Research paper

Hedging Bond Futures with FX Futures

Architects of trusted markets EUREX

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1. Introduction

Global fixed-income allocation is a cornerstone of institutional portfolio diversification. However, international bond investing inherently introduces a dual-source risk profile: interest rate risk (reflected in bond price movements) and currency risk (derived from exchange rate fluctuations between the asset's denomination and the investor's home currency).

For example, a U.S. dollar-based investor purchasing EUR-denominated Eurex Bund Futures (FGBL) is exposed to both the yield dynamics of German Bunds and the USD/EUR exchange rate. If the euro weakens relative to the U.S. dollar during the holding period, the investor’s performance in home-currency terms will diminish, potentially erasing any gains achieved on the underlying fixed-income contract.

To mitigate this currency exposure, market participants can utilize Eurex FX Futures. This paper establishes a step-by-step framework for executing a Eurex FX Futures overlay on bond futures, presents a realistic empirical scenario, and demonstrates how leveraging Eurex' clearing ecosystem – specifically Eurex PRISMA – optimizes capital efficiency through portfolio margining.

2. Methodology: A Five-Step Hedging Framework

To isolate fixed-income performance, establishing an accurate currency hedge requires a systematic calculation process to align the nominal value of the bond contracts with the currency overlay.

Step 1: Convert USD Capital into Total EUR Exposure
Convert the USD investment allocation into the base currency of the bond futures contract (EUR) using the prevailing spot exchange rate.

Total EUR Exposure = USD Investment × Exchange Rate (EUR/USD)

Step 2: Calculate the Price-Adjusted Notional Value per Contract
Because bond futures do not trade at par and must account for the specific conversion factor of the deliverable basket, the nominal contract value must be adjusted to reflect its true, price-sensitive market value.

Price-Adjusted Notional Value per Contract = (Price/100) × Contract Notional Value × Conversion Factor

Step 3: Determine the Number of Bond Futures Contracts
To determine the required contract volume, divide the total EUR-denominated investment (from Step 1) by the price-adjusted contract value (from Step 2).

Number of Bond Contracts = Total Investment (EUR)/Price-Adjusted Value Per Contract

Step 4: Determine the Number of FX Futures Contracts
To neutralize currency risk, calculate the required number of FX futures contracts. For a complete linear currency hedge, a hedge ratio of 1 is applied.

Number of FX Futures = (Total EUR Exposure × Hedge Ratio)/FX Futures Contract Size

Step 5: Simultaneous Execution
To minimize execution slippage and market-lag risk, execute the bond futures and the FX futures currency overlay simultaneously in the market.

Structural Implementation Considerations
While currency overlays successfully isolate bond returns, practitioners must manage several operational realities:

- **Dynamic Hedging:** As the bond futures price fluctuates or the Cheapest-to-Deliver (CTD) bond changes, the overall EUR notional exposure will shift, requiring periodic rebalancing of the FX futures position.
- **Basis Risk:** Imperfect convergence between the FX futures exchange rate and the spot exchange rate can introduce minor tracking errors.
- **Rolling Costs:** FX futures have fixed quarterly expirations; holding a long-term bond position requires periodically rolling the FX overlay forward, introducing potential transaction costs.

3. Case Study: Eurex Bund Futures (FGBL) Overlay Analysis

To validate the dynamics of global fixed-income currency exposure, we analyze a scenario of a U.S.-based investor seeking to deploy USD100 million into Eurex Bund Futures (FGBL) over the period from September 22, 2025, to November 11, 2025.

3.1 Unhedged Scenario Performance

At inception (September 22, 2025), the investor converts the USD capital into EUR exposure and purchases bond futures without executing any currency defense. The initial transaction parameters are detailed in the table below.

Initial Parameters at Inception (September 22, 2025)

Parameter	Value
Initial USD Capital	USD 100,000,000
EUR/USD Spot Rate	1.1803
Resulting EUR Capital	EUR 84,724,222
FGBL Price	128.26
Cheapest-to-Deliver Conversion Factor	0.8166
FGBL Contract Notional	EUR 100,000

To determine the size of the position, the price-adjusted notional value per FGBL contract is calculated as follows:

- Price-Adjusted Notional Value per Contract = (Price/100) × Contract Notional Value × Conversion Factor
- Price-Adjusted Notional Value per Contract = (128.26/100) × EUR 100,000 × 0.8166 = EUR 104,737

Using the total EUR exposure, the number of purchased bond contracts is calculated as follows:

- Number of Bond Contracts = Total Investment (EUR) / Price-Adjusted Value Per Contract
- Number of Bond Contracts = EUR 84,724,222 / EUR 104,737 **= 809 FGBL contracts purchased at 128.26**

On November 11, 2025, the investor exits the position:

- FGBL Exit Price: 129.23
- EUR/USD Spot Rate at Exit: 1.1582

Local Currency Return (EUR): The price of the FGBL contract increased from 128.26 to 129.23. This favorable movement yields a **local profit of EUR 648,915 or +0.76%**.

Home Currency Return (USD): Because the investor did not hedge, the EUR profit and the underlying capital must be converted back to USD at the depreciated spot rate of 1.15820 with a **result of –USD 1,120,832 or –1.12%**.

Analysis: Despite having the correct directional view on German interest rates, currency depreciation transformed a +0.76% local return into a –1.12% absolute loss in domestic terms.

3.2 Hedged Scenario Performance

To prevent this currency-driven erosion of capital, the investor must execute a currency futures overlay simultaneously with the core bond purchase. In order to accomplish the proper hedge, the investor simply needs to follow the previously discussed framework.

Step 1: Convert USD Capital into Total EUR Exposure

- Total EUR Exposure = USD 100,000,000 / 1.1803 = **EUR 84,724,222**

Step 2: Calculate the Price-Adjusted Notional Value per Contract

- Price-Adjusted Notional Value Per Contract = (128.26/100) × EUR 100,000 × 0.8166 = **EUR 104,737**

Step 3: Determine the Number of Bond Futures Contracts

- Number of Bond Contracts = EUR 84,724,222 / EUR 104,737 **= 809 FGBL contracts**

Step 4: Determine the Number of FX Futures Contracts

- Number of Bond Contracts = (EUR 84,724,222 × 1) / EUR 100,000 = **847 FCEU contracts**

Step 5: Simultaneous Execution

- The investor simultaneously buys 809 FGBL contracts at 128.26 and sells 847 FCEU contracts at 1.18403 to lock in the currency defense overlay.

On November 11, 2025, the investor closes both positions:

- FGBL Exit Price: 129.23
- FCEU Exit Price: 1.16227
- EUR/USD Spot Rate at Exit: 1.1582

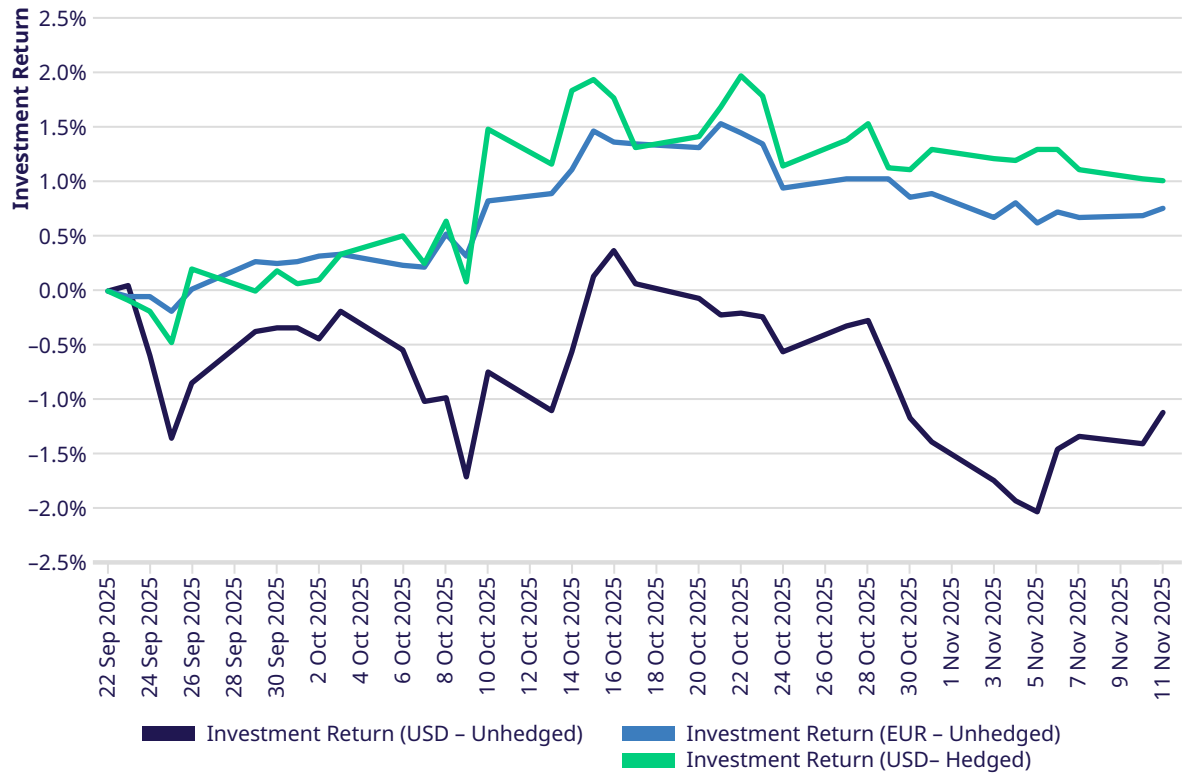
FX Futures Profit and Loss: The futures contract gain amounted to 217.60 points. Based on a contract multiplier of EUR 10 per point across the 847 contracts, the total foreign exchange gain was EUR 1,843,072. When converted at the exit spot rate, this yielded a total gain of USD 2,134,646.

Combined Hedged Return (USD): The currency overlay successfully offset the losses incurred in the underlying asset. By combining the unhedged portfolio loss with the gains from the FX futures, the overall performance of the hedged position is calculated as follows:

- Hedged Return = Unhedged Loss (−USD 1,120,832) + FX Futures Gain (USD 2,134,814) = USD 1,013,814 (1.01%)

Analysis: Ultimately, by neutralizing exchange rate volatility, the hedged USD return of +1.01% closely aligned with the underlying performance of the sovereign bond futures (+0.76%). This outcome demonstrates the overall success and efficacy of the currency overlay strategy.

Investment Return Comparison



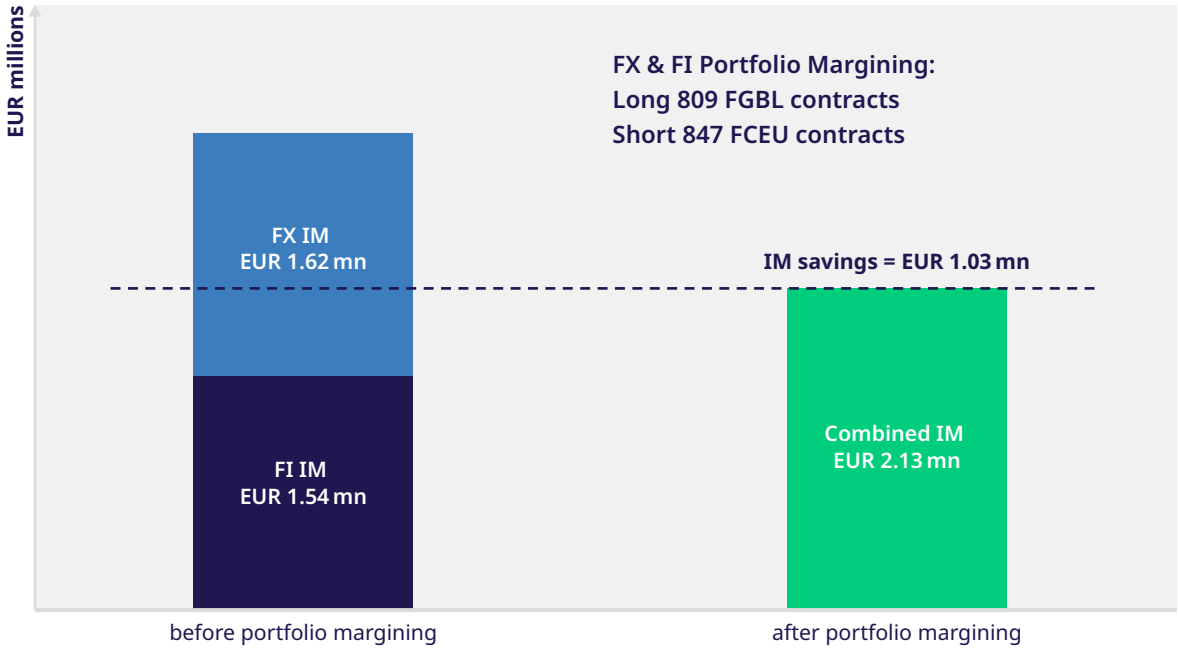
4. Capital Efficiency via Portfolio Margining

While hedging mitigates market risk, maintaining two separate derivative positions (fixed income and FX) historically required substantial capital allocation for initial margin (IM).

As of June 24, 2026, Eurex Clearing allocated all 27 Eurex FX Futures and 12 FX Options to the listed fixed-income liquidation group (PFI01) within its proprietary PRISMA risk engine. This structural integration allows the clearing house to recognize that a long euro-denominated bond future and a short EUR/USD FX Future possess offsetting risk profiles during market liquidation scenarios.

For the case study portfolio (Long 809 FGBL contracts / Short 847 FCEU contracts), the margin requirements before and after the introduction of portfolio margining are evaluated below. Through the netting of exposures within the PFI01 liquidation group, Eurex PRISMA reduces the capital requirement by EUR 1.03 million in this example (a 32% reduction in initial margin).

Practical Example: Currency Overlay



Portfolio margining via Eurex PRISMA reduces initial margin requirements by EUR 1.03 mn or 32%.

Conclusion

Currency fluctuations present a major risk to international fixed-income portfolios, capable of eroding strong underlying bond performance.

As demonstrated, a listed FX futures overlay provides a mechanism to neutralize currency risk, successfully aligning home-currency returns with local bond performance.

Furthermore, clearing innovations – specifically the inclusion of FX derivatives into Eurex' PFI01 fixed-income liquidation group – may reduce the margin footprint of these overlays substantially. This integration significantly lowers the cost of hedging, encouraging safer, more capital-efficient global portfolio diversification.

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