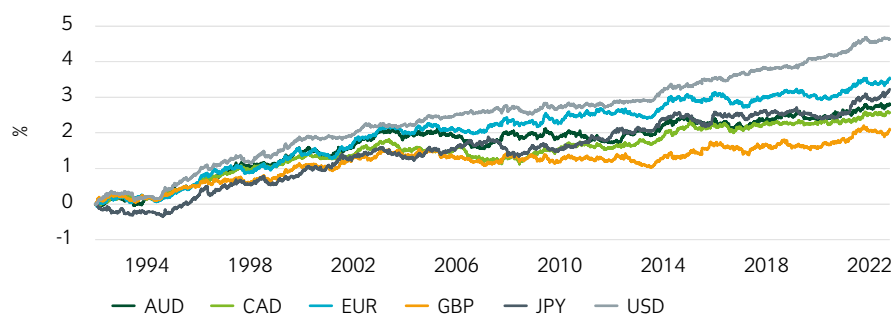


Figure 19: Annualised enhanced passive performance and opportunity for different base currencies²⁰

	AUD	CAD	EUR	GBP	JPY	USD
Returns	0.09%	0.08%	0.11%	0.07%	0.10%	0.15%
Volatility	0.18%	0.16%	0.18%	0.17%	0.18%	0.14%
Passive	-0.17%	-0.11%	-0.02%	-0.06%	0.01%	0.00%
GAP	0.25%	0.20%	0.13%	0.13%	0.10%	0.15%

^{19, 20} Source: Data calculated by Insight between 31 December 1992 and 30 September 2023.

APPENDIX 1

The theoretical formula for calculating the change in hedge ratio (HR) due to currency and asset price changes is as follows:

$$\frac{HR_{old}}{(1 + \text{spot_return})(1 + \text{asset_return}) + \text{hedging_P\&L}}$$

Ignoring second order terms, and acknowledging that the 'spot_return' and the 'hedging_P&L' mostly offset each other, and we are left with the approximation:

$$HR_{new} \approx \frac{HR_{old}}{(1 + \text{asset_return})}$$

So, the drift in daily hedge ratio is almost entirely due to local market asset returns. If asset prices appreciate hedge ratios fall and vice versa.

APPENDIX 2

The drift stemming from this pro-cyclicality can be extracted more formally through time by accumulating the product of recent equity returns with today's spot return weighted by the MSCI World Index basket as per the formula:

$$\text{Drift Return}(T) = \text{weight} * ((1 + \text{spot_return}(T))(1 + \text{asset_return}(T-1)) - 1)$$

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RISK DISCLOSURES

Past performance and simulated performance is not indicative of future results. Investment in any strategy involves a risk of loss which may partly be due to exchange rate fluctuations.

The performance results shown, whether net or gross of investment management fees, reflect the reinvestment of dividends and/or income and other earnings. Any gross of fees performance does not include fees, taxes and charges and these can have a material detrimental effect on the performance of an investment. Taxes and costs incurred when purchasing, holding, converting or selling any investment, will impact returns. Costs may increase or decrease as a result of certain currency conversions, such as currency hedging, and exchange rate fluctuations.

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Portfolio holdings are subject to change, for information only and are not investment recommendations.

^{16, 17} Source: Data calculated by Insight between 31 December 1992 and 30 September 2023.

ASSOCIATED INVESTMENT RISKS

Currency risk management

Currency hedging techniques aim to eliminate the effects of changes in the exchange rate between the currency of the underlying investments and the base currency (i.e. the reporting currency) of the portfolio. These techniques may not eliminate all the currency risk.

Derivatives may be used to generate returns as well as to reduce costs and/or the overall risk of the portfolio. Using derivatives can involve a higher level of risk. A small movement in the price of an underlying investment may result in a disproportionately large movement in the price of the derivative investment.

Investments in emerging markets can be less liquid and riskier than more developed markets and difficulties in accounting, dealing, settlement and custody may arise.

Where leverage is used as part of the management of the portfolio through the use of swaps and other derivative instruments, this can increase the overall volatility. While leverage presents opportunities for increasing total returns, it has the effect of potentially increasing losses as well. Any event that adversely affects the value of an investment would be magnified to the extent that leverage is employed by the portfolio. Any losses would therefore be greater than if leverage were not employed.

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