Compiling external sector statistics: challenges and opportunities\textsuperscript{1}

Kaushik Jayaram,

Bank for International Settlements

\textsuperscript{1} This presentation was prepared for the meeting. The views expressed are those of the authors and do not necessarily reflect the views of the BIS, the IFC or the central banks and other institutions represented at the meeting.
Compiling external sector statistics: challenges and opportunities

Kaushik Jayaram
Monetary and Economic Department
Bank for International Settlements

The views expressed in this presentation are those of the speaker and do not necessarily reflect those of the BIS.
Introduction

- In the compilation and analysis of external sector statistics; central banks face three important developments:
  
  - “Micro-data revolution” – to strengthen and complement Macro statistical framework (Tissot, 2016);
  
  - Big data and their relevance to Central Banks (IFC 2016);
  
  - New patterns of financial integration, statistics need to deal with the evolution of globalised financial markets (BOP, IIP…but also national accounts) (Avdjiev et al. 2018).
Outline

1. Sources for compilation of external statistics: traditional vs new datasets

2. Data quality and the challenges of globalisation

3. New data sources and techniques

4. International initiatives: the response of the statistical community

5. Conclusions
Compilation of External Statistics: Traditional vs New sources of data

Traditional datasets are still pre-dominant:

- **Administrative datasets/Registries:**
  - International Merchandise Trade Statistics/Customs data: Customs documents sent to the national statistical office where staff process the documents and compile data.
  - International Transaction Reporting Systems (ITRS): transactions vis-à-vis residents, reported by counterparties (originally, were elements of foreign exchange controls)
  - Other: external public debt, taxation, foreign investment applications.

- **Surveys:** are used to complement administrative data.
Compilation of External Statistics: Traditional versus New Datasets

- Some drawbacks of traditional datasets:
  - **Costly**: ad-hoc registers to collect certain information (i.e., custom data)
  - **Not flexible**: lack of identifiers/legal aspects/technical problems prevented data sharing and combination
  - **Inconsistencies (and reconciliation)**: datasets are not always consistent and need to be statisticians need to take decisions to reconcile them.
  - **Data gaps**: despite the effort, there are data gaps; the evolving nature of globalisation can create additional gaps
Compilation of External Statistics: New Datasets

- **Micro data**: to access granular information covering cross-broader activities;

- **New (reuse) administrative datasets**: to reuse datasets designed for a given purpose for other needs; for instance, regulatory data is used for statistical purposes (credit registers; US regulatory data);

- **Big data techniques**: combining structured and unstructured data to complement traditional external sector data;

- **Private data providers**: Reuters, Bloomberg, provide very good data that it is used every data by market participants to invest. It can be helpful, in particular, to monitor big corporations.

- **Data sharing**: data can be better harnessed and combined in different ways; common identifiers allow exchanging information (eventually, across countries).
Data Quality and the challenges of globalisation: Problems of residence level data

External debt of resident entities is not necessarily the right measure; important to focus on debt on a consolidated level.

Reserves are central bank foreign currency assets—which institutional sectors have the debt?

---

Graph 3: Rising external indebtedness and worsening reserve coverage

- **External indebtedness** (red line)
- **Reserve coverage** (blue line)

**Oil exporters**
- Months: 08 09 10 11 12 13 14 15 16
- % of GDP: 7.5, 10.0, 12.5, 15.0

**Other resource-intensive exporters**
- Months: 08 09 10 11 12 13 14 15 16
- % of GDP: 4.0, 4.4, 4.8

**Other selected countries**
- Months: 08 09 10 11 12 13 14 15 16
- % of GDP: 2.4, 2.8, 3.2, 3.6, 4.0

---

Sources: IMF, World Economic Outlook, April 2017; BIS calculations.
Data quality and measurement: BIS nationality based debt security liabilities

International debt securities\(^1\) amounts outstanding
National vs resident issuers\(^2\), in billions of US dollar, at the end of year

<table>
<thead>
<tr>
<th></th>
<th>China</th>
<th>Brazil</th>
<th>Russia</th>
<th>India</th>
<th>Israel</th>
<th>South Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td>07</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>09</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>11</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>13</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>15</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>17</td>
<td>800</td>
<td>240</td>
<td>240</td>
<td>120</td>
<td>80</td>
<td>60</td>
</tr>
</tbody>
</table>

\(^1\) All issuers and all maturities.  
\(^2\) Nationality basis refers to issuers with headquarters in the selected countries. Residence basis refers to issuers resident in the selected countries.

Sources: Dealogic; Euroclear; Thomson Reuters; Xtrakter Ltd; BIS calculations.

Measures diverge because firms issue bonds using offshore affiliates.
Data Quality and measurement: BIS nationality based debt security liabilities

International debt securities\(^1\) amounts outstanding

National vs resident issuers\(^2\), in billions of US dollar, at the end of year

<table>
<thead>
<tr>
<th>Country</th>
<th>National Issuers</th>
<th>Resident Issuers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azerbaijan</td>
<td>1.6</td>
<td>0.4</td>
</tr>
<tr>
<td>Georgia</td>
<td>3.2</td>
<td>0.8</td>
</tr>
<tr>
<td>Armenia</td>
<td>1.2</td>
<td>0.4</td>
</tr>
</tbody>
</table>

\(^1\) All issuers and all maturities. \(^2\) Nationality basis refers to issuers with headquarters in the selected countries. Residence basis refers to issuers resident in the selected countries.

Sources: Dealogic; Euroclear; Thomson Reuters; Xtrakter Ltd; BIS calculations.
New data sources– Uses of Micro level data

- Micro data offers new opportunities to support macroeconomic analysis and policy decisions
- In bridging gaps in external sector statistics more granular access to information covering cross-border activities:
  - Shadow banking cannot be easily captured under traditional SNA or prudential reporting frameworks;
  - Cross-border dimensions of derivative reporting also need to be strengthened with granular data;
  - Globalisation of supply chains and value creation creates new challenges as does:
  - Residence versus nationality issues
  - Off-balance sheet exposures –derivative transactions data (trade repositories or direct reporting)
New data sources– Big Data

- **What is the potential of big data?** Big data can benefit macroeconomic and financial statistics and ultimately policymaking through at least three features:
  - By answering new questions and producing new indicators
  - By bridging time lags in the availability of official statistics and supporting the timelier forecasting of existing indicators
  - As an innovative data source in the production of official statistics
New data sources—Big Data

- Central Banks are actively exploring the use of big data and its related processing technologies (IFC 2016)
- Big data is characterized by three Vs, high volume, high velocity and high variety, which also adds a fourth V, veracity, the need to separate information from noise
- Big data is not necessarily big, but very granular and varied;
- Human sourced, machine sourced or business process sourced.
  - Data sources (human/households): social media, Internet search/web scraping, travel, tourism;
  - Data sources (business): official, private, e-commerce, credit cards
  - Data Sources (machine): mobile phone and GPS tracking
Big Data technologies in External Sector Statistics

- Ability to combine structured, semi-structured and unstructured information as innovation in official statistics;
- Opportunities to extract economic signals and leading sentiment indicators on a real-time basis;
- Using machine learning and AI techniques to gauge, refine and simulate indicators to predict trends and refine policy signals;
- Some applications:
  - Global financial flows monitoring: using SWIFT message traffic to monitor flow volumes; currency composition and ExIM indicators;
  - Internet based analysis of cross-border e-Commerce trades and tourist flows;
  - real estate price and volume data to estimate FDI flows in real estate sector
Progress on Data Gaps Initiatives (DGI 2) - external sector statistics

- **II.10. International Investment Position**
  - Provide quarterly IIP data including currency breakdown and OFCs

- **II.11. International Banking Statistics**
  - Fully implement the agreed IBS enhancements

- **II.12. Coordinated Portfolio Investment Survey**
  - Reporting of semi-annual CPIS data including sector of holder

- **II.13. Coordinated Direct Investment Survey**
  - Reporting inward and outward data split by equity and debt

- **II.14. Cross-border Exposures of Non-bank Corporations**
  - Provision of IBS and Securities data separately identifying the non-financial corporations sector
  - Reporting of the Standardized Report Form 4SR
DATA GAPS INITIATIVE: LEGAL ENTITIY IDENTIFIER and GLOBAL INTERCONNECTEDNESS

- LEIs can help to define interlinkages between institutions, through asset and liability-side exposures to securities: An example is monitoring large exposures through syndicated loans.
It is possible to link LEIs to other identifiers (ISIN, CUSI, SEDOL, ticker); importance of linking LEIs to administrative IDs. There is ongoing work.

<table>
<thead>
<tr>
<th>Company</th>
<th>CUSIP</th>
<th>ISIN</th>
<th>SEDOL</th>
<th>Legal Entity Identifier</th>
<th>Ticker</th>
<th>Business ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZAGG Inc</td>
<td>98884U108</td>
<td>US98884U1088</td>
<td>B1BYGH6 .</td>
<td></td>
<td>ZAGG</td>
<td></td>
</tr>
<tr>
<td>Zayo Group Holdings Inc</td>
<td>98919V105</td>
<td>US98919V1052</td>
<td>BRJ3H07 .</td>
<td></td>
<td>ZAYO</td>
<td></td>
</tr>
<tr>
<td>Zimmer Biomet Holdings Inc</td>
<td>98956P102</td>
<td>US98956P1021</td>
<td>2783815 2P2YLDVPES3BXQ1FRB91</td>
<td>ZBH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zebra Technologies Corp</td>
<td>989207105</td>
<td>US9892071054</td>
<td>2989356  PO0I32GKZ3HZMMDPZZ08</td>
<td>ZBRA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zendesk Inc</td>
<td>98936J101</td>
<td>US98936J1016</td>
<td>BMH0MR7  549300SLi6BN94BKKO36</td>
<td>ZEN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zillow Group Inc</td>
<td>98954M101</td>
<td>US98954M1018</td>
<td>BVYJBR3 .</td>
<td></td>
<td>ZG</td>
<td></td>
</tr>
<tr>
<td>Zogenix Inc</td>
<td>98978L204</td>
<td>US98978L2043</td>
<td>BYTJZL1  54930089H3HF4C32SK78</td>
<td>ZGNX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zions Bancorp</td>
<td>989701107</td>
<td>US9897011071</td>
<td>2989828  YYQWUR1Z2BCX32HQS333</td>
<td>ZION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intrexon Corp</td>
<td>98973P101</td>
<td>US98973P1012</td>
<td>B0HZZ46 .</td>
<td></td>
<td>ZIOP</td>
<td></td>
</tr>
<tr>
<td>Zynga Inc</td>
<td>98986T108</td>
<td>US98986T1088</td>
<td>B79PX49 .</td>
<td></td>
<td>ZNGA</td>
<td></td>
</tr>
<tr>
<td>Zoetis Inc</td>
<td>98978V103</td>
<td>US98978V1035</td>
<td>B95WG16  549300HD9Q1LOC9KLJ48</td>
<td>ZTS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Additional perspectives

• In some circumstances the old approach, based on the traditional BOP/IIP statistics fail to capture vulnerabilities.

• But there are good datasets able to complement (not supersede) BOP/IIP

• BIS has coordinated efforts to compile the International Banking Statistics; and produces the Debt Securities Statistics

• Importance of data sharing to use “mirror data”;
  ▪ The BIS IBS could be used to complement BOP Statistics;
  ▪ confidentiality constraint may need to be revised to improve data sharing across jurisdictions.
Conclusion

- Measuring external exposures is complex, and to compile external statistics statisticians need to use various inputs (administrative data, and surveys).

- There are challenges, partly as a result of globalization; and also opportunities, due to new datasets and techniques (eg big data).

- Newer techniques are here to stay – innovations are key;

- The statistical community is responding, as shown by the DGI and the datasets compiled as a result.
THANK YOU FOR YOUR ATTENTION
REFERENCES

- Avdjiev, S., M. Everett, P. Lane, and H. Shin, “Tracking the international footprints of global firms”, BIS QR March 2018
- IAG (2017), “Update on the Data Gaps Initiative and the Outcome of the Workshop on Data Sharing”, March