Exchange Rate Data Sources

A Comprehensive Guide to Global Databases, Indices & Uncertainty Measures

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About This Document

This guide catalogues the leading publicly available databases for exchange rate analysis, covering actual and equilibrium effective exchange rates, purchasing power parity (PPP) measures, exchange rate uncertainty indices, historical regime classifications, and complementary multilateral data resources. The guide is intended for researchers in international macroeconomics, central bank analysts, policy economists, and graduate students.

Primary sources: CEPII EQCHANGE (2017) · The Economist Big Mac Index (1986–present)
Rossi–Sekhposyan Uncertainty Indices · IMF EER/IFS · BIS EER · ECB SDW · FRED
IRR Regime Classification · Penn World Tables · Jordà–Schularick–Taylor Macrohistory Database · OECD

Contents

1 CEPII EQCHANGE Database

EQCHANGE, developed by the Centre d'Études Prospectives et d'Informations Internationales (CEPII), is a comprehensive world database of annual indicators on actual and equilibrium effective exchange rates. It was introduced in 2017 by Couharde, Delatte, Grekou, Mignon, and Morvillier to consolidate scattered exchange rate data into a single, publicly accessible resource.

Quick Reference: EQCHANGE

Full name	EQCHANGE: A World Database on Actual and Equilibrium Effective Exchange Rates
Institution	CEPII, Paris, France
Working paper	CEPII Working Paper No. 2017-14, July 2017
Authors	C. Couharde, A.-L. Delatte, C. Grekou, V. Mignon, F. Morvillier
Country coverage	187 countries (NEER/REER); 182 economies (BEER/misalignments)
Time coverage	Annual, 1973–2016 (updated in later releases)
Access	http://www.cepii.fr/CEPII/fr/bdd$_m$odele/bdd$_m$odele$_i$tem.asp?id = 34

1.1 Sub-Database 1 — Nominal and Real Effective Exchange Rates

The first sub-database provides effective exchange rate indices for 187 countries computed under three distinct weighting schemes and two trading-partner panels (186 partners and a top-30 panel):

- **GDP weights:** Partner country shares based on GDP, useful for broad macroeconomic comparisons.
- **Trade weights:** Partner shares based on bilateral merchandise trade flows—the most common approach in policy analysis.
- **Double-export weights:** Account for third-market competition, following the IMF's Information Notice System methodology.

The Real Effective Exchange Rate (REER) adjusts the Nominal Effective Exchange Rate (NEER) for relative inflation differences using consumer price indices, yielding a measure of international price competitiveness.

1.2 Sub-Database 2 — BEER Estimates and Currency Misalignments

The second sub-database provides Behavioral Equilibrium Exchange Rate (BEER) estimates for 182 economies. BEER models regress the actual REER on a set of medium- to long-term fundamentals:

- Net foreign asset (NFA) position relative to GDP
- Productivity differentials (Balassa–Samuelson effect)
- Terms of trade
- Trade openness

Currency misalignment is defined as the percentage deviation of the actual REER from its BEER-estimated equilibrium:

$$\text{Misalignment}_{i,t} = \frac{\text{REER}_{i,t} - \widehat{\text{REER}}^{\text{eq}}_{i,t}}{\widehat{\text{REER}}^{\text{eq}}_{i,t}} \times 100$$

A positive (negative) misalignment denotes overvaluation (undervaluation).

1.3 Equilibrium Exchange Rate Methodologies

Table 1: Equilibrium Exchange Rate Approaches Covered by EQCHANGE

Approach	Core Concept	Key Variable	Horizon
Macroeconomic Balance (MB)	Compares projected current account with estimated CA norm	Current account balance	Medium-term
Behavioral Equilibrium EER (BEER)	Estimates equilibrium REER via cointegration on fundamentals	REER vs. fundamentals	Medium–long term
External Sustainability (ES)	CA needed to stabilise net foreign assets at benchmark level	NFA/GDP ratio	Long-term

2 The Big Mac Index

The Big Mac Index (BMI) is an informal economic indicator published by *The Economist* since September 1986. Originally conceived by journalist Pamela Woodall as a lighthearted illustration of purchasing power parity (PPP), it has since become one of the most widely cited currency valuation benchmarks.

Quick Reference: Big Mac Index

First published	September 1986, *The Economist* (Pamela Woodall)
Frequency	Annual (1986–2010); semi-annual since 2011
Base country	United States (USD reference)
Country coverage	~70 countries/territories
Maintained by	The Economist Intelligence Unit
Access	`https://www.economist.com/big-mac-index`

2.1 Calculation Methodology

The implied PPP exchange rate for currency i against the USD is:

$$\text{Implied PPP rate}_i = \frac{\text{Price of Big Mac in country } i \text{ (local currency)}}{\text{Price of Big Mac in US (USD)}}$$

The degree of misalignment is:

$$\text{Misalignment}_i\,(\%) = \frac{\text{Implied PPP rate}_i - \text{Actual exchange rate}_i}{\text{Actual exchange rate}_i} \times 100$$

2.2 GDP-Adjusted Big Mac Index

To account for the Penn effect (prices of non-traded goods tend to be lower in poorer countries), *The Economist* introduced a GDP-adjusted BMI since 2011. The adjusted misalignment is the residual from a cross-sectional regression of local Big Mac prices on GDP per capita.

2.3 Comparison with EQCHANGE

Table 2: Big Mac Index vs. CEPII EQCHANGE (BEER)

Dimension	Big Mac Index	EQCHANGE (BEER)
Concept	PPP via single tradeable good	Macro-fundamental equilibrium REER
Exchange rate type	Bilateral (vs. USD)	Multilateral / effective
Frequency	Semi-annual	Annual
Country coverage	~70 countries	182–187 countries
Time-varying equil.	No (static PPP)	Yes (evolving fundamentals)
Data requirement	Single product price	NFA, productivity, ToT, openness
GDP-adjusted version	Yes (since 2011)	Inherently controls for fundamentals

3 Monthly Exchange Rate Uncertainty Indices

The Monthly Exchange Rate Uncertainty Indices are maintained on Barbara Rossi's academic website and measure how unpredictable exchange rates are relative to their own historical past. They underpin the paper *"Uncertainty and Deviations from Uncovered Interest Rate Parity"* (Ismailov and Rossi, 2018).

Quick Reference: Rossi–Sekhposyan Uncertainty Indices

Underlying paper	Ismailov & Rossi (2018), *Journal of International Money and Finance*, 88, 242–259
Methodology	Rossi & Sekhposyan (2015), *AER P&P* 105(5), 650–655
Frequency	Monthly
Forecast horizon	Three-month-ahead (random walk model + Consensus surveys)
Countries	Australia, Canada, Switzerland, Denmark, Eurozone, UK, Japan, Norway, New Zealand, Sweden
Index types	Overall, Upside, and Downside uncertainty
Access	`https://sites.google.com/site/barbararossiwebsite/data`

3.1 Construction Methodology

1. **Generate forecast errors:** Three-month-ahead exchange rate forecasts are obtained from the random walk model and Consensus survey forecasts. Forecast errors are the difference between realised rates and forecasts.

2. **Build the historical distribution:** For each point in time t, the unconditional empirical distribution of all past forecast errors is constructed.

3. **Assess the current error's position:** The realised forecast error at t is compared with this historical distribution. High probability of lying in the tails signals high uncertainty.

3.2 Index Variants

Table 3: Three Variants of the Exchange Rate Uncertainty Index

Index	Definition	Economic Interpretation
Overall Uncertainty	$\Pr(\lvert e_t\rvert >$ median historical $\lvert e\rvert)$	General unpredictability
Upside Uncertainty	$\Pr(e_t$ is unusually large and positive)	Risk of unexpected appreciation
Downside Uncertainty	$\Pr(e_t$ is unusually large and negative)	Risk of unexpected depreciation

3.3 Key Finding

Ismailov and Rossi (2018) show that Uncovered Interest Rate Parity (UIP) deviations are significantly smaller—and sometimes statistically absent—during periods of *low* exchange rate uncertainty. This reinforces the importance of distinguishing between volatility and genuine uncertainty in exchange rate modelling.

4 IMF Effective Exchange Rates (EER) Database

Quick Reference: IMF EER Database

Institution	IMF Statistics Department
Coverage	~90 IMF member countries
Frequency	Monthly (some annual series)
Base year	2010 = 100
Weighting	3-year average trade weights (merchandise + services + tourism + manufacturing), sourced from UN, OECD, World Bank, UNWTO, UNIDO
Access	https://data.imf.org/en/datasets/IMF.STA:EER

The IMF publishes both NEERs and REERs. Weights are calculated as three-year averages of annual data from UN, OECD, World Bank, UNWTO, and UNIDO. These data help policymakers assess export competitiveness, monitor currency trends, and inform monetary policy decisions.

5 IMF International Financial Statistics (IFS)

The IFS is the IMF's flagship statistical publication providing comprehensive international and domestic finance data for most member countries. It includes balance of payments, exchange rates, interest rates, prices, and national accounts. Nominal bilateral exchange rates versus USD and SDR are available from the 1940s for many countries.

The **Information Notice System (INS)** sub-file contains NEER and REER series (base year 2010) starting from 1979, reviewed by IMF country desks.

Access: https://data.imf.org/ | IMF eLibrary Data

6 World Bank DataBank

The World Bank's DataBank provides the Official Exchange Rate (LCU per USD, period average) sourced from IMF IFS and the World Development Indicators (WDI). The REER index (2010 = 100) is also available through WDI. These series are valuable for cross-country panel regressions given the World Bank's standardised country metadata.

Access: https://databank.worldbank.org/databases/exchange-rates

7 BIS Effective Exchange Rates

Quick Reference: BIS EER

Institution	Bank for International Settlements (BIS)
Coverage	61 economies
Frequency	Monthly
Index types	Broad (61 partners) and narrow (27 economies) NEER and REER
Start date	1990s
Access	`https://www.bis.org/statistics/eer.htm`

The BIS broad-index REER is widely used in monetary and financial stability analysis. The narrow index restricts attention to major trading partners among advanced economies.

8 ECB Statistical Data Warehouse (SDW)

Quick Reference: ECB SDW Exchange Rates

Institution	European Central Bank (ECB)
Dataset code	EXR (Exchange Rates dataset)
Frequency	Daily, monthly, quarterly, annual
Coverage	Euro reference rates against ~40 currencies; EER indices for the euro area
Start date	1999 (euro reference rates)
API	SDMX 2.1 RESTful web service (`data-api.ecb.europa.eu`)
Access	`https://data.ecb.europa.eu/data/datasets/EXR`

The ECB SDW is a fully metadata-driven application based on the SDMX standard. The Exchange Rates dataset (EXR) provides:

- **Daily reference rates** for ~40 currencies against the euro, published each business day at 16:00 CET.
- **ECB Nominal and Real EERs** computed using trade weights drawing on ECB, BIS, Eurostat, European Commission, OECD, and IMF CPI data.
- **Harmonised Competitiveness Indicators (HCIs)** for euro area member states.

The SDMX REST API enables programmatic data retrieval in CSV, JSON, or XML format, making the ECB SDW particularly useful for automated data pipelines and reproducible research.

9 FRED — Federal Reserve Economic Data

Quick Reference: FRED Exchange Rates

Institution	Federal Reserve Bank of St. Louis, Research Division
Total series	>816,000 economic time series from diverse sources
FX series	>260 exchange rate series (daily, weekly, monthly, annual)
Coverage	Spot rates vs. USD; Broad, Major, OITP dollar indices; OECD EERs
Frequency	Daily through annual depending on series
Start date	Varies by series; many from 1950s–1970s
API	FRED API (JSON/XML); R package `fredr`; Python `fredapi`
Access	https://fred.stlouisfed.org/categories/15

FRED aggregates exchange rate data from the Federal Reserve Board (H.10 release), the Board of Governors, and OECD. Key series include:

- **Spot bilateral rates** (USD vs. EUR, GBP, JPY, CNY, CAD, MXN, CHF, AUD, and many others) at daily frequency.
- **Nominal Broad U.S. Dollar Index** and sub-indices for major currencies and Other Important Trading Partners (OITP).
- **Trade-weighted indices** from the Federal Reserve Board (H.10), updated weekly.
- **FRED-MD/FRED-QD** macro panels including exchange rate factors for "big data" research.

As of January 2009, the Federal Reserve Board discontinued the daily H.10 update. Daily rates are now published in a weekly release and uploaded to FRED accordingly.

10 IMF AREAER — Exchange Arrangements and Exchange Restrictions

The Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) is an authoritative IMF publication that classifies each member country's de jure *and* de facto exchange rate regime and documents exchange and capital account restrictions.

- Regime categories include: freely floating, floating, crawl-like, stabilised, crawling peg, pegged within band, conventional peg, currency board, and no separate legal tender.
- Available annually for 190 countries since 1950.
- Essential for conditioning empirical tests on exchange rate flexibility.

Access: https://www.imf.org/en/Publications/AREAER

11 Ilzetzki–Reinhart–Rogoff (IRR) Regime Classification

Quick Reference: IRR Classification Database

Authors	Ethan Ilzetzki, Carmen M. Reinhart, Kenneth S. Rogoff
Key papers	Reinhart & Rogoff (2004), *QJE* 119(1); Ilzetzki, Reinhart & Rogoff (2019), *QJE* 134(2)
Countries	194 countries and territories
Coverage	Monthly, 1946:1–2016:12; annual versions also available
Novelty	Uses parallel (black market) exchange rates to determine de facto regimes; classifies anchor currencies jointly
Access	https://www.ilzetzki.com/irr-data | https://carmenreinhart.com/exchange-rate/

The IRR database provides a "**natural" classification** of exchange rate arrangements that differs fundamentally from IMF de jure classifications. Key innovations:

- Employs monthly data on **market-determined parallel exchange rates** going back to 1946 for 153 countries (Reinhart & Rogoff, 2004). When official regimes are declared pegs, roughly half the time the underlying monetary reality is a float or crawl, and vice versa.
- The 2019 update jointly classifies both the **exchange rate arrangement** (14 fine categories ranging from no separate legal tender to freely falling) and the **anchor currency** (USD, EUR, gold, or composite baskets).
- The 2021 update ("Rethinking Exchange Rate Regimes") documents the growing centrality of the US dollar as the de facto anchor for much of the world.

Table 4: IRR Coarse Exchange Rate Classification Categories

Code	Category	Description
1	Hard peg / no separate currency	Currency board, dollarisation, monetary union
2	Conventional peg / crawling peg	Narrow band or pre-announced crawl
3	Managed / dirty float	Managed but without pre-announced path
4	Freely floating	Market-determined with minimal intervention
5	Freely falling	Monthly inflation $\geq$ 40% or post-crisis collapse

12 Penn World Tables (PWT)

Quick Reference: Penn World Tables

Institution	University of Groningen / University of California Davis
Key paper	Feenstra, Inklaar & Timmer (2015), *American Economic Review* 105(10), 3150–3182
Coverage	183 countries, 1950–present
Frequency	Annual
FX content	PPP-adjusted exchange rates (national/chained); price level indices; real GDP per capita
Access	https://www.rug.nl/ggdc/productivity/pwt/

The Penn World Tables are particularly valuable for long-run real exchange rate and productivity research. PPP-adjusted exchange rates from PWT are closely related to the Balassa–Samuelson fundamentals used in BEER-type models such as EQCHANGE.

13 Jordà–Schularick–Taylor (JST) Macrohistory Database

Quick Reference: JST Macrohistory Database

Authors	Òscar Jordà, Moritz Schularick, Alan M. Taylor
Key paper	Jordà, Schularick & Taylor (2017), *NBER Macroeconomics Annual*, Vol. 31
Countries	18 advanced economies
Coverage	Annual, 1870–present (Release 6: 2022)
Variables	48 real and nominal variables including USD exchange rate (LCU/USD)
FX content	Bilateral nominal USD exchange rates; current account; imports; exports
Award	Engerman–Goldin Prize, Economic History Association
Access	https://www.macrohistory.net/database/

The JST database covers 18 advanced economies since 1870, providing the most extensive long-run macro-financial dataset available. Countries include Australia, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, UK, and USA. The database includes annual bilateral nominal exchange rates (local currency per USD), capturing the near-universe of advanced-economy output dynamics.

14 OECD Data Explorer — Exchange Rates and PPPs

Quick Reference: OECD Exchange Rate Data

Institution	Organisation for Economic Co-operation and Development (OECD)
Coverage	38 OECD members + selected partner economies
Frequency	Daily, monthly, quarterly, annual
Series types	Nominal bilateral rates vs. USD; PPP conversion factors; REER; Economic Outlook projections
API	OECD SDMX API / OECD.Stat
Access	https://data-explorer.oecd.org

The OECD Data Explorer includes:

- **Nominal exchange rates vs. USD** (average of daily rates), published in the OECD Economic Outlook and Main Economic Indicators.
- **PPP conversion factors** from the OECD–Eurostat PPP Programme, updated annually.

- **Real effective exchange rates** drawn from IMF and BIS methodologies, accessible via OECD.Stat.
- **Economic Outlook projections** (biannual), providing forward estimates of exchange rates for scenario analysis.

OECD exchange rate data are hosted on **FRED** under the OECD category, making them accessible alongside Federal Reserve series without separate registration.

15 Comprehensive Comparative Summary

16 Research Design Guidance

16.1 Combining Databases for Robust Analysis

No single database meets all research needs. A robust exchange rate study typically combines datasets as follows:

- **Misalignment measurement:** CEPII EQCHANGE (BEER estimates) cross-validated with IMF REER deviations from Hodrick–Prescott trends, and checked against Big Mac Index signals.
- **PPP benchmarking:** Penn World Tables and OECD PPP conversion factors as alternative equilibrium anchors for long-run studies.
- **Uncertainty controls:** Rossi–Sekhposyan monthly uncertainty indices as conditioning variables in regression models.
- **Regime controls:** IRR de facto classification to test whether results differ across exchange rate regimes; AREAER for de jure regime.
- **Trade competitiveness:** BIS and IMF EERs for robustness across weighting schemes; ECB SDW for euro area analysis.
- **Historical depth:** JST Macrohistory Database for studies spanning financial crises back to 1870.
- **Real-time / high-frequency:** FRED for daily spot rates; ECB SDW for daily euro reference rates via SDMX API.

16.2 Key Methodological Considerations

- **Effective vs. bilateral rates:** EQCHANGE, IMF EER, BIS EER, and ECB SDW use multilateral trade-weighted indices. The Big Mac Index and FRED spot rates are bilateral (vs. USD or EUR). Ensure the choice is theoretically motivated.
- **De jure vs. de facto regimes:** IMF AREAER reflects official self-classification, which often differs from actual behaviour. Always cross-reference with IRR natural classification for

Table 5: Side-by-Side Comparison of All Major Exchange Rate Databases

Database	Institution	Type	Frequency	Coverage	Best Used For	URL
EQCHANGE	CEPII	Equilibrium & actual EER (BEER, NEER, REER)	Annual	187 countries, 1973–2016+	Currency misalignment, BEER estimation	cepii.fr/…/bdd_modele
Big Mac Index	The Economist	PPP proxy (single good)	Semi-annual	~70 countries, 1986–present	Quick PPP signal, teaching, media	economist.com/big-mac-index
FX Uncertainty Indices	Rossi/Sekhposyan	Forecast uncertainty	Monthly	10 industrial economies, 1993–2015	UIP tests, risk premium research	barbararossiwebsite/data
IMF EER Database	IMF Statistics	NEER & REER	Monthly	~90 countries, 1975–present	Competitiveness monitoring, policy	data.imf.org/…/EER
IMF IFS	IMF	Bilateral FX + macro-finance	Monthly/Annual	190+ countries, 1940s–present	Broad macro panel data	data.imf.org
World Bank DataBank	World Bank	Official FX + REER	Annual	190+ countries, 1960–present	Development research, WDI panels	databank.worldbank.org
BIS EER	BIS	Broad/narrow NEER & REER	Monthly	61 economies, 1990s–present	Financial stability, monetary policy	bis.org/statistics/eer
ECB SDW	ECB	Euro reference rates + EER	Daily–Annual	~40 currencies, 1999–present	Euro area FX, SDMX pipelines	data.ecb.europa.eu
FRED	St. Louis Fed	Spot FX + dollar indices	Daily–Annual	50+ currencies, 1950s–present	US-centric FX research, real-time data	fred.stlouisfed.org/categories/15
IMF AREAER	IMF	Regime classification (de jure)	Annual	190 countries, 1950–present	Regime-conditioned analysis	imf.org/…/AREAER
IRR Classification	Ilzetzki, Reinhart, Rogoff	Regime classification (de facto + anchor)	Monthly/Annual	194 countries, 1946–2016	De facto regime tests, anchor currency	ilzetzki.com/irr-data
Penn World Tables	U. Groningen / UC Davis	PPP & real GDP	Annual	183 countries, 1950–present	Long-run growth, BEER fundamentals	rug.nl/…/pwt
JST Macrohistory	Jordà/Schularick/Taylor	Historical macro-finance + FX	Annual	18 advanced economies, 1870–present	Long-run FX, financial crises, history	macrohistory.net/database
OECD Data Explorer	OECD	Bilateral FX + PPP + projections	Daily–Annual	38+ economies, 1960s–present	OECD comparisons, PPP factors	data-explorer.oecd.org

empirical work.

- **Base year sensitivity:** REER indices are sensitive to the choice of base year. Standardise or normalise when merging series from different sources (e.g., all rebased to a common year).
- **Volatility vs. uncertainty:** GARCH-based volatility is not interchangeable with the Rossi–Sekhposyan uncertainty index. The latter captures tail-event unpredictability and is preferred in UIP-related regressions.
- **Parallel market rates:** For developing economies, especially pre-1990, official exchange rates may diverge sharply from market rates. The IRR database incorporates parallel market data precisely for this reason.
- **Data vintage effects:** CEPII EQCHANGE and other databases revise data as underlying trade and price data are updated. Always document the data release version used to ensure replicability.
- **Purchasing power vs. competitiveness:** PPP-based measures (Big Mac Index, PWT, OECD PPP factors) target absolute price equalisation. REER-based measures (IMF, BIS, ECB, EQCHANGE) target relative competitiveness. These address distinct questions and should not be conflated.

16.3 Citation References

Table 6: Recommended Citations for Each Database

Database	Primary Citation
EQCHANGE	Couharde, Delatte, Grekou, Mignon & Morvillier (2017). *EQCHANGE: A World Database on Actual and Equilibrium Effective Exchange Rates.* CEPII Working Paper 2017-14.
Big Mac Index	*The Economist* (1986–present). *The Big Mac Index.* economist.com/big-mac-index
FX Uncertainty	Ismailov & Rossi (2018). Uncertainty and Deviations from UIP. *Journal of International Money and Finance*, 88, 242–259.
Methodology	Rossi & Sekhposyan (2015). Macroeconomic Uncertainty Indices. *AER P&P*, 105(5), 650–655.
IMF EER	IMF Statistics Department. Effective Exchange Rate (EER) Database. data.imf.org
BIS EER	Bank for International Settlements. Effective Exchange Rates. bis.org/statistics/eer
ECB SDW	European Central Bank. Statistical Data Warehouse — EXR. data.ecb.europa.eu
FRED	Federal Reserve Bank of St. Louis (1997–present). FRED Economic Data. fred.stlouisfed.org
IRR Regime	Ilzetzki, Reinhart & Rogoff (2019). Exchange Arrangements Entering the 21st Century. *QJE*, 134(2), 599–646.
Penn World Tables	Feenstra, Inklaar & Timmer (2015). The Next Generation of the Penn World Table. *AER*, 105(10), 3150–3182.
JST Macrohistory	Jordà, Schularick & Taylor (2017). Macrofinancial History and the New Business Cycle Facts. *NBER Macroeconomics Annual*, 31.
OECD	OECD (2024). OECD Data Explorer: Exchange Rates and Financial Indicators. data-explorer.oecd.org

This document is an informational guide compiled for research purposes. All databases referenced are publicly available. URLs were verified as of April 2026. Users should consult the original documentation of each database for the most current coverage, methodology, and licence details.