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CURRENCY HEDGING REVIEW

LONDON BOROUGH OF HARINGEY PENSION FUND (“THE FUND”)

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Executive Summary

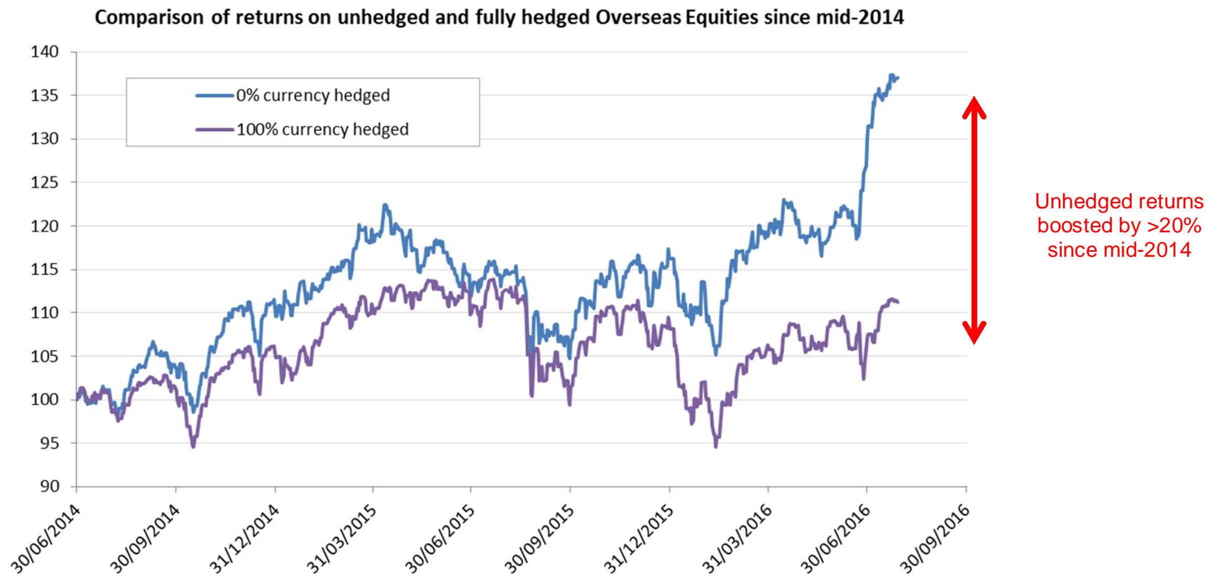
Allocations to non-domestic assets introduce exposure to foreign currencies in addition to the exposure to the underlying assets themselves. Traditionally, foreign currency risk is viewed as ‘unrewarded’ (i.e. increased return is not expected for the extra risk) and it is possible to remove (or hedge) this currency exposure. For the Fund, overseas currency exposure arises primarily from the overseas equity portfolio managed by Legal & General Investment Management (“LGIM”). The Fund’s benchmark benchmark allocation to overseas equities represents around 48% of total assets and therefore the impact of currency movements will be an important source of risk that the Fund is exposed to given that the liabilties are Sterling based.

Return patterns generated by hedged and unhedged currency exposures deviate through time, often by a material amount, and for significant periods of time. The Fund currently does not hedge the currency element of its overseas equities.

From a strategic perspective, we believe that a currency hedge ratio of 50%-75% is usually appropriate for overseas equity investments, given the risk reduction benefits. From a tactical perspective, if the Fund was to introduce currency hedging, it would ideally want to do so when Sterling is relatively weak. This is because a strengthening of Sterling would lead to better returns for investors with currency hedging in place, all else being equal.

Following the significant depreciation of Sterling following the recent EU referendum result, it has worked in the Fund’s favour to have “unhedged” overseas currency exposures. Specifically, returns in the overseas equity portfolio have been boosted significantly compared to a fully currency hedged investor.

The chart below illustrates how returns have been boosted significantly for unhedged investors as a result of the significant depreciation of Sterling since mid-2014.



In monetary terms, we estimate that returns from the overseas equity portfolio have been enhanced by at least £60m over the period since the Brexit vote alone (compared to a fully currency hedged investor in the same benchmark indices). Please note that this analysis does not account for the change in the overseas equity mandate over the period (i.e. the introduction of an allocation to a low carbon index fund, which is being implemented in a phased manner over three tranches), but given the low carbon fund at LGIM is also invested in an unhedged share class we believe the figure is representative of the gains experienced by the Fund.

Whilst there is the prospect for Sterling to depreciate further, for example due to a disorderly separation from the EU or following further cuts in the Bank of England Base Rate we believe that the dramatic fall in Sterling (which now stands at c.1.3 versus the US Dollar, compared to c.1.7 only two years ago) should trigger a discussion on whether to introduce a hedge.

Our recommendation would be to introduce a 50% currency hedged position. We would view this as a sensible compromise between “banking” the recent gains from the Sterling weakness and reducing the impact of future currency moves on the returns from the overseas equity portfolio, but also reducing the possible regret risk (versus a higher currency hedge ratio) should Sterling depreciate materially further.

Implementing a currency hedging policy would be straight-forward and, in our view, not expensive. A portion of the existing unhedged market capitalisation overseas equities could simply be switched to the equivalent funds with LGIM that are currency hedged. Additional ongoing management charges would be 2.5 bps p.a. and the estimated cost of switching would be 1 to 2 bps of assets.

To reduce the timing risk involved with introducing currency hedging, we would recommend that a build up to a 50% hedged position is phased in over a period of time. A pragmatic suggestion for this would be over a 6 month period.

Introduction

This paper is addressed to the Pensions Committee of the London Borough of Haringey Pension Fund ("the Fund"). The purpose of the paper is to discuss the strategic merits of currency hedging of the Fund's overseas equity exposure and to highlight the current opportunity to introduce currency hedging at what we consider to be a relatively attractive time given the dramatic fall of Sterling versus other major currencies following the surprise "Brexit" vote.

The first section of this paper sets out the strategic rationale for why investors often chose to hedge a proportion of their overseas equity exposure. We then examine the recent moves in currency markets, what this has meant for the Fund in terms of impacting the returns from the overseas equity portfolio and whether now may represent an opportune time to reconsider the current approach to leaving such overseas currency exposure unhedged. Finally, we consider the practical steps that would need to be worked through should the Committee wish to introduce currency hedging within the equity portfolio.

Background – what overseas currency exposure does the Fund have?

The table below sets out where the primary overseas currency exposure arises for the Fund. The table uses target allocations and assumes the final tranche of investment in the MSCI World Low Carbon Index Fund has been completed, and that the Long Lease Property mandate with Aviva has been fully drawn down and invested (this would be sourced from the equity assets).

Mandate	Target Allocation (%)
Passive UK Equities (LGIM)	9.6
Overseas Market Capitalisation Equities* (LGIM)	31.6
Overseas Low Carbon Equities (LGIM)	16.3
Passive UK Index-Linked Gilts (LGIM)	15.0
Conventional Property (CBRE)	7.5
Long Lease Property (Aviva)	5.0
Multi-Sector Credit (CQS)	5.0
Infrastructure Debt (Allianz)	5.0
Private Equity (Pantheon)	5.0
Total	**100.0**

*This mandate includes stand-alone allocations to US, Europe (ex-UK), Japan, Asia Pacific ex-Japan and Emerging Market equities.

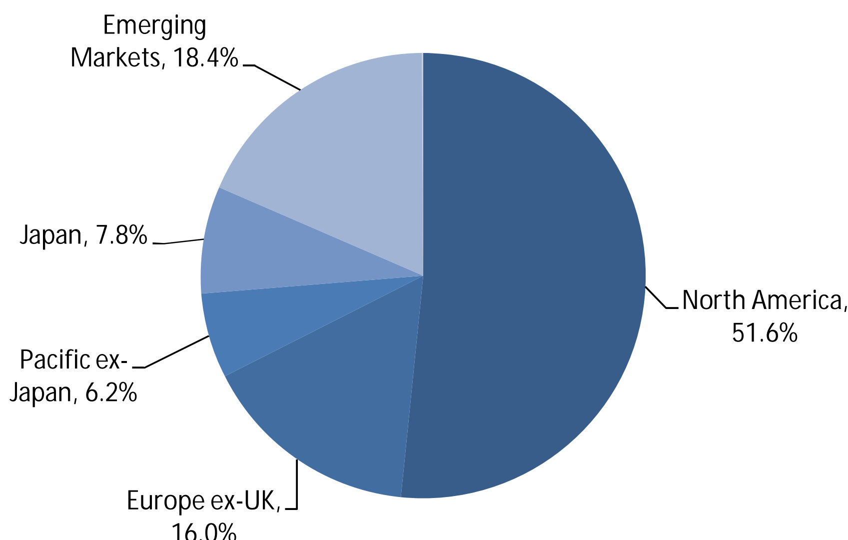
As highlighted above, the key foreign currency exposure arises from the overseas market capitalisation and low carbon equity mandates managed by LGIM (c. 48% of total assets).

There is additional foreign currency exposure that arises from the alternatives mandates (particularly the Pantheon Private Equity mandate, where the underlying funds are denominated in USD and EUR). However, we do not consider the overseas currency exposure arising from these mandates for the following reasons:

- The size of the overseas currency exposure within the alternatives mandates is small when compared to the significant (unhedged) holdings in overseas equity funds; and
- Hedging the overseas currency exposure within these mandates would be more complex from an operational perspective, and we do not feel it is necessarily worthwhile

The focus of this paper is therefore the unhedged currency exposure from the overseas equity mandate managed by LGIM.

The approximate benchmark regional equity exposures for the mandate are illustrated in the chart below, which incorporates the holdings in the regional market capitalisation equity funds as well as the overseas exposure within the MSCI World Low Carbon Target Index Fund. Please note that this presumes that the final tranche of investment into the MSCI World Low Carbon Target Index Fund has taken place, albeit in reality this will not be implemented until 1 November 2016.



As illustrated in the chart above, the exposure to USD, Euro and Yen makes up the large majority of the overseas currency exposure.

Why do many investors hedge overseas currency exposure?

<u>The fundamental starting point</u>

Many investors take the view that by investing in an asset within an overseas market they are doing so to access the returns on that underlying asset, rather than to gain unintended currency exposure. For example, a pension scheme investing in the S&P 500 index (a US equity index) would be doing so to benefit from a rise in the S&P 500 index, not necessarily to benefit through an appreciation of the US Dollar versus Sterling. Such investors may therefore see the starting point as being 100% currency hedged. This is akin to viewing the overseas currency exposure as an “unrewarded” risk.

Why is this important?

Return patterns generated by hedged and unhedged currency exposures deviate through time, often by a material amount, and for significant periods of time. The table below compares the returns on the MSCI World ex UK index in local currency terms and in Sterling terms over select periods where there has been significant moves in currency markets in recent years.

	Q1 2013	Q3 2013	Q2 2015	Q2 2016
Return in local currency terms (i.e. the return on the index for an investor in the base currency of the relevant regions; this is equivalent to a fully currency hedged investment)	+9.9%	+6.7%	-0.3%	+1.1%
Return in Sterling terms (i.e. the return allowing for the currency movements; this is equivalent to an unhedged investment, as per the Fund's current position)	+16.1%	+1.1%	-5.3%	+9.0%
Difference in returns for an unhedged investor	**+6.2%**	**-5.6%**	**-5.0%**	**+7.9%**

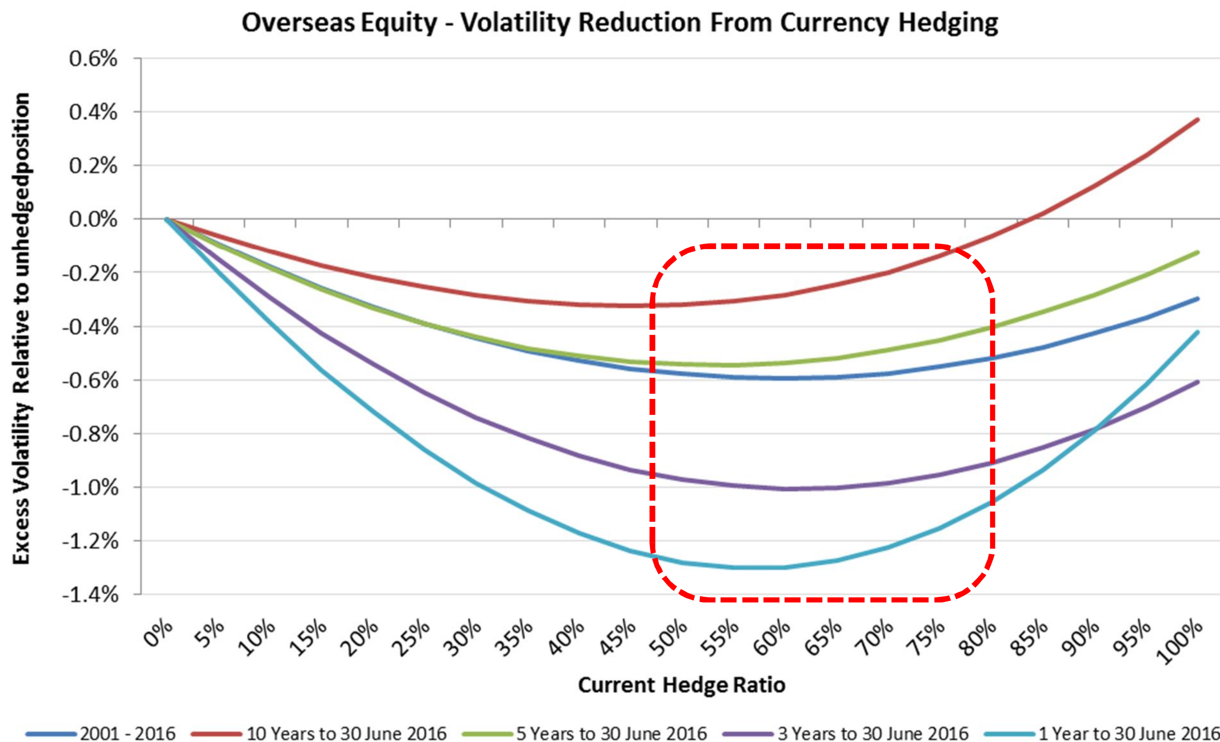
Source: Databank.

Given the potential for volatility, we believe that investors should be aware of their currency exposures and should consider a strategic currency hedging policy. Foreign currency hedging aims at reducing the risk from future movements in the exchange rate; this is a two-way risk as exchange rates can move adversely or favourably (as shown in the table above).

Why do most investors not always hedge 100% of overseas currency exposure?

There has been various academic research which has considered the “optimal” level of currency hedging for different types of overseas investments. For lower risk assets, such as bonds, the optimal hedge ratio is widely regarded to be 100%. This is because the volatility in currency markets is significantly greater (over the long run) than the volatility of bond returns. Hence the returns for an unhedged overseas bond exposure would be dominated by currency moves, and this is not the intention for such investors. For higher risk investments, such as equities, this conclusion is different. Looking over different periods, the optimal hedge ratio for overseas currency exposure (in terms of volatility reduction) is usually around 50-75%.

The chart below shows a back-test comparing the volatility of returns on overseas equities. The lines show the volatility reduction, over various periods, for various level of currency hedging compared to an unhedged investment (i.e. compared to 0% currency hedging).



Source: Thomson Reuters DataStream and Mercer calculations.

The analysis demonstrates that over most periods there is a risk reduction from using currency hedging (up to around 75% currency hedging). Intuitively, there will be times when the currency moves go in your favour, and times when they go against you. Over time, this volatility is reduced by retaining some unhedged exposure.

A further consideration is the cost of currency hedging. Typically these costs are relatively modest, but clearly setting a hedge ratio of 50% for currency hedging will be cheaper than hedging all overseas currency exposure.

If the Committee have a strong conviction that Sterling is likely to depreciate further from its current position, this would be a further reason not to be fully currency hedged. For the Fund, we do not believe this view should necessarily rule out introducing currency hedging at some level, but it would perhaps rule out introducing currency hedging at the higher end (i.e. >75%).

<u>What is an appropriate strategic target hedge ratio for overseas currency exposure?</u>

The appropriate level of currency hedging is dependent on a number of factors including the investor's specific circumstances (e.g. objectives, risk preferences), hedge implementation methods available and views on the base currency of the investor.

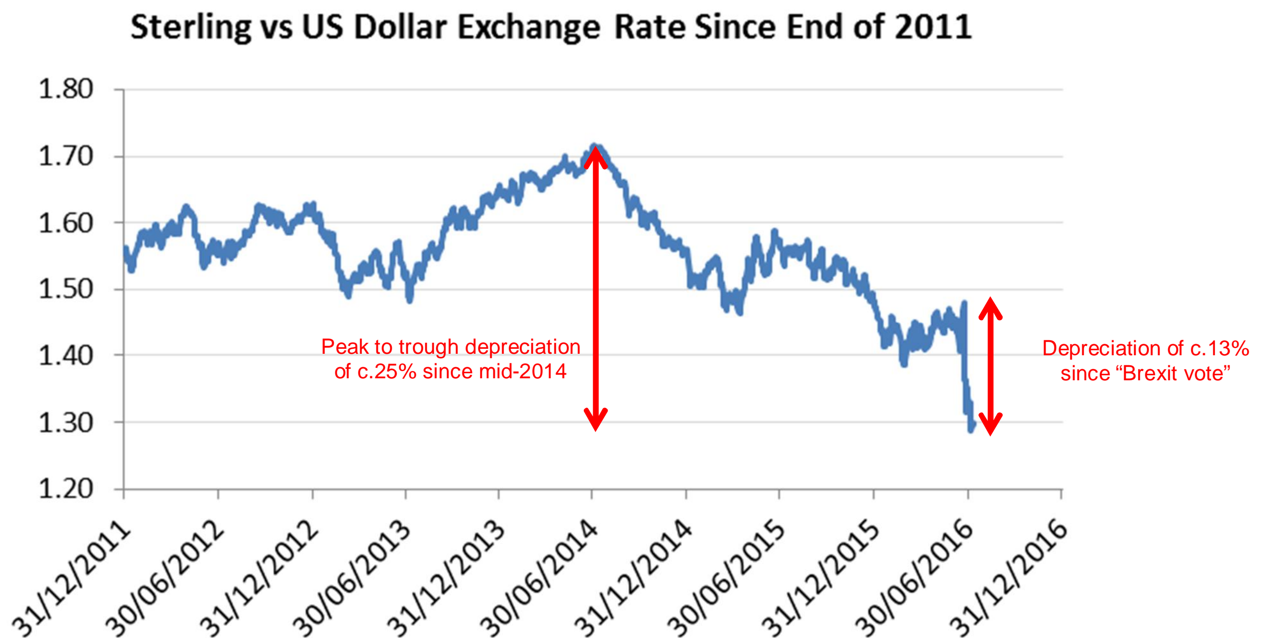
Our advice to UK pension schemes has typically been to hedge at least a portion of the developed market overseas currency exposure (usually in the 50% to 75% range) arising from investment in overseas equities. This advice reflects the fact that pension schemes have historically been heavily biased towards equities and equity risk (including foreign currency risk) is likely to be a key contributor to overall risk. Mercer's analysis shows that a reduction in volatility can be achieved (over long time periods) from currency hedging and this is typically attractive to pension schemes.

Further details on the basic principles of currency hedging are included in Appendix A as reference material.

Recent market moves and what this has meant for the Fund's overseas equities

Following the decision in the recent EU referendum, Sterling has depreciated materially against most other major currencies. It should also be noted that Sterling had been weakening against the US Dollar, in particular, since it reached the recent heights of around $1.7/£1 as recently as mid-2014.

US equities make up a significant portion of the overseas equity portfolio managed by LGIM. The moves in the $/£ exchange rate are therefore a useful barometer for the deviation in returns for hedged and unhedged investors in overseas equities. The chart below shows the moves in that key exchange rate over recent years.



Source: Databank. Figures to 11 July 2016.

This depreciation has impacted the returns for unhedged overseas equity investors, such as the Fund. For example:

- The returns since mid-2014 have been boosted by over 20%; and
- The returns since the result of the Brexit vote have been boosted by around 10% alone.

Without explicitly taking account of the funding of the passive low carbon mandate, we estimate that the Fund's equity portfolio was up c. 11% over the six month period to 30 June 2016. The equivalent figure if the Fund had been invested in hedged equity funds would be c. 1.5% - an incremental gain of c. 9.5%.

If, over the long term, the weakening of Sterling was to be reversed, then these additional gains seen over the recent past would be "given back" in reduced returns versus currency hedged investors in the future.

Outlook for Sterling

The financial press is awash with predictions from economists and market commentators on the direction of Sterling in the short and medium term. It is fair to say that the majority of these forecasts point to Sterling coming under further pressure.

These forecasts are primarily a result of the perceived long term weakness which will follow as a result of the UK's decision to leave the EU. In the extreme, we have seen forecasts of Sterling trading at parity to the US Dollar. Further quantitative easing and/or stimulus through rate cuts by the Bank of England may put such pressure on Sterling in the short-to-medium term (to the extent that this is not already priced into markets).

The Committee should be mindful that if these forecasts were to play out in markets over the coming months and years, then the Fund would (in hindsight) have been better placed retaining the current approach of not hedging currency exposures.

Scenario testing

Perhaps the best way to illustrate the potential impact of different levels of currency hedging is to show how they would impact equity returns for different Sterling / US Dollar exchange rate outcomes. This is shown in the following table .

Sterling vs US Dollar exchange rate in the long term	Impact of overall equity returns			
	0% hedged (current position)	50% hedged	75% hedged	100% hedged
Sterling appreciates to 1.7 vs US Dollar	-24%	-12%	-6%	No impact
Sterling remains at around 1.3 vs US Dollar	No impact	No impact	No impact	No impact
Sterling weakens to parity vs US Dollar	+30%	+15%	+8%	No impact

Assumes a starting exchange rate of 1.30. Assumes a straight line move.

There are two clear observations from our perspective:

- If there is a strong view that Sterling is likely to weaken further from here, then a lower (or nil) currency hedge ratio will boost returns .
- If the consensus is that over the long term it is difficult to know with any certainty what the exchange rate will be, then a higher hedge ratio will dampen the impact of any currency moves (positive or negative to the Fund).

In Appendix B we have outlined further scenarios focused specifically on different economic outcomes as a result of the recent Brexit vote. In short, a relatively quick resolution in relation to negotiations with the EU over trade deals could result in a strengthening over Sterling over the next couple of years. However, as you might expect, a protracted negotiation and a loss of global investors' confidence in the UK could lead to further weakness.

Clearly with this uncertainty, and a potentially wide range of exchange rate moves over the next couple of years (and over the long term), we would urge caution against extreme currency hedging policies (i.e. 0% or 100%).

Implementation Considerations

If the Committee are minded to introduce currency hedging for the overseas equity portfolio, then there will be a number of practical considerations to work through.

We propose that the currency hedging is undertaken by LGIM given they manage the overseas equity assets on behalf of the Fund. The most efficient way to implement a currency hedge ratio at LGIM is to invest in hedged share classes of the underlying funds that the Fund invests in at present. The underlying investments in the funds would remain the same; the only difference would be the introduction of currency forward contracts to hedge the exposure back to Sterling.

LGIM currently manage hedged share classes for the following underlying funds that are components of the current overseas equity portfolio:

- North America Equity Index
- Europe (ex UK) Equity Index
- Japan Equity Index
- Asia Pacific ex Japan Equity Index

We note that LGIM do not currently offer hedged shareclasses for the Emerging Market or Low Carbon Target Index funds that make up the remainder of the overseas equity portfolio, and therefore implementing a currency hedge on these assets would require additional complexity (i.e. a separate, segregated currency hedging mandate managed by LGIM or a third party provider).

For operational ease we recommend that these assets are excluded from the proposed currency hedge. We also note that we do not typically recommend hedging emerging market currency exposure, given the higher cost involved (due primarily to greater illiquidity of the underlying hedging instruments) and the long term potential for appreciation versus developed market currencies.

We estimate that in order to achieve the proposed target currency hedge ratio of 50%, the Committee should switch c. 85% of the remaining holdings in the overseas equity funds listed above (excluding the final tranche of investment into the MSCI World Low Carbon Index Fund that is due to take place on 1 November) to hedged shareclasses.

The table overleaf shows the current and proposed benchmark allocations for LGIM for all of the equity assets in order to move to a c. 50% currency hedged position.

Mandate	Benchmark (Current)	Benchmark (Proposed)
UK Equities	16.7%	16.7%
Low Carbon	28.3%	28.3%
North America	24.2%	3.6%
North America (Hedged)	-	20.5%
Europe ex-UK	8.2%	1.2%
Europe ex-UK (Hedged)	-	6.9%
Pacific ex-Japan	3.8%	0.6%
Pacific ex-Japan (Hedged)	-	3.3%
Japan	3.8%	0.6%
Japan (Hedged)	-	3.3%
Emerging Markets	15.0%	15.0%
Total	**100.0%**	**100.0%**

LGIM charge an additional 2.5 bps p.a. for investment in currency hedged share classes. This would be in addition to the current fee of 3.5 bps p.a. on the regional equity funds listed above, and as such this will take the total fee on these mandates to 6 bps p.a. We note that the fees that have been negotiated with LGIM are the result of a competitive tender process that took place last year, and we are comfortable that despite the slight increase in cost the overall fee LGIM would charge remains competitive for a mandate of this size and complexity.

LGIM estimate that the transaction costs incurred from the switch will be c. 1-2bps on assets transferred, presuming that the implementation can be scheduled for month-end. This transaction cost is therefore minimal when considered at the total portfolio level.

To reduce the timing risk involved with introducing currency hedging, we would recommend that a build up to a 50% hedged position is phased in over a period of time. A pragmatic suggestion for this would be over a 6 month period.

If the Committee agrees to proceed, we would be happy to liase with LGIM to provide updated documentation (i.e. supplemental proposal, fee side letter, and instruction letter) to implement the switch.

Summary and recommendation

We would recommend that the Committee considers introducing a currency hedge ratio of 50%.

This level of hedging would be considered meaningful enough to be “worthwhile” in terms of; (1) helping to bank the unhedged gains should Sterling rise in the future , (2) the Fund would still benefit if Sterling were to weaken further, but not to the same degree as being completely

unhedged, and (3) longer term, this would be expected to provide a reasonable level of risk reduction.

There are two important aspects to this recommendation:

1) Due to the recent c. 10% fall in Sterling (e.g. versus the US Dollar) we would regard the level of equity returns experienced year-to-date as benefitting from what could be considered an “abnormal” boost from being unhedged. Given the relatively low level of Sterling on a historic basis, introducing some level of currency hedging would help “bank” recent unhedged gains on the assumption that, over time, Sterling appreciates (there is no guarantee this will happen, however); and

2) This is not simply about aiming to bank short-term unhedged gains. Investing in assets that are subject to currency market fluctuations represents a risk relative to the Fund’s sterling based liabilities. As this does represent a meaningful risk that the Fund is exposed to, there will always be a strategic case to consider hedging this risk. As such, if the Committee does decide to implement a currency hedging policy, we would see this as a long-term investment decision. This, however, does not rule out the possibility of considering reducing the level of hedging in the future, for example, following a scenario where Sterling moves to a historic high versus the US Dollar.

This is at the lower end of the typical strategic targets for the currency hedge ratio that pension schemes use. This reflects the potential for further weakness in Sterling, which the Fund would still benefit from by not being 100% hedged, but also a desire to reduce the impact of currency moves on the overall returns from the equity portfolio.

To reduce the timing risk involved with introducing currency hedging, we would recommend that a build up to a 50% hedged position is phased in over a period of time. A pragmatic suggestion for this would be over a 6 month period. This would allow the Committee to take advantage of a historically attractive entry point to make a strategic decision to hedge one of the most significant risks to the Fund, whilst also reducing the prospect of being negatively impacted from a potential rise in Sterling over a given timeframe in the future.

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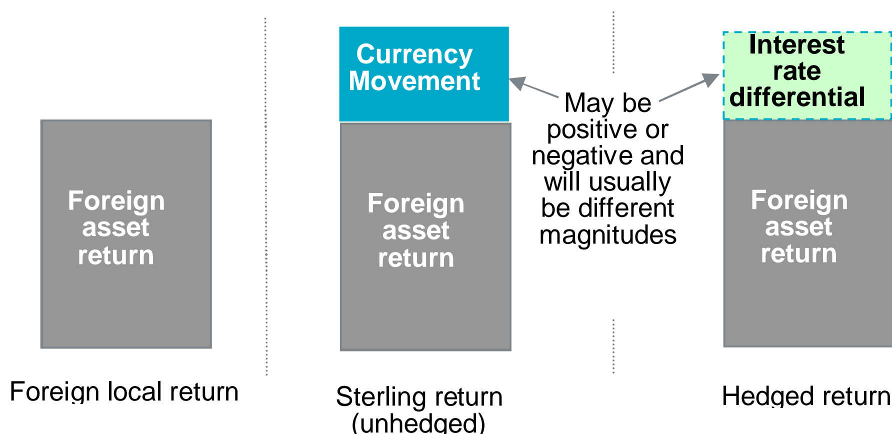
Steve Turner
Partner
August 2016

Appendix A - Currency hedging: the basic principles

Currency hedging converts foreign currency exposures back to Sterling. Currency hedging is typically accomplished by utilising one or three month currency forward contracts. A currency hedged asset return can be decomposed into the following two components:

1. Foreign local currency return of the asset; and
2. The impact of the current interest rate differential which is embedded in the forward rates (which will be positive if the domestic interest rate exceeds the foreign interest rate and vice versa).



When Sterling appreciates, the value of overseas asset returns are now worth less in Sterling terms. Sterling investors may benefit from currency hedging which removes some of the impact of a strengthening pound. When Sterling depreciates, a currency hedge may lose value for Sterling investors. The value of overseas asset returns will be worth more in Sterling terms, helping to offset the loss from a currency hedge.

Whether currency hedging will be beneficial to an investor from a risk and return perspective depends on many factors, the most important being the nature of the domestic currency. Currency hedging will impact on returns if the movement in the currency over the investment period is different from the gain or loss on the interest rate differential achieved via the hedging contract.

Our approach to developing a hedging strategy is to use qualitative reasoning supported, where appropriate, by quantitative analysis.

From a qualitative perspective it could be argued that:

- The primary aim of non-sterling investments is to gain exposure to a broader universe of underlying assets and active strategies than would be possible if only sterling investments were considered.
- The currency exposure associated with any non-sterling investments should be viewed as a consequence of investing in these assets, and not part of the investment thesis itself.
- The currency exposure should, therefore, be removed to the extent that this is practical and cost effective.

In terms of quantitative analysis, it is reasonable to place greater reliance on historical data if:

- Historical patterns can be rationalised by a fundamental explanation.
- Historical patterns appear to be stable and continuing.

Appendix B – Scenarios for Sterling post-Brexit

The tables below set out a number of potential scenarios and their impact on currency markets.

More favourable outcomes

1a. Quick resolution - Hard Brexit
There is a relatively fast political resolution with the UK leaving the EU and reverting to WTO rules, but seeking to conclude trade deals with the EU and other trading blocs. At an industry sector level in the UK there are winners and losers; some reduction in the ability of the financial sector to passport services into the EU, and movement of jobs to other EU centres, is partially offset by a boost to other exporters from weaker GBP and government policy initiatives. Sterling and risk assets initially fall sharply, however economic activity recovers by 2018 as overseas trade picks up. This results in some short-term inflation. However, inflation comes back under control and long-term break-evens remain steady. GBP recovers modestly towards the end of the period as the economic slowdown proves short-lived, assisted by significant policy intervention. **GBP/USD estimate by the end of 2018 = $1.30 (i.e. broadly as per the current rate)**

1b. Quick resolution - Soft Brexit
The UK experiences a sharp slowdown in economic activity during the second half of 2016 and GBP remains weak. Following this there is a relatively fast political resolution in mid-2017. This could include an EEA-type arrangement or even a reversal of the referendum result. As it becomes clear the UK will retain access to the single market, economic and financial conditions, including the GBP exchange rate, revert towards pre-referendum levels. There is positive reaction in Europe and market-friendly wins in the Italian referendum (October) and elections taking place in Germany, France and Netherlands in 2017. There are no other referenda on EU membership across Europe. The removal of pan-European uncertainty provides a modest boost to global equity markets. **GBP/USD estimate by the end of 2018 = $1.45 (i.e. Sterling appreciates)**

Less favourable outcomes

2a. Protracted uncertainty - Inflationary
Negotiations between the UK and EU do not progress smoothly. There is no sign of a deal that provides continued access to the EU single market on good terms. The UK economy slows sharply and remains at or close to recession through 2018. Public finances are hit hard (with government potentially maintaining the deficit to provide fiscal stimulus) and GBP depreciates further, contributing to sharply higher inflation expectations. Inflation and exchange rate concerns limit the Bank of England's ability to loosen monetary policy. The UK experience serves to contain internal tensions within the remainder of the EU and anti-EU parties see their popularity wane. The impact on global equities is only modestly negative as the negative outcome for the UK economy is balanced by greater political cohesion within continuing EU. **GBP/USD estimate by the end of 2018 = $1.00 (i.e. Sterling depreciates to parity)**

2b. Protracted uncertainty – Disinflationary
Negotiations between the UK and EU make slow headway. By the end of 2018 there is still no resolution; but in the meantime the UK remains within the single market. The UK economy slows and economic growth remains close to zero through 2018. The Bank of England cuts base rates to 0% in 2016. GBP falls only slightly. Continued uncertainty (for UK and EU) has a dampening effect on global equity markets and helps keep global bond yields low. **GBP/USD estimate by the end of 2018 = $1.20 (i.e. Sterling depreciates)**

Least favourable outcomes

3a. Global contagion
Negotiations between the UK and EU are acrimonious. The UK enters a period of prolonged political instability as it fails to resolve the single market access versus free movement of labour dilemma. Anti-EU parties elsewhere in the EU gain ground. Sovereign credit concerns within the Eurozone re-emerge, pressure for other member states to leave the EU. The UK moves into recession and global growth also slows. As a result GBP does not fall as far against other major currencies. The public sector deficit in the UK worsens and becomes a major political concern; however inflation remains subdued and yields continue to fall. **GBP/USD estimate by the end of 2018 = $1.15 (i.e. Sterling depreciates)**

3b. Loss of confidence in UK
Negotiations between the UK and EU are acrimonious. The UK enters a period of extreme political instability as it fails to resolve the single market access versus free movement of labour dilemma. Anti-EU parties elsewhere in the EU gain ground. Sovereign credit concerns within the Eurozone re-emerge, pressure for other member states to leave the EU. The UK moves into recession and global growth also slows; but the UK's downturn is sharper. The scale of the UK public sector and current account deficits results in overseas investors selling sterling assets including gilts. There are further cuts to the UK's credit rating. The decline in GBP has a modest inflationary impact in the UK. **GBP/USD estimate by the end of 2018 = $1.00 (i.e. Sterling depreciates to parity)**