

Global risk factors in exchange rate movement

What drives THB movement in recent years?

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10 March 2026

Agenda

- Motivation
- Methodology
- Results and its implication
- Next step

Motivation: From Fundamentals to Risk Factors

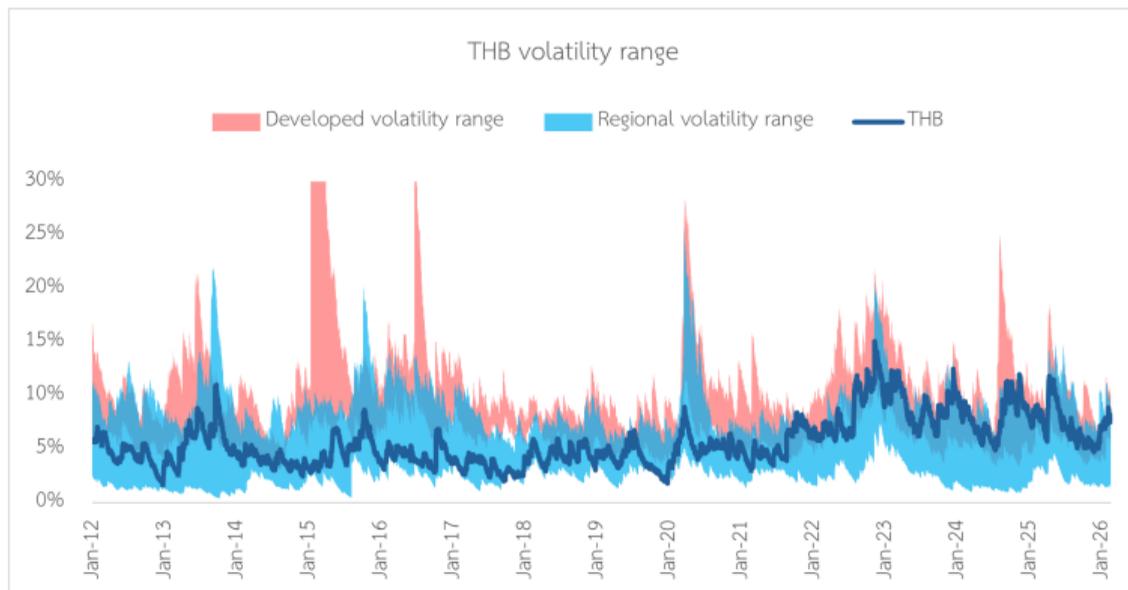
- Traditional FX models based on macro fundamentals perform poorly empirically in explaining short- to medium-term movement:
 “exchange rate disconnect puzzle” (Meese and Rogoff, 1983)
- Exchange rates exhibit high volatility and weak linkage to observable fundamentals
- Growing evidence that global shocks and risk sentiment play a dominant role

Motivation: Why Risk-Factor Approach?

- Captures common global drivers of FX movement
- Provides economic interpretation in terms of risk exposure and compensation
- Separates systematic (global) vs idiosyncratic (country-specific) movements
- Recently, FX resembles financial asset - **asset-pricing lens**

Motivation: Why Thailand? What Do We Learn?

- Historically stable, but increasingly exposed to global factors
- **Key questions:**
 - Why THB volatility has increased after Covid?
 - Does gold price impact THB movement?



- Fama and French (1993): Common risk factors in equities (value, size)
- Lustig et. al. (2011): Common risk factors in FX - using two factors (dollar and carry factors) can explain cross-section of FX returns
- Verdelhan (2017): The two factors explain 18% to 80% of R^2 and provides structural framework for factors interpretation
- Krohn and Maguina (2024): Oil factor is constructed to explain CAD movement in addition two dollar and carry factors

- The returns of THB is regressed against the three global factors constructed from basket of currencies

$$\Delta s_t = \alpha + \beta_D \text{Dollar}_t + \beta_C \text{Carry}_t + \beta_G \text{Gold}_t + u_t$$

- where Δs_t is the weekly change in log spot rate $\Delta s_t = s_t - s_{t-1}$
- FX universe: 25 currencies from 2006 – 2025

Source: Lustig et.al.(2011), Verdelhan(2017)

Factor construction

- Dollar factor: average returns against dollar
 - Country-specific risks are averaged out
 - Captures US and global shocks

$$\text{Dollar}_t = \frac{1}{N} \sum_{i=1}^n \Delta s_{i,t}$$

- Carry factor: returns on doing carry trade (portfolio longing (holding) high-interest currencies and shorting (funded) by low-interest currencies)
 - Country-specific risks are averaged out by long-short portfolio (long 5 high-interest currencies and short 5 low interest currencies)
 - Captures additional returns for holding 'risky' currencies

$$\text{Carry}_t = \frac{1}{N_H} \sum_{i \in H} \Delta s_{i,t} - \frac{1}{N_L} \sum_{i \in L} \Delta s_{i,t}$$

Source: Lustig et.al.(2011), Verdelhan(2017)

Factor construction: why gold?

- Commodity currencies:
 - Cashin et. al. (2002): long-run equilibrium relationship between commodity prices and exchange rates for commodity-exporting countries via terms of trade
 - Chen and Rogoff (2003): commodity prices (especially oil) influence currencies of countries that export that commodity
- **Expectation:** Currencies of gold-exporting countries should co-move with gold prices
- **Problems:** Gold has a safe-haven status and was used to back paper money previously
- **The case of THB**

Average 1 Year rolling gold correlation of regional currencies

Year	THB	CNY	IDR	INR	KRW	MYR	PHP
2025	65%	29%	29%	20%	35%	15%	29%
2022 - 2024	46%	33%	27%	19%	29%	19%	18%

Note: correlation between daily return of USDTHB and gold price (as of 19 September 2025)

Source: Bank of Thailand

Factor construction: gold factor

- **Step 1:** Estimate each currency's sensitivity to gold-price changes
 - Rolling 52-week regression
 - Controls in the regression: dollar factor, carry factor, VIX

$$\Delta s_{i,t} = \alpha_{i,t} + \beta_{i,t} \Delta XAU_t + \omega_{i,t} Carry_t + \theta_{i,t} Dollar_t + \gamma_{i,t} VIX_t + \epsilon_{i,t}$$

- **Step 2:** Sort currencies based on sensitivity (β)
- **Step 3:** Long 5 most sensitive currencies and short 5 least sensitive currencies and calculate the returns from the portfolio

$$Gold_t = \frac{1}{N_H} \sum_{i \in H} \Delta s_{i,t} - \frac{1}{N_L} \sum_{i \in L} \Delta s_{i,t}$$

Source: Krohn and Maguina (2024) provides methodology for oil factor on currencies

Factor construction: Gold portfolio constituents

Countries with most frequent appearances in low sensitivity to gold portfolio

Countries	Frequency in weeks (% of times)	Gold trade balance (US mn)
Hungary	593 (57.1%)	-18
Poland	539 (51.9%)	-231
Sweden	472 (45.4%)	712
Czech	347 (33.4%)	-121
Romania	299 (28.8%)	150

Countries with most frequent appearances in high sensitivity to gold portfolio

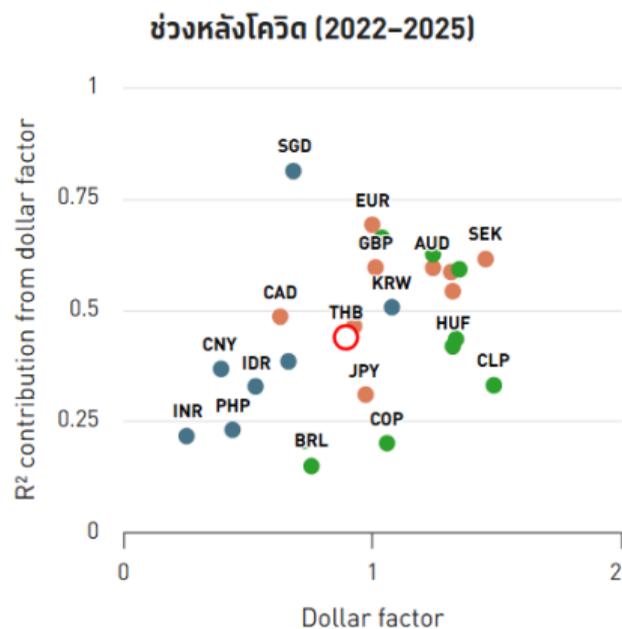
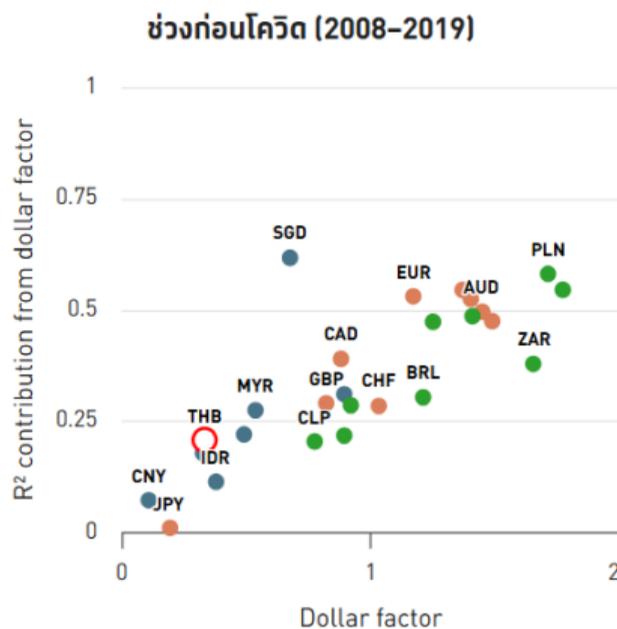
Countries	Frequency in weeks (% of times)	Gold trade balance (US mn)
Japan	596 (57.4%)	17,349
Australia	468 (45.0%)	17,040
South Africa	453 (43.6%)	7,052
Switzerland	416 (40.0%)	11,162
Canada	370 (35.6%)	18,378

THB became more exposed to global factor with dollar factor as the main driver with gold as an amplifying factor

Variables	Dependent variable: weekly THB return		
	Full period (2006–2025)	Pre-Covid (2010–2019)	Post-Covid (2021–2025)
Dollar	0.447*** (0.025)	0.336*** (0.024)	0.893*** (0.067)
Carry	-0.044** (0.021)	0.015 (0.021)	-0.204*** (0.052)
Gold	0.065*** (0.024)	0.045** (0.023)	0.177*** (0.065)
R^2	0.25	0.26	0.47
N	1,039	678	208

Notes: Robust standard errors in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

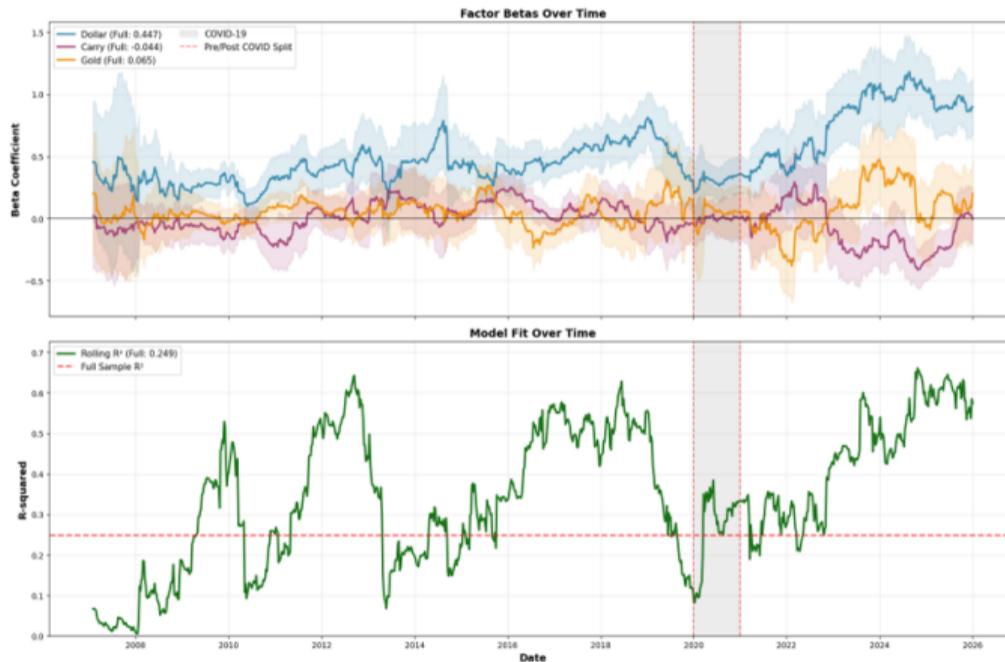
THB is shifting toward developed currency regime



Legend: Blue: Regional, Green: LATAM and Central Europe, Orange: Developed

THB is more influenced by global factors over time with all factors exerting larger effects on THB volatility

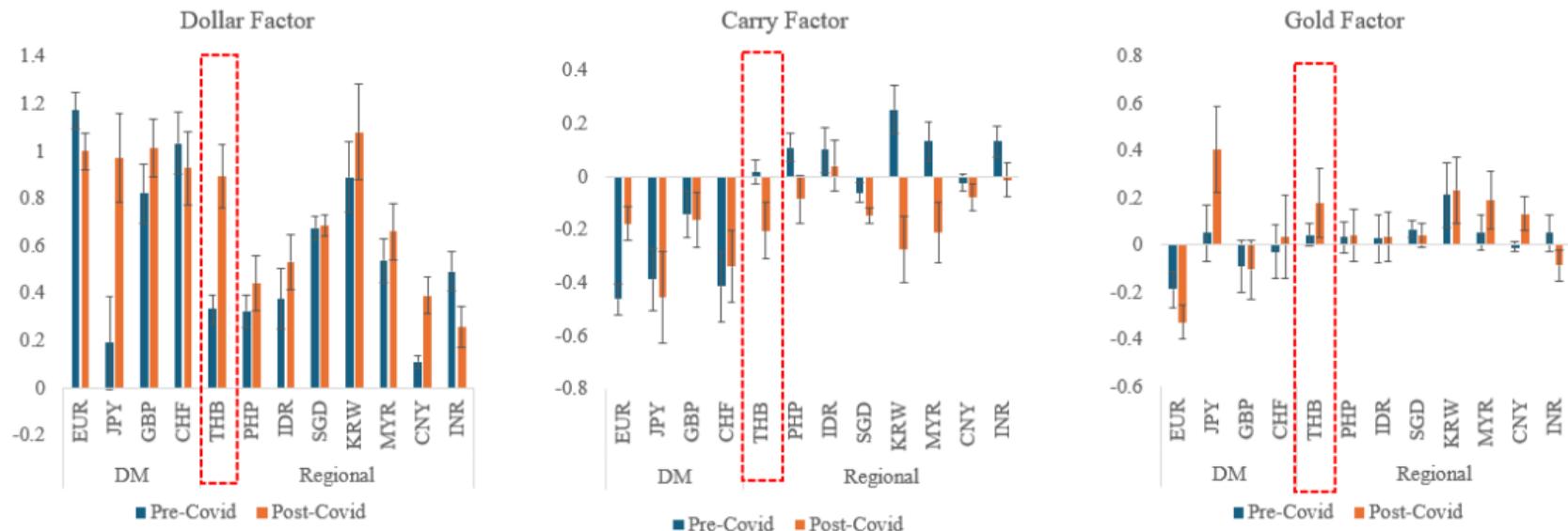
52-week Rolling Betas and Time-Varying Factor Exposure



- THB is less effective as a shock absorber due to larger influence from global factors
- Shifting from predicting FX to managing FX risk
- Targeted policies for non-fundamental factors such as gold trading

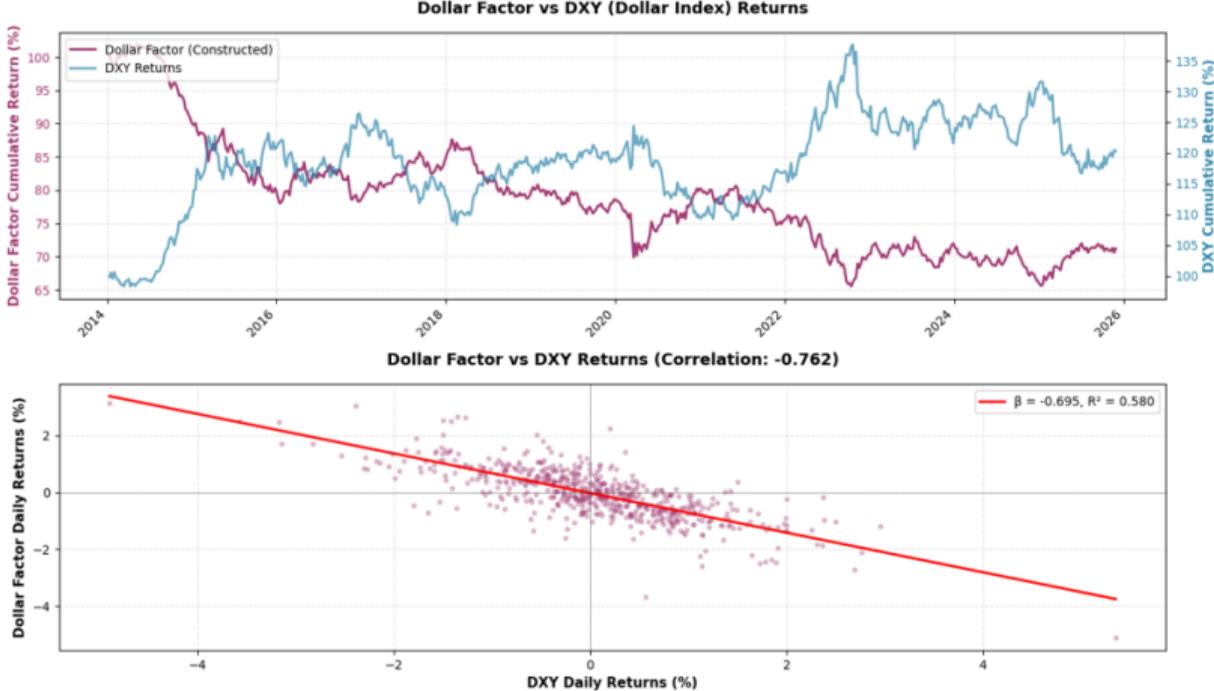
- Why THB is more exposed to global factors post-Covid?
 - Financial flow? (BIS, 2020)
 - Global Financial Cycle? (Rey, 2018)
 - FX market structure? (Huang et. al., 2025)
- Impacts of more volatile THB on real economy
- FX risk premium - is there another risk that explains THB overperformance?

Appendix: Comparison of factor loadings between Regional and DM



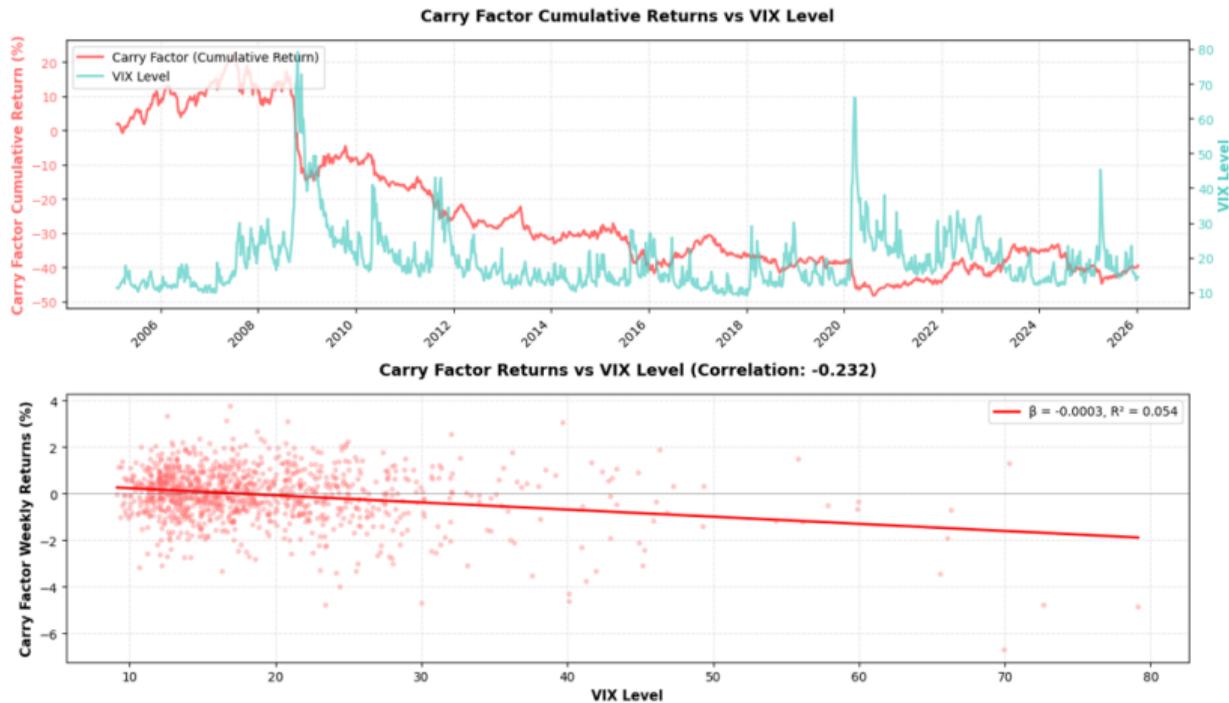
Note: Pre-Covid: 2008 – 2019, Post-Covid: 2022 – 2025)

Appendix: Extracted dollar factor against DXY returns



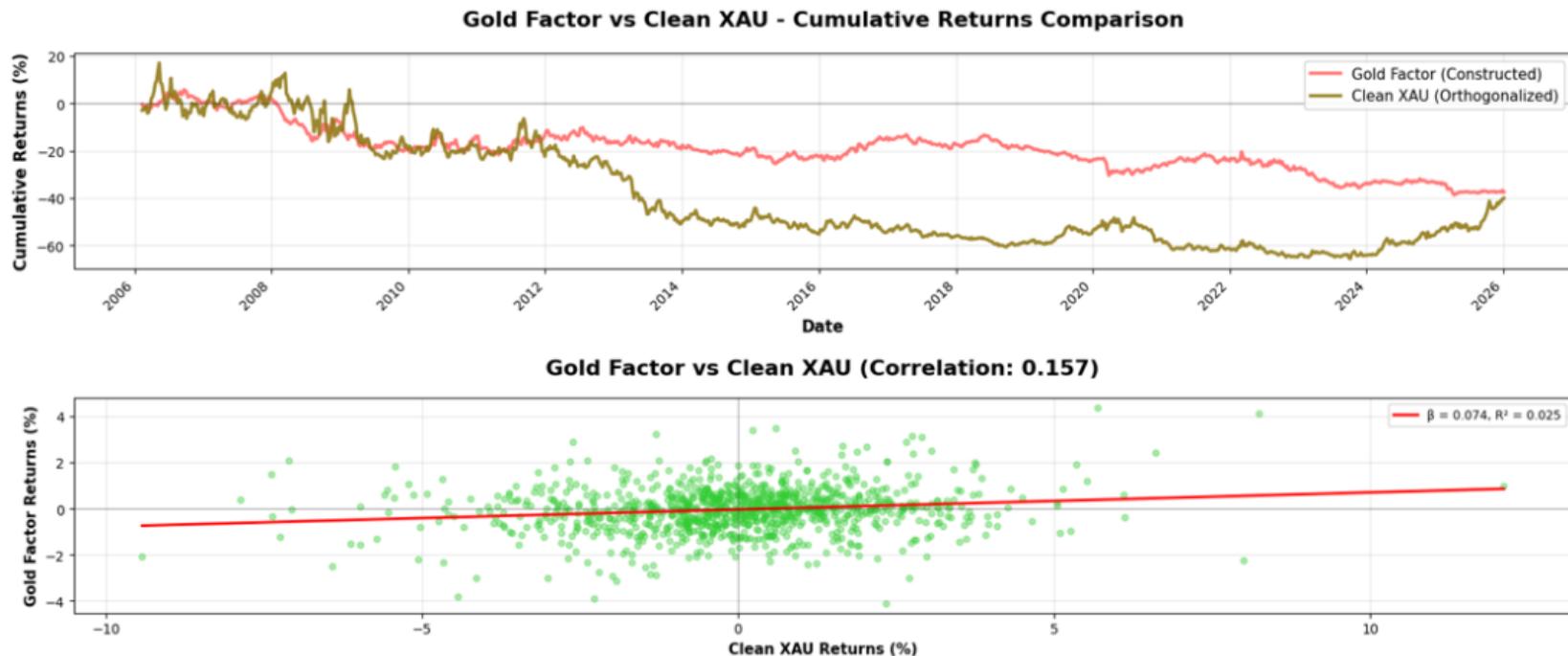
Note: Dollar factor is in the opposite direction of DXY (When USD is strong, DXY returns are positive and dollar factor is negative)

Appendix: Extracted carry factor against VIX



Note: Carry factor does not include returns from interest rate differentials. Carry factor returns is negative when VIX spikes (higher global risk)

Appendix: Extracted gold factor against XAU returns



Note: Clean XAU returns are obtained by getting residuals from the regression $XAU\ returns_t = \alpha + \beta_1 Dollar_t + \beta_2 Carry_t + \beta_3 VIX_t + \epsilon_t$

Appendix: Carry factor portfolio constituents

Countries with most frequent appearances in low carry portfolio

Countries	Frequency in weeks (% of times)	Average interest rate (%)
Switzerland	1038 (99.5%)	-1.90
Japan	1014 (97.6%)	-2.29
Europe	623 (60.0%)	-0.79
Sweden	575 (55.3%)	-0.58
Czech	431 (41.5%)	-0.15

Countries with most frequent appearances in high carry portfolio

Countries	Frequency in weeks (% of times)	Average interest rate (%)
Brazil	910 (87.6%)	8.54
South Africa	863 (83.1%)	5.63
India	605 (58.2%)	4.22
Indonesia	583 (56.1%)	5.42
Mexico	530 (51.0%)	5.16