

CURRENCY: RISK AND RETURN

MADE SIMPLE GUIDE





ACKNOWLEDGEMENTS

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FOREWORD

RECORD CURRENCY MANAGEMENT, ONE OF THE WORLD'S LARGEST AND LONGEST-STANDING CURRENCY MANAGERS, HAS PRODUCED THIS GUIDE TO HELP IMPROVE YOUR UNDERSTANDING OF CURRENCY RISK FACTORS AND THE ROLE THEY CAN PLAY WITHIN YOUR PORTFOLIO.

Broadly speaking, there are two primary ways of using currency risk factors:

First, you can use them to generate returns. This can be achieved through systematic exposure to currency risk factors.

Second, currency risk factors can be used within a risk management framework, helping you decide on how best to manage the currency risk inherent in your international asset allocations.

◆◆ **FOR MANY UK PENSION FUNDS,
FOREIGN CURRENCY REPRESENTS
ONE OF THE BIGGEST RISKS IN
THEIR PORTFOLIOS** ◆◆



◆◆ **THIS GUIDE IS INTENDED TO
IMPROVE YOUR UNDERSTANDING OF
CURRENCY RISK FACTORS** ◆◆

CURRENCY RISK FACTORS FOR RETURN

Five currency risk factors (carry, momentum, value, range-trading and growth) have been proven to generate positive risk-adjusted returns over the long term.

We show that an equally weighted portfolio of currency risk factors exhibits a return to risk ratio of 0.78.

Exhibit low correlations with traditional assets, resulting in strong diversification benefits when combined into a single portfolio.

An equally weighted portfolio of currency risk factors exhibits a 0.34 correlation with global equities and a (0.07) correlation with global bonds.

CURRENCY RISK MANAGEMENT

Within a portfolio of international investments, currency risk should be incorporated into the decision-making process.

Investors can manage foreign currency risk using either a 'passive' (static hedge ratio) or 'active' (varying hedge ratio) approach, the latter involving the use of currency risk factors.

1 INTRODUCTION

IN THE SPHERE OF INVESTMENT MANAGEMENT, TERMS SUCH AS 'FACTORS' AND 'RISK FACTORS' ARE NOT UNIVERSALLY UNDERSTOOD. IN ITS BASIC FORM, A RISK FACTOR IS ANY SOURCE OF RISK. TO THE EXTENT THAT YOU CAN CHARACTERISE AND QUANTIFY THESE SOURCES OF RISK, YOU CAN USE THEM FOR RISK ATTRIBUTION, PORTFOLIO ALLOCATION, STRATEGY CONSTRUCTION, ETC.

WHAT IS CURRENCY RISK?

Currency risk describes the sources of risk and return inherent in the international components of your portfolio. For a UK pension fund, this would represent any investment that is denominated in a currency other than sterling. For many funds, foreign currency represents one of the biggest risks in their portfolios and should be incorporated into the investment decision-making process.

HOW DOES THIS RELATE TO CURRENCY RISK FACTORS?

Currency risk can be deconstructed or attributed to multiple risk factors. Therefore, it is essential that you understand these various factors from both a risk-reducing and return-seeking perspective.



2 CURRENCY RISK FACTORS

INVESTORS CAN INCORPORATE CURRENCY RISK FACTORS INTO THEIR PORTFOLIOS IN A VARIETY OF WAYS:

- ▶ AS A CURRENCY-FOR-RETURN STRATEGY
- ▶ IN COMBINATION WITH A HEDGING PROGRAMME, REALLOCATING UNREWARDED RISK IN INTERNATIONAL INVESTMENTS TO ACTIVELY MANAGED, REWARDED CURRENCY RISK FACTORS
- ▶ AS PART OF A CURRENCY HEDGING PROGRAMME

We identify five established currency risk factors that demonstrate appealing risk and return characteristics across differing time spans and economic regimes.¹ Below, we describe each of the five factors and provide an explanation for their existence.

DEVELOPED AND EMERGING MARKET CURRENCY RISK FACTORS

Table 1: Summary of currency risk factors

CURRENCY RISK FACTOR	DEFINITION	WHY DOES IT EXIST?
Carry	High interest rate currencies tend to outperform low interest rate currencies	Economies must offer higher interest rates to offset supply and demand imbalances
Momentum	Currency pairs trend in the short to medium term	Investor biases result in over-reactions that can cause currency appreciation or depreciation
Value	Currency pairs mean-revert to 'fair value' in the long term	Cheap (expensive) currencies relative to their fair value offer an arbitrage opportunity as they converge towards fair value
Range-trading	Currency volatility tends to be elevated at the short term, compared with the medium term	Supply and demand imbalances at the short term horizon result in currency volatility that offers a return to liquidity providers
Growth	High growth currencies tend to outperform low growth currencies	Poorer economies grow more quickly to 'catch up' with richer economies, resulting in real exchange rate appreciation

¹ There are additional currency risk factors beyond the five that we identify. However, these factors tend not to be as widely researched or empirically tested in academic literature.

◆ Developed and Emerging Market Factors ◆ Emerging Market Factors only

CARRY

One of the best-known currency risk factors, refers to the tendency for high interest rate currencies to outperform low interest rate currencies.

Carry may reflect a risk premium that 'riskier' economies have to offer to investors. In developed market (DM) economies, countries with persistent current account deficits must find a way to fund these, and typically this funding comes at a price. As such, countries differ in terms of the real and nominal interest rates they offer, with deficit countries offering higher interest rates to attract foreign capital.

MOMENTUM

Aims to exploit the phenomenon of trending, taking long positions in currencies that have recently appreciated and short positions in currencies that have recently depreciated.

Investor biases may provide some explanation for momentum, as herding behaviour of market participants exacerbates trends. Additionally, one could argue that delta hedging of options by market makers may also lead to trending. As the price of the underlying currency rises (falls) the delta of call (put) options rises, in absolute terms, so market makers must increase underlying long (short) positions in order to delta hedge.²

VALUE

Exploits the tendency for currencies to be mean-reverting at longer time horizons.

Specifically, economists use the concept of a currency's 'fair value' to describe equilibrium values to which currencies return over the long run. An investor who can correctly identify deviations from these equilibrium values and take a position reflecting expected convergence back to fair value will expect to make a return.

RANGE-TRADING

The observed phenomenon whereby the price of a currency pair stays within a specified range for a period of time.

Range-trading is the observed regularity that the currency spot rate is more volatile when measured over a day than it is over a one to three month period. This is because demand and supply for currency changes at different times, so there is a "premium" to be earned for capital providers willing to help balance these short term pressures.

GROWTH

As emerging market economies grow and converge towards developed market economies their exchange rates appreciate in real terms.

Economies that experience faster productivity gains find their exchange rates appreciate in real terms. An investor who takes a long position in faster growing economies, funded by a short position in more slowly growing economies, can expect to pick up this appreciation over the long term.

² Typically, the banking sector is net short options, which would make this process structural in nature.

3 DEFINING CURRENCY MANAGEMENT OBJECTIVES

THERE ARE SEVERAL KEY OBJECTIVES TO CONSIDER BEFORE IMPLEMENTING A RISK MANAGEMENT OR RETURN-SEEKING CURRENCY PROGRAMME. GENERALLY, CURRENCY INVESTORS FALL INTO ONE OF TWO CATEGORIES.

1. THOSE WHO WISH TO GENERATE RETURNS FROM CURRENCY RISK FACTORS
2. THOSE WHO WISH TO MANAGE (PASSIVELY OR ACTIVELY) THEIR INTERNATIONAL PORTFOLIO'S EXPOSURE TO CURRENCY RISK

◆◆ THERE ARE SEVERAL KEY OBJECTIVES TO CONSIDER BEFORE IMPLEMENTING A RISK MANAGEMENT OR RETURN-SEEKING CURRENCY PROGRAMME ◆◆

RETURN-SEEKING

The design of a pure return-seeking (or 'alpha') currency programme differs from a risk-reducing programme: in the former, an investor makes the conscious decision to take on more currency risk, with the aim of generating excess returns over the long run.

When implementing a return-seeking currency programme, an investor should be clear on the relationship between the currency risk factors that they are exposed to and the other assets within their portfolio.

RISK REDUCTION

Investors looking to reduce foreign currency risk may see hedging as a strategic decision, designed to remove a portion or all of the currency risk inherent in their international portfolio(s). Once you have made the strategic decision to manage currency risk, you must then decide on how best to implement a currency risk management programme: passively or actively, the latter involving the use of currency risk factors.

4 CURRENCY RISK FACTORS FOR RETURN

FOR YEARS, INVESTORS HAVE BEEN TARGETING THE 'TRADITIONAL' RISK PREMIA AVAILABLE IN EQUITY AND FIXED INCOME MARKETS THROUGH DIRECTIONAL LONG EXPOSURES TO WELL-ESTABLISHED RISK FACTORS. SIMILARLY, CURRENCY RISK FACTORS ARE DESCRIBED AS SOURCES OF 'ALTERNATIVE' RISK PREMIA, MANIFESTING AS COMPENSATION FOR TAKING RISK OR AS A BY-PRODUCT OF BEHAVIOURAL BIASES.

Unlike traditional asset factors that tend to be captured with long-only investments, currency risk factors tend to be exploited by buying currencies with attractive characteristics and selling currencies with poor characteristics. For example, an investor could earn currency carry by taking a long position in high interest rate currencies, funded by a short position in low interest rate currencies. In doing so, the investor picks up the nominal interest rate differential through the pricing of forward contracts.³ Put simply, the investor earns the difference between the higher interest rate currency and lower interest rate currency, assuming that the spot rate remains unchanged.

In Table 2, we document the historical return to risk ratio of the five currency risk factors between January 1990 to June 2018. As can be seen, all five currency risk factors generate positive return to risk ratios over the sample period, ranging from 0.14 to 0.63.

Table 2: Return to risk ratio of currency risk factors

	CARRY	MOMENTUM	VALUE	RANGE-TRADING*	GROWTH**	EQUALLY WEIGHTED PORTFOLIO
Return to risk ratio	0.42	0.14	0.39	0.63	0.51	0.78

Source: Record Currency Management. Excess return to risk ratio is calculated using monthly, gross returns. *Range-Trading returns are sampled between June 1999 to June 2018. **Growth returns are sampled between January 1998 to June 2018. An equally weighted portfolio is created using three currency risk factors (Carry, Momentum and Value) between January 1990 to December 1997, four currency risk factors (Carry, Momentum, Value and Growth) between January 1998 to May 1999 and five currency risk factors (including Range-Trading) thereafter.

BUILDING A DIVERSIFIED CURRENCY RISK FACTOR PORTFOLIO

Each currency risk factor has a different relationship to the underlying macroeconomy and, when combined, results in a robust and well-diversified portfolio with appealing return and risk characteristics. In other words, each individual currency risk factor can experience difficult periods, but the difficult periods tend not to occur simultaneously.

In Table 3, we show the correlations between each of the five risk factors. Most currency risk factors exhibit close to zero correlation with the others, with the exception of growth and carry. This is because carry is one of the primary drivers of returns in the growth factor. As such, the currency carry factor in developed markets exhibits a moderately positive correlation with currency growth. Ultimately, a weighted combination of the five currency risk factors achieves a higher return, at the same level of risk, than any individual currency risk factor.

³ Higher interest rate currencies are priced at a discount from Covered Interest Parity – a theoretical condition in which the relationship between interest rates and the spot and forward currency values of two countries are in equilibrium.

◆◆ EACH INDIVIDUAL CURRENCY RISK FACTOR CAN EXPERIENCE DIFFICULT PERIODS, BUT THE DIFFICULT PERIODS TEND NOT TO OCCUR SIMULTANEOUSLY ◆◆

Table 3: Correlations between the returns of currency risk factors

	CARRY	MOMENTUM	VALUE	RANGE-TRADING*	GROWTH**
Carry	–	(0.17)	0.12	0.07	0.62
Momentum	(0.17)	–	(0.03)	(0.28)	(0.14)
Value	0.12	(0.03)	–	(0.07)	0.07
Range-Trading*	0.07	(0.28)	(0.07)	–	0.10
Growth**	0.62	(0.14)	0.07	0.10	–

Source: Record Currency Management. Correlations are calculated using monthly, gross returns. *Range-Trading returns are sampled between June 1999 to June 2018. **Growth returns are sampled between January 1998 to June 2018.

CURRENCY RISK FACTORS AS PORTFOLIO DIVERSIFIERS

Currency risk factors not only exhibit diversification properties amongst themselves, but also have relatively low correlations with traditional assets, such as equities and bonds, as demonstrated in Table 4.

An equally weighted portfolio of the five currency risk factors exhibits a 0.34 correlation with global equities and a (0.07) correlation with global bonds.

Table 4: Correlations with the returns of traditional assets

	EQUITIES	BONDS	60% EQUITIES, 40% BONDS
Carry	0.17	(0.34)	0.03
Momentum	(0.09)	0.12	(0.04)
Value	0.17	0.10	0.17
Range-Trading*	0.05	0.00	0.05
Growth**	0.60	(0.05)	0.51
Equally weighted portfolio	0.34	(0.07)	0.26

Source: Record Currency Management, MSCI and Barclays. Equity returns are represented by the MSCI World Index and bond returns are represented by the Barclays Global Aggregate Index. All returns are excess, gross of fees. *Range-Trading returns are sampled between June 1999 to June 2018. **Growth returns are sampled between January 1998 to June 2018. An equally weighted portfolio is created using three currency risk factors (Carry, Momentum and Value) between January 1990 to December 1997, four currency risk factors (Carry, Momentum, Value and Growth) between January 1998 to May 1999 and five currency risk factors (including Range-Trading) thereafter.

Ultimately, a currency risk factor portfolio utilised in combination with a traditional asset portfolio can improve returns, diversify risk and enhance risk-adjusted performance. In Table 5, we show the hypothetical impact on return to risk ratios of reallocating 5% and 10% of a 60/40 portfolio to an equally weighted portfolio of currency risk factors.

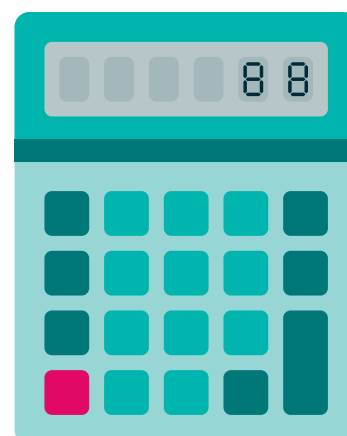
Table 5: Hypothetical impact of adding currency risk factors to a traditional portfolio

	60/40 PORTFOLIO	REALLOCATE 5% TO CURRENCY RISK FACTORS	REALLOCATE 10% TO CURRENCY RISK FACTORS
Return to risk ratio	0.58	0.62	0.65

Source: Record Currency Management, MSCI and Barclays. Equity returns are represented by the MSCI World Index and bond returns are represented by the Barclays Global Aggregate Index. Excess return to risk ratio is calculated using monthly, gross returns. *Range-Trading returns are sampled between June 1999 to June 2018. **Growth returns are sampled between January 1998 to June 2018. An equally weighted portfolio is created using three currency risk factors (Carry, Momentum and Value) between January 1990 to December 1997, four currency risk factors (Carry, Momentum, Value and Growth) between January 1998 to May 1999 and five currency risk factors (including Range-Trading) thereafter.

In conclusion, investors can incorporate currency risk factors into their portfolios in a variety of ways.

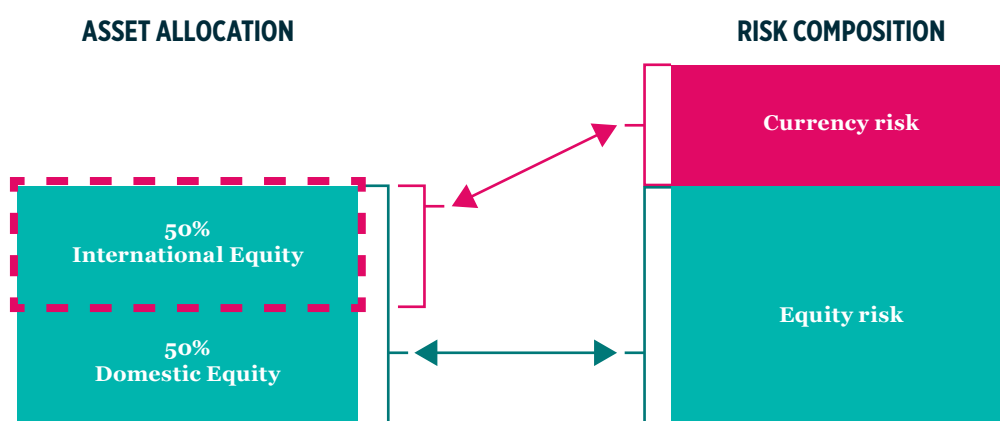
- ▶ **As a currency-for-return strategy**
- ▶ **In combination with a hedging programme, reallocating unrewarded risk in international investments to actively managed, rewarded currency risk factors**
- ▶ **As part of a currency hedging programme**



5 CURRENCY RISK MANAGEMENT

INVESTORS OFTEN OVERLOOK THE RELATIONSHIP BETWEEN CURRENCY RISK AND INTERNATIONAL ASSET EXPOSURES, LEAVING THEIR PORTFOLIOS UNHEDGED BY DEFAULT. HOWEVER, INVESTORS SHOULD BE AWARE THAT INVESTING IN UNHEDGED INTERNATIONAL ASSETS RESULTS IN TWO DISTINCT EXPOSURES: INVESTMENT IN THE FOREIGN ASSET AND A LONG POSITION TO THE FOREIGN CURRENCY EXPOSURES.

Figure 1: Holding foreign equities exposes you to foreign currency risk



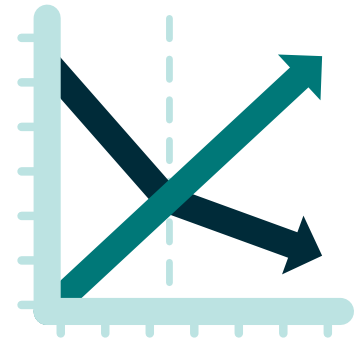
Foreign currency exposure can have a substantial impact on returns in any year, sometimes of a magnitude greater than that of the underlying asset returns. Hedging developed market currencies therefore offers an opportunity to smooth portfolio returns and reduce volatility.

VOLATILITY REDUCTION

The extent of volatility reduction achievable from currency hedging depends on the correlation between the returns of the international asset and the returns of the foreign currency that it is priced in.⁴ In the case where the two returns are positively correlated, hedging would reduce portfolio volatility. However, if the two returns are negatively correlated, hedging could increase portfolio volatility. Therefore, investors should consider the relationship between the foreign currency and underlying asset when making hedging decisions.

◆◆ HEDGING DEVELOPED MARKET CURRENCIES OFFERS AN OPPORTUNITY TO SMOOTH PORTFOLIO RETURNS AND REDUCE VOLATILITY ◆◆

⁴ From a mathematical point of view, we will express currency returns as positive if the foreign currency appreciates relative to the investor's base currency.



CASH FLOWS FROM HEDGING

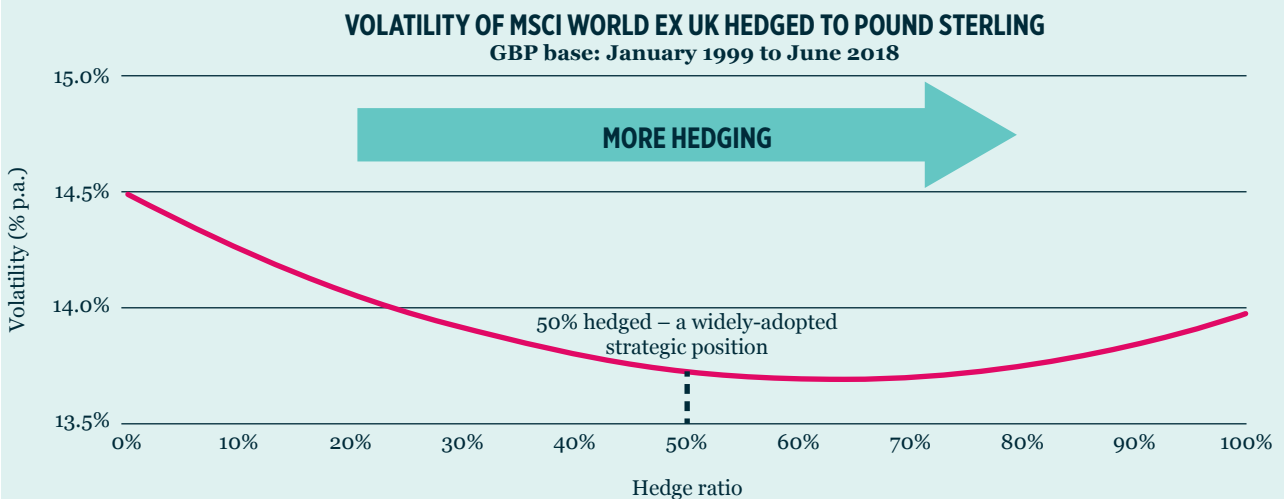
Volatility reduction also depends on the proportion of each exposure currency that is hedged, or the ‘hedge ratio’. One of the main costs of implementing a hedging programme relates to regular cash flows, which can require asset liquidations if large and negative. Cash flows, expressed as a percentage of underlying assets, rise in direct proportion to the hedge ratio – i.e. doubling the hedge ratio will lead to cash flows which are twice as large.

Effective currency risk management strategies should consider the trade-off between volatility reduction and increased cash flows for each asset class. With this in mind, investors can manage foreign currency risk using either a ‘passive’ (static hedge ratio) or ‘active’ (varying hedge ratio) approach, the latter involving the use of currency risk factors.

HEDGING INTERNATIONAL EQUITIES

Figure 2 illustrates the volatility reduction provided by passively hedging the exposures generated by an MSCI World ex UK equity portfolio. As the hedge ratio increases past 50%, the marginal rate of volatility reduction declines, with the result that a 50% hedge ratio in fact delivers approximately 80% of the maximum volatility reduction from hedging. Many investors balance the incremental volatility reduction with the cash flows arising from hedging international equities by setting a benchmark hedge ratio of 50%.

Figure 2: Volatility reduction from hedging international equities



Source: Record Currency Management, MSCI.

PASSIVE CURRENCY RISK MANAGEMENT

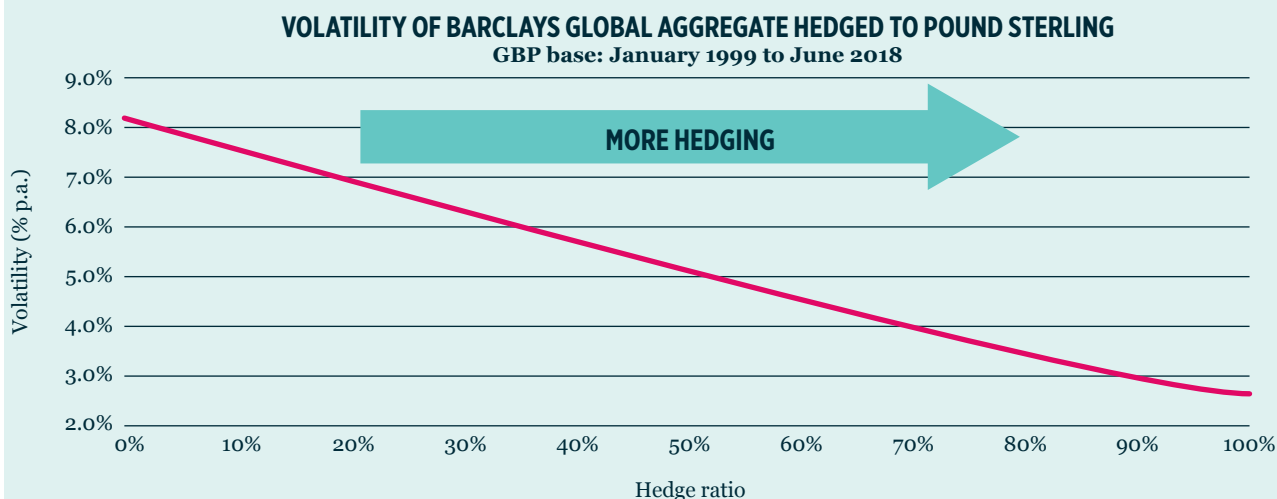
It is possible to offset exposures to foreign currency risk in a portfolio with passive hedging. This involves establishing and maintaining forward currency contracts to sell the relevant foreign currency versus your base currency.

One challenge of passive hedging is managing the cash flows that arise from the maturing forward currency contracts. These are regular, and are in effect payments on account for the accruing profits or losses of the hedge.⁵ In a passive hedge, they are not entirely avoidable, can be disruptive and require asset liquidations to pay for them. Specialist currency managers can help design hedging programmes that minimise the impact of such cash flows using overlapping, 'laddered' forward contracts.

HEDGING INTERNATIONAL BONDS

The volatility reduction provided by passively hedging the exposures generated by an international bond portfolio, represented by the Barclays Global Aggregate Index, is shown in Figure 3. The benefit of increasing the hedge ratio in this case is constant for hedge ratios up to 100%. It is for this reason that investors typically set hedge ratios at 100% when hedging the currency exposures associated with an international bond portfolio.

Figure 3: Volatility reduction from hedging international bonds



Source: Record Currency Management, Barclays.

⁵ Please note these cash flows due on settlement are separate from daily variation margin based on mark-to-market movements which may be required for some investors.

CURRENCY RISK FACTORS FOR ACTIVE CURRENCY RISK MANAGEMENT

Active hedging is any hedging activity that involves a view or discretion to deviate from a fixed hedge ratio. Specialist currency managers who offer active hedging mandates usually operate techniques designed to alter hedge ratios in response to signals produced by one or more risk factors.

While passive hedging offsets both positive and negative currency returns, active hedging allows investors to benefit from their foreign currency exposure, while also protecting from the additional volatility associated with investing internationally. In essence, investors can use currency risk factors as 'signals' that alter the hedge ratios on each exposure currency in response to market fluctuations.

For example, you could use a single currency risk factor, such as momentum, to incrementally increase portfolio hedge ratios when there is an expectation that your base currency will appreciate and decrease portfolio hedge ratios when there is an expectation that your base currency will depreciate. This progressively removes hedges that would lead to cash outflows in periods of foreign currency strength (i.e. base currency weakness). Conversely, hedges are maintained as an 'insurance overlay' in periods of base currency strength.

Alternatively, you could use multiple currency risk factors to determine the optimal portfolio hedge ratio. Each risk factor could be managed individually for each exposure currency.

For example, the currency carry factor could be used in combination with the value and momentum factors to create an active hedging strategy that maintains exposure to currencies expected to appreciate, while hedging exposures expected to depreciate over a defined time horizon.

CURRENCY RISK MANAGEMENT IN EMERGING MARKETS

Emerging market (EM) exposures are becoming more important to UK pension funds and other institutional investors alike. In an environment of low developed market yields, the higher yields available in emerging markets appear increasingly attractive.

Lower levels of transparency and higher volatility within EM currencies may offer additional risk factor premia, relative to developed market (DM) currencies. As a result, many investors leave their EM currency exposures unhedged, taking the view that EM currencies will appreciate, in real terms, against DM currencies over the long term.⁶ In addition, the higher transaction costs and potential lack of liquidity associated with trading EM currencies supports the argument for leaving EM currency exposures unhedged.

However, EM currencies can experience sharp draw-downs, which are interspersed with more benign periods. In such cases, short term, currency risk factor-based signals could provide tail-risk protection against sudden EM currency depreciation.

For example, a currency momentum factor hedging strategy could be used to increase hedge ratios when the EM currencies trend downwards against their developed market counterparts.

⁶ This appreciation occurs as a result of the Balassa-Samuelson effect: exchange rates vary according to productivity because of the existence of a non-tradable sector. As economies become more productive, increases in productivity in the tradable goods sector lead to wage increases which filter into the non-tradable sector raising prices and wages. The resulting price rises cannot be arbitrated out by the exchange rate, and this expresses itself as a real exchange rate appreciation.

6 CURRENCY IMPLEMENTATION FRAMEWORK

CURRENCY BENCHMARKS

AS IN TRADITIONAL ASSET CLASSES, A CURRENCY BENCHMARK SHOULD SET OUT THE STRATEGIC EXPOSURE AN INVESTOR WISHES TO EMBRACE AND ACT AS A REFERENCE POINT AGAINST WHICH YOU CAN JUDGE THE PERFORMANCE OF YOUR INVESTMENTS (OR INVESTMENT MANAGER). HOWEVER, CURRENCY BENCHMARKS ARE NOT AS INTUITIVELY EASY TO UNDERSTAND OR CONCEPTUALISE AS MAY BE THE CASE IN OTHER ASSET CLASSES.

DEFINING A RETURN-SEEKING CURRENCY BENCHMARK

Return-seeking currency strategies are often categorised as a type of absolute return mandate. As such, a large number of currency strategies opt for a strategic benchmark of zero or some sort of proxy for the risk-free rate.

Currency risk factor investing, however, implies that the behaviour of the currency market can be described by well-understood, persistent sources of return (or factors). Therefore, an appropriate benchmark could simply reflect a rules-based, systematic exposure to currency risk factors.

DEFINING A CURRENCY HEDGING BENCHMARK

An investor with a high proportion of equities in their portfolio may adopt a strategic portfolio benchmark which includes, for example, 70% equities. This choice establishes a basis for allocating capital, and is representative of the investor's 'neutral' position. As a result, the performance of the investor's equity investments will be judged against the performance of an equity index acting as an equity benchmark. Similarly, with currency benchmarks, an investor wishing to hold no currency exposure in their strategic benchmark will set a fully hedged benchmark – i.e. a strategic position that eliminates all currency risk. An investor who wishes to hold all the currency exposure that comes with their international exposure will choose an unhedged benchmark. Choosing to strategically hold half the currency exposure would imply a 50% hedged benchmark.

◆◆ **CURRENCY BENCHMARKS ARE NOT AS INTUITIVELY EASY TO UNDERSTAND OR CONCEPTUALISE AS MAY BE THE CASE IN OTHER ASSET CLASSES** ◆◆

CREDIT AND COUNTERPARTY RISK

WHILE A LARGE NUMBER OF CURRENCY TRANSACTIONS ARE EXECUTED USING CURRENCY SPOT TRADES, FOR SHORT-DATED SETTLEMENT, THE MAJORITY OF RETURN-SEEKING AND CURRENCY HEDGING TRANSACTIONS ARE DONE USING CURRENCY FORWARD CONTRACTS.

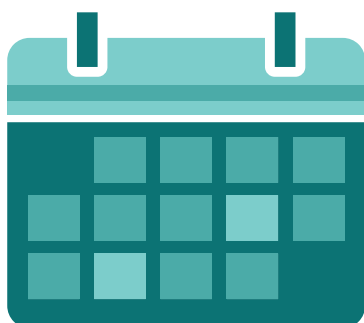
Forward contracts are over-the-counter (OTC) instruments and are negotiated directly between the two parties involved in the transaction, rather than through a centrally cleared counterparty. Therefore, there is a risk that either counterparty (generally the investor or the bank) may default or fail to make payment on the contract at settlement.

To manage credit and counterparty risk, investors need adequate infrastructure allowing for currency forward contract exposures to be either collateralised (i.e. the risk is contained to the size of daily margin calls with the counterparty or with an FX Prime Broker) or diversified among a number of high grade counterparties, with a proactive management of counterparty limits if required. As such, there are a number of different ways pension funds can design this infrastructure, including:

- 1) Trading bilaterally under their own International Swaps and Derivatives Association (ISDA) agreement⁷
- 2) Trading under their investment manager's umbrella ISDA agreements, with the manager acting as agent
- 3) Trading with a dedicated FX Prime Broker (PB).

The negotiation of bilateral ISDAs between counterparties can be a lengthy process and will incur costs. These costs often limit a pension fund's ability to negotiate multiple agreements and create a diversified bank panel with whom they can trade. However, specialist managers often have longstanding relationships with a large number of counterparty banks. As a result, pension funds can delegate the authority to establish such agreements to their dedicated investment or currency manager, allowing a larger, more diversified bank panel to be implemented in a cost-effective and timely manner.

Alternatively, pension funds could opt for an FX Prime Brokerage service, whereby Brokers allow their PB clients to trade with third party counterparties on the Broker's balance sheet. This service is normally provided on a collateralised basis and is generally used by investors that would not be granted a 'direct' FX trading facility (under an ISDA agreement) by banks due to their credibility or size. Such agreements usually incur additional fees (a PB normally requires a fee per transaction). In any case, pension funds should consider the trade-off between increased counterparty diversification, credit risk and cost when considering the different types of FX trading relationships.

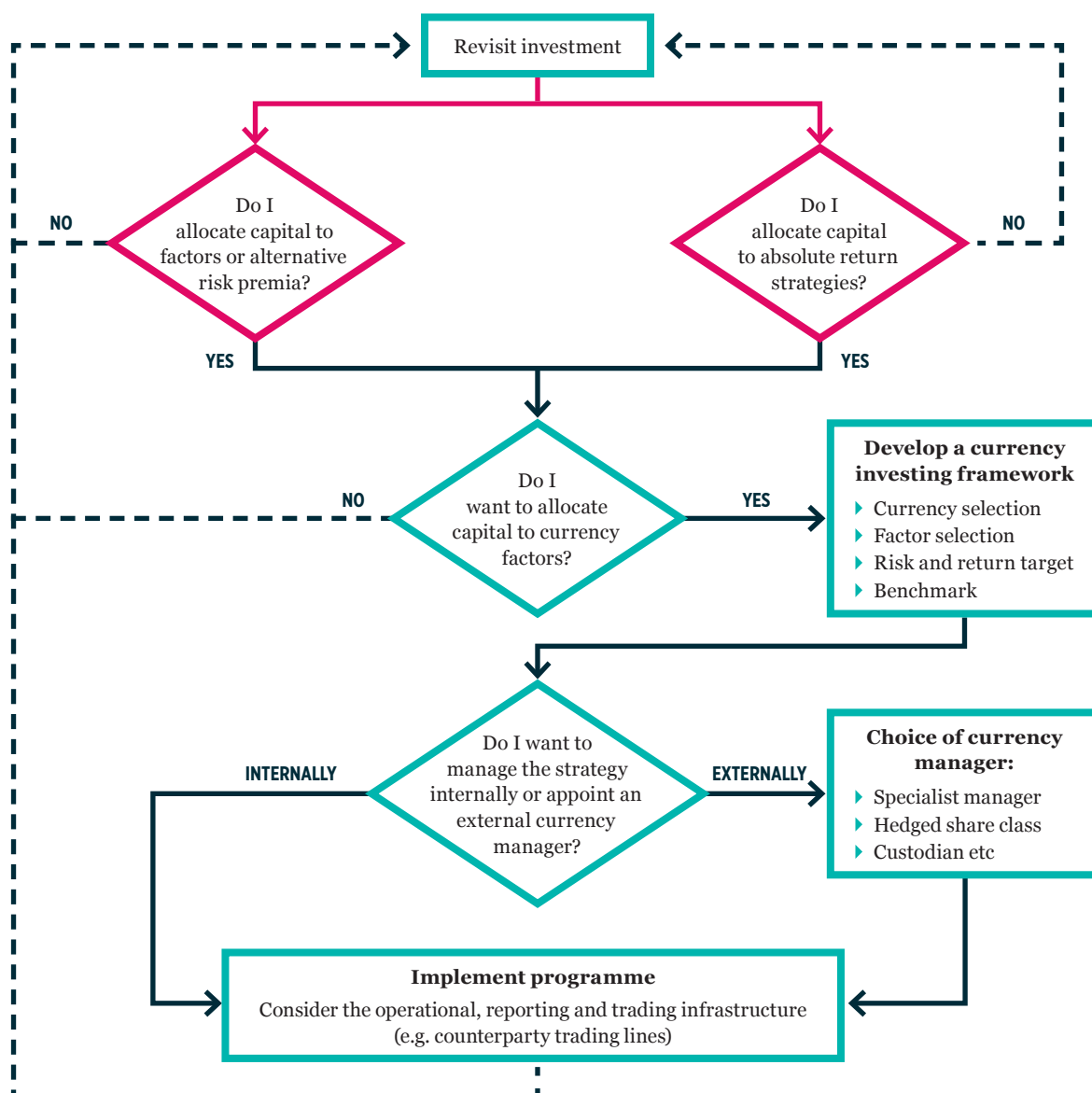


⁷ The ISDA serves as a legal agreement, used by financial market participants, to help identify and mitigate risk in trading relationships.

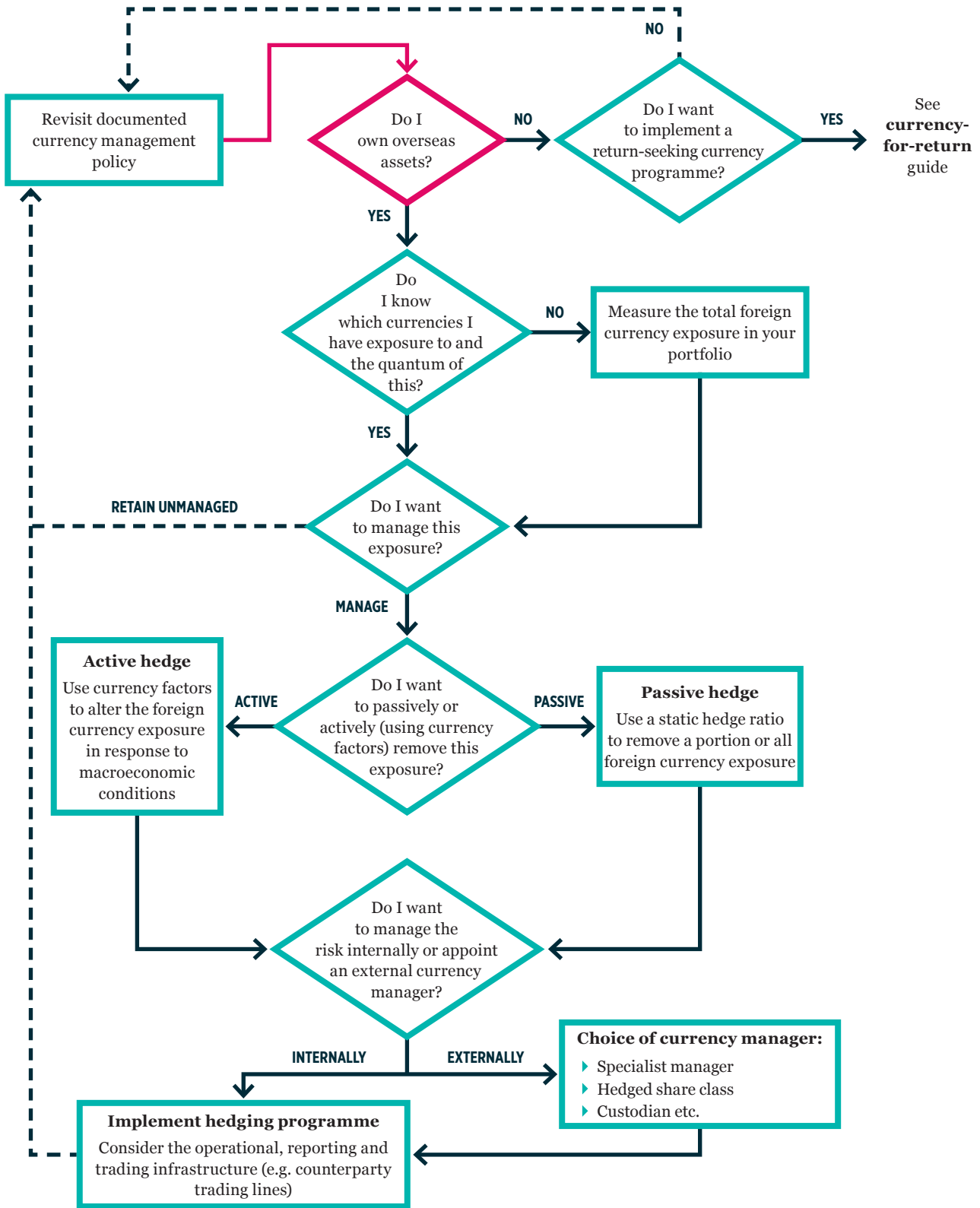
7 CURRENCY PROGRAMME STEP-BY-STEP GUIDES

THERE ARE A NUMBER OF DIFFERENT APPROACHES THAT CAN BE EMPLOYED BY PENSION FUNDS WHEN IMPLEMENTING A RISK MANAGEMENT OR RETURN-SEEKING CURRENCY PORTFOLIO. THE STEP-BY-STEP GUIDES BELOW MAY ACT AS USEFUL STARTING POINTS FOR UNDERSTANDING HOW BEST TO MANAGE YOUR SCHEME'S FOREIGN CURRENCY EXPOSURES OR HOW CURRENCY RISK FACTORS CAN BE ADDED TO YOUR RETURN-SEEKING PORTFOLIO.

CURRENCY-FOR-RETURN



CURRENCY RISK MANAGEMENT



STEP-BY-STEP GUIDES KEY



Return to investment policy



Next step policy

8 CONCLUSION

CURRENCY FACTORS FOR RETURN

Although many currency risk factors have been documented, only a small number have established themselves across different economic regimes, geographies and time periods. Five factors (carry, momentum, value, range-trading and growth) have been proven to generate positive risk-adjusted returns and, when combined into a traditional asset portfolio, improve performance.

We demonstrate that currency risk factors exhibit low correlations with traditional assets, resulting in strong diversification benefits when combined into a single portfolio. As such, we believe that pension funds can benefit from diversifying into multiple currency risk factors, creating portfolios with the potential to deliver better risk-adjusted performance than simple allocations to 60/40 equity/bond portfolios.

CURRENCY RISK MANAGEMENT

For many UK pension funds, foreign currency represents one of the biggest risks in their portfolios. Hence, within a portfolio of international investments, currency risk should be incorporated into the decision-making process.

Effective, strategic use of currency risk management calls for consideration of the trade-off between volatility reduction and increased cash flows for each foreign asset class. We illustrate how an investor can manage their foreign currency risk using either a 'passive' (static hedge ratio) or 'active' (varying hedge ratio) approach, the latter involving the use of currency risk factors.

This guide should help to improve your understanding of currency risk factors and the role they can play within your portfolio, but there is much more to discover in the currency market and within the realm of factor investing.



9 GLOSSARY OF TERMS

Active hedge	A currency hedge programme with a variable hedge ratio.
Base currency	This refers to the investor's domestic or home currency.
Cash flow	The physical amount exchanged between the two parties to a foreign exchange transaction on the maturity date, resulting from gains or loss in value of the contract.
Currency risk factor	A source of alternative risk premium, resulting either as compensation for taking risk or as a by-product of behavioural biases.
Currency hedge	A transaction to offset, wholly or in part, the extent to which the value of an investor's foreign asset when translated into its base currency varies with the exchange rate.
Delta hedge	A risk management methodology for options that aims to reduce the risk of price movements associated with the underlying asset.
Draw-downs	Peak-to-trough decline of a currency during a specific recorded period.
Excess return	The investment returns from an asset or portfolio that exceed the riskless or risk-free rate of return (such as a certificate or government-issued bond).
Exposure or foreign currency	The currency of the underlying foreign asset.
Forward or forward currency contract	An agreement to buy (or sell) a specific amount of one currency against another, at a specific date in the future, and at a specific rate.
Funding currency	A currency that is exchanged in a currency carry trade transaction. A funding currency typically has a low interest rate.
Hedge ratio	The percentage of the hedgeable amount in any exposure currency that is hedged.
Interest rate differential	The difference in interest rate between two currencies in a pair.
Long position	A long (or long position) is the buying of a security such as a stock or currency.
Mark-to-market	The unrealised profit or loss on an open foreign exchange transaction, as determined by reference to the prevailing market rate.
Nominal interest rate	The interest rate before taking inflation into account.
Overlay	Any currency investment strategy implemented by means of unfunded foreign exchange transactions, typically forward contracts, which conceptually sit on top of or 'overlay' a portfolio of securities or other investments.
Over-the-counter	Transactions that are traded without the supervision of a registered exchange.
Passive hedge	A currency hedge programme with a fixed hedge ratio.
Real interest rate	An interest rate that has been adjusted to remove the effects of inflation.
Spot exchange rate	The price to exchange one currency for another for delivery on the earliest possible value date.
Short position	A short (or short position) is the selling of a security such as a stock or currency.
Tail-risk	A form of portfolio risk that arises as a result of 'extreme' events.
Total return	The actual rate of return of an investment or a pool of investments over a given period. This includes any interest, capital gains, dividends or coupons earned over the period.
Variation margin	Collateral typically exchanged both ways between the parties to a foreign exchange transaction, as agreed between the parties and typically representing the mark-to-market value on a regular (daily) basis.

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