



STATISTICS

Power of Data for Smarter Economic Policymaking

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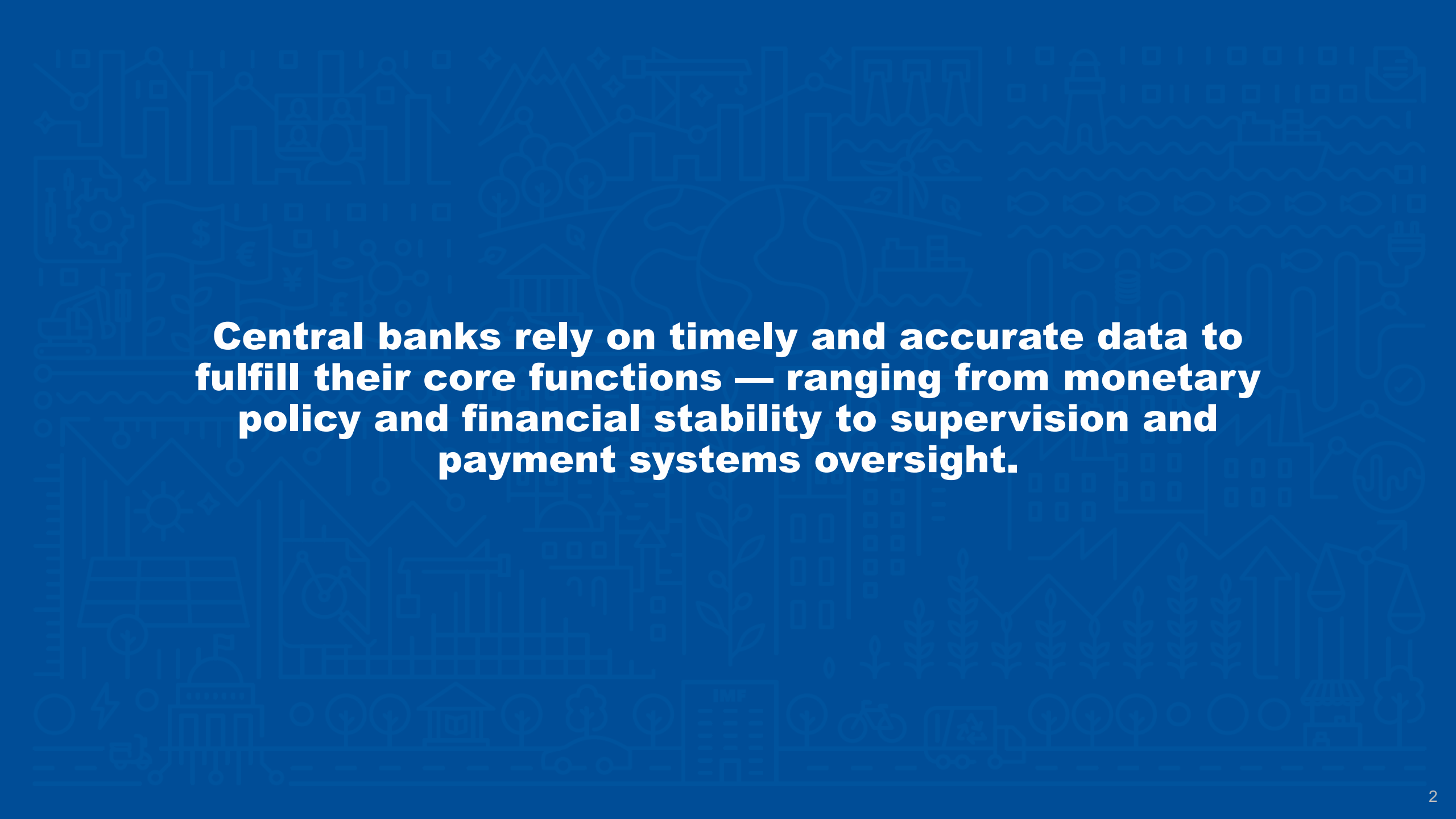
6TH STATISTICS CONFERENCE

“THE POWER OF DATA FOR A SMART WORLD”

CENTRAL BANK OF CHILE

JUNE 3, 2025

The views expressed herein are those of the author and should not be attributed to the IMF, its Executive Board, or its management



Central banks rely on timely and accurate data to fulfill their core functions — ranging from monetary policy and financial stability to supervision and payment systems oversight.

Central Bank Policy Decisions: Data at the Core

Central bank statistics

Comprehensive, high-quality financial data due to its role, as regulator, supervisor, money issuer, and reserve manager.

Timely and reliable due to mandated reporting of financial institutions as per accounting standards.

Economic mirror: Financial sector data reflect broader economic activity by tracking resource flows and transactions, mirroring real economic movements.

- Monetary Statistics (Broad Money, Monetary Base, Liquidity).
- Balance of Payments and International Investment Positions
- External Debt Statistics
- Exchange Rates
- Interest Rates and Yield Curves
- Financial Soundness Indicators
- Payment Systems and Settlement Data
- Banking and Financial Sector Surveys: Credit/Loans of banks and non-bank financial institutions

Other statistics

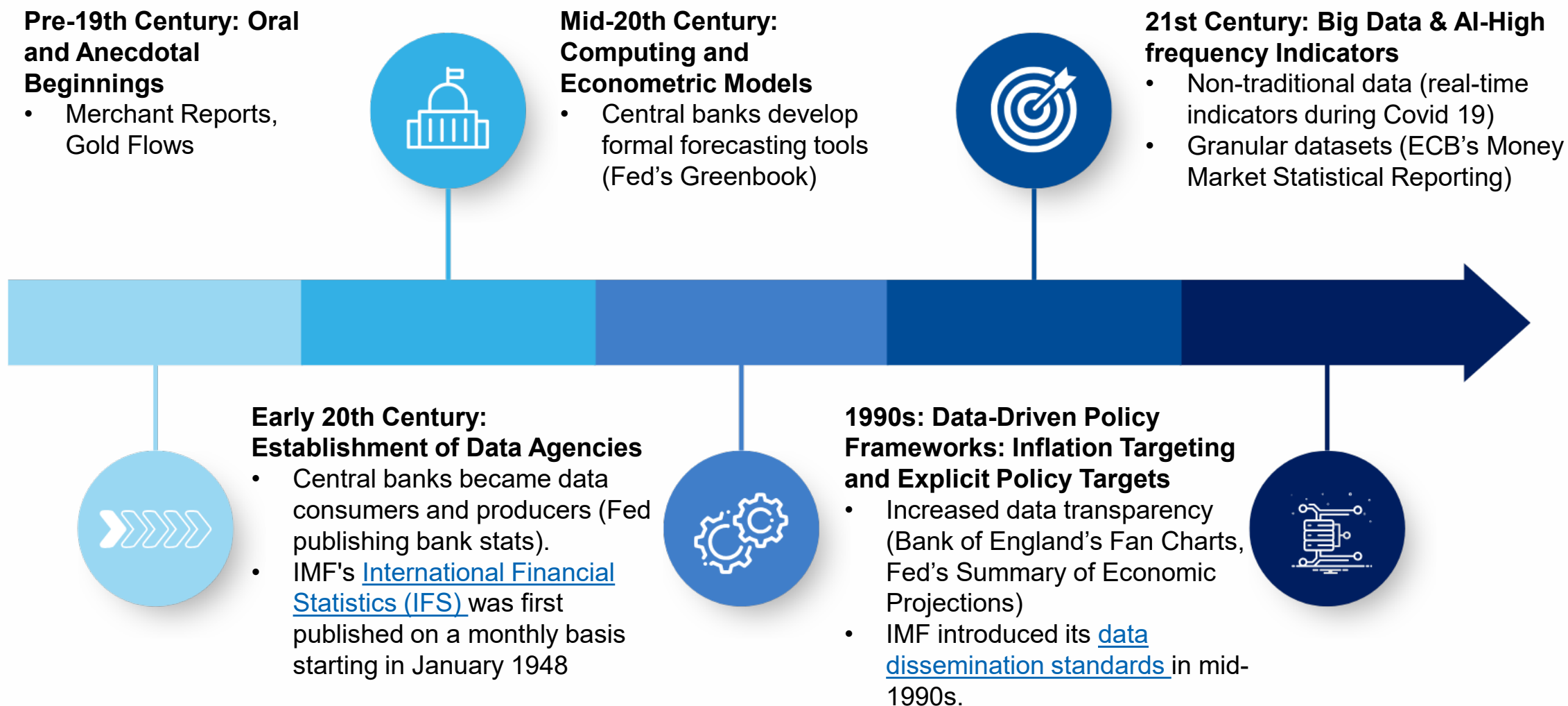
- Inflation Data (Consumer Price Index, Producer Price Index)
- Unemployment and Labor Market Data
- Government Fiscal Data
- Consumer and Business Sentiment Data



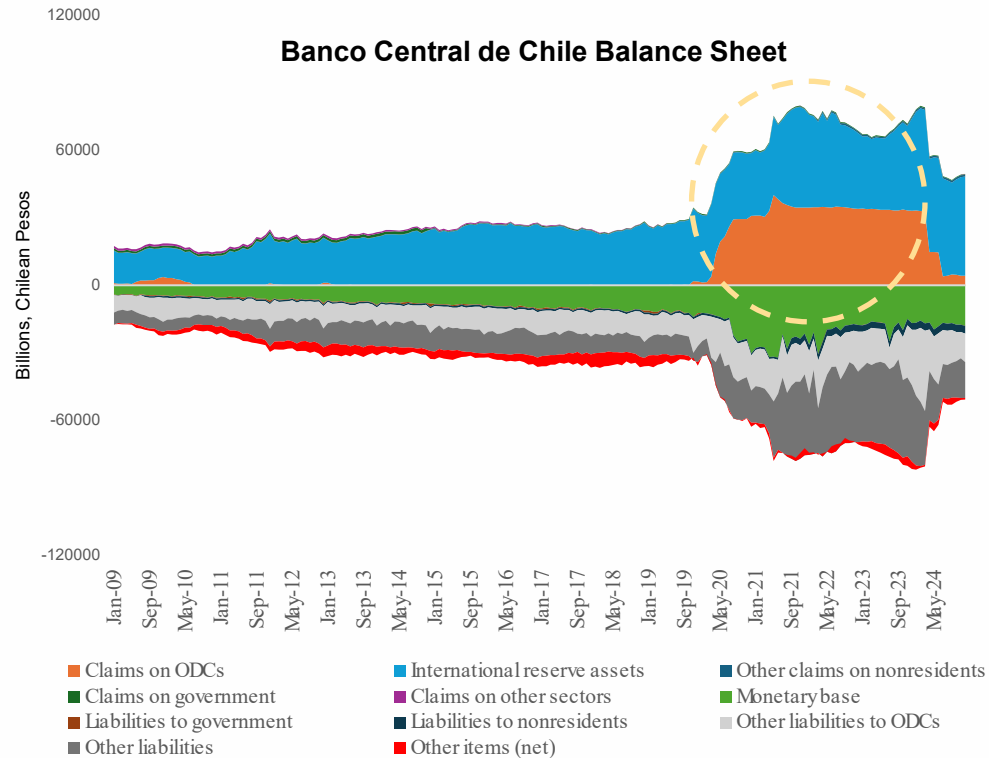
Implementing its expanding mandate

- Monetary policy to maintain price stability and employment
- Support economic growth
- Maintain financial stability
- And oversee the payments system
- Etc.

The Evolution of Data in Central Banking



Traditional Macroeconomic Statistics Remain a Foundational Pillar for Policymaking



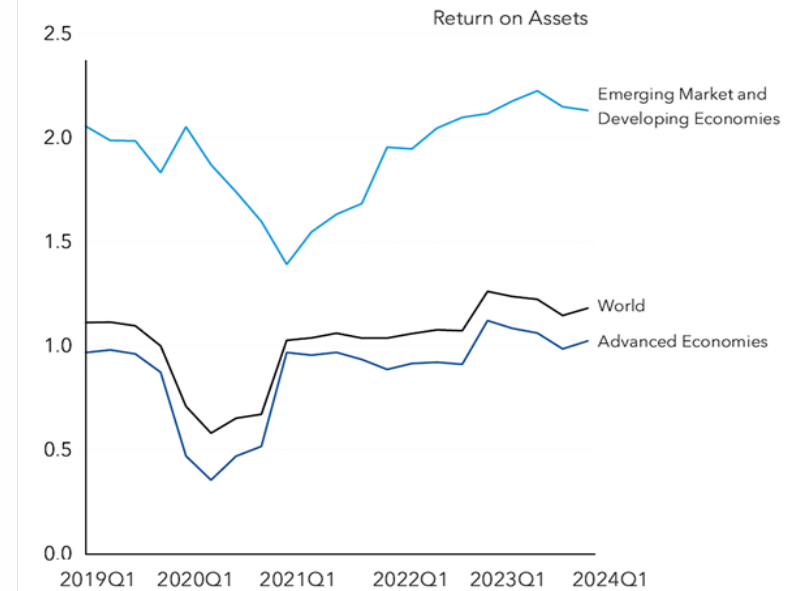
Source: IMF MFS Dataset and Staff Calculations

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Monetary and Financial Statistics: Granular data on positions of financial institutions including the central bank may help, for instance, to assess how the BCC's initiatives like special lending facilities to banks drove a large expansion of its balance sheet during COVID-19, eventually prompting sharp policy rate hikes in response to mounting inflation.

Banking Profitability has Risen Since 2021

Percent



Source: IMF FSIs Dataset and Staff Calculations.

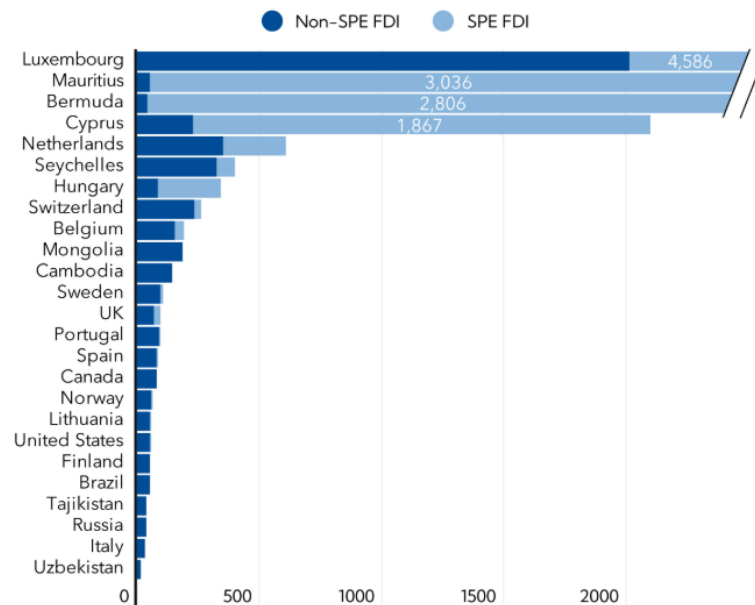
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Financial Soundness Indicators: Granular, country-level FSI data can be aggregated by income level or regions to reveal broader patterns—such as how rising interest rates, prompted by widespread monetary tightening, have increased interest income in the banking sector—and to assess whether a country's banking sector follows or diverges from these trends.

Traditional Macroeconomic Statistics Also Remain a Key Reference for Investors, Researchers and Other Users

FDI breakdown

The share of Special Purpose Entity (SPE) related foreign direct investment is highest in Bermuda, Mauritius, and Cyprus.
(percent of GDP, end-2020)



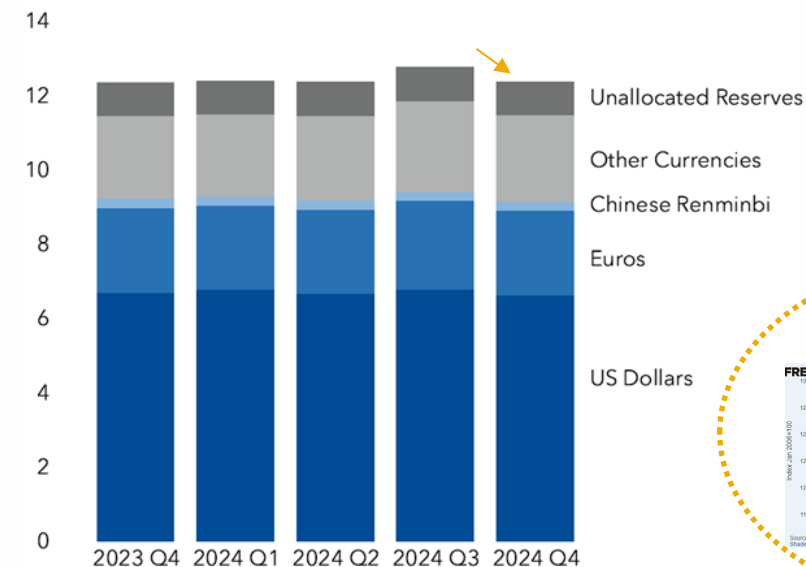
Source: IMF staff calculations. Note: The figures for the UK do not include the Isle of Man, Channel Islands, or overseas territories.

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External sector statistics: One-off datasets that build on regular [FDI statistics](#) are critically important—FDI statistics often don't distinguish between FDI made through SPEs vs. non SPEs. But such data helps, understand where economic activity is taking place and the extent to which FDI flows are driven by tax considerations.

World Official Foreign Currency Reserves Decreased in the Fourth Quarter of 2024

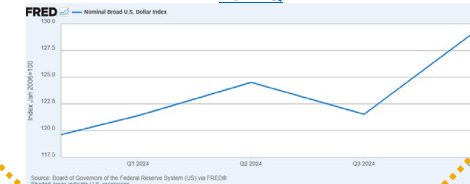
Trillions of US Dollars



Source: IMF COFER Dataset.

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Nominal Broad USD Index 2023Q4-2024Q



Currency Composition of Official Foreign Exchange Reserves:

The latest IMF's COFER survey results show that total FX reserves decreased to \$12.36 trillion in 2024Q4 from \$12.75 trillion in 2024Q3, mostly reflecting the depreciation of reserve currencies against the US dollar.

Central Bank's Analysis May be Strengthened by Micro Datasets

Examples

US Federal Reserve

- Fed analyzed credit card spending patterns to gauge consumer behavior during Covid-19 pandemic
- This data revealed significant declines in spending during the early stages of the pandemic, offering timely signals of reduced consumer demand and financial stress among household
- Source: [FRB](#)

European Central Bank

- AnaCredit (loan-level data) is generally used to gain insights into bank lending behaviors across the euro area.
- During the pandemic, this data helped ECB to:
 - Design targeted lending facilities
 - Gauge country-level bank responses
 - Fine-tune monetary stimulus effectively
 - Source: [ECB](#)

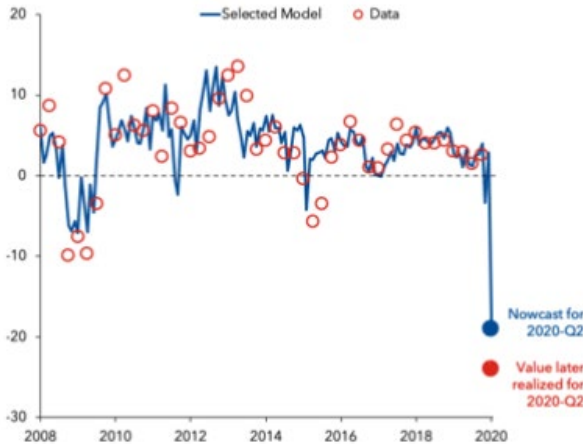
Availability of data — in volume, variety, and velocity — is revolutionizing how central banks and other policymakers make decisions in an increasingly complex and uncertain world.

Advantages of Big Data for Macroeconomic and Financial Analysis

Timeliness

Real-time read

Nowcasting for Botswana's GDP helped inform policymaking by predicting trends months before official data were available.
(annual change in quarterly GDP, percent)



Sources: Botswana authorities; Haver Analytics; and IMF staff calculations.

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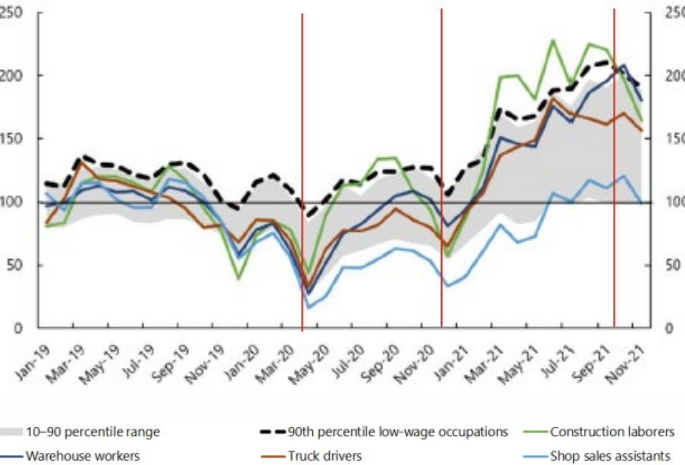
Source: [Choi and Iyer \(2022\)](#).

Granularity of the analysis

Figure 1.1: Vacancies in Selected Low-Wage Occupations

(Average 2019 = 100)

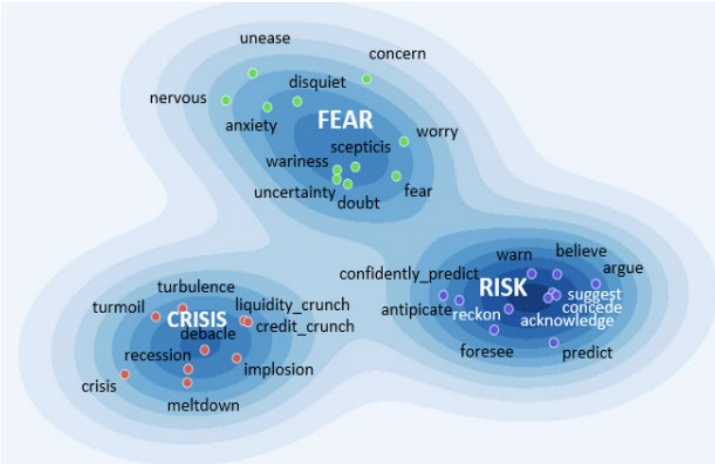
Canada



Source: [Duval and others \(2022\)](#).

Filling the areas where official statistics are lacking

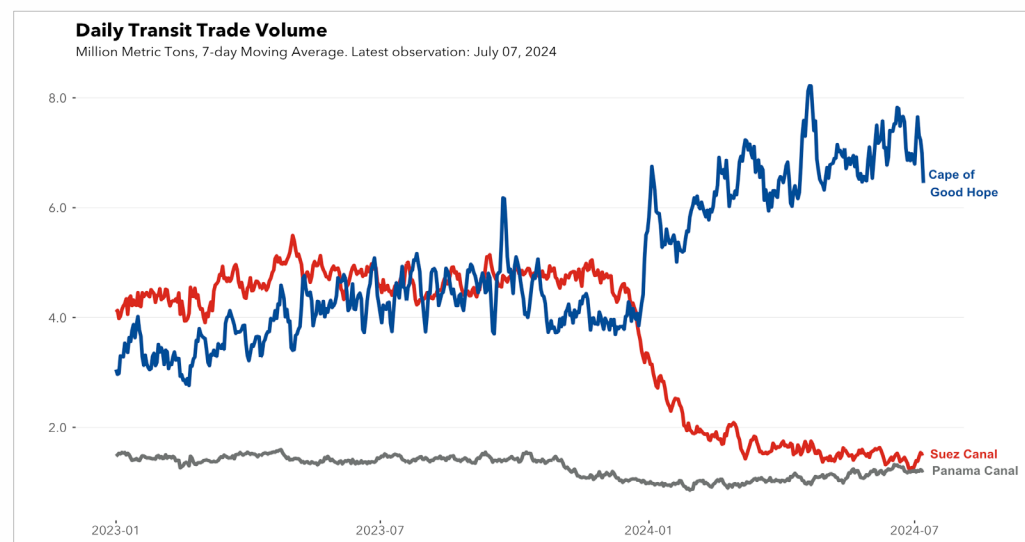
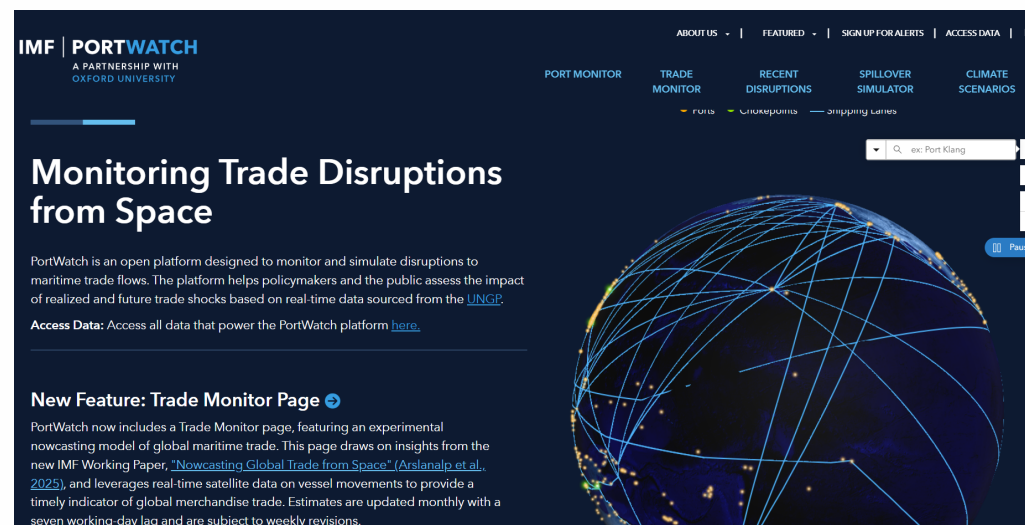
Word Vector Representations, Semantic Clustering, and Sentiment



Source: [Huang and others \(2019\)](#).

PortWatch: Analyze Trade Disruptions in Real-Time

- **Automatic Identification System (AIS) data** (on vessel traffic) have been used in tracking international trade in real time.
- [PortWatch](#) releases AIS-derived **real-time trade estimates** to monitor disruptions from shocks, assessing their regional and global spillovers through port-to-port linkages.



Early Signals on Global Trade Tensions

Trade nowcasting: PortWatch enables early detection of geopolitical tensions and structural shifts in trade patterns well before these changes are reflected in official customs data.

Rising Visibility: Journalistic inquiries are increasing, and platform traffic surged (6K users May 5-8) following a [YouTube video](#) with 1.3M views.

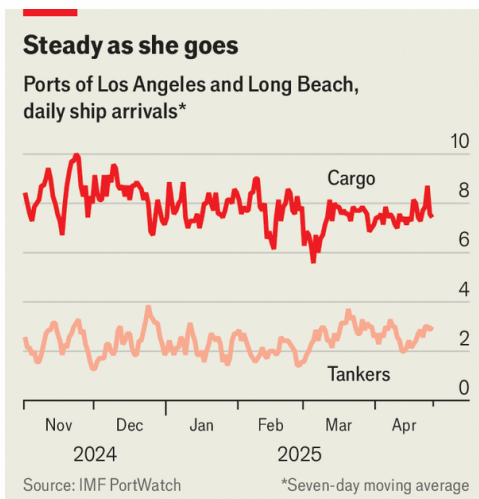
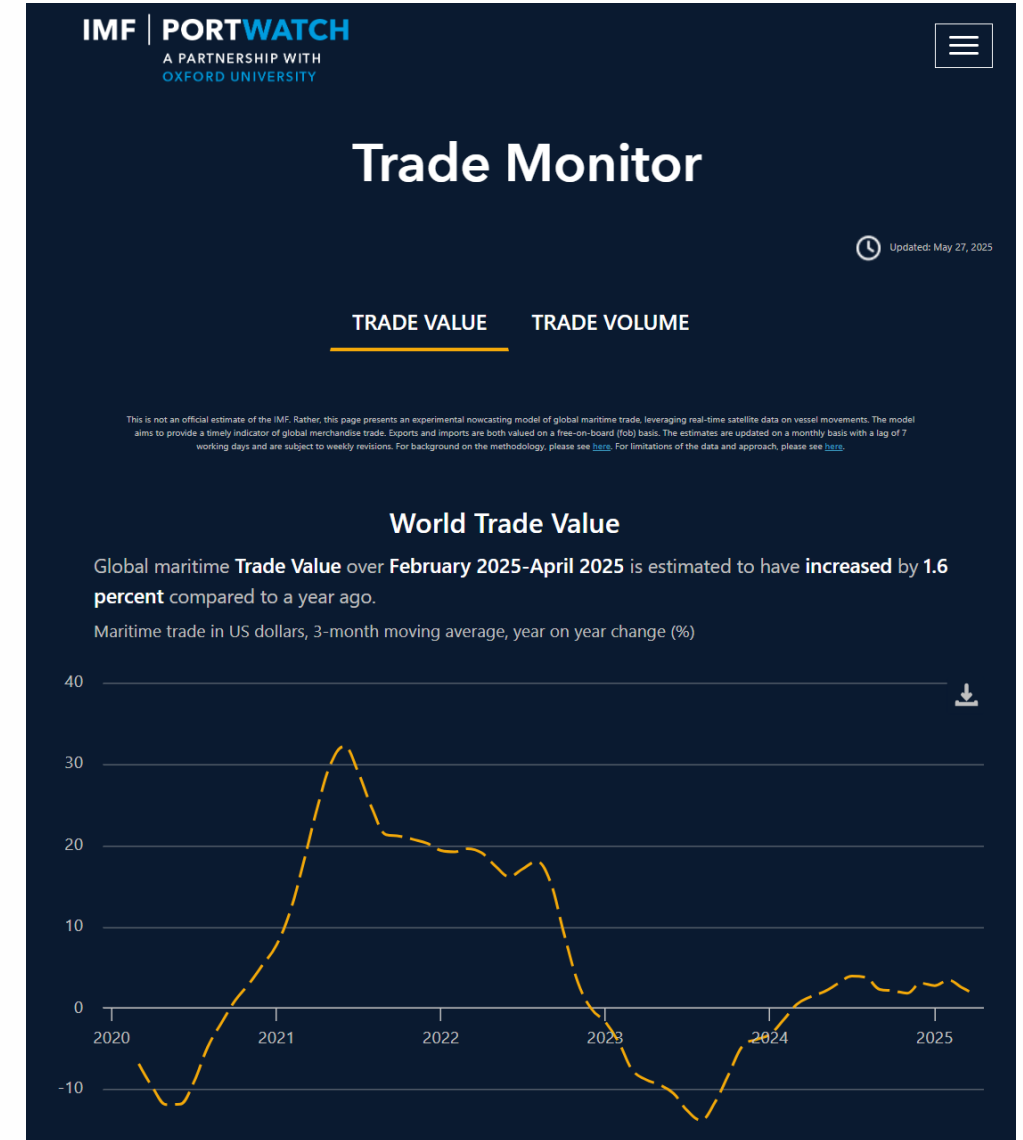


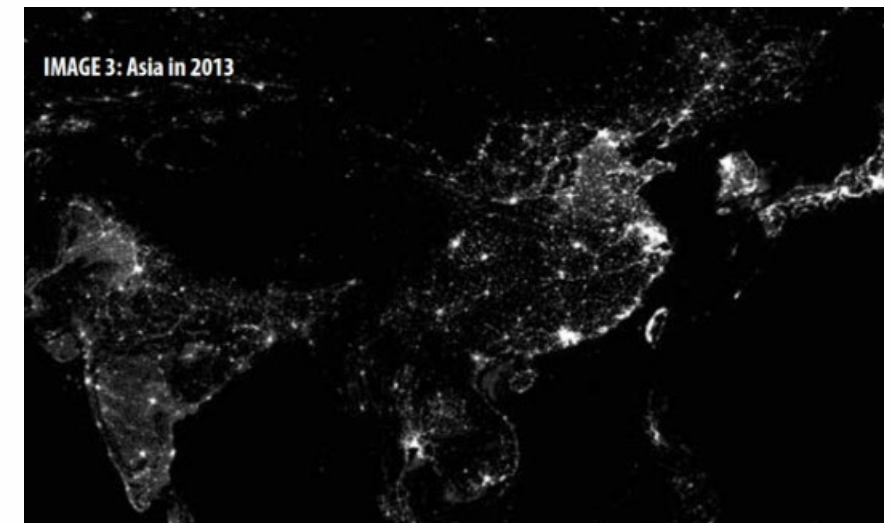
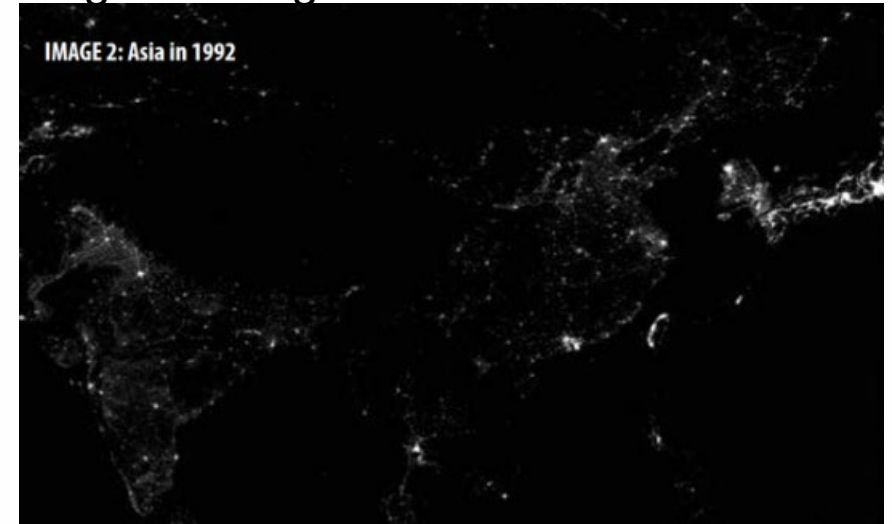
Chart: [The Economist](#)



GDP Nowcasting Using Satellite Data and Other Alternative Data Sources

- On-going research addresses delays in GDP data dissemination or lack of capacity to publish quarterly GDP data, enriching policy advice.
- To **nowcast GDP**, alternative predictors complementary to traditional input such as PMI have been studied:
 - **Satellite-based indicators** such as nightlights, NO2 emissions, or vegetation index
 - **Google Trends volumes**
 - **PortWatch trends**
- Explored with machine learning techniques
 - for an individual country
 - for a panel of countries

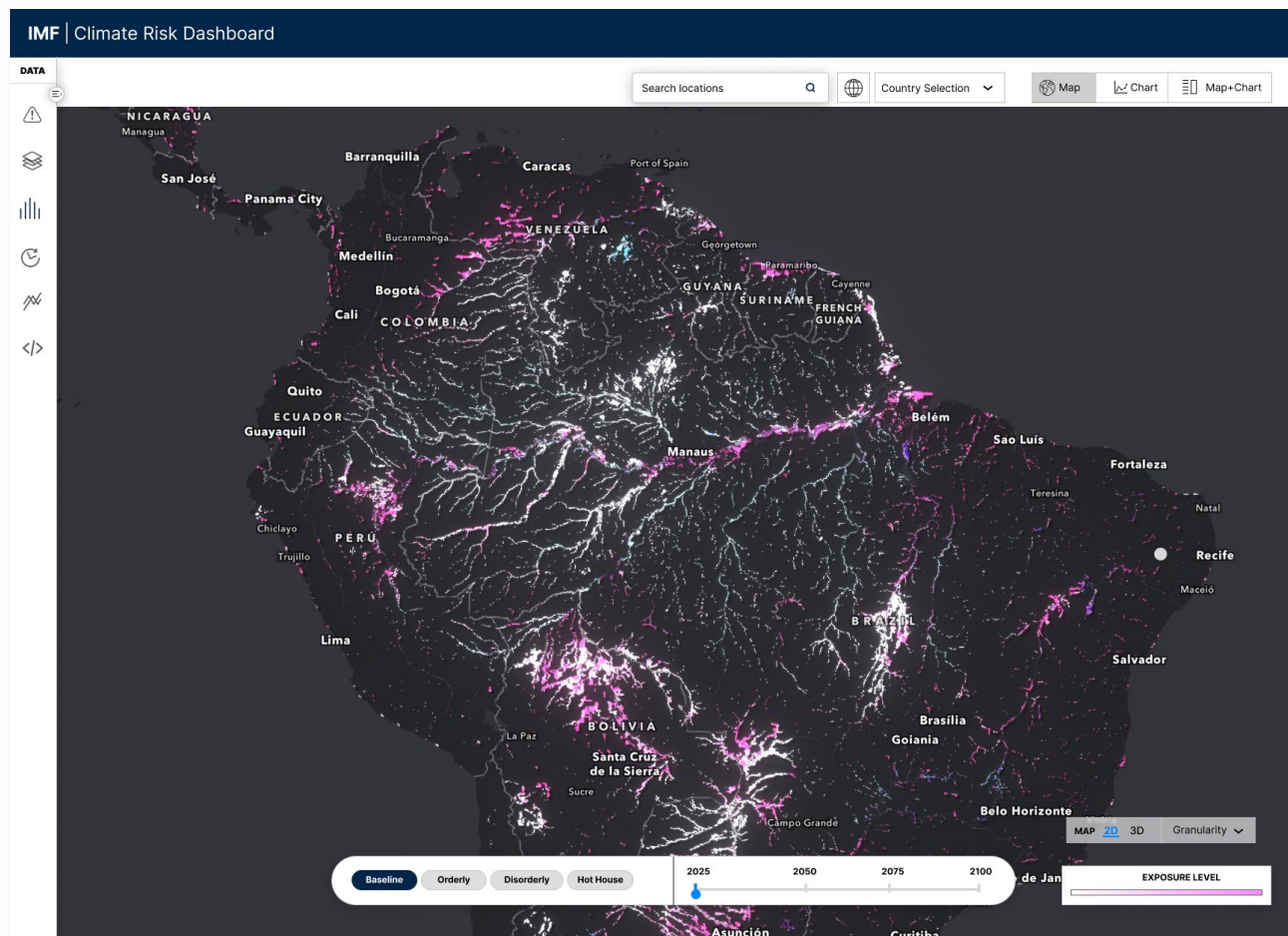
Nighttime Light



Source: [Illuminating Economic Growth](#), IMF Blog

IMF Geospatial Data Dissemination Platform | In development

- IMF public geospatial data dissemination platform
- Functionality:
 - Levels of granularity
 - Country
 - Subnational
 - Grid
 - Standardized charts
 - Visualization of data and statistics with several dimensions
 - Comparison between geographic areas, scenarios, across time

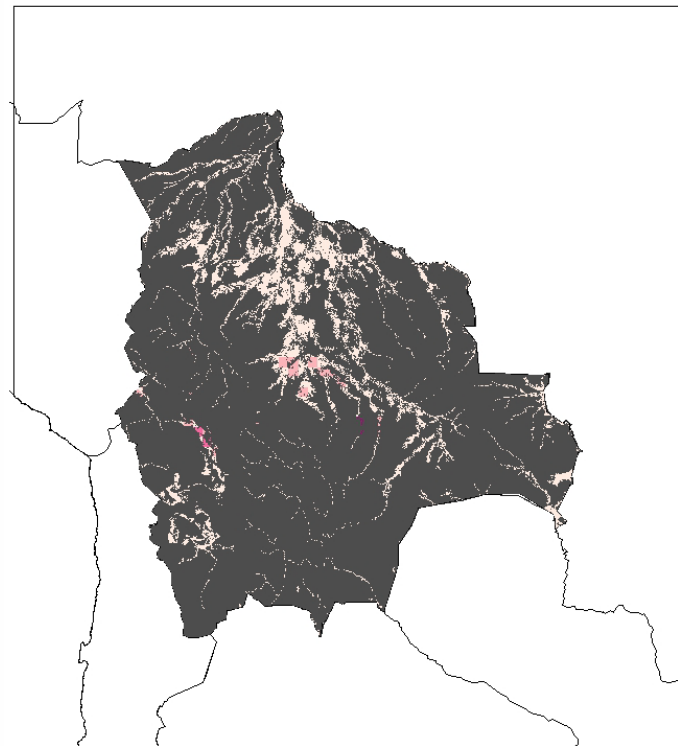


Showing population exposure to riverine floods. Baseline scenario based on Aqueduct, World Resources Institute (WRI).

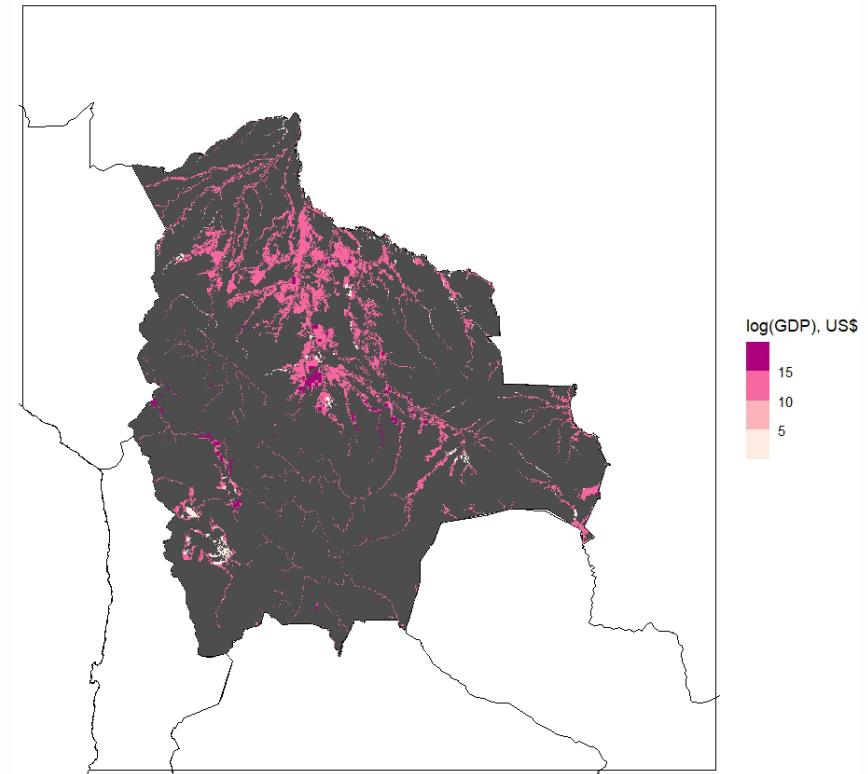
Source: Staff computations using flood data from Aqueduct Floods Map (WRI); Gridded Population (WB, CCKP); Gridded GDP (Murakami et al. (2021))

Global Indicators for Assessing Economic and Financial Impact of Physical Risks

Population, baseline
100-years return period



GDP, baseline
100-years return period



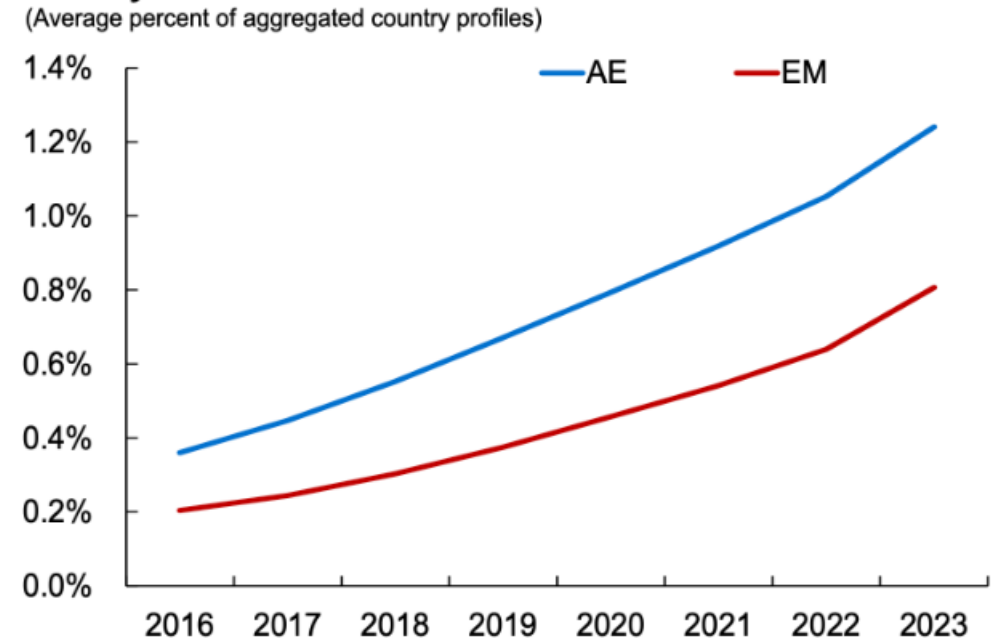
Source: Staff computations using flood data from Aqueduct Floods Map (WRI); Gridded Population (WB, CCKP); Gridded GDP (Murakami et al. (2021)). Baseline year for GDP is Purchasing Power Parity (PPP) 2010.

Job Postings for Granular and Timely Analysis of the Labor Market

Job posting data from Indeed and LinkedIn have been used to:

- analyze the evolution of the greener employment.
- analyze tightness in the labor market post-pandemic.
- analyze emergence of new skills by industry and occupation.

Concentration of LinkedIn Members in the Financial Services Industry with AI Skills
(Average percent of aggregated country profiles)



Sources: LinkedIn Economic Graph, IMF staff calculations

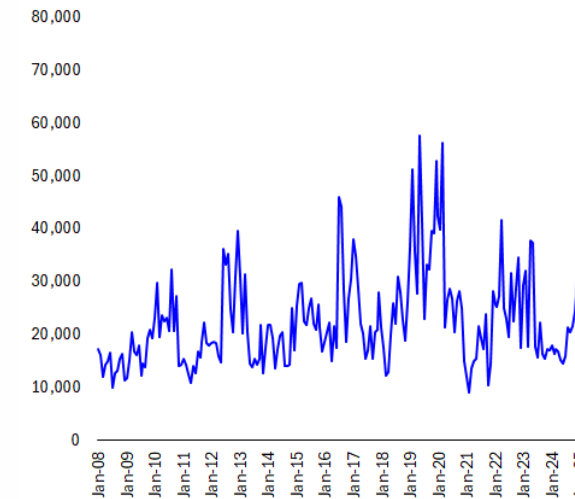
Source: [Analyzing Adoption of AI in Capital Market Activities](#), IMF/DDP blog

Power of Text for Real-Time Monitoring

- IMF staff has developed innovative indicators using news-based text analytics to monitor financial stress, economic uncertainty, and geopolitical risks in real time.
- **World Uncertainty Index**: available for 143 countries. Widely used by Central Banks.
 - **2025**: Ireland, Italy, Philippines, and Turkey.
 - **2024**: BIS, ECB, Italy, Portugal, Slovakia, and Uzbekistan. (and more)
- **Financial Stress Index**: Available for 110 countries.

World Uncertainty Index

Index, GDP Weighted Average, January 2008 to April 2025

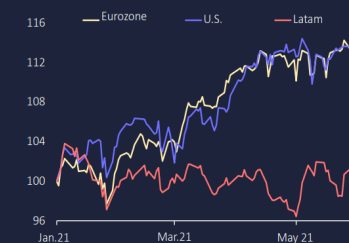


MONETARY POLICY REPORT

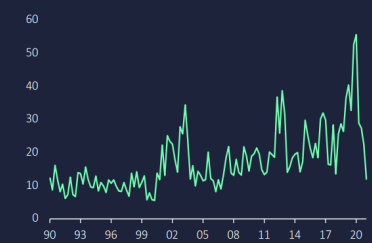
JUNE 2021



Stock markets (1)
(index, 4 January 2021=100)



World uncertainty index (2)
(index, weighted averaged GDP of each country)



(1) For Latin America, the simple average of indexes of Brazil, Colombia, Mexico, and Peru are used. (2) The index is calculated by counting the frequency of the word "uncertain" (or variants) in the country reports by The Economist Intelligence Unit. A higher number denotes more uncertainty and vice-versa. Data at first quarter of 2021. Sources: Ahir, Bloom, and Furceri (2018) and Bloomberg.

Central Banks & Innovative Data: Navigating the Crypto Landscape

Challenges of Crypto Assets Data

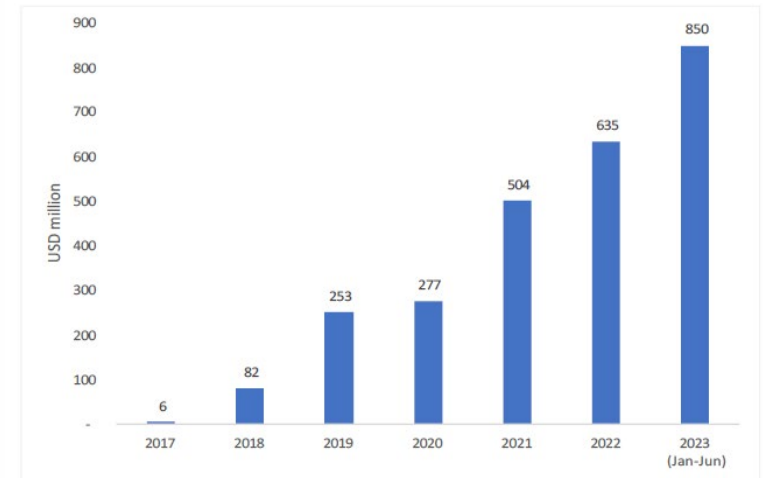
- Regulatory framework still under development, with no mandated reporting
- Unlike traditional financial sector statistics based on institutions' financial statements, crypto assets like Bitcoin lack an "issuer"
- Data collection must rely on financial auxiliaries like crypto exchanges, or wallet providers which are a diverse group and often fragmented.

Source: A stock-taking exercise by IMF of G20 and FSB economies under Recommendation 11 of the G20 Data Gaps Initiative 3

Innovative Solutions

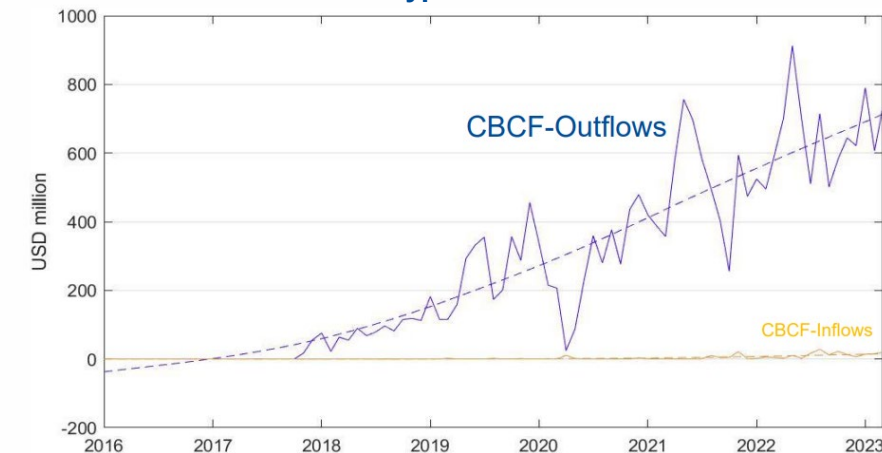
- Central banks are exploring **blockchain monitoring tools** for AML/CFT supervision
- A few others are extracting crypto assets data from **FX contracts** by financial intermediaries authorized to operate on FX market
- Others are relying on data from **tax authorities** to make estimations
- Data from **commercial providers** (that explore information from blockchains) are being used as a useful complimentary tool

Cross border crypto assets transaction –volume of transactions (average monthly) in Brazil



Source: BCB Staff Paper

Cross border crypto flows in Brazil



Source: IMF WP

IMF Big Data Center for Macroeconomic Analytics

IMF BIG DATA CENTER



Drive transformative and responsible use of Big Data for impactful policy decisions



Revolutionize macroeconomic statistics through data-driven innovation

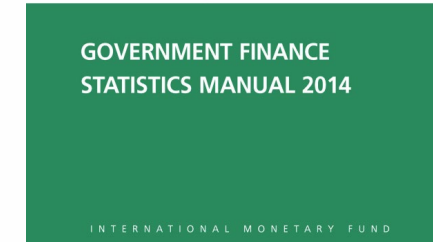
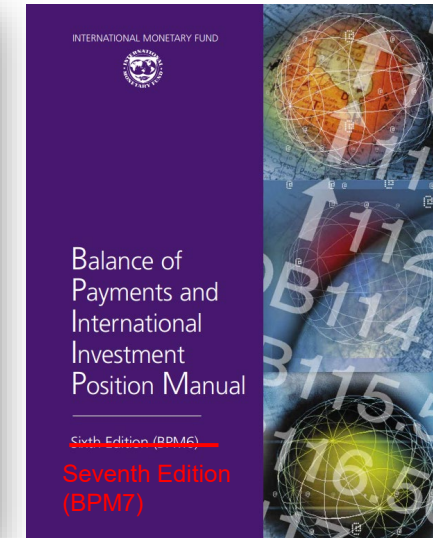
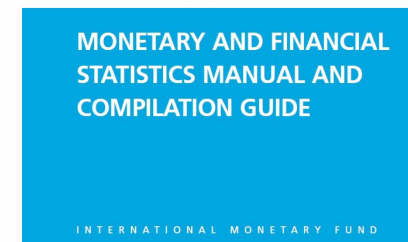
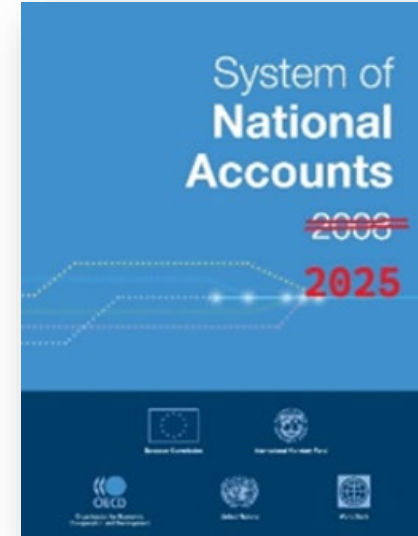


Lead collaboration and training to boost data science capacity of IMF members

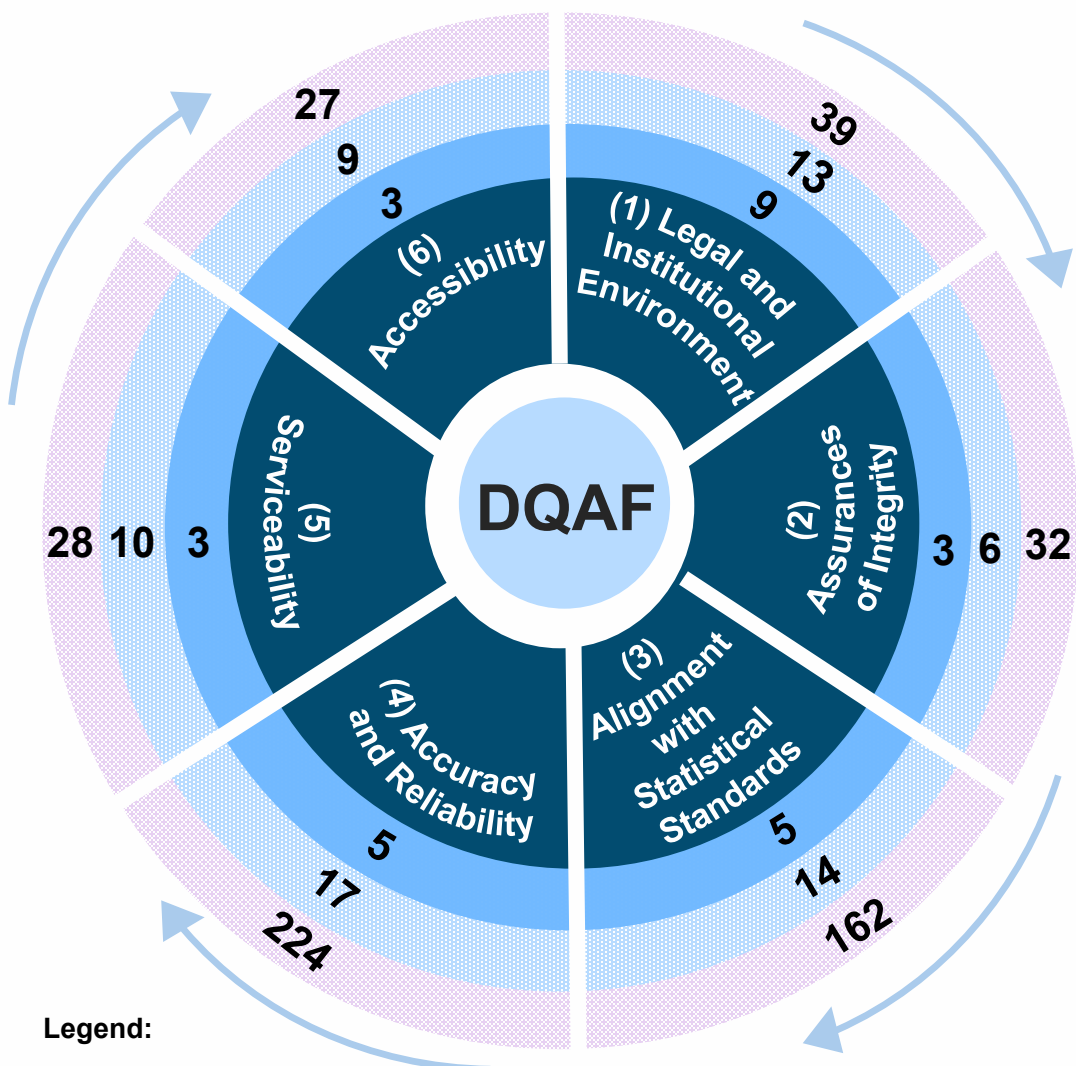
As a global institution, the IMF is helping shape the future of economic data governance by improving both the quality of data and the processes that make it accessible, interoperable, and policy-ready.

New Statistical Manuals to Adapt Measurement with Changing Times

- **Tectonic shifts in the global economy**
 - 2008 global financial crisis highlighted data shortcomings
 - Digitalization, financial innovation, globalization,
 - Increasing demand for data to address climate change
- **The conceptual frameworks designed to be robust and resilient**
 - But shortcomings in analytical usefulness exposed
 - Digitalization and globalization posed new challenges to data compilation
- **Respond to data needs identified through global reviews**
 - The G20 Data Gaps Initiative
 - The Stiglitz-Sen-Fitoussi Commission



Updated Data Quality Assessment Framework to Increase Trust



The IMF Statistics Department launched a project update of its Data Quality Assessment Framework, aligned with UN Principles of Official Statistics, to incorporate recent advances:

-  Statistical Laws / Privacy Laws.
-  Data Sharing and Data Access
-  Data Governance
-  Revised statistical methodologies (e.g BPM7, SNA 2025).
-  Big Data and Data Science
-  Dissemination and serviceability practices.

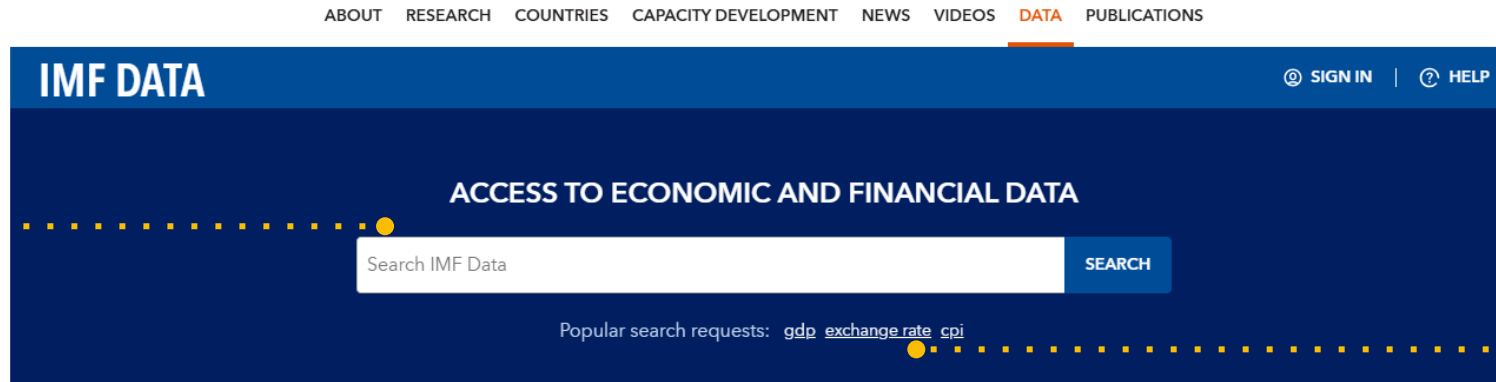
Legend:
elements of quality indicators of quality assessment criteria*

*number of indicators/criteria vary by domain

New IMF Data Portal to Empower World with Data

A web-based one-stop shop with seamless access to economic and financial data for anyone anywhere on any device

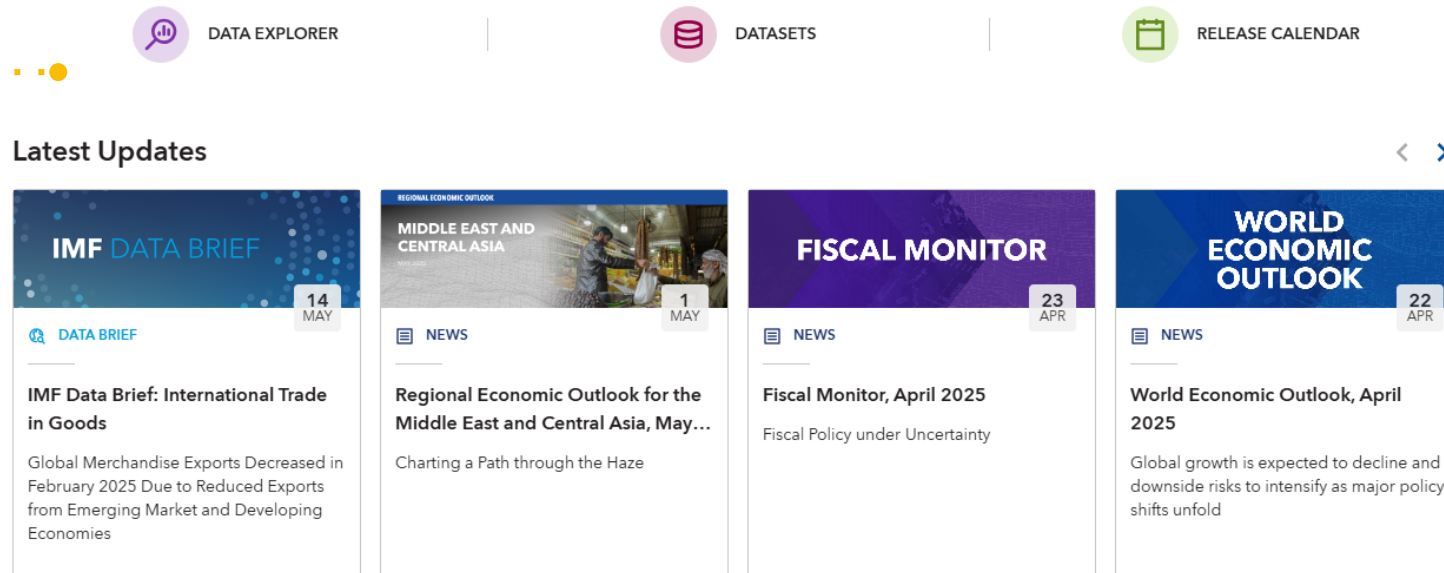
The **Search** feature lets you search for keywords among datasets, indicators, news and documents



Browse Data By provides two options:

- a. **Explorer:** Deep dive into a specific dataset
- b. **Datasets:** Provides a listing of all datasets on the Portal

The **Latest Updates** section displays latest information the IMF would like to highlight, including datasets, documents, news articles, and more

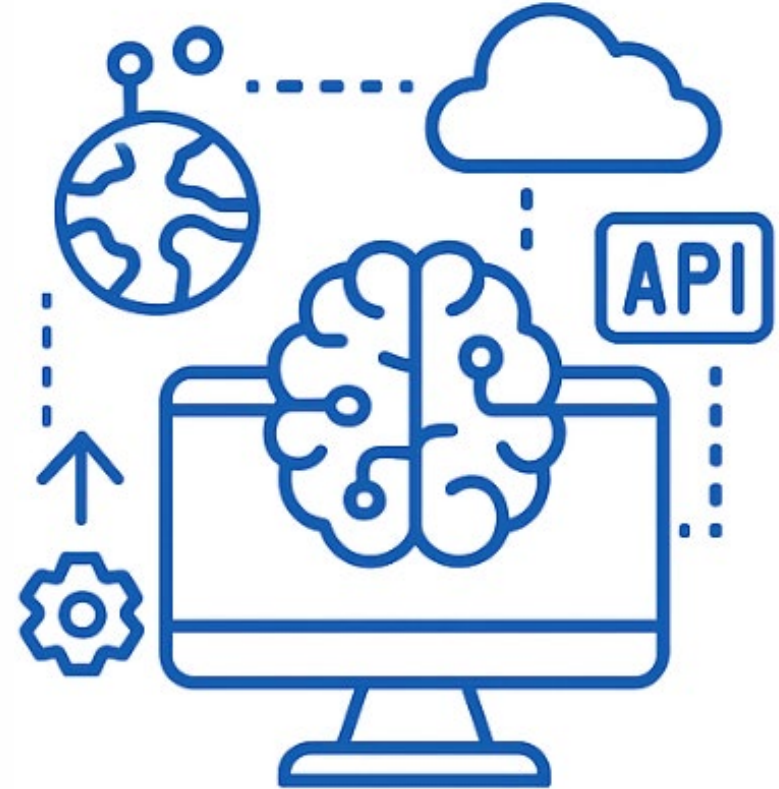


Scan to open
data.imf.org



Making Data AI-Ready

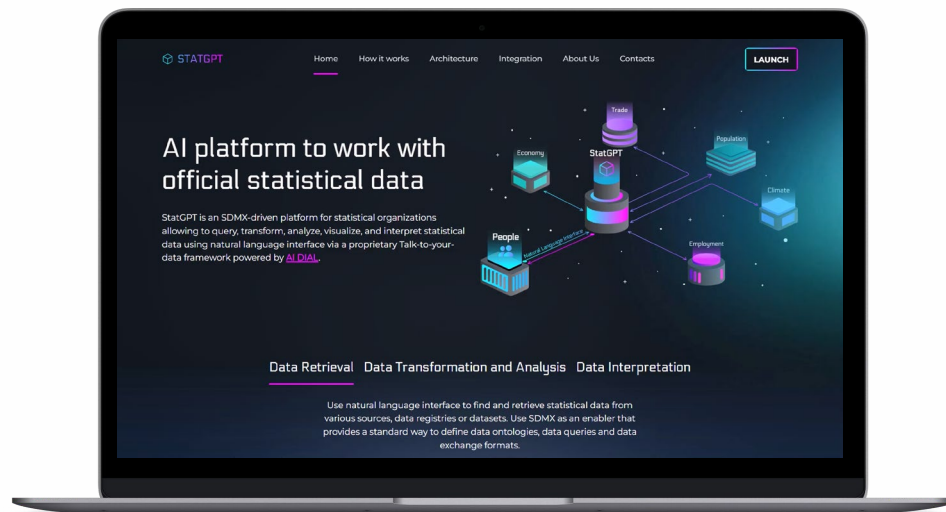
- IMF is planning to assist countries in modernizing their data infrastructure
- Enhancing data dissemination and accessibility using international standards (SDMX)
- Improving data collection from IMF through API
- Preparing data systems for future AI integration



Making AI Tools Speak to Official Statistics

IMF has been actively developing gen AI tools to enhance trust, data accessibility, and adoption of standards in official statistics.

StatGPT: Talk to Official Data



Talk2Manuals: Talk to Statistical Manuals





Innovative public-private partnerships are crucial to ensure granular data are shared effectively and securely for tomorrow's policymaking.

Development Data Partnership (DDP) as a Successful Model to Enable Access to Private Sector Data

Key advantages

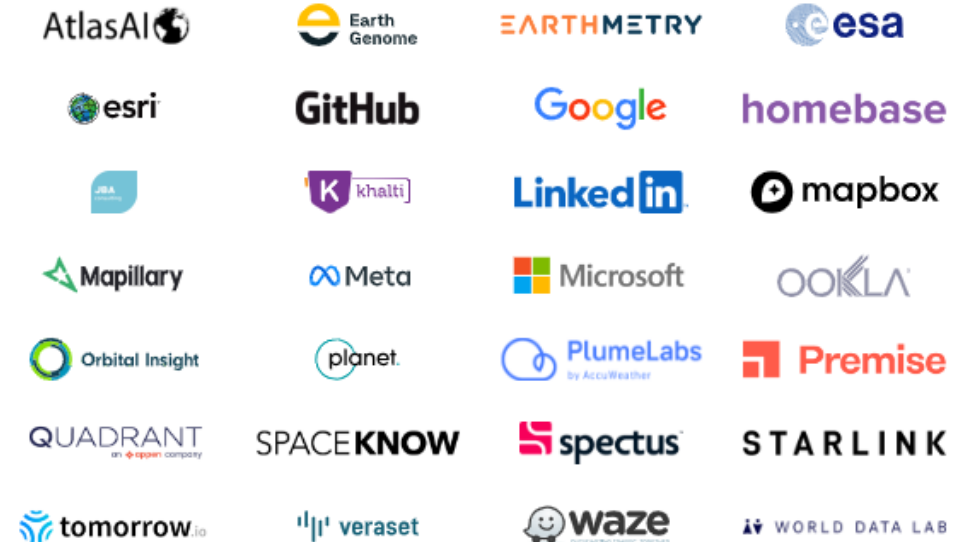
- Common legal foundation
- Global marketplace of opportunities
- Secure IT architecture
- Multi-disciplinary teams
- Enable data goods



<https://datapartnership.org/>

Data Partners

A Data Partner is an organization that provides data and/or services under the Master Data License Agreement.

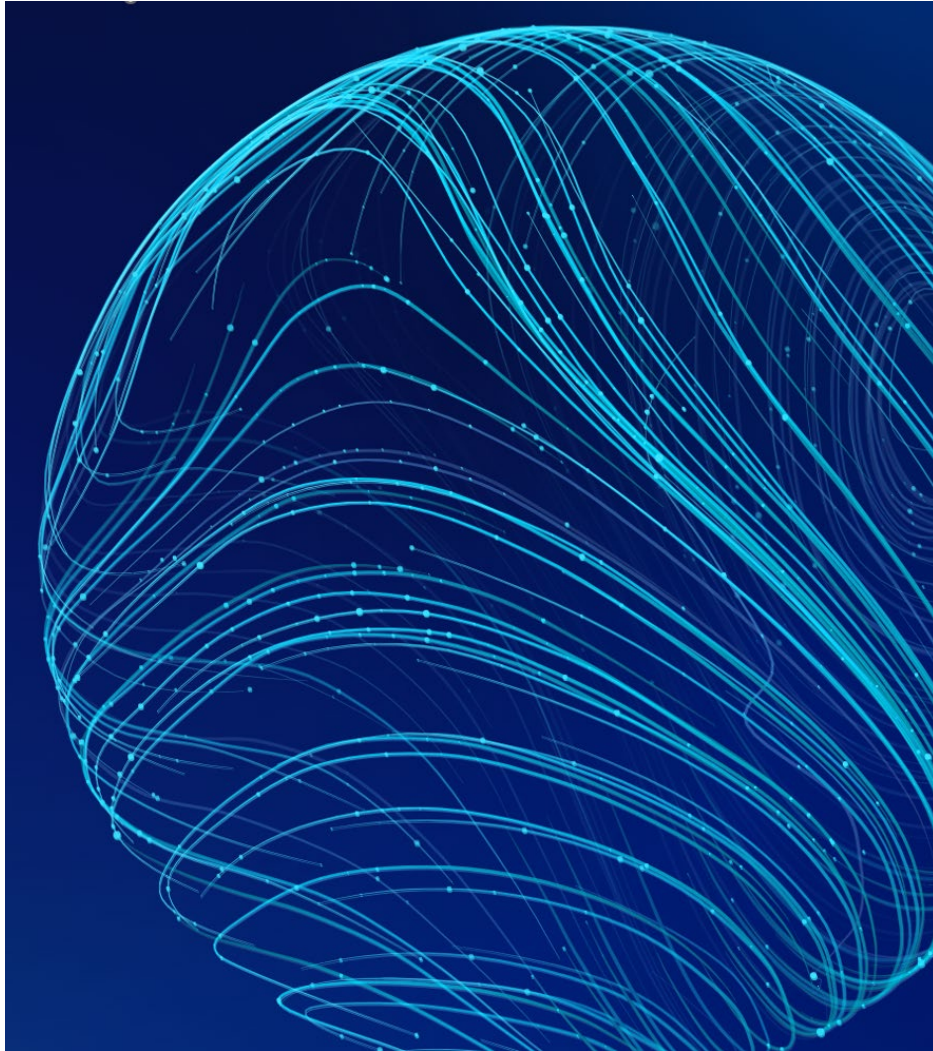


Development Partners

A Development Partner is an international organization that receives data and/or services under the Master Data License Agreement.



Unlocking the Power of Microdata for Macroeconomic Policy



- Significant shift in variety and granularity of data available in central banks and other public sector agencies.
 - Customer and firm-level data, Credit registries, tax registries, etc.
- IMF is exploring ways to access such data securely and provide more robust policy advice at the country level.
- Pilot projects are being conducted with central banks of Chile, Colombia, Brazil and countries from other regions
 - **Central Bank of Chile** has been a leader by putting together data available internally and from other agencies.

Unlocking the Power of Microdata for Macroeconomic Policy

- Secure access has been executed in a variety of ways, based on the authorities' preference and legislation
 - Remote code execution by data-holding organization
 - IMF staff visiting data-holding organization
 - Data anonymization
- Key findings of these projects will be presented [at a conference co-organized by IMF and Central Bank of Colombia on August 5-6th](#).



From Micro to Macro: Leveraging Microdata to Address Macroeconomic Issues

Organized by the Banco de la República, the Latin American Reserve Fund (FLAR), the International Monetary Fund and the *IMF Economic Review*

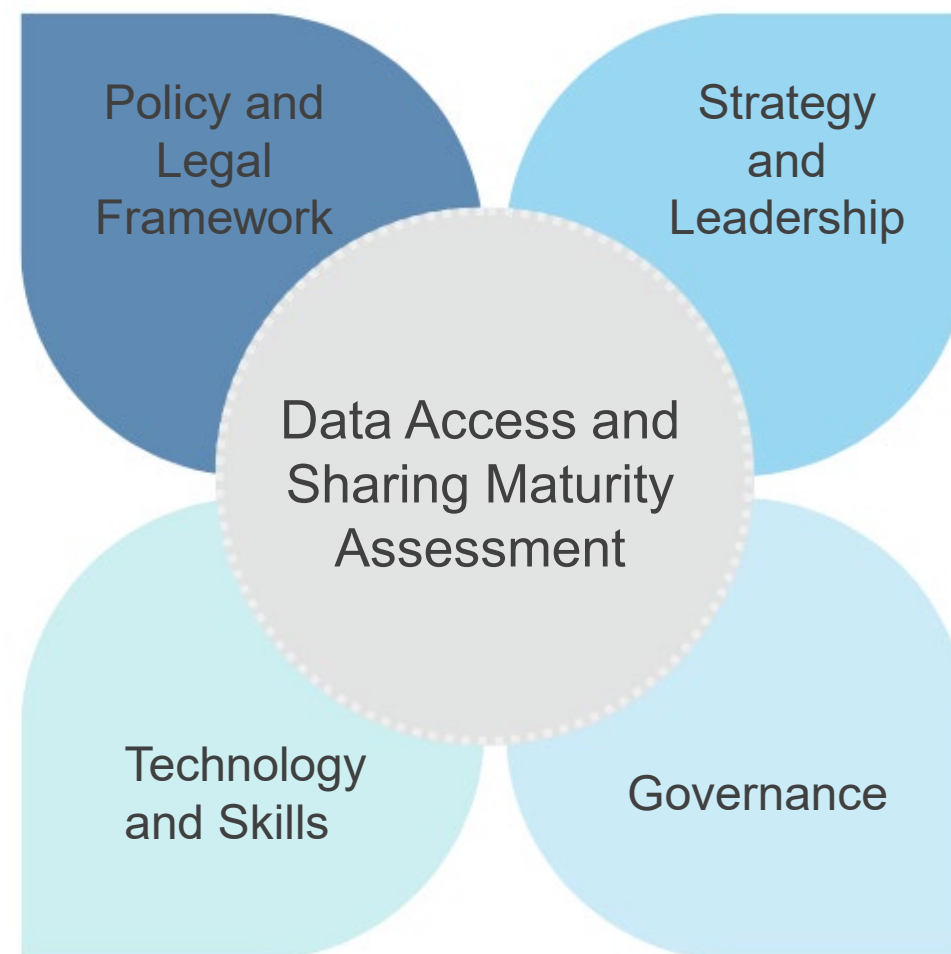
August 5-6, 2025

CALL FOR PAPERS

The Banco de la República, the Latin American Reserve Fund (FLAR), the International Monetary Fund, and the *IMF Economic Review* are inviting paper submissions for their joint conference on "From Micro to Macro: Leveraging Microdata to Address Macroeconomic Issues" to be held in person in Bogotá, Colombia, on August 5-6, 2025.

Strengthening Commitment to Data Access and Sharing

- **New self-assessment tool** developed by IMF and other agencies in the context of the G-20 Data Gaps Initiative (DGI)
 - Aligned with UN National Quality Assessment Framework
- Ambition is to help organizations responsible for official statistics to identify strengths and areas for improvement in data access and sharing practices.
- Tool will be presented at the upcoming G-20 DGI Global Conference (South Africa, June 17-19, 2025).



Concluding Remarks



Data is at the core of central banking policymaking.

From anecdotal evidence to real-time, high-frequency, and granular insights.



As a global organization, IMF is enabling innovation.

Through tools like PortWatch, GDP Nowcasting, StatGPT, and the Big Data Center, alongside new data quality standards and AI-readiness.



Data partnerships are key.

Trusted public-private collaboration is essential for secure, effective microdata use.



A call to action.

Build a modern, interoperable, and policy-ready data ecosystem—together.

