Building a database on cryptocurrencies

Ilaria Mattei and Anamaria Illes, *Bank for International Settlements*

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Database on cryptocurrencies

- **What is it?**
  - Overview, scope and definitions
- **How did we build it?**
  - Preparatory work
  - Data sources
  - Key challenges and measures taken to tackle these
  - Daily automated updates
  - Recurring manual tasks (for stablecoins only)
- **Current applications**
- **What's next**

Overview, scope & definitions

- The cryptocurrencies database is a collection of:
  - **Market variables** (market capitalization, prices, trading volumes, …) for all cryptocurrencies coming from multiple data sources
  - **Derived indicators**, mostly on *stablecoins*: market structure, price volatility, price deviations from peg, reserves (monthly).

- *Stablecoins* in scope: cryptocurrencies that aim (claim) to maintain a stable value relative to a specified asset, or a pool or basket of assets, and that have a positive market capitalisation.
  - A. **Fiat-backed:** claim to be backed by assets denominated in a fiat currency.
  - B. **Crypto-backed:** claim to be backed by other cryptoassets.
  - C. **Commodity-backed:** claim to be backed by commodities.
  - D. **Unbacked:** do not claim to be backed by any reserves and rather seek to maintain a stable value through, for instance, algorithms or protocols.

From the conceptual idea to its materialization

1. Definition of the **dimensions to monitor:**

   - Size and features of the market

   - Quality of the stabilization mechanism (for stablecoins only)

   - Composition of the reserves (for stablecoins only)

2. Identification of the **variables:**

   - Market capitalization, volumes, prices

   - Attestation reports (for stablecoins)

3. Identification of the **data sources**: CoinGecko, CCData (CryptoCompare), websites of stablecoins

Data source and variables in details

Sources	Database of market variables	Database of derived indicators
CoinGecko	List of stablecoins	(1) Number of stablecoins
	Market capitalisation	(1) Levels of and changes in market capitalisation (2) Ranking (3) Market concentration (HHI) (4) Turnover
	(Off-chain) volume	(1) Trading volume (2) Turnover
	Closing prices	(1) Price (2) Price volatility (3) Deviations from peg
CCData (CryptoCompare)	OHLC prices	(1) Prices (2) Deviations from peg
Stablecoins' websites	Composition of reserves	(1) Breakdown and timeseries of reserves

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Challenges

Solutions

- Lack of *unique identifiers* across data sources

- Lack of consistent *definitions* of stablecoin types

- Lack of *reporting standards* for the reserves

- Creation of own **mapping rules**

- Creation of own **metadata**

- Lack of provision of data on "*dead*" cryptoassets

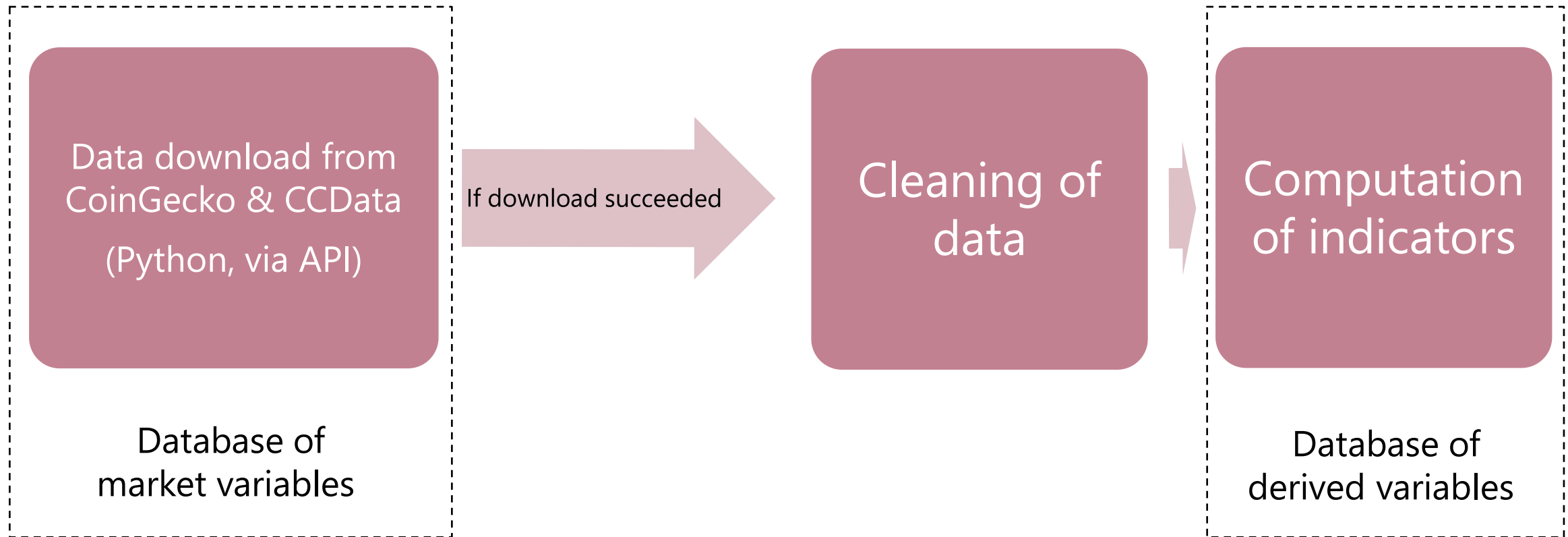- Publicly available data being subject to *copyrights*

- Storing **vintages**
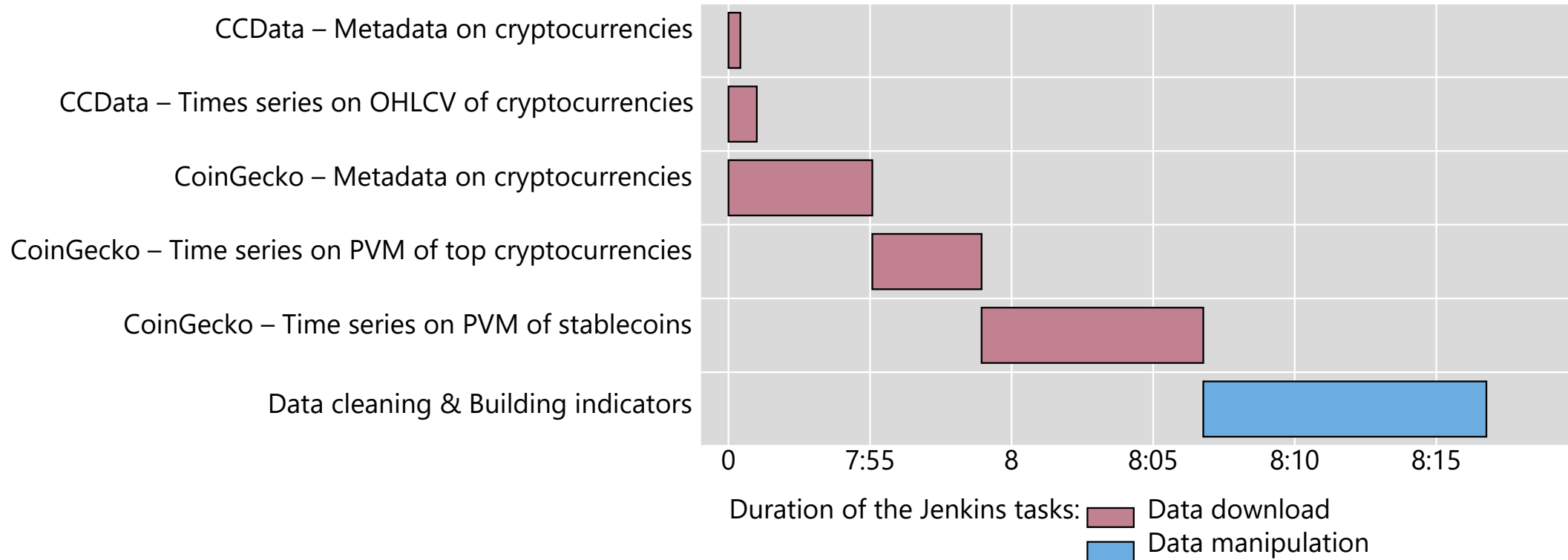
- Get in contact for **permissions**

Result
Centralised database that is built in a structured way
to allow for a consistent comparison across data sources and time

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The process runs automatically every day and takes less than 20 minutes

Data download from CoinGecko & CCData (Python, via API)

If download succeeded

Cleaning of data

Computation of indicators

Database of market variables

Database of derived variables

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In a typical day...

OHLCV = open-high-low-close prices and volumes; PVM = prices, volumes and market capitalization

Recurring manual tasks (for stablecoins only)

- **At the start and on an ad-hoc basis:**
  - Checking of (new) coins against our definition
  - Categorisation of (new) stablecoins by type
  - Mapping of (new) stablecoins among data sources

- **Troubleshooting codes which fail to run, eg due to:**
  - New (stable)coins
  - Temporary access restrictions to public API
  - Change in data structure (rare)

- **Update of breakdown of reserves on a monthly basis:**
  - Manually extract the information from the stablecoins' websites
  - Map the reserve-assets into our own eight high-level asset types
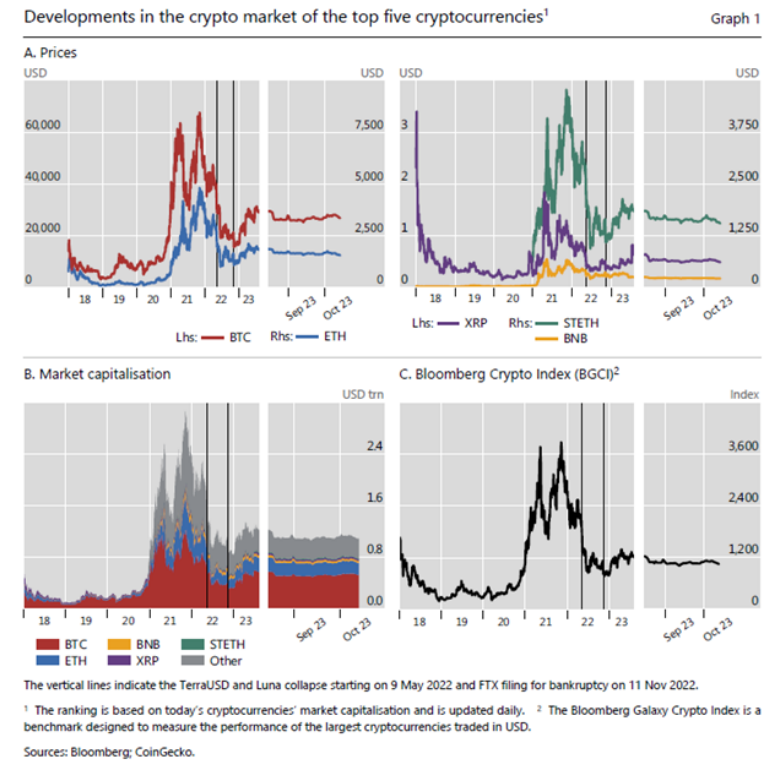
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Current applications

Current applications

- Daily (internal) newsletter on cryptocurrencies

- Stablecoins Dashboard (internal)

- Forthcoming paper

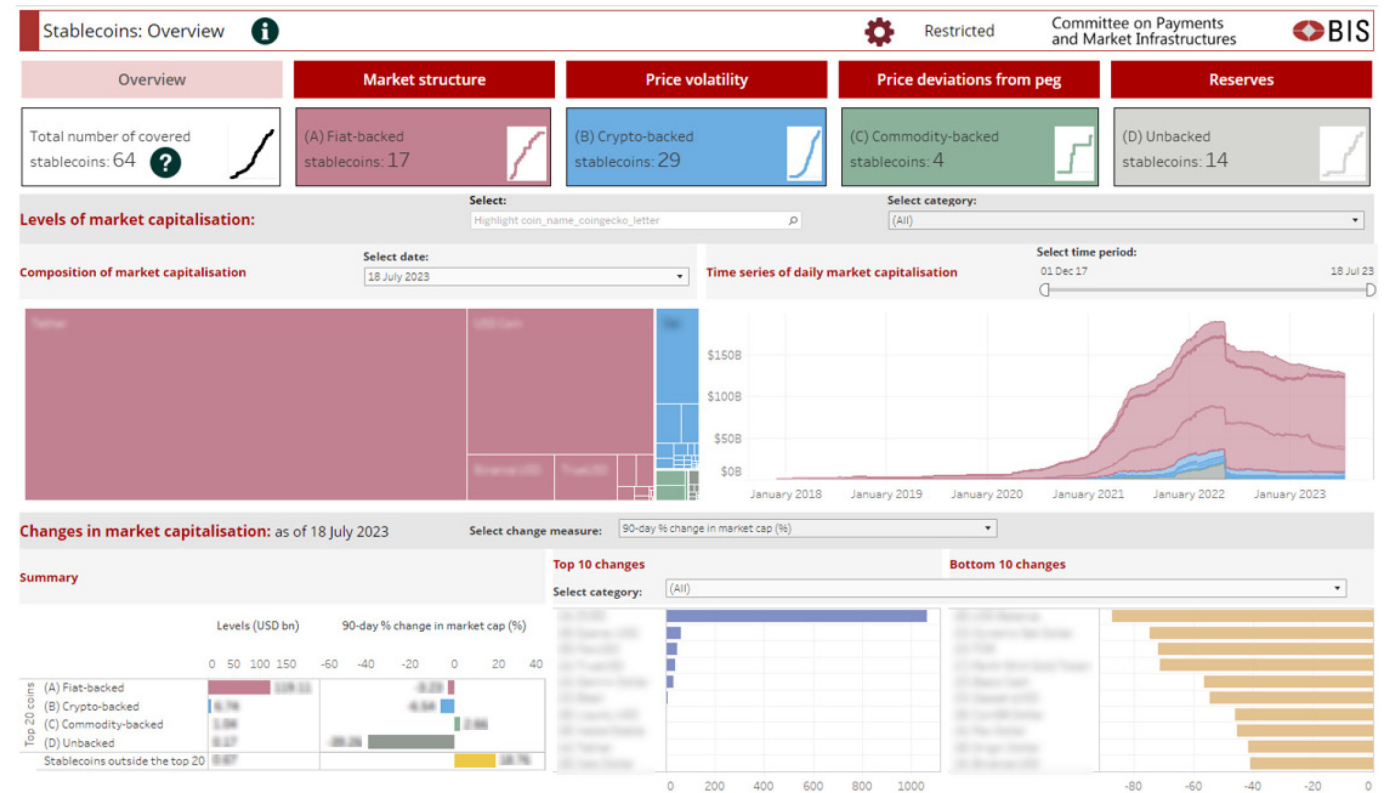Price changes for top five cryptocurrencies[1]   Table 1

	Last price (USD)	1-day change (%)	7-day change (%)	30-day change (%)	1-year change (%)	Beginning of year (%)
Bitcoin (BTC)						
Ethereum (ETH)						
BNB (BNB)						
XRP (XRP)						
Lido Staked Ether (STETH)						

[1] The ranking is based on today's cryptocurrencies' market capitalisation and is updated daily.

Source: CoinGecko.

Developments in the crypto market of the top five cryptocurrencies[1]   Graph 1

A. Prices

B. Market capitalisation

C. Bloomberg Crypto Index (BGCI)[2]

The vertical lines indicate the TerraUSD and Luna collapse starting on 9 May 2022 and FTX filing for bankruptcy on 11 Nov 2022.

[1] The ranking is based on today's cryptocurrencies' market capitalisation and is updated daily.   [2] The Bloomberg Galaxy Crypto Index is a benchmark designed to measure the performance of the largest cryptocurrencies traded in USD.

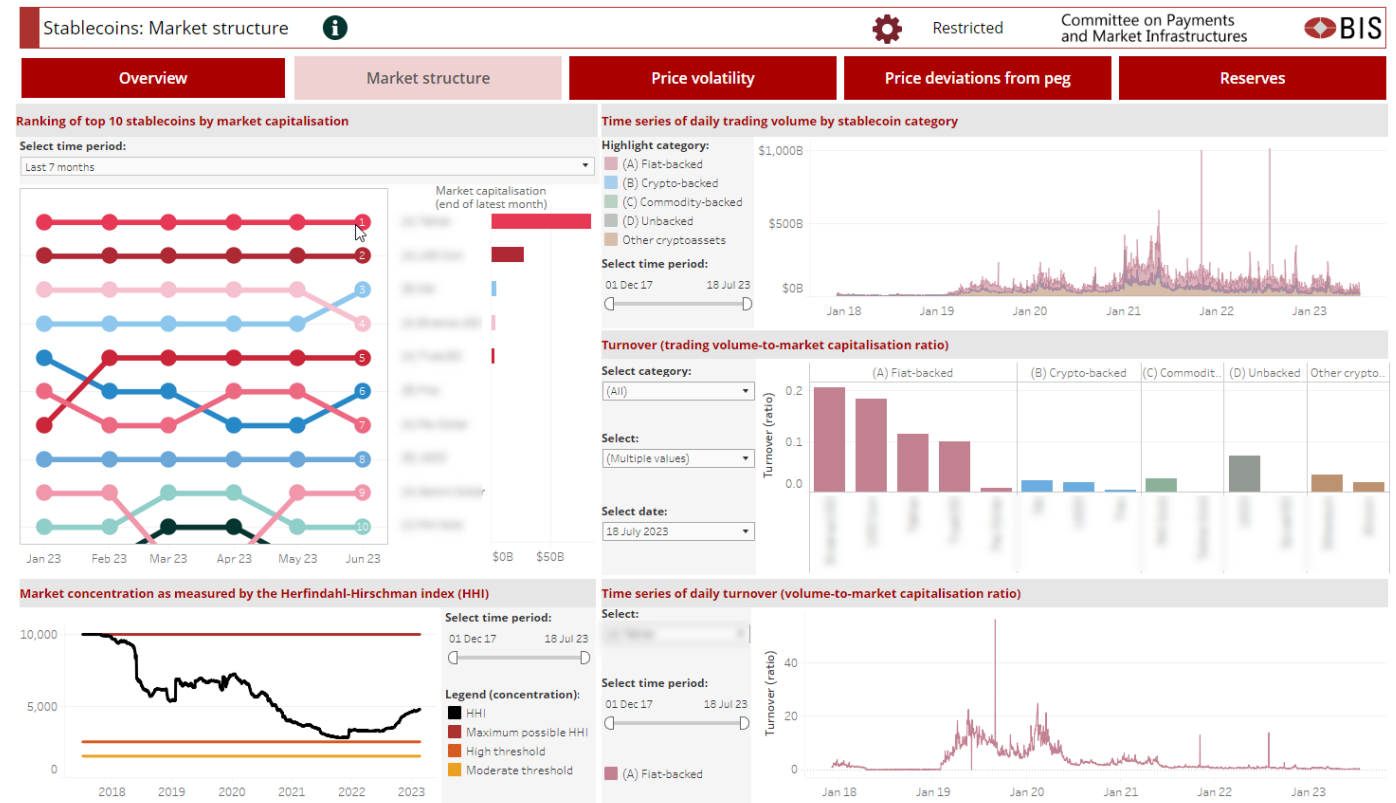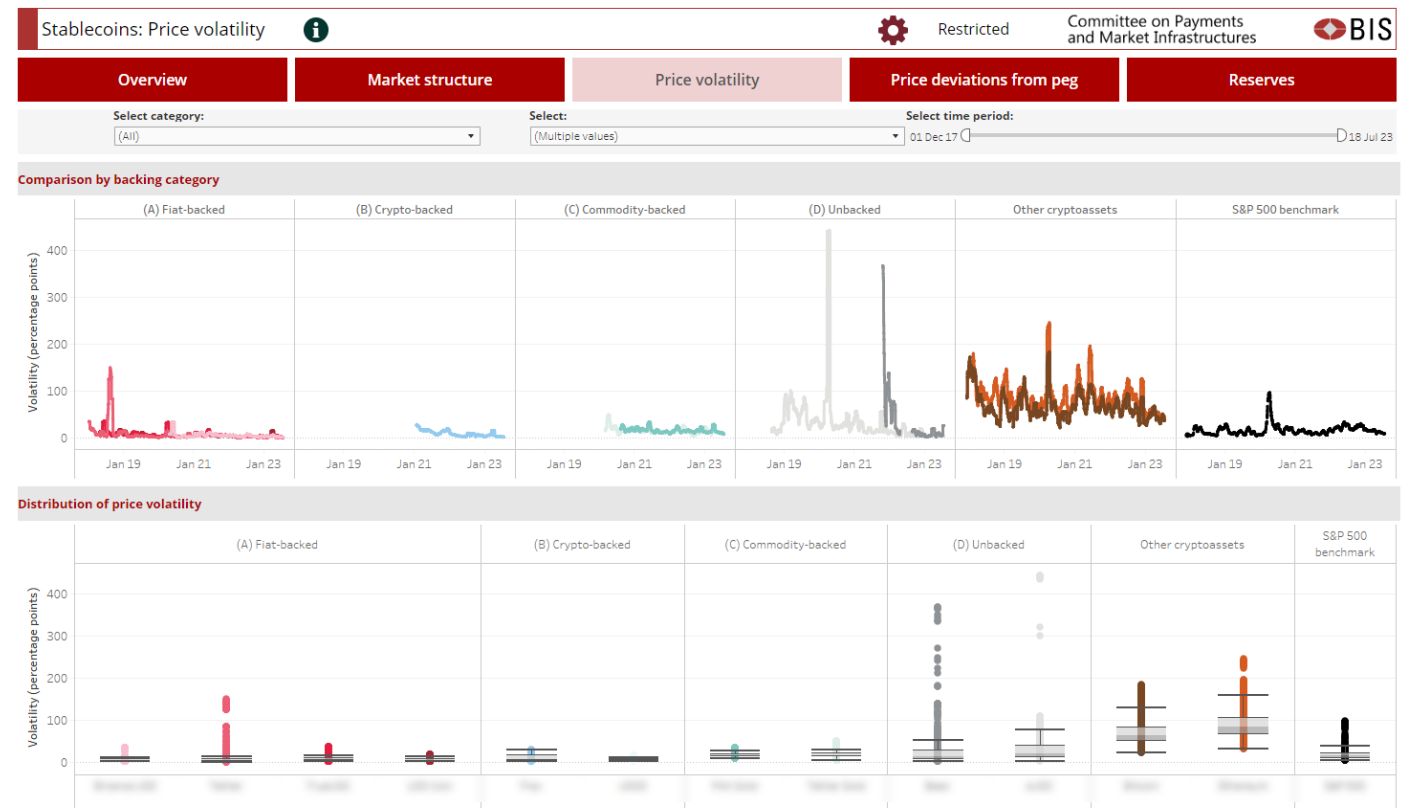Sources: Bloomberg; CoinGecko.

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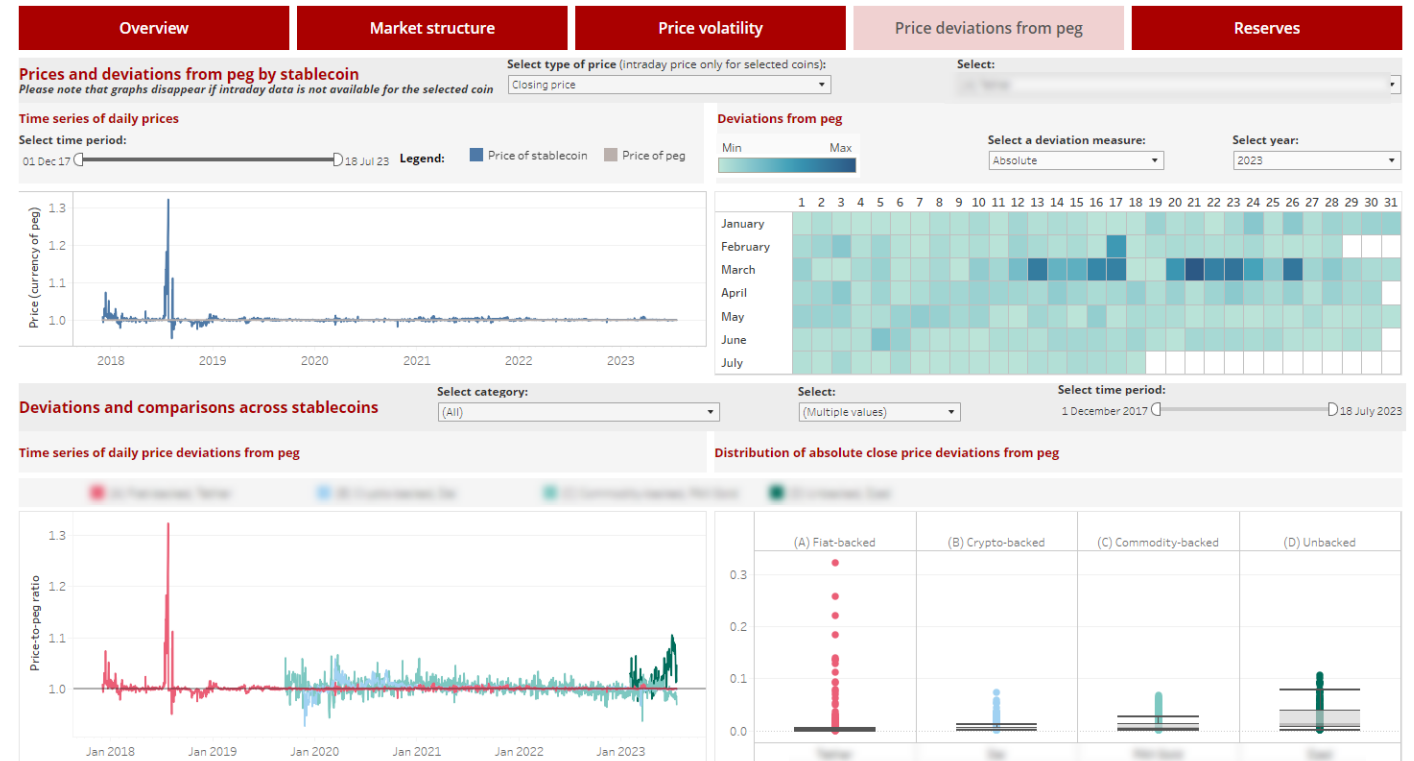- Stablecoins Dashboard (internal)

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Ideas for future upgrades

- **Further automation:**
  - String matching of cryptoassets' names across data sources
  - Collection of information on reserves
- **Exploration of other sources, eg:**
  - Coinmetrics
  - IntoTheBlock
  - Chainalysis
  - ....
- **Addition of new indicators, eg:**
  - Transactions
  - Inflows to/outflows from exchanges
  - DeFi
  - ...

Questions?