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Managing the Risk of a Strategic USD-Asian Exposure

A Markowitz Approach to Proxy Hedging

Introduction

Framework

- A **Asian Asset Manager** holds some **USD assets** and wants to hedge the resulting FX exposure.

- A **3-month horizon** is considered as the flexibility to rebalance the hedges is key.

- The current **interest rate differential** between USD and home currency (5.25% against 1.50%) implies a **high cost of hedging** this position.

- A potential solution to **mitigate the cost of the carry** on the hedge is to **hedge** the underlying exposure **with a proxy**.

- We analyze the various proxy alternatives and try create a framework for analyzing the proxy hedging strategy

Definition

- When a proxy is used for hedging, the hedger bears the **risk that the variations on the proxy do not offset the variations of the underlying FX exposure**.

- Proxy hedges can be evaluated along 2 axis:

  - **The carry**: The difference in carry between the proxy and the hedged exposure represents the gain of entering the proxy rather than a normal hedge.

  - **The tracking error** of the proxy compared to the underlying exposure: The tracking error is an indication of the hedging power of the proxy.

Proxy Currency Selection

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- It is possible to differentiate two categories of proxies:
  - **Single currency proxies**: a derivative in a third currency pair is entered to hedge the underlying exposure.
  - **Proxy Baskets**: Alternatively, a portfolio of forwards or a basket option can be used to hedge a single currency exposure.
- The only advantage of a single currency proxy is its ease of use and monitoring.
- **Proxy Baskets** gives the hedger **more flexibility** than single currency proxies.
- In addition, The use of multiple currencies enables to mitigate the specific risk of the proxy currencies themselves.

Proxy Currency Selection

Currency Selection

- A closer look at the interest rates and correlations enables to exclude some currencies from the final proxy subset:
    - JPY and CNY: interest rates are too low. It would not make sense to hedge an exposure with a proxy if the proxy has a worse carry than the currency it is suppose to replace.
    - AUD: the correlation is too low.
    - HKD: due to its controlled exchange rate, HKD has an almost perfect correlation with the USD when measured against third currencies.
- This leaves a **subset 6 currencies: KRW, THB, INR, SGD, PHP and IDR**

Optimisation Framework

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Methodology

- As discussed in the introduction on proxy hedging, the quality of a proxy depends on 2 criteria:
    - **The Carry** (defined as the interest rate differential between the currencies and the USD).
    - **The expected Tracking Error** (defined as the residual error between the exposure hedged with the proxy and the exposure fully hedged).
- An efficient proxy is a proxy with the **highest carry for a given expected tracking error** or similarly the proxy with the lowest expected tracking error for a given carry.
- This proxy basket selection methodology is similar to the mean-variance portfolio selection in the **Markowitz framework**.

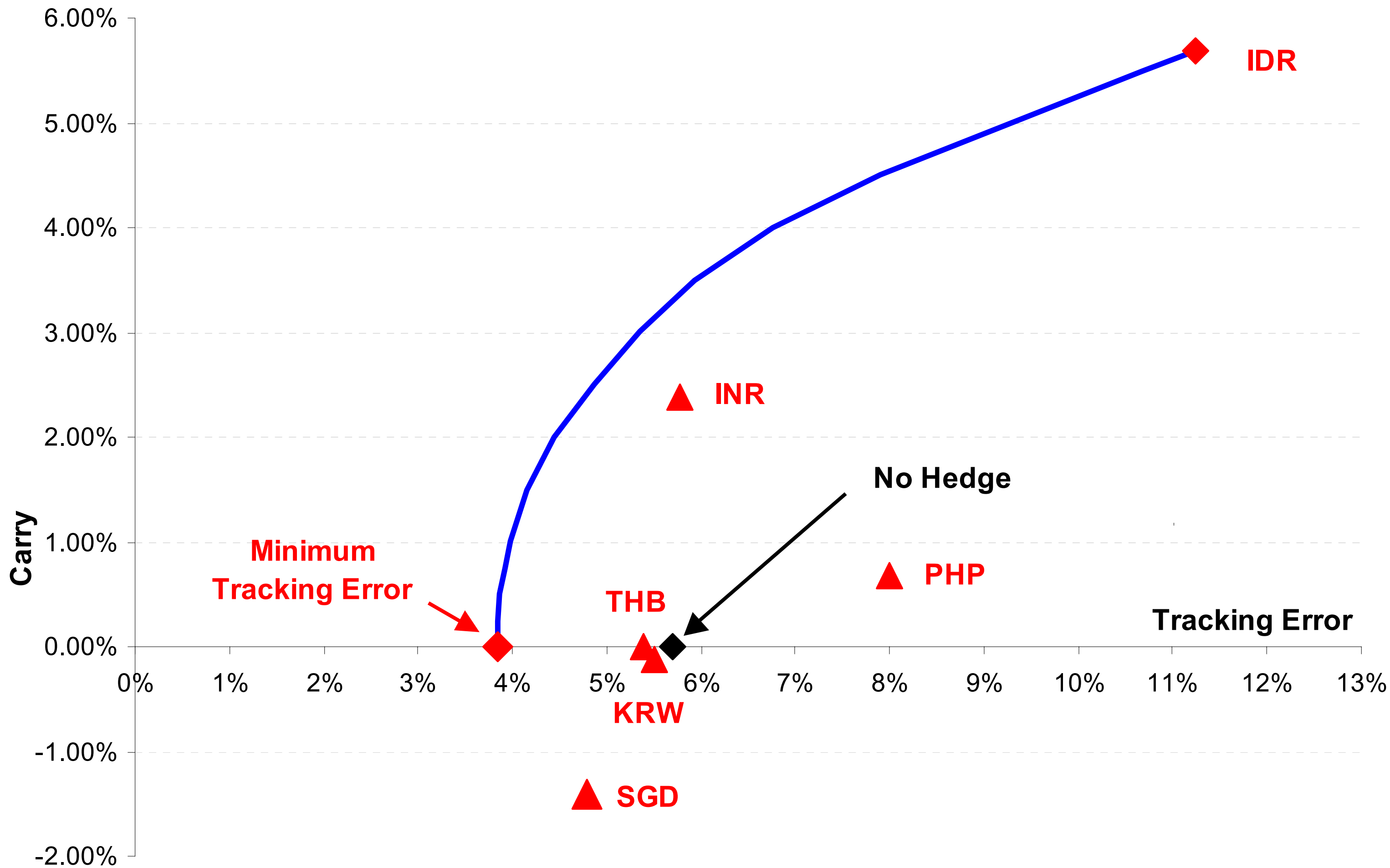
Optimisation Framework

Data

- Correlation Matrix (5-years of weekly data)

	TWD	KRW	INR	THB	SGD	PHP	IDR
TWD							
KRW	64%						
INR	38%	31%					
THB	65%	61%	34%				
SGD	58%	61%	29%	67%			
PHP	28%	32%	10%	37%	34%		
IDR	23%	28%	11%	36%	40%	34%	

Set of Efficient Proxy Hedges
(5 year Correlation Data)



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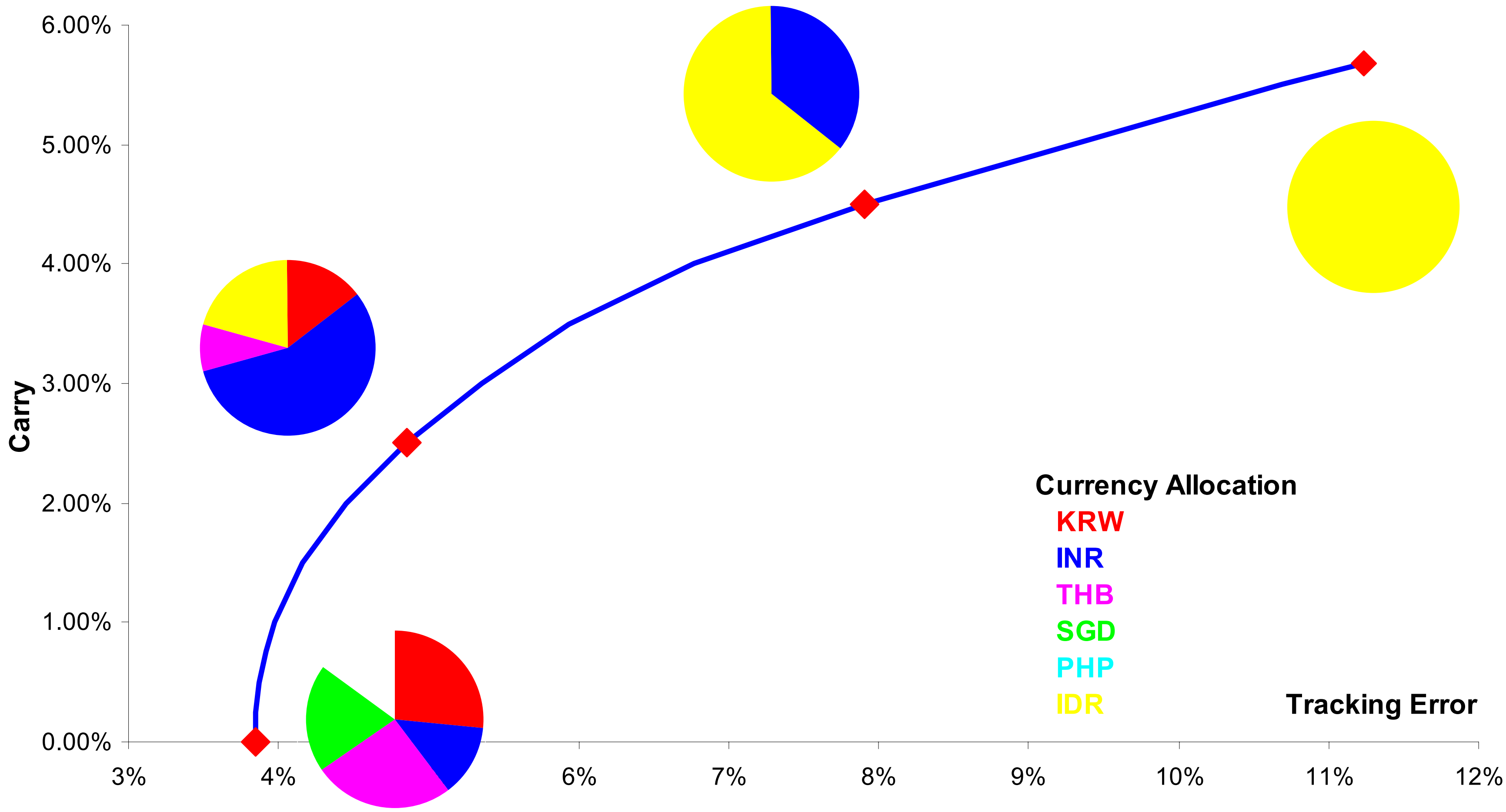

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