Collection of Macro Financial Statistics for Central Banking in Reserve Bank of India – Evolution of Information Acquisition and Management Technology

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Agenda

- Role of the Reserve Bank of India in Statistical System
- Challenges to the Statistical System
- Evolution of Data Collection Processes
- Different Systems for Data Submission
- Data Dissemination
- Initiatives to Improve the Statistical Infrastructure
  - XBRL System
  - Harmonisation of Statistics
  - Automated Data Flow Project
- System Level Benefits
- Way Forward
Statistical System in India – Brief Overview

- Central Statistical Office
- National Sample Survey Organisation
- Ministries and Directorates for specific purpose
- State Governments
- Regulatory Organisations (RBI, SEBI, IRDA etc.)
  - Regulators collect large amount of data for their own use
  - These data are also disseminated to public through publications and website
  - Data exchanged with other government / international agencies for functional and statistical requirements
- RBI disseminates macro-economic statistics, including those compiled by other statistical agencies, as part of “Database on Indian Economy” through website and “Handbook of Statistics on Indian Economy”
Role of the Reserve Bank of India in Statistical System

- Monetary and Financial Statistics
  - Assets and liabilities of banks, Money supply, reserve money, interest rates
- External Sector Statistics
- Financial Sector Stability
- National Accounts Statistics
  - Flow of fund accounts, finances of private corporate business sector, savings and investment estimates of corporate sector
- Surveys
  - Policy related and statistical (external, banking and corporate sectors)
Challenges to the Statistical System

- **Infrastructural Challenges**
  - Increasing data volume, declining staff, need to bring in discipline in timeliness and quality, technological transformation of infrastructure

- **Changing Regulatory Requirements**
  - Undergone considerable changes in response to Basel regulations (Bank for International Settlements) and international initiatives (such as Financial Standard Board)

- **Changing economic, business and technological environment**
  - Bank Branch Locator- a dynamic tool providing information on various aspects of bank branches
  - Includes detailed information like location, type of business on branches of commercial banks.

- **Addressing the Data Gaps**
  - Compliant with the IMF Special Data Dissemination Standard (SDDS)
  - Reports data on 12 core and 13 encouraged financial soundness indicators (FSI) for banks
Evolution of Data Collection Processes

- **Paper Based**
  - In the form of magnetic and other media
    - formats were tied to a particular software or generated by a specific data entry / compilation software
- **Program Bound**
  - Standard file formats (either text or CSV)
    - The banks could generate from their internal systems.
- **Standards Based**
  - Adoption of the XBRL standard.
Hardcopy

Banks → RBI

Softcopy Through Data Entry Software

Banks → RBI
Different Systems for Data Submission

- Online Return Filing System (ORFS)
- Using Magnetic/Optical Media
- Direct Data Upload
- XBRL based Data Submission System
The online validation checks **improve the quality** of information to a large extent.

Resulted in considerable **reduction of the time lag** between the time of data submission by banks and the **time required for data processing** by user departments.
Direct Data Upload

- Enables banks to upload and monitor their data directly into application with proper authentication and validation.
- The reporting entities are provided with a web interface to upload the data.
- The online validation checks indicate the errors which will help them in correcting the data immediately.
- The offline validators provided enable the reporting entities to validate the data at their end before uploading.
- On successful submission, banks will get acknowledgment immediately.
Data Dissemination

- Paper Based Publication

- Publication through the Website
  - Data released in pdf and excel formats

- Dissemination through Data Warehouse
  - Public interface for disseminating the data to the general public - Database on Indian Economy (DBIE)
  - Near real time generation of the major macro-economic / financial data
  - Enables integration of regulatory, supervisory and market data

- SDMX based Report
  - A separate web portal set up based on the SDMX (Statistical Data and Metadata Exchange) standard
Initiatives to Improve the Statistical Infrastructure

1. XBRL Project

2. Harmonisation of Statistics

3. Automated Data Flow
What is XBRL?

- XBRL stands for eXtensible Business Reporting Language (an XML based reporting platform)
- Standard way to communicate business and financial information
- Defined by meta-data set out in ‘taxonomies’ which capture the definition of individual reporting concepts and the relationships between them.
- Standardisation of data elements is achieved by defining taxonomies
- Has provisions for defining the data element, its label, relationship with other elements, validation checks etc.
XBRL – More Than Just Definitions

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97 returns have been developed so far

- Financial accounts of the banks
- Regulatory monitoring like, Cash Reserve Ratio, Statutory Liquidity Ratio, Unclaimed Deposits, Gap, Positions and Balances (GPB), Capital Adequacy (designed as per Basel II guidelines) etc.
- Supervisory monitoring like Off-Site Monitoring and Surveillance System (OSMOS), Fraud Monitoring System

- Facilitates proper communication between the data seeker and data provider
- Enables data quality improvement in terms of consistency of data within a particular return and also with other related returns
- Enables automated data receipt monitoring and follow up with non-responding institutions.
XBRL System at RBI - Architecture

- XBRL site
- Upload
- Validation
- XBRL database (Oracle)
- ETL
- Data warehouse Database (Oracle)
- Oracle Table

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CRILC and CFR

- Central Repository for Information on Large Credits (CRILC) has been set up to collect, store and disseminate credit data with respect to borrowers having aggregate fund-based and non-fund based exposure of ₹50 million and above.
- All commercial banks are required to mandatorily report their credit information w.e.f Sept 2014.
- Non-Banking Finance Companies and Insurance companies are also going to report.
- Same system will be used for reporting CRILC by banks, NBFC & Insurance companies.
- Central Fraud Registry (CFR)- a searchable database to help banks detect instances of fraud by borrowers early on.
- The CFR has been developed on the basis of the returns relate to frauds submitted under the XBRL system.
Harmonisation of Statistics

- The core taxonomy created under XBRL project formed the basis of the harmonisation of statistics project.

- The key step—Agreeing common definitions of the information required across returns owned by different departments of the Reserve Bank.

- The harmonisation project will now strengthen the XBRL system by
  - providing a base for defining all data elements required for XBRL taxonomy
  - deleting existing duplicate/ creating new data elements, as the case may be.
Automated Data Flow

Data Acquisition Layer:
- CBS 1
- CBS 2
- Treasury
- Other Systems

Data Integration & Storage Layer:
- Required calculations/validations are done automatically using this data
- Centralized data Repository for RBI reporting

Data Conversion Layer:
- Data Converter

Data Submission Layer:
- Data Validation
- Messages

Data Validation Layer:
- Centralized data Repository in RBI

Metadata Management
- Data Quality Management
- Security
- Governance

Taxonomy
- Metadata Management
- Data Quality Management
- Security
- Governance
Automated Data Flow

- An initiative taken by the Reserve Bank in order to ensure accurate and consistent flow of data to the Reserve Bank without any manual intervention.
- Mandates all banks to have a Centralised Data Repository (CDR), which forms the reporting database for all filings.
- The common end state is broken down into four distinct logical layers:
  - Data Acquisition: Capture data from various source systems
  - Data Integration & Storage: Extract and integrate the data from source systems with maximum granularity
  - Data Conversion: Converts the data stored in the CDR to the prescribed formats using pre-defined business rules.
  - Data Submission: A Single transmission channel channel which ensures file upload mechanism in a STP mode
System Level Benefits

- Has adopted the best-in-breed solution by advocating the use of XBRL for data submission, and disseminating data from the data warehouse using ETL and BI tools.
- Reduction of dependence on the vendors-use of open source platforms and providing feasible transparency of related information.
- Does not advocate the use of any particular platform for complying with the reporting prescribed.
- The data disseminated through the DBIE are downloadable in different formats like .pdf, .xls, .csv which aids in the easier manipulation of data by the user.
Way Forward

**ADF Server** - Storage of elements

Submission through XBRL system

Storage and report generation

Dissemination to users
Way Forward

- Aiming at bringing all the returns under its XBRL system and disseminating the various related statistics through DBIE.
- Allowing better integration of data from various sources and will give a better picture by performing cross-return analysis.
- Exploring the use of open source data warehousing solutions like Hadoop in related areas such as data quality, big data analytics etc.
References


Questions?

Thank you!