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How insurers can hedge currency risk when investing in non-euro bonds

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European insurers can achieve higher yields and diversification by tapping into international fixed income markets. But accessing these benefits presents challenges, because foreign bonds provide exposure to currencies and interest rates that diverge from the insurer's home environment. This can generate economic and regulatory balance sheet volatility. Tailored currency hedging allows the investor to manage these risks, such as additional Solvency II capital requirements, and other key sensitivities. It is a multifaceted activity that requires significant expertise with financial instruments and understanding of how they interact with the complexities inherent in insurance balance sheets. This article focuses on European insurers that use fixed income assets to match their liabilities.

Why currency hedging is so important for insurers

Most European insurers are already active in government and corporate bond markets, but can benefit from a more international view. For example, US Treasuries provide higher returns after hedging than German and Dutch (also AAA-rated) sovereign bonds at longer maturities. The US corporate bond market is the largest and most liquid in the world, but still provides European investors with a premium to local markets after hedging. Many US companies only issue debt within their home market which allows European investors to diversify their investable issuer base. In addition, emerging market debt (EMD) is an established but growing asset class with attractive returns that is predominately non-euro denominated and therefore needs a hedging solution.

For an insurer with euro-denominated liabilities, investing in USD assets not only introduces currency risk but also foreign (USD) interest rate risk. When using a matching approach, this also creates an implicit short interest rate risk versus the liabilities. When hedging liability driven investing (LDI) portfolios at NN Investment Partners, we typically consider currency an unrewarding risk. So we seek to limit exposure to just the asset class and not the currency. The objective of the strategy thus becomes hedging all of the currency risk, and also potentially the other associated unrewarding risks like foreign interest rate risk.

Hedging instruments

For life insurers especially, LDI uses the cash flows of fixed income assets to match liabilities. The key metric to assess bond attractiveness is the z-spread. The z-spread is the constant spread above the zero interest-rate swap curve to bring the present value of the cash flows back to that of the investment purchase price. The euro z-spread of a foreign denominated bond is calculated using the cash flows of a matching cross currency interest rate swap (CCIRS, see below) and the foreign bond. As liability cash flows are discounted using the interest rate curve, the z-spread demonstrates the benefit of the investment compared to the liabilities.

Strategy		FX Spot	Short-term $/€ Interest Rates	Long-term $/€ Interest Rates	Short-term currency basis	Long-term currency basis
Rolling FX Forwards	Short-term (e.g. 3-month) rolling forwards	Hedged	Exposure	Exposure	Exposure	No exposure
Cross Currency IRS	Fixed-fixed swap matching foreign asset	Hedged	No exposure	Hedged	No exposure	Exposure

Source: NN Investment Partners

Hedged share classes offer a way for investors to access foreign assets with operational simplicity, especially for actively traded portfolios. Hedging the net asset value (NAV) of a fund packages the investment and currency risk together. But as we describe later, this may not be the optimal solution to achieve balance sheet goals.

We consider two of the most common hedging strategies as laid out in the table above:

FX Forwards

FX forwards are bilateral contracts whereby two parties lock in the exchange rate for the purchase or sale of a currency on an agreed date, typically for a short maturity such as three months. FX forwards are priced on the basis of interest rate differentials and the short-term cross-currency basis (see below). They are extremely liquid at short maturities. A commonly applied hedging strategy is to enter a rolling string of forward contracts thereby eliminating the spot currency risk of the investment. It does not however offset the foreign interest rate exposure and additionally creates exposure to the short-term cross-currency basis and short-term interest rate differential.

Cross-Currency Interest Rate Swaps (CCIRS)

CCIRS are bilateral derivatives where two parties exchange a series of cash flows denominated in different currencies. Floating rate CCIRS, where a cash flow is indexed to an interest rate such as Euribor or Libor, are common in the inter-bank market. More intuitive for LDI investors are fixed rate CCIRS, where the foreign currency (pay) leg matches the fixed coupon and principal cash flows of the hedged asset, and the euro (receive) leg is also fixed in order to match liabilities.

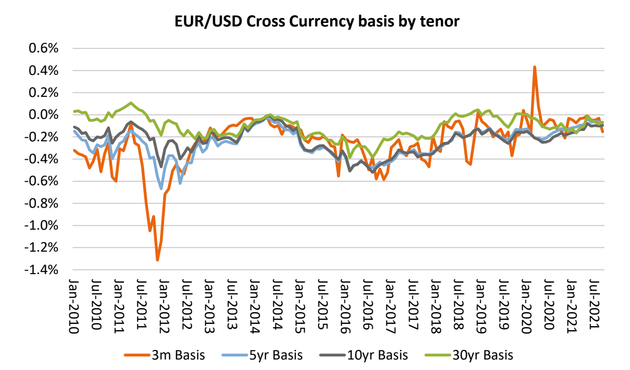
The USD and EUR rates are determined at inception, fixing the interest rate differential and cross-currency basis until the maturity of the CCIRS. By paying the foreign principal and interest and receiving euro principal and interest, this effectively transforms the foreign bond into a euro instrument. Hedging with CCIRS can be implemented on a “micro” basis, where the CCIRS matches the characteristics of an underlying bond, or on a “macro” basis, where it matches a portfolio of underlying bonds in aggregate.

Cross-Currency Basis

Cross-currency basis is the impact on forward FX rates that is not explained by interest rate differentials. It can be thought of as a market supply and demand factor for a currency and it fluctuates for a variety of reasons. One of these is the status of the US as a safe haven - which means demand for USD increases in times of crisis. There can also be short-term effects from sources such as the hedging of US debt issuance back to home currency by non-US issuers.

When hedging with three-month FX forwards, each contract locks in the rate for only three months, leaving the investor exposed to fluctuations in the short-term cross-currency basis. As you can see from the table below, the short-term basis is significantly more volatile than the long-dated cross-currency basis. Additionally at the expiry of each forward the investor is exposed to interest rate reset risk because the differential between the short-term interest rates fluctuates.

Using a CCIRS to hedge a bond to its maturity locks in the long-term cross-currency basis as well as the differential between the two interest rate curves. The long-term basis can cause some profit and loss volatility in relation to the market value of the foreign bond, but it is far less volatile than the short-term basis. One important consideration with CCIRS is that upon default of a hedged bond the investor can be left with a potentially long-dated currency and interest rate position. This may of course be closed out; but since there is no offsetting exposure from the foreign bond, any negative impact will be realized. For this reason, low-rated bonds with a high probability of default may be more effectively hedged with FX forwards than CCIRS, or with a combination as described later.



Source: Bloomberg October 2021

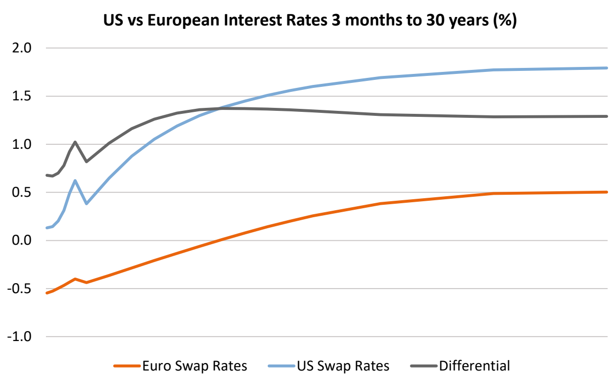
At inception, the expected return of an FX forward hedging strategy should be similar to that of a CCIRS on the assumption that prevailing forward curves are the market’s best indicator of expectations of future rates. In practice it is very likely that future rates will differ from expectations, and there will be volatility on the way.

Investment decision-making

When deciding to invest in foreign currency assets, an insurer has to be sure that the returns in home currency fulfil the requirements of the Strategic Asset Allocation (SAA) or other investment plans. Frequently these returns are estimated with simple approximations that can deviate materially from more rigorous calculations and thus form the basis of flawed investment decisions.

Two simple proxies often utilized to calculate expected returns in home currency are presented below. Both can overstate estimated returns and should be used with caution:

1. Adding the cross-currency basis of the next forward point (short-term) to the asset's USD z-spread. This ignores the relative shape of the curves and their future evolution. Currently the interest rate differential between EUR and USD is at its narrowest in the near term (see graph below), so this method is likely to underestimate lifetime hedging costs. The investor should also bear in mind that when hedging with forwards the returns expressed in EUR are simply an estimate with the result only known at maturity and subject to volatility in the interim period.



Source: Bloomberg October 2021

2. Summing the cross-currency and interest rate basis corresponding to the tenor of the bond (long-term) with the USD z-spread of the bond. This is simple because the term basis and USD z-spread are easily retrieved from information systems like Bloomberg. This "standard" basis however is calculated as the difference between two floating rate legs of a CCIRS, with the spread of one leg (USD) set to zero. This ignores the effect of the bond coupon. This oversimplification creates a divergence that is amplified for bonds with longer maturities and higher spreads. The table below illustrates the effect.

Both approximations shown above overstate the returns in EUR. The difference is exacerbated by longer maturity and higher spreads. "Quick and dirty" calculations as illustrated above might indicate that a bond investment beats a defined hurdle rate, whereas in reality the scarce capital could be better allocated elsewhere. Derivation of the EUR z-spread requires technical calculations albeit using observable data such as the interest rate and basis curves, FX rates and bond price. At NN Investment Partners, we have spent considerable resources creating robust tools to ensure that expected euro returns reflect actual outcomes to the greatest extent possible.

FX hedging and balance sheet KPIs

There are multiple hedging strategies available for non-euro assets. Before the best hedging instrument can be selected, the fundamental decision needs to be made about what the investor is trying to hedge. The three main "views" or frameworks for making this decision are: economic reality; the accounting (IFRS) balance sheet; and the Solvency II regulatory balance sheet. These frameworks can operate in a contradictory fashion. And given that it is near-impossible to achieve a hedge that is perfect for every metric, the insurer must think carefully about where it is optimal to accept volatility or mismatches.

Solvency II is a market-value based regime, although incentives and results can be different from economic reality especially at long maturities. Accounting frameworks like IFRS allows for choices around fair value and book value for both investments and hedging instruments. This can facilitate optimally tailored hedging programs.

FX forwards are short term and flexible instruments that can be easily adjusted for changes in the portfolio such as rebalancing, bond market value fluctuations or when a bond is called or defaults. For simplicity we can think about a single USD bond being hedged back to EUR. If the bond is held and hedged at market value, then FX forwards can broadly immunize currency volatility in both accounting and solvency balance sheets. If the bond is held at book value, then by hedging this quantity with forwards it will limit P&L volatility but will cause a mismatch with Solvency II, as the USD market value of the bond (not the book value) will be translated back to EUR. In both cases, the USD interest rate exposure is unhedged which will create noise on the balance sheet and likely require additional Solvency II capital due to the mismatch with euro liabilities.

CCIRS do not truly hedge either the fair value or the book value of the asset, rather they hedge the instrument's principal and interest cash flows. Changes in the value of the bond due to foreign interest rate movements are hedged as the fixed leg of the swap typically offsets the fixed leg of the bond or portfolio of bonds. Similarly the interest rate sensitivity of the euro leg of the swap aligns with the euro liabilities. This results in a limited interest rate solvency capital requirement. There will be some mismatch in market value of the CCIRS and bond due to credit

Issuer	Maturity	Rating	Coupon	Proxy Method 1	Proxy Method 2	Calculated Z-spread
PEMEX*	23/01/2030	BB+	6.84%	4.31%	4.36%	4.12%
Broadcom Inc*	15/02/2041	BBB-	3.50%	1.48%	1.55%	1.37%
Codelco Inc*	15/01/2051	A-	3.15%	1.57%	1.69%	1.38%
Oracle Corp*	25/03/2061	BBB	4.10%	1.70%	1.88%	1.44%

* For illustration purposes only. Company name, explanation and arguments are given as an example and do not represent any recommendation to buy, hold or sell the stock, or in any way invest in these companies. The security may be/have been removed from portfolio at any time without any pre-notice. Source: Bloomberg and NN Investment Partners, 28th October 2021

spread and long-term cross-currency basis movements, but the majority of currency and interest rate risks are covered. Techniques like hedge accounting can be employed to dampen P&L volatility, at the cost of some operational burden.

The complexity of the insurance balance sheet, including liability matching and the impact of taxation, means that many insurers implement a "buy-to-maintain" rather than an actively traded, strict benchmark-following investment style. This limited portfolio rebalancing is another reason that CCIRS can be considered an optimal hedging strategy. Actively traded portfolios may also be hedged with CCIRS, but monitoring and rebalancing is required to ensure that mismatches with the underlying portfolio are minimized.

There are a multitude of other considerations present when constructing a hedging strategy. These include best-execution trading, risk management and monitoring, and collateral for derivatives margining. These are beyond the scope of this article but highlight the necessity to involve an experienced party when undertaking the journey towards investing in foreign denominated assets.

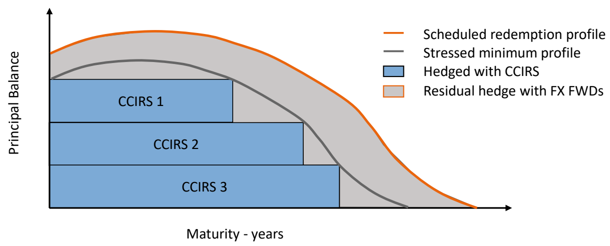
Hedging alternative investments

Unlisted investments such as infrastructure debt, real estate debt and corporate loans, and structured bonds including ABS and CLOs create additional hedging challenges. . This is due to features such as amortizing principal profiles, structured coupons and irregular drawdown and repayment schedules that require non-standard hedging solutions. A customized hedging solution could be provided by an investment bank, but these can be expensive and may not cover all risks. Additionally trade-capture and valuation of such a solution could prove prohibitively difficult.

The major risk for foreign currency loan investors is the right for borrowers to refinance at any time. If hedged with CCIRS then early redemption of the loan could leave the investor with a long-dated currency and interest rate exposure. If markets have moved the wrong way, then this could mean a negative result on the hedge which is no longer offset by the hedged item. Some loans have make-whole provisions that can at least in part compensate for this.

Where an insurance investor has a portfolio of non-standard cross-currency assets, it is possible to implement a macro hedge. This involves making an assessment of a minimum expected amount of principal outstanding along the maturity profile. This base profile can be hedged with CCIRS, with any excess hedged with FX forwards. This technique ensures that at least a significant proportion of the foreign interest rate exposure can be hedged, and short term reset volatility can be avoided. This approach especially suits granular portfolios such as residential mortgages.

Laddering Macro Hedge for Alternative Investments



Source: NN Investment Partners

Conclusion

Global fixed income markets offer many opportunities for insurers to benefit from additional returns and avenues for diversification within familiar asset classes and beyond. But the benefits in yield from tapping an outperforming foreign asset class can evaporate if the currency hedging strategy is not optimal. This strategy must include much more than just hedging the economic impact of risk and returns. Insurance balance sheets are complicated, the hedging strategy must accommodate key KPIs including regulatory capital and accounting treatment. Failure to accurately evaluate hedged returns can result in opportunity costs and misallocation of capital. NN Investment Partners can provide tailored hedging solutions borne out of many years of experience to ensure that our clients can be confident in their investment outcomes.

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