



Tailored FX Solutions for Accessing International Fixed Income Markets

International fixed income markets can provide insurance investors with higher yields and diversification opportunities. 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 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. Finally, emerging market debt (EMD) is an established but growing asset class with attractive returns that is almost entirely non-euro denominated and therefore needs a hedging solution.

WHEN USING A MATCHING APPROACH, THIS ALSO CREATES AN IMPLICIT SHORT INTEREST RATE RISK VERSUS THE LIABILITIES

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 IP, we typically consider FX an unrewarding risk, meaning that the investor seeks exposure to the asset class rather than 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, defined as 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.

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

Strategy		FX Spot	Short-term \$/E Interest Rates	Long term \$/E Interest Rates	Short Term Currency basis	Long Term Currency basis
Rolling FX Forwards	Short term (eg 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 ✗

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.

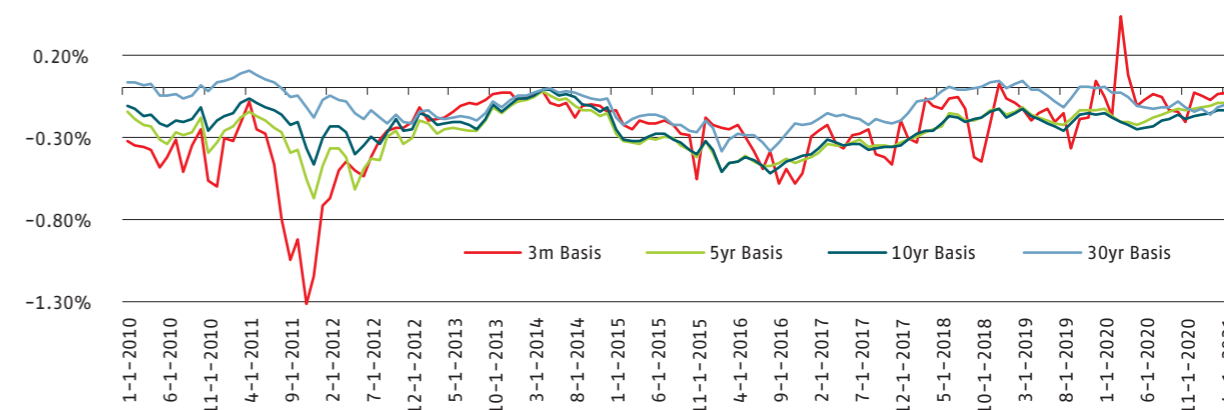
CROSS-CURRENCY BASIS

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 – in times of crisis demand for USD increases. 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 P&L 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 naked 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 better hedged with FX forwards than of CCIRS, or with a combination as described later.

EUR/USD Cross Currency basis by tenor



*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 expectation, 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 utilised to calculate expected returns in home currency are presented below. Both can overstate 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, 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.
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 one leg (USD) set to zero. This ignores 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:

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%

*Source: Bloomberg and NNIP, 1st October 2021

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 IP, 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 hedging programs that can be tailored in an optimal fashion.

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 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.

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. The additional returns due to selecting an outperforming foreign asset class can evaporate if critical consideration of the FX hedging strategy is not undertaken. This must include much more than just hedging the economic impact of risk and returns. As insurance balance sheets are complicated, the hedging strategy must accommodate key KPIS including regulatory capital and accounting treatment. By not accurately evaluating hedged returns, opportunity costs and misallocation of capital can arise. NN IP can provide tailored hedging solutions borne out of many years of experience to ensure that our clients can be confident in their investment outcomes. ■