

## Emerging market sovereign bonds dataset: compilation guide

The dataset covers sovereign bonds, defined as long-term debt securities with original maturities longer than one year, issued by general governments in domestic and international markets. The general government comprises the central government, state and local governments as well as social security funds, but excludes state-owned companies and the central bank. Reported and collected bonds are at nominal value where available, and market values otherwise. Nominal values represent issuers' repayment obligation vis-à-vis bond holders.

The dataset has been built for research purposes by the authors. Please consult and cite: Onen et al (2023) "Overcoming original sin: insights from a new dataset", BIS WP 1075. The dataset combines official sources and adjustments by the authors. Data on government bonds outstanding are collected mainly from [BIS Table C4](#) (links to [reporting practices](#), [feature article](#)). They are matched with data on external holdings by foreign investors, as set out in the working paper's annex (general methodology) and as described in more detail in this document.

This compilation guide provides meta data by country. For each country, it lists the sources and sets out the main steps involved in constructing the holdings series for the sovereign bonds dataset. The descriptions in the guide are not exhaustive; the underlying Stata code also performs routine operations, such as backdating series using growth rates of related series, and enforcing consistency by constraining all holdings series to lie between 0 and the outstanding amounts.

## Target characteristics

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|---------------------|---|
| Issuer sector       | General government  |
| Holder sector       | Foreign investors   |
| Market of issue     | Domestic and international                                  |
| Maturity            | Original maturity longer than one year                      |
| Currency type       | Local and foreign currencies                                |
| Valuation           | Nominal   |
| Currency conversion | Converted to US dollars using end-period BIS exchange rates |

## Acronyms and abbreviations used in this document

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|      |  |
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| ADB  | Asian Development Bank   |
| AT   | Arslanalp& Tsuda Sovereign Debt Investor Database for Emerging Markets |
| BCB  | Banco Central do Brasil (Central Bank of Brazil)                       |
| BCC  | Banco Central de Chile (Central Bank of Chile)                         |
| BCRP | Banco Central de Reserva del Perú (Central Reserve Bank of Peru)       |
| BIS  | Bank for International Settlements                                     |
| BNB  | Bulgarian National Bank  |
| BNM  | Bank Negara Malaysia (Central Bank of Malaysia)                        |
| BNR  | Banca Națională a României (National Bank of Romania)                  |
| BM   | Banco de Mexico (Bank of Mexico)                                       |
| BOI  | Bank of Israel   |
| BOK  | Bank of Korea  |
| BOT  | Bank of Thailand   |
| BSP  | Bangko Sentral ng Pilipinas (Central Bank of the Philippines)          |
| CB   | Central bank   |
| CBR  | Central Bank of the Russian Federation                                 |
| CBRC | Central Bank of the Republic of China (Chinese Taipei)                 |
| CBRT | Central Bank of the Republic of Turkey                                 |
| CNB  | Česká národní banka (Czech National Bank)                              |
| CSD  | Central securities depository  |
| HKMA | Hong Kong Monetary Authority   |
| HNB  | Hrvatska narodna banka (Croatian National Bank)                        |
| MNB  | Magyar Nemzeti Bank (Hungarian National Bank)                          |
| MoF  | Ministry of finance  |
| IDS  | International debt securities (BIS statistics)                         |
| IMF  | International Monetary Fund  |
| SAFE | State Administration of Foreign Exchange (People's Republic of China)  |
| SARB | South African Reserve Bank   |
| QEDS | Quarterly External Debt Statistics (World Bank)                        |

## 1. China (CN)

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Sources: BIS; ADB; SAFE; AT; QEDS.

Availability: Q4 2005–Q4 2022.

Valuation: Nominal/Market.

- Data on outstanding amounts are available after 2008 from BIS. For outstanding amounts before 2008, we import the public-sector outstanding bonds in local currency data from ADB. We use the growth rate of this series to backdate outstanding amounts.
- For foreign holdings, we import data on long-term government bonds from SAFE, available from 2014. For values prior to 2014, we use AT (all foreign bond holdings) to backdate.
- We use BIS IDS as a proxy for the outstanding amount of long-term foreign-currency bonds. We assume that outstanding IDS = foreign held IDS = foreign held FC bonds.
- We approximate the foreign holdings of local-currency bonds by subtracting IDS from foreign holdings of all long-term government bonds.

## 2. India (IN)

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Sources: BIS; RBI; AT; QEDS.

Availability: Q4 2005–Q4 2022 .

Valuation: Nominal.

- We collect two series from the RBI– the share of foreign investors in central government bond market and share of foreign investors in state government bond market.
- However, the share of foreign investors in state government bond market is available only from 2015 onwards. Since the share is very small anyway, we replace missing values with 0s pre-2015.
- Foreign investor share in central government bond market from RBI is only available from 2007Q1. We backdate general government bond market series using AT.

## 3. Indonesia (ID)

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Sources: BIS; MoF; AT; QEDS.

Availability: Q4 2005–Q4 2022 .

Valuation: Nominal.

- Foreign holdings of long-term government debt securities from QEDS. If QEDS missing, we use AT to backdate.
- Foreign holdings of long-term local currency debt securities from the MoF. If missing, we use AT to backdate.
- Foreign holdings of foreign-currency bonds are inferred as residual.

#### **4. Korea (KR)**

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Sources: BIS; ADB; BOK; QEDS.

Availability: Q4 2005–Q4 2022.

Valuation: Nominal.

- We import three series from ADB: foreign holdings of local-currency bonds, outstanding amount of local-currency bonds. Since these are likely to include short-term bills, we take the ratio of foreign participation based on these two imported series. Once we have the generalised ratio, we multiply the BIS series on general government bonds outstanding in local currency to estimate the foreign holdings of local currency bonds.
- Foreign holdings of all long-term general government bonds come from BOK.
- Foreign holdings of foreign currency bonds estimated to be the residual. These values are capped with total foreign currency bonds outstanding.

#### **5. Argentina (AR)**

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Sources: BIS; AT; QEDS.

Availability: Q4 2005–Q4 2022.

Valuation: Nominal.

- AT cover all government securities. To estimate the foreign holdings of long-term debt securities, we use QEDS to generate a ratio of long-term to short-term foreign holdings. AT series are then scaled down by this ratio in order to estimate foreign holdings of long-term government bonds in local and foreign currencies.
- We make sure holdings are capped with amounts outstanding from BIS debt securities statistics and BIS IDS.

#### **6. Bulgaria (BG)**

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Sources: BIS; MoF; BNB; QEDS; AT; ECB.

Availability: Q4 2005–Q4 2022.

Valuation: Nominal.

- We import central and general government long-term bonds outstanding from the BNB database. We then import the outstanding amount of foreign currency bonds from the ECB database (only available from 2009). For the overlapping periods, we regress the ECB series against our IDS series in foreign currency. We then use the predicted values to backdate foreign currency bonds outstanding series. Local currency bonds outstanding are estimated as a residual between all bonds and foreign currency bonds.
- To estimate foreign holdings of all long-term bonds, we use QEDS and BNB data. To estimate foreign holdings of local currency bonds, we use data from the ministry of finance. We backdate missing periods using the growth rate of non-resident share in domestic market.
- Finally, we calculate foreign holdings of foreign currency bonds as a residual.

## **7. Brazil (BR)**

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Sources: BIS; BCB; MoF; AT.

Availability: Q4 2005–Q4 2022.

Valuation: Nominal.

- We use the ministry of finance data to estimate foreign holdings of local currency bonds. For missing periods (before 2007), we backdate using AT.
- We use a combination of central bank, QEDS, and AT data to estimate the foreign holdings of bonds in all currencies.
- Foreign holdings of foreign currency bonds are calculated as a residual, capped with outstanding amount of foreign currency denominated bonds.

## **8. Colombia (CO)**

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Sources: BIS; QEDS; National Treasury.

Availability: Q4 2005–Q4 2022.

Valuation: Market/Nominal.

- QEDS data on government debt securities do not include bonds issued in domestic markets and held by foreigners. It includes bonds denominated in foreign currencies (and COP global bonds) issued in international capital markets.
- Therefore, we create a ratio: QEDS/international bonds outstanding (IDS).
- Then we multiply this ratio by foreign-currency denominated international bonds (IDS in FC). This estimates the foreign holdings of foreign currency bonds.
- Foreign holdings of local currency bonds estimated as residual between total foreign holdings and foreign-currency foreign holdings.

## **9. Chile (CL)**

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Sources: BIS, BCC.

Availability: Q4 2005–Q4 2022.

Valuation: Nominal (adjusted).

- Foreign holdings of local currency bonds from central bank; only available from 2013.
- Foreign holdings of foreign currency bonds from central bank; only available from 2013.
- Outstanding amounts are from the BIS, backdated by central bank data. Foreign currency bonds outstanding series is a combination of central bank and IDS data.

## 10. Czech Republic (CZ)

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Sources: BIS; CNB.

Availability: Q4 2005–Q4 2022.

Valuation: Nominal.

- Foreign holdings of long-term government bonds from the central bank.
- We assume foreigners hold all IDS in foreign currencies. We then subtract IDS from foreign holdings of all long-term government bonds to estimate foreign holdings of local currency bonds. Although this is a strong assumption, we observed that it gives a close estimate (when compared with internal data). Note that the Ministry of finance provides data on foreign holdings of debt securities issued in the domestic market. However, these include securities denominated in euro.

## 11. Hong Kong SAR (HK)

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Sources: BIS; HKMA.

Availability: Q4 2005–Q4 2022.

Valuation: Nominal.

- Foreign holdings of all long-term government bonds from central bank (HKMA).
- Data on currency breakdown of foreign holdings are not available.

## 12. Singapore (SG)

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Sources: BIS.

Availability: Q4 2005–Q4 2022. (for amount outstanding)

Valuation: Nominal (for amount outstanding).

- The data on foreign holdings of government securities are not published by the authorities. Official statistics indicate that government has no external debt. This is based on the compilation methodology that defines external debt as foreign currency debt or debt issued in international capital markets.

## 13. Croatia (HR)

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Sources: BIS; HNB.

Availability: Q4 2005–Q4 2022.

Valuation: Nominal/Market (for holdings).

- Data on currency breakdown of foreign holdings are available but confidential.
- Foreign holdings of all government bonds from the central bank website.

#### **14. Hungary (HU)**

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Sources: BIS; MNB.

Availability: Q4 2005–Q4 2022.

Valuation: Nominal (adjusted from market value).

- Currency breakdown of holdings from the central bank. We measure the foreign participation ratios based on series given in market value. These ratios are then applied to our amounts outstanding series in nominal valuation.

#### **15. Israel (IL)**

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Sources: BIS; BOI; QEDS; IMF.

Availability: Q4 2005–Q4 2022.

Valuation: Nominal.

- Foreign holdings of local currency bonds from central bank.
- Foreign holdings of all government bonds from QEDS and International Investment Position (IIP).
- Foreign holdings of foreign currency bonds estimated as a residual.

#### **16. Malaysia (MY)**

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Sources: BIS; BNM; AT; QEDS.

Availability: Q4 2005–Q4 2022.

Valuation: Nominal valuation for collected local-currency holdings series. Market valuation for all-currencies holdings series. Face valuation for holdings series prior to 2008 from AT. Difference between nominal and market value not big enough to change the overall trends.

- Collected series are foreign holdings of conventional government bonds and sukuk. Sum of these correspond to long-term general government bonds in domestic currency held by foreigners. These are only available after 2008. To backdate, we use AT.
- Foreign holdings of all government bonds from QEDS/AT.
- Foreign holdings of foreign-currency bonds estimated as residual.

#### **17. Mexico (MX)**

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Sources: BIS; BM.

Availability: Q4 2005–Q4 2022.

Valuation: Nominal.

- Foreign holdings of local and foreign currency bonds from the central bank database.
- Foreign holdings of foreign currency bonds capped by outstanding amounts.
- Foreign holdings of all government bonds as the sum of local and foreign currency series.

## **18. Peru (PE)**

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Sources: BIS; BCRP.

Availability: Q4 2005–Q4 2022.

Valuation: Nominal.

- Foreign holdings data from the central bank.

## **19. Philippines (PH)**

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Sources: BIS; BSP; AT.

Availability: Q4 2005–Q4 2022.

Valuation: Nominal.

- Foreign holdings of long-term government bonds in local currency from the central bank. These data are available from 2010, but are confidential. Therefore, we do not publish them as a part of the attached data file or the dashboard. We backdate the official data by using the growth rate in AT/QEDS.

## **20. Poland (PL)**

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Sources: BIS; MoF; QEDS; AT.

Availability: Q4 2005–Q4 2022.

Valuation: Nominal.

- Foreign holdings of all government bonds from AT/QEDS. Foreign holdings of local currency bonds from the ministry of finance. Foreign holdings of foreign currency bonds estimated as a residual.

## **21. Romania (RO)**

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Sources: BIS; BNR; QEDS.

Availability: Q4 2005–Q4 2022. (for total foreign holdings/amounts outstanding) Q1 2013–Q4 2022 (for currency breakdown of foreign holdings).

Valuation: Nominal.

- Foreign holdings data from the central bank.

## **22. Russia (RU)**

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Sources: BIS; CBR.

Availability: Q4 2005–Q4 2022.

Valuation: Nominal.

- Foreign holdings of local and foreign currency bonds data from the central bank. Total foreign holdings estimated as the sum of these two.



### **23. Saudi Arabia (SA)**

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Sources: BIS.

Availability: Q4 2005–Q4 2022 (for amounts outstanding).

Valuation: Nominal.

- There are no holdings series available. Amounts outstanding data from the BIS.

### **24. Thailand (TH)**

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Sources: BIS; BOT.

Availability: Q4 2005–Q4 2022.

Valuation: Nominal.

- Foreign holdings of local currency bonds data from the central bank.
- Government of Thailand phased out foreign currency bonds. Currently, all bonds are denominated in local currency. However, according to our correspondence with the central bank, all foreign currency bonds were held by residents when they were still in circulation.
- Therefore, foreign holdings of all government bonds same as foreign holdings of local currency bonds.

### **25. Turkey (TR)**

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Sources: BIS; CBRT; CSD; AT.

Availability: Q4 2005–Q4 2022.

Valuation: Nominal.

- Data requested from the CSD (*Merkezi Kayıt Kuruluşu* in Turkish) correspond to foreign holdings of local currency bonds. However, these are only available post-2012. For pre-2012, we use the growth rate in foreign holdings of domestic government bonds from the central bank. For values before Q1 2006, we use the growth rate in AT to backdate.
- Foreign holdings of all government bonds from QEDS/AT. Foreign holdings of foreign currency bonds are estimated as residual.

## 26. Chinese Taipei (TW)

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Sources: BIS; CBRC.

Availability: Q4 2005–Q4 2022.

Valuation: Market.

- The only available data for Chinese Taipei: International investment position (IIP), government debt securities held by foreigners. All bonds are in local currency.
- IIP data are in annual frequency, so we expand to quarterly frequency by linear interpolation (after converting to local currency terms). However, IIP data include short-term bills.
- We find the ratio of short- to long-term maturity in the amount outstanding of general government securities. Then, the IIP data are scaled down by this ratio to estimate foreign holdings of long-term debt securities (bonds).
 
$$A = \text{Long-Term Outstanding} / [\text{Short-Term Outstanding} + \text{Long-Term Outstanding}]$$
- Foreign holdings of LC = Total foreign holdings = A \* International Investment Position (GG, debt securities liabilities).
- Foreign holdings of foreign-currency bonds = 0.

## 27. South Africa (ZA)

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Sources: BIS; National Treasury; SARB; QEDS; AT.

Availability: Q4 2005–Q4 2022.

Valuation: Nominal.

- For the post-2011 period, we take the foreign participation in government domestic bond market from the treasury. We multiply this ratio by outstanding amounts to obtain foreign holdings of local-currency bonds. Foreign holdings of local government bonds from SARB.
- For the pre-2011 period, foreign holdings of local currency bonds is a residual between total foreign holdings and IDS in foreign currencies (GG\_tt\_XB- GG\_fc\_IDS).
- We then adjust this pre-2011 portion of the data by multiplying it with the ratio when joined. Essentially, we extend back local currency holdings by using the growth rate in GG\_tt\_XB-GG\_fc\_IDS.
- Then we recalculate foreign currency holdings as a residual: GG\_tt\_XB-GG\_dc\_XB, capped with outstanding amount in foreign currency.