



# Libra or Librae?

Basket based stable coins to mitigate  
foreign exchange volatility spillovers  
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# Outline

## What We'll Be Covering

01. **Is stablecoin a next big thing?**
02. **The idea behind SHC**
03. **Facebook's Libra**

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04. **Remittance transfers - entrance of bigtechs**
05. **Stablecoins and e-money**
06. **Global currencies**
07. **Optimal basket and stability analysis**
08. **Closing Remarks**

# Let's discuss...

- What is cryptocurrency?
- Importance of US dollar on global trade
- The idea of global currency
- Privately issued stablecoin (i.e. Facebook)



**"Bitcoin, and the idea behind it, will be a disruptor to the traditional notions of currency. In the end, currency will be better for it.**

— Edmund C. Moy  
American businessman

# Is stable coin a next big thing?

- Digital currencies, such as Bitcoin, were the purview of speculators and coders, not stodgy central bankers. But last winter, the Federal Reserve announced that it's investigating the possibility of issuing its own digital coin. Speaking at Stanford, Federal Reserve Governor Lael Brainard noted that the "potential for digitalization to deliver greater value and convenience at lower cost" has piqued the interest of the traditionally risk-averse institution.
- For now, the Fed's interest in digital currency might be most notable as a sign of how the world has changed
- Enthusiasts often point to cryptocurrencies' potential to enhance both the efficiency and reach of e-commerce
- If key financial institutions like the Fed give their stamp of approval, we might really see a lower reliance on fiat currency and actual paper money in our day-to-day lives



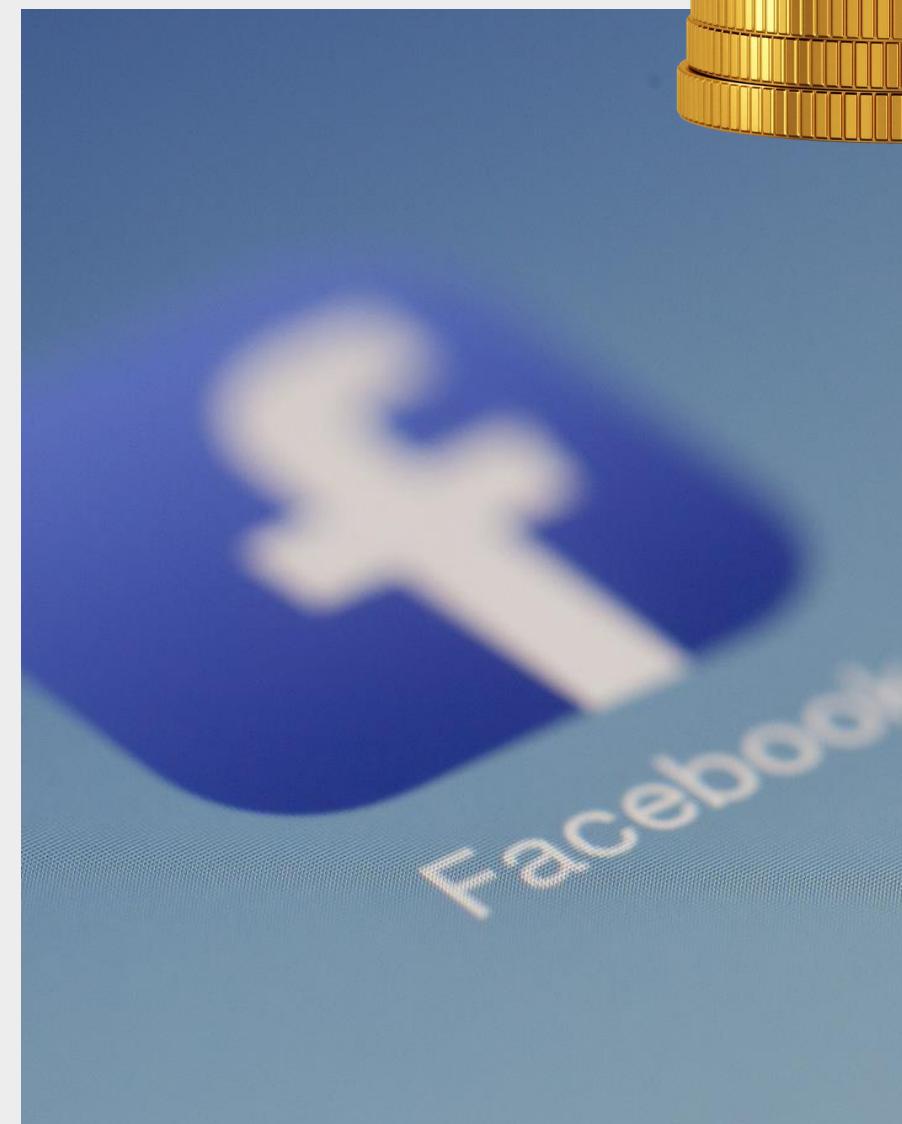
# The idea behind SHC

- Synthetic Hegemonic Currency (SHC) should be provided by a public sector?
- The rationale would be that a global currency, underpinned by a basket of reserve assets, could better support global outcomes. For example, an SHC could dampen the dominating influence of the US dollar on global trade, it could alleviate spillovers to exchange rates from shocks to the US economy, and trade across countries could become less dependent on the dollar
- The revival of discussions concerning an SHC, have somewhat been sparked by the discourse surrounding central bank digital currency (CBDC) and stablecoins
- In particular, Facebook announced plans for its own privately issued stablecoin that could emulate some of the characteristics of an SHC. The proposition is to construct a stablecoin that can circulate globally with a value that is **derived from an underlying basket of assets comprised of the major currencies**



# Why have regulators reacted with such caution to Facebook's plans to issue a stablecoin?

- Firstly, as a tech-giant Facebook can push Libra to its vast user-base, approximately 2.41 billion monthly active users. To put this into perspective, currently it is estimated there around 40 million bitcoin wallets and 1 million daily users
- Facebook would have to successfully penetrate 2% of its user base to match what is an upper bound on a proxy for the size of bitcoins user base, the most commonly used cryptoasset.
- Whilst the two assets may serve different purposes, there is potential for Facebook's Libra to rapidly acquire a significant user base transacting in a privately issued global digital currency. This may affect significantly, in particular, private individuals' transfers of money from remittances



# Remittance transfers - entrance of bigtechs

- A remittance is a transfer of money made by a foreign worker to an individual in its home country. Remittances are one of the largest capital flows to developing countries. According to the World Bank, in 2018 overall global remittance grew 10% to 689 billion dollars, including 529 billion dollars to low income countries. India consecutively remains the top receiver of remittances, with 80 billion dollars in 2018 (about 3% of India's GDP), followed by China, the Philippines, Mexico and Nigeria
- While in the past the remittance industry has been dominated by few financial players (such as Western Union), with a high transaction cost, recently many fintech startups (such as TransferWise) have entered the market with competitive offers, opening the door to the possible entrance of bigtechs such as Facebook, with its Libra project.





# Investigating...

- the consequences of a global SHC
- stability of an SHC to that of a single currency based currency (Libra)
- optimal design of an SHC that is backed by a basket of underlying reference currencies, such as those included in the International Monetary fund Special Drawings Rights (SDRs), and compare the resulting volatility with that of single currencies
- currencies which mostly determine volatility spillovers among exchange rates
- the impact that shocks on the driving currencies would carry on the SHC or on single currencies, to understand which stablecoin design (Libra or Librae) better preserves the values of remittances from low income countries

# Stablecoins and e-money

- 'stablecoin' represents a crypto-asset designed to maintain a stable value relative to another asset (typically a unit of currency or commodity) or a basket of assets
- types of stablecoins:

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- **Tokenised funds** - denote stablecoins that are a claim on a pool of collateral that consists of funds, including cash, electronic money, commercial bank money or central bank reserve deposits e.g. Tether, Utility Settlement Coin
- **Off-Ledger Collateralised** - stablecoins that are a claim on a pool of collateral that is comprised of various assets e.g. multiple currencies, T-Bills etc
- **On-Ledger Collateralised** - stablecoins that are a claim on a pool of underlying collateral that is held on a blockchain e.g. Dai
- **Algorithmic** - take users expectations into account to stabilise the value of the coin (mostly conceptual) e.g. BasisCoin





# Global currencies

- The IMF's issuance of SDRs could be seen as a supranational currency issued by central banks, although the SDR does not fulfil all functions of money. Whilst serving as a store of value and unit of account, SDRs are only used by some central banks and international institutions as a means of exchange to pay each other. For this, they may not be strictly considered as a "true" global currency.
- A boost to the importance of SDRs was given in 2009, when China called for reforms to the international monetary system by adopting the SDR as a reserve asset.
- Given the persistent importance of the US dollar, the question is whether this will remain so under the fintech transformation that is changing the financial world. And, in particular, whether a dollar based stable coin is more likely to be adopted than a basket based one

ggit	1.41
Euro	37.74
Australia	24.07
England	52.97
Korea	25.40
Zealand	23.43

# Remittances and exchange rates

- A stablecoin backed by a basket of currencies could be an attractive asset for foreign workers that make remittances to families in their home countries. In particular where its value is not directly tied to the domestic currency. Under the status quo, an appreciation in the value of the domestic currency can reduce the remittances ratio because workers want to keep the additional earning from the appreciation of the currency
- One specific challenge for countries that face large inflows of worker remittances could lead to the emergence of "Dutch disease," that is, remittance inflows could result in an appreciation of the equilibrium real exchange rate that would tend to undermine the international competitiveness of domestic production, particularly that of nontraditional exports
- A basket based currency could dampen some of these effects as it is less susceptible to appreciation and depreciation of the domestic and foreign currencies. However, the effects are likely to be ambiguous and depend on how the stablecoin is used

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**Let's take a  
closer look at the  
analysis...**

# Data and empirical findings

- Usage of daily foreign exchange rate data over the period 1 January 2002 - 30 November 2019
- To build a optimal basket of currencies, collected data is relative to the foreign exchange pairs between the currencies that are included in the IMF's Special Drawings Rights: the US dollar, the Chinese Renmimbi, the Euro, the British pound and the Japanese Yen
- assuming that the obtained basket of currencies correspond to a stable coin which can be exchanged and compared with a single currency based stablecoin, for example based on the US dollar. This, in particular, for foreign individuals sending remittances to their home country

Currency	USD	CNY	EUR	GBP	JPY
Optimal Weights	0.17	0.2	0.23	0.19	0.21
IMF SDR Weights	0.42	0.11	0.31	0.08	0.08

Table 1. Weights of the currency in the chose basket, according to our methodology (Optimal) and the IMF Special Drawing Rights (IMF SDR)

# Optimal basket and stability analysis

- note that the method yields weights which are relatively equal among each other, in fact each are approximately a fifth, with a slightly heavier weighting on the EUR. The weights are quite different from the weights of the IMF SDR, which are highly concentrated on the USD dollar. Fluctuations of SDRs will strongly be correlated with fluctuations in USD and EUR.
- The SAC distributes the weights more evenly across the basket to minimise the variations in fluctuations. Since, the basket is comprised of hard currencies the diversification tends to work since the currencies move systematically over time relative to one another. Such that, if the value of a particular currency depreciates relative to the SAC, but simultaneously there is an appreciation of another currency, their movements would tend to cancel each other, all else the same
- China has managed a floating peg against the USD and hence these two currencies are likely to be strongly linked. In the SDR these two currencies make up 53% of the basket compared to 37% in the SAC. Indicating, perhaps more diversification is needed to offset movements in the dollar. To better interpret the results, Figure 1 represents the time series of the Reduced Normalised Values of all considered currencies in the basket, along with our basket based stable coin, in the considered period.



# Optimal basket and stability analysis

- Figure 1 - evolution of the RNVAs of the currencies composing the basket during the whole sample period. After a first period of small turbulences, the time series start to diverge roughly from the beginning of 2006 onwards. From that point onwards, two clusters seem to emerge: the 1st includes USD and CNY, while the 2nd pertains EUR, GBP and JPY.
- For many years, the CNY value was pegged to the dollar and, therefore, its dynamics shows quite similar patterns to that of the USD. As expected by construction, the Reduced Normalised Value of the basket based stable coin lies in the middle "mediating" between the different currencies, and compensating single deviations with diversification benefits.

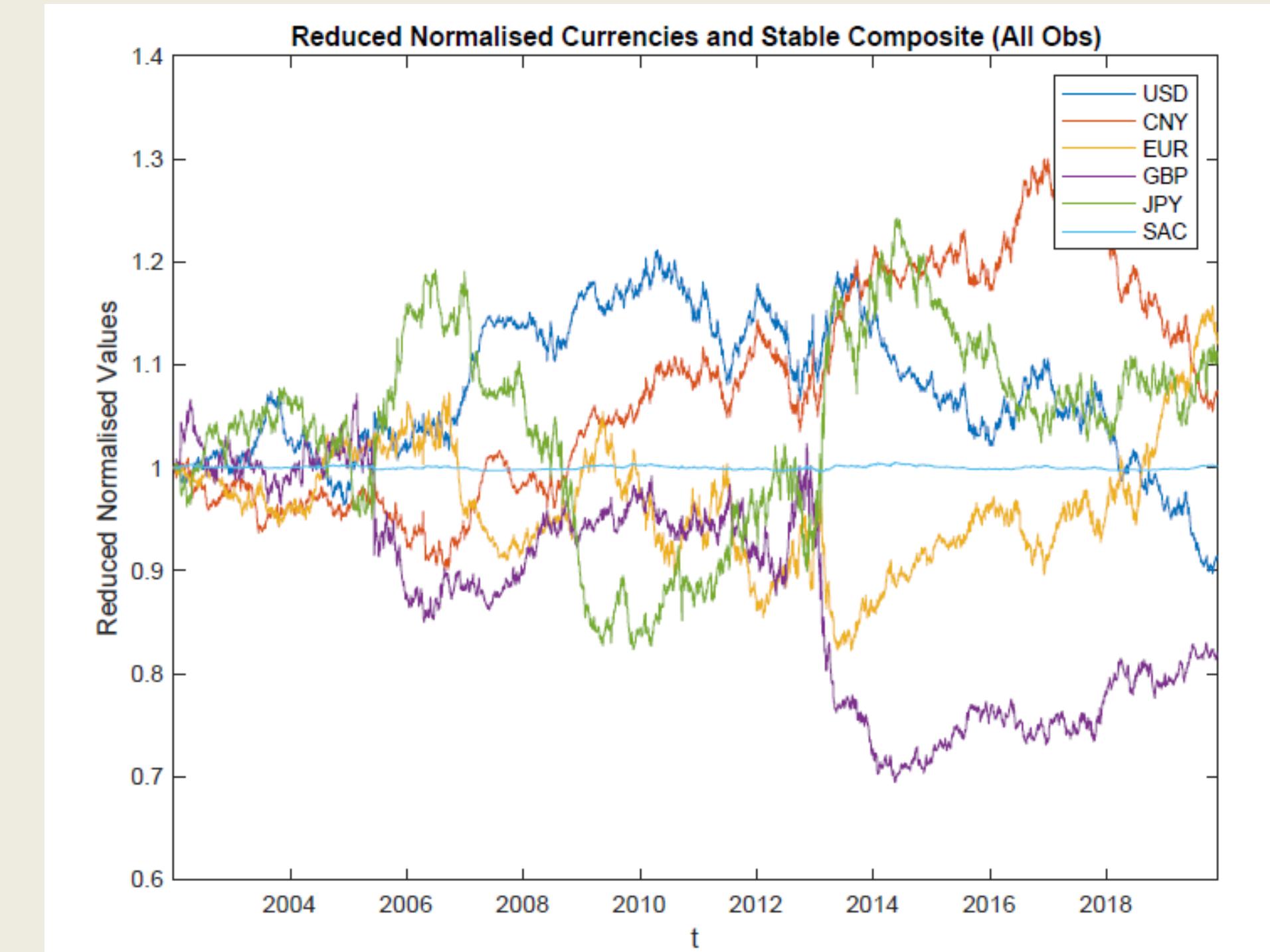
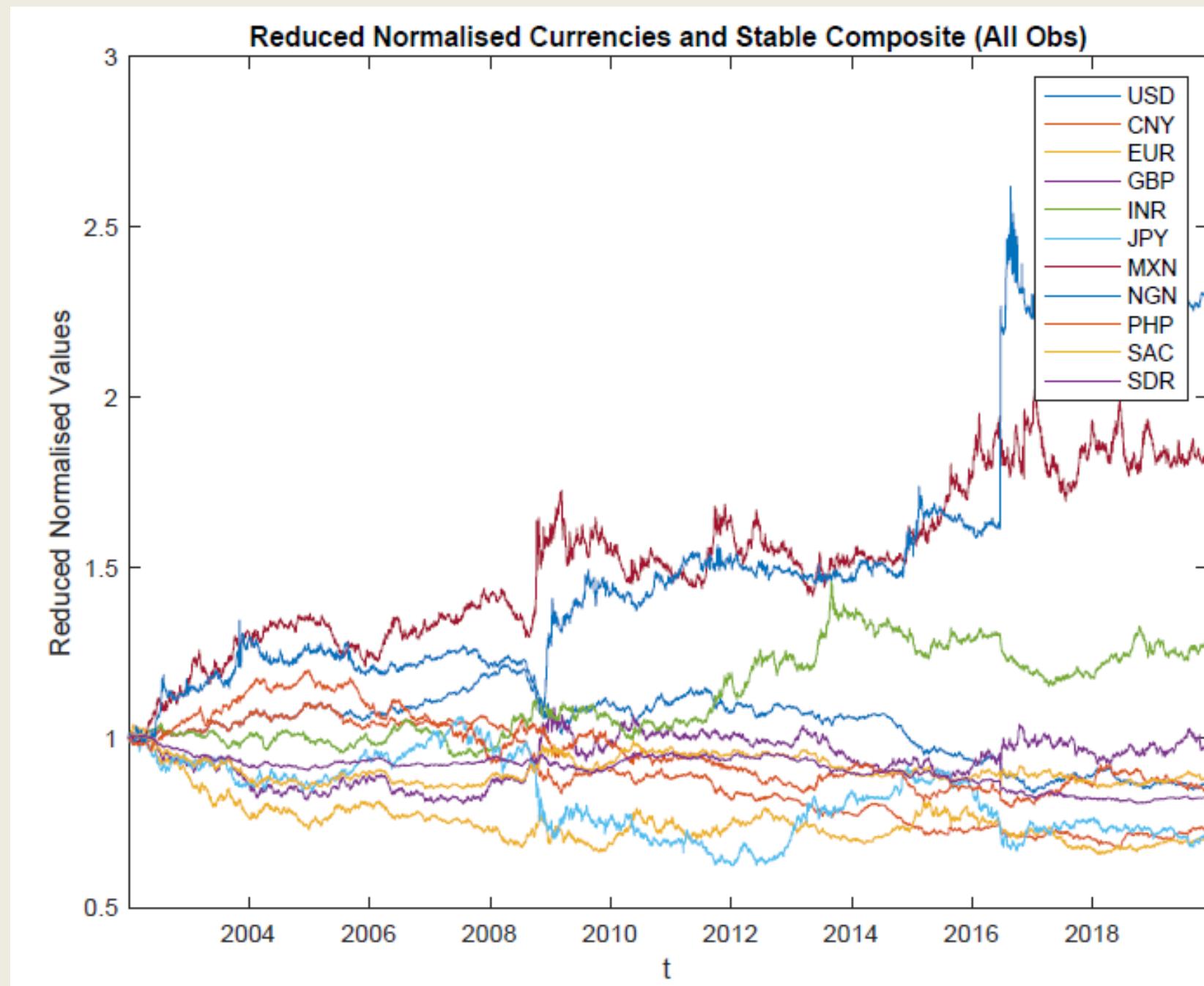


Figure 1. Time evolution of the Reduced Normalised VALUE of the basket currencies (USD, CNY, EUR, GBP, JPY), and of the basket based stable coin (SAC)

# Optimal basket and stability analysis



- For the sake of analyzing the world's emerging market currencies with the highest portions of remittances, the RNVALs were recomputed including them
- In the figure is included, besides our basket based stable coin, another one that employs the same weights as the Special Drawing Rights.
- All the other currencies seems to belong to another cluster, in the sense that they do not follow an upward trend as the previous ones, but rather fluctuate below the value of 1, with different patterns. The only exception is the Indian rupee (INR), whose value grows over time, although not with the same magnitude as USD and CNY do. Note that both basket based stable coins lie in the middle, similarly as in Figure 1, although their Reduced Normalised value fluctuates. This because the baskets are built using only five currencies, but are normalised with respect to all nine included in Figure 2.

Figure 2. Time evolution of the Reduced Normalised VALUE of the basket currencies (USD, CNY, EUR, GBP, JPY), of the considered emerging market currencies (INR, MXN, NGN, PHP) and of the basket based stable coins (SAC, SDR)

# Optimal basket and stability analysis

- To understand more precisely which stable coin is more stable (Libra: single currency based, or Librae: basket based), Table 2 presents their volatilities, measured by their standard deviations and correlations.
- As far as correlations are concerned, USD and CNY exhibit relatively strong negative or little correlation with others currencies in the basket, but are weakly positive between themselves (see Fig 1).
- EUR acts as a good diversifier, as its pairwise correlations are quite low if compared to those between other currencies. Correlation matrix shows that the stablecoin shows almost 0 correlations with the other currencies.
- Low correlations with other currencies is a clear sign of the goodness of our stablecoin in being isolated with respect to the fiat currencies' dynamics and, therefore, „stable”.

	USD	CNY	EUR	GBP	JPY	SAC
USD	1	0.14	-0.68	0.01	-0.41	0.02
CNY	0.14	1	-0.4	-0.8	0.17	0.02
EUR	-0.68	-0.4	1	0.26	-0.09	0.03
GBP	0.01	-0.8	0.26	1	-0.64	0.02
JPY	-0.41	0.17	-0.09	-0.64	1	0.02
SAC	0.02	0.02	0.03	0.02	0.02	1
$\sigma$	0.07	0.1	0.06	0.1	0.09	0.002

Table 2. Volatility and Correlations between the RNVALs of the basket currencies, and the optimal basket based stable coin

# Spillover analysis

	USD	CNY	EUR	GBP	JPY	FROM
USD	44.94	35.33	13.02	6.67	0.04	11.01
CNY	34.49	49.40	10.76	5.34	0.00	10.12
EUR	15.81	15.22	62.29	6.48	0.19	7.54
GBP	11.4	10.21	6.28	69.58	2.53	6.08
JPY	0.41	0.14	0.01	3.94	95.51	0.90
TO	12.42	12.18	6.01	4.49	0.55	35.66

Table 3. Spillover table

- As far as specifications are concerned, VAR models are built on price changes in reduced normalized values (RNVALs). VAR lag is determined by a Bayes-Schwarz information criterion (BIC) that penalizes overparametrization compared to other widely employed information criteria. The optimal number of lag determined by the BIC is 1. A H = 100 step-ahead forecast horizons is used for forward iteration of the system.

- Two currencies are highly interconnected with the others, meaning USD and CNY, whereas EUR, GBP and in particular JPY are more isolated in terms of return connectedness. Furthermore, the scene appears to be dominated by USD and CNY, whose contributions in terms of price change spillovers towards other currencies are much higher than those of the remaining currencies in the basket.
- The analysis of dynamic spillovers is able to clarify the results obtained in the unconditional spillover analysis by means of observing the evolution of spillovers over time**
- Dynamic directional spillovers can shed light on which of the currencies transmit price change spillovers to others and which of them receive price change spillovers from others



# Spillover analysis

- Net spillover dynamics summarizes the dominant position of the USD, being it always positive and taking relatively high values over the sample period. However, the magnitude of spillovers transmitted by USD follows a negative trend over time, **meaning the currency is gradually losing its potentiality to contribute to the evolution of the others**, perhaps due to the affirmation of emerging economies in the latter period, especially after the 2009 crisis. Despite that, the latter considerations are in line with the full sample results obtained, which point to the dominance of USD as a spillover transmitting currency.
- the dynamic analysis shows CNY is not such a leading currency in transmitting price change shocks
- results indicate that CNY does not particularly contribute to the price change evolution of the other currencies in the basket, although it can exert shocks through sudden policy decisions

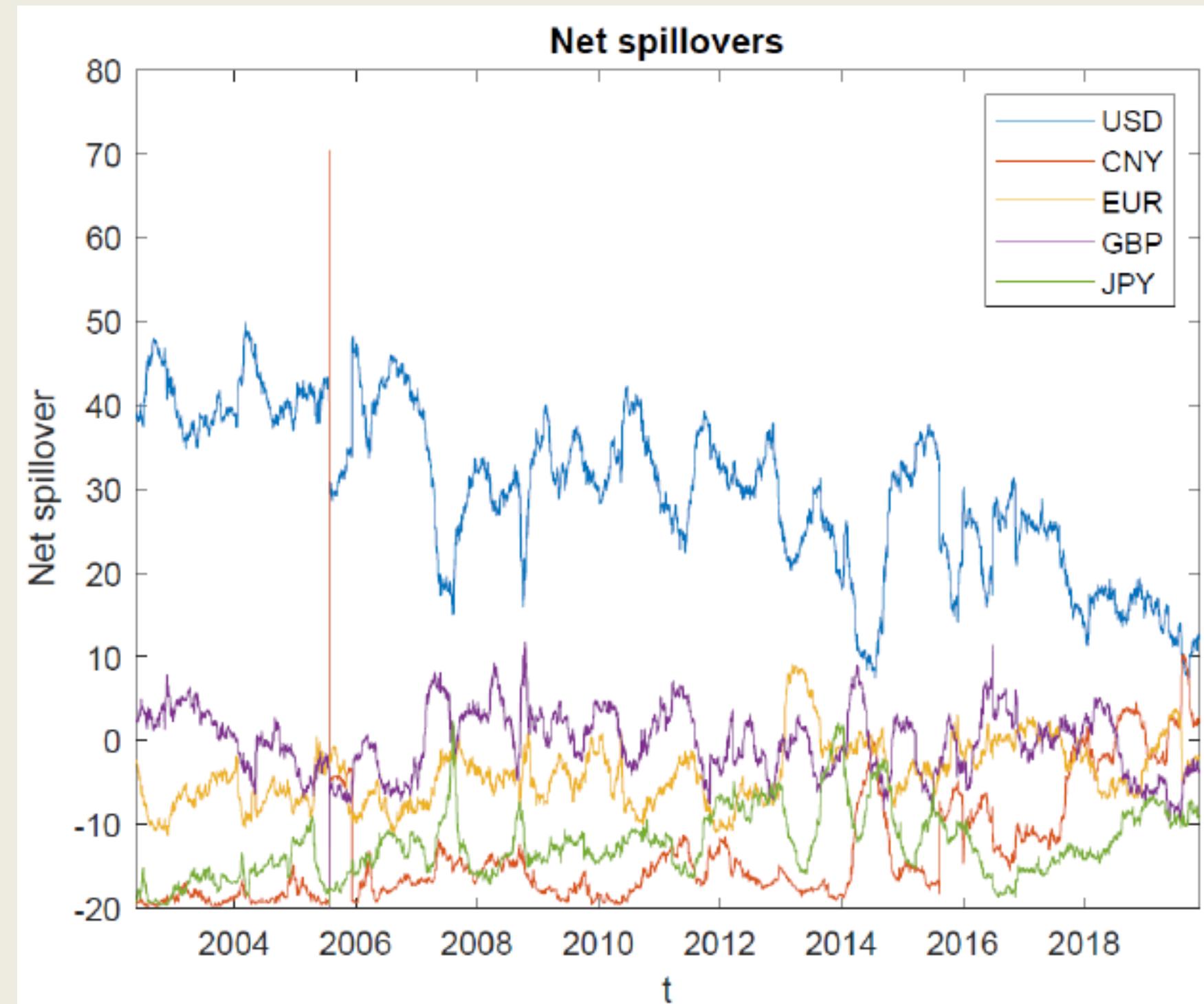
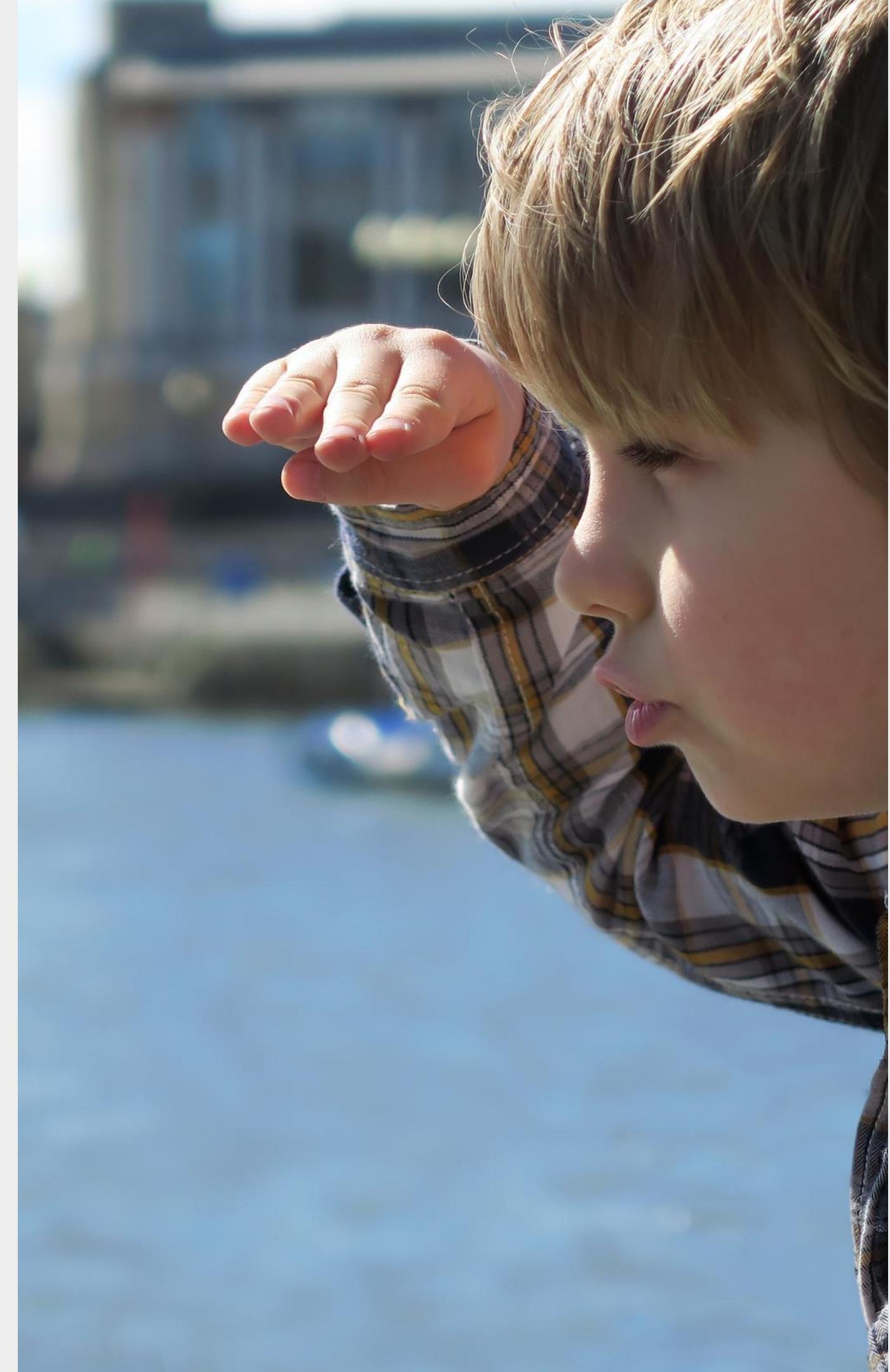


Figure 3. Net spillovers

# Closing Remarks

- stablecoin (Librae) appears to be less volatile than single currencies and, therefore, with respect to single currency stable coins (Libra). It can thus constitute a valuable proposal especially for workers who live abroad and make remittances to their own country, a market segment with a high potential of being attracted by payments in stablecoins
- the dollar is the currency which mostly impact the market, and that a basket based coin is better than a dollar based one, from a stability and value maintenance viewpoint
- With a basket based stablecoin it is possible to offset the risk of currencies shocks. This is of relevance for different policy purposes and, in particular, for emerging markets and countries having high remittances
- **Future research may consider basket that dynamically evolve over time ("AI baskets"), although these are bound to be more difficult to achieve consensus. Furthermore, currency volumes in circulation may be taken to account, along with the technical characteristics of the coins (for example: cybersecurity, redeemability, reliability), from a different, more theoretical, viewpoint.**





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# Thank you for attention!

Have a great day



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