Risk-Adjusted Carry Trade Strategies: A Quantitative Approach to FX Hedging

Ruoshi Wang, Bozhang Chen, Mingcong Xu, Kailin Hong, Yuezhou Fu

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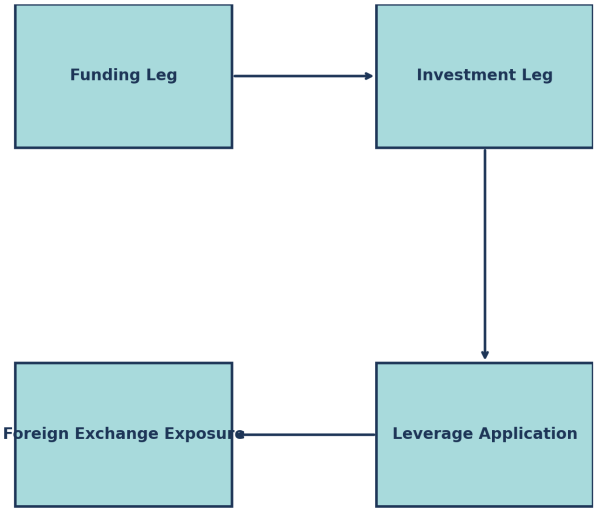
Introduction

- **Integrated Carry Trade Strategy:** Combines traditional carry trade with macroeconomic uncertainty analysis to optimize FX trading and risk management.
- **Currency Pair Selection:** Focuses on six highly liquid CHF-based currency pairs, chosen for their market depth, trading volume, and macroeconomic sensitivity.
- **Hedging Mechanisms:** Implements forward contracts for fixed returns and FX options for asymmetric risk protection to mitigate FX volatility.
- **Performance Evaluation:** Assesses the impact of hedging strategies on risk-adjusted returns, improving carry trade robustness in uncertain market conditions.

Strategy Overview

- Targeting six liquid currency pairs: CHF/HKD, CHF/EUR, CHF/JPY, CHF/GBP, CHF/CAD, and CHF/USD.



- **Funding Leg**: The investor borrows CHF at the prevailing OIS rate, adjusted for transaction costs.
- **Investment Leg**: The borrowed capital is used to acquire 5-year sovereign bonds denominated in the target currency.
- **Leverage Application**: A leverage ratio of 5x is applied, amplifying the exposure to interest rate differentials.
- **Foreign Exchange Exposure**: At each roll-over period, the foreign bond's value is translated back into CHF, incorporating exchange rate fluctuations.

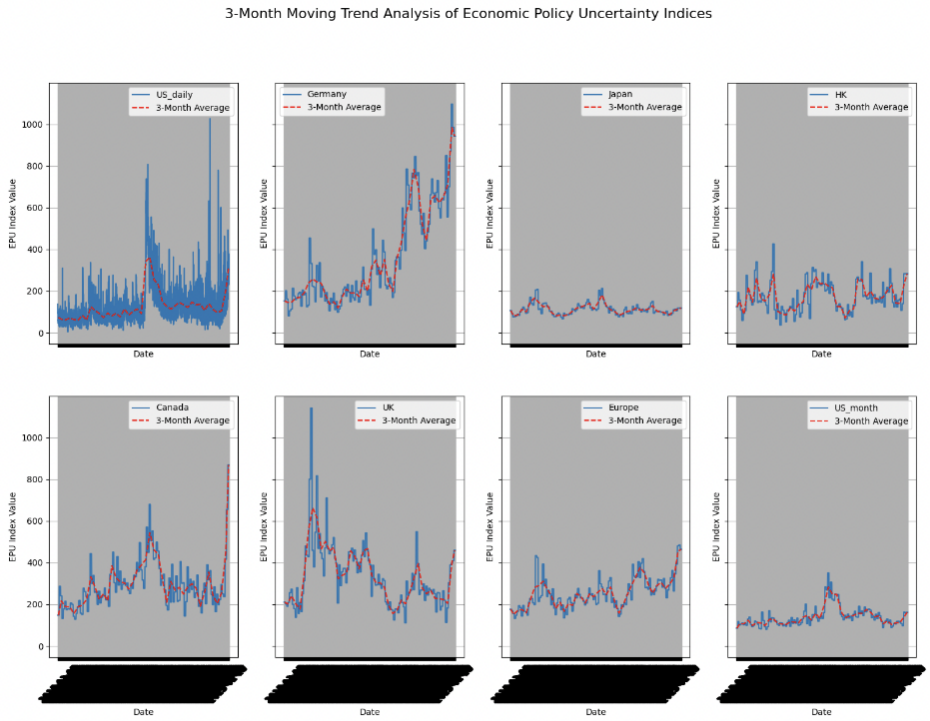
Carry Trade Strategy Results

- Implemented carry trade strategy using CHF as the funding currency.
- Performance evaluated using return metrics and risk-adjusted measures.
- Findings: Positive returns observed in most pairs, but high sensitivity to FX volatility.

Currency Pair	Cumulative PnL (CHF)
CHF/GBP	248956.59
CHF/JPY	11497.62
CHF/USD	345474.41
CHF/HKD	298423.06
CHF/DEM	81381.60
CHF/CAD	304943.04

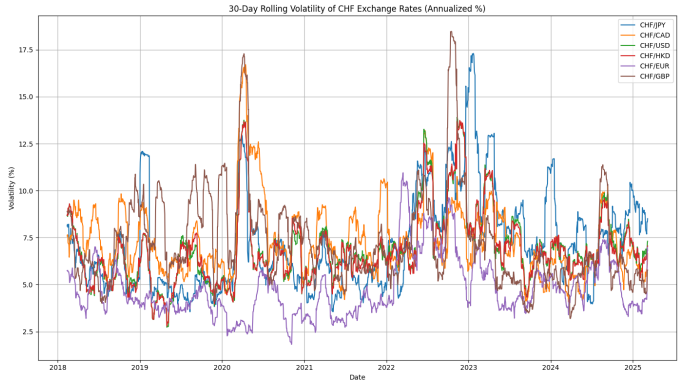
Risk Management

- Macroeconomic environment uncertainty could pose impact to carry trade
- Adjusted carry trade exposure dynamically based on risk assessment.

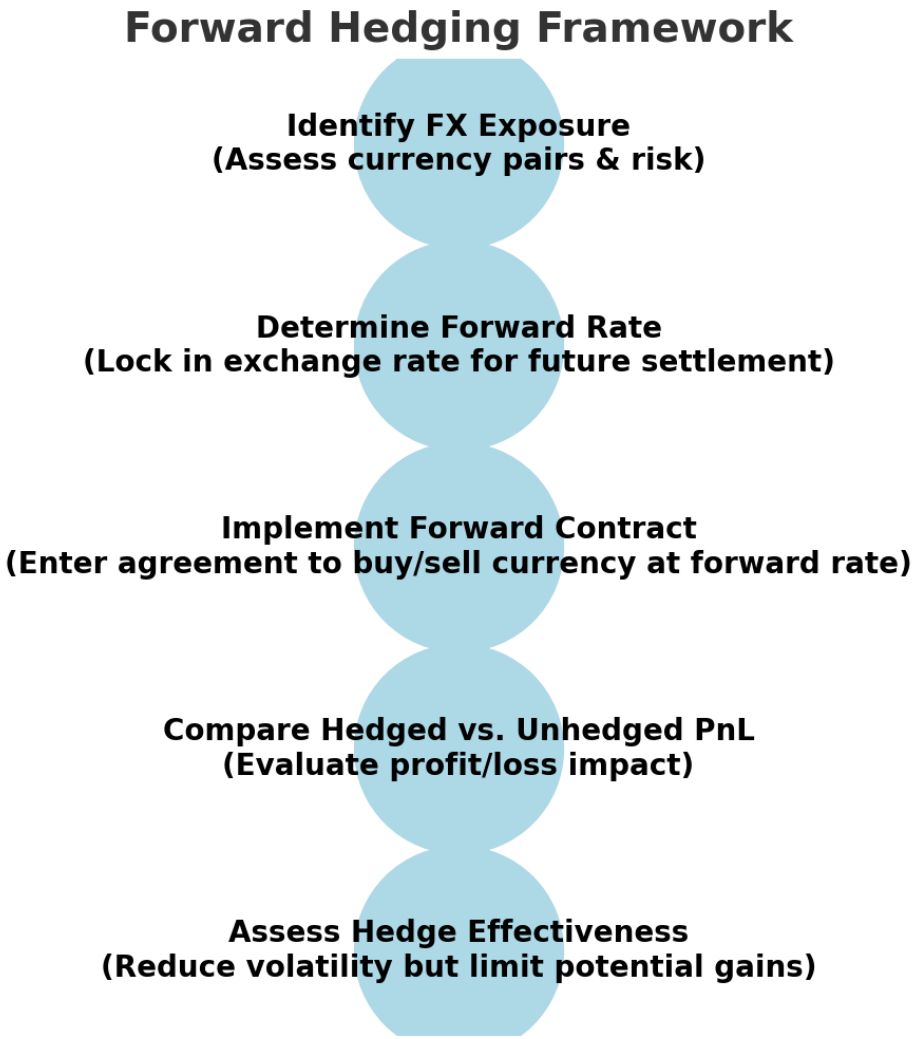


Risk Management

- Given this volatility structure, EUR-funded or EUR-targeted carry trades involving CHF would provide the most stable basis for carry trade strategies. CHF/JPY, due to its high volatility, may be riskier for such trades.
- To address the inherent risks posed by macroeconomic uncertainty, this study introduces two primary hedging mechanisms: Forward Hedging and Options-Based Hedging

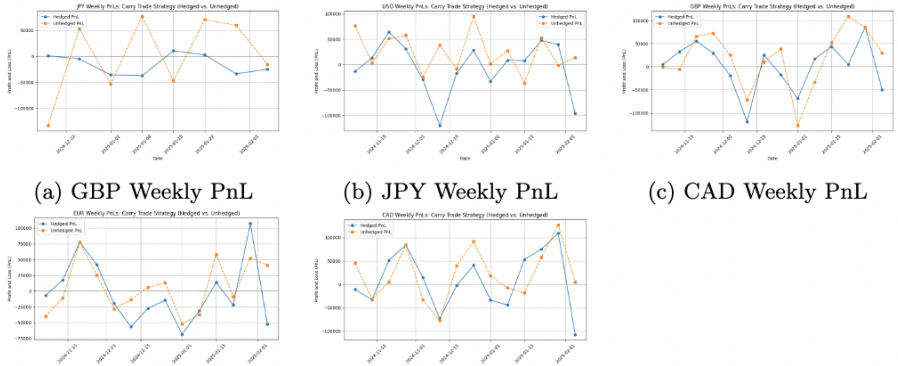


Forward Hedging Analysis



Forward Hedging Analysis

- Used forward contracts to hedge against unfavorable FX movements.
- Forward hedging provided stability but limited profitability.
- Most forward-hedged trades underperformed compared to unhedged positions.

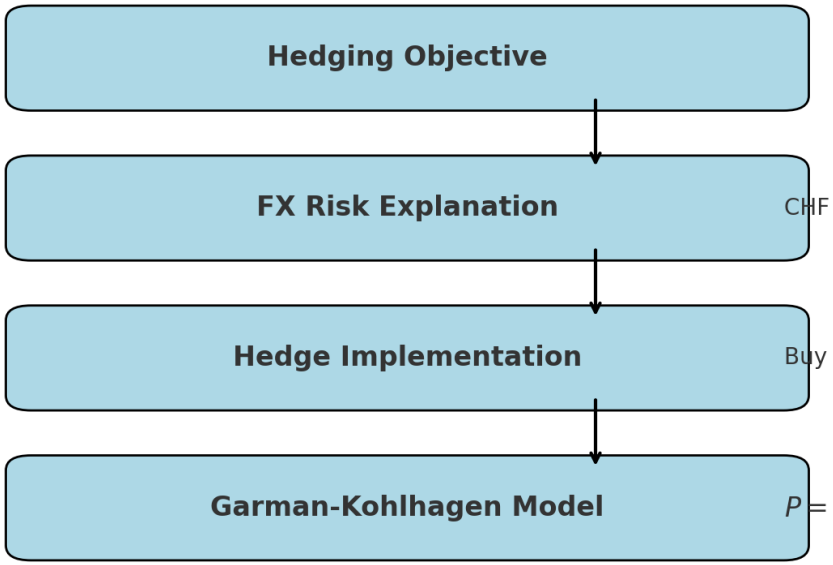


(a) GBP Weekly PnL (b) JPY Weekly PnL (c) CAD Weekly PnL

(d) USD Weekly PnL (e) HKD Weekly PnL

Figure 7: Comparison of Weekly PnL for Hedged vs. Unhedged Carry Trade

Option Hedging Analysis



Option Hedging Analysis

- Implemented put options on USD/CHF to mitigate downside risk.
- More effective in limiting losses while retaining upside potential.
- Demonstrated superior risk-adjusted returns compared to forward hedging.

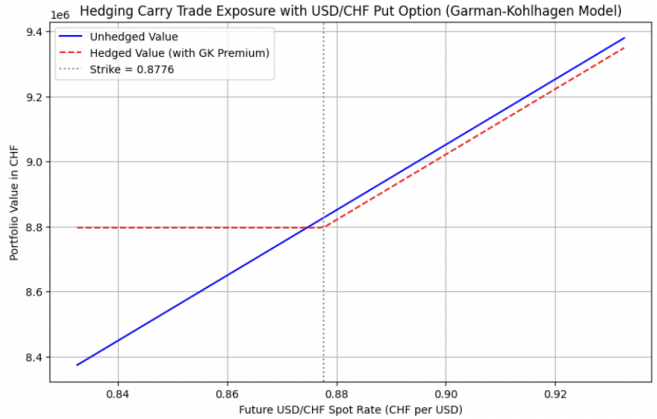


Figure 8: Hedging Carry Trade Exposure with USD/CHF Put Option (Garman-Kohlhagen Model)

Final Recommendation

- Forward hedging offers risk reduction but at a significant cost to returns.
- Option hedging provides better downside protection with reasonable cost.
- Investors should prioritize options-based hedging strategies over forwards.
- Carry trade remains profitable but requires effective hedging to manage volatility.