

Which of the G10 Currencies is the Riskiest to Hold for a Swiss Resident?

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Introduction

Components of G10 currency

G10 currencies:

the US dollar (USD), the euro (EUR)

the Japanese yen (JPY), the UK pound sterling (GBP),

the Swiss franc (CHF), the Norwegian krone (NOK),

the Swedish krona (SEK), the Canadian dollar (CAD),

the Australian dollar (AUD) and the New Zealand dollar (NZD)

Introduction

Currency Pairs

Currency Pairs for Swiss Citizen:

CHF/USD, CHF/EUR, CHF/GBP, CHF/JPY,
CHF/AUD, CHF/NZD, CHF/CAD, CHF/NOK,
CHF/SEK

Our goal is to analysis these pairs returns and find the riskiest one

Data

Daily data of the exchange rate of currency of one year from 2020 to 2022 is used

The data is retrieved from the API of apilayer as one of the known sources for apis

Some spot exchange rate data is retrieved from several major forex data providers in real-time, validated, processed and delivered hourly, every 10 minutes, or even within the 60-second market window.

Model

Sample Variance is used to estimate the risk. the formula is as follows:

$$s^2 = \frac{\sum_i^N (X - \mu)^2}{N - 1} \quad (1)$$

Expected shortfall is expressed as follows:

$$ES_\alpha(X) = -\frac{1}{\alpha} \int_0^\alpha VaR_\gamma(X) d\gamma \quad (2)$$

$$VaR_\alpha(X) = -\inf \{x \in R : F_X(X) > \alpha\} \quad (3)$$

	CHFUSD	CHFEUR	CHFGBP	CHFJPY	CHFAUD	CHFNZD	CHFCAD	CHFNOK	CHFSEK
Mean	0.000228	0.000005	0.000142	0.000087	-0.000022	0.000294	0.000178	0.000184	-0.000106
Median	0.000228	0.000005	0.000142	0.000087	-0.000022	0.000294	0.000178	0.000184	-0.000106
Std. dev.	0.000228	0.000005	0.000142	0.000087	-0.000022	0.000294	0.000178	0.000184	-0.000106
Std. dev.	0.000228	0.000005	0.000142	0.000087	-0.000022	0.000294	0.000178	0.000184	-0.000106

Table 1: Summary Table of the Returns

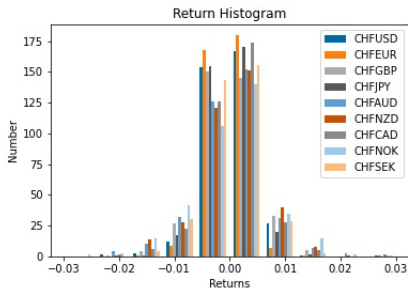


Figure 1: Return Histogram

Empirical Results

Expected Shortfall Heat Map

On the heat map of ES (figure 2) we can see that CHF/NOK has the highest downside Risk among all the other currency pairs.

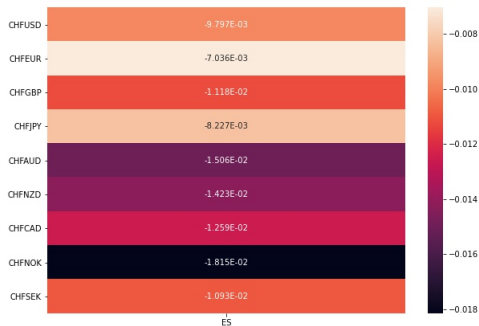


Figure 2: Expected Shortfall

Empirical Results

Variance Heat Map

On the heat map of Variances (figure 3) we can also notice that CHF/NOK is attached to the highest variance among all the other Currency pairs.



Figure 3: Variance

Conclusion

Both of this riskmeasures has shown that CHF/NOK is the riskiest over the year of 2021. Therefore, during the 2021, we come to a conclusion that CHF/NOK is the riskiest Currency pair position to hold

In another words, to hold the he Norwegian krone (NOK) is the riskiest strategy for a Swiss citizen.

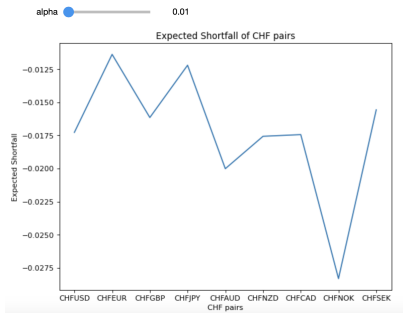


Figure 4: Interactive app