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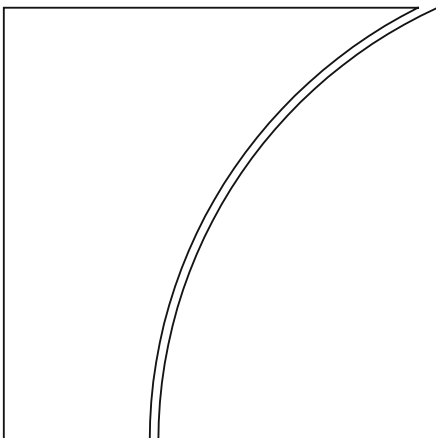
IFC Bulletin

No 48

External Sector Statistics: current issues and new challenges

Proceedings of the IFC-Central Bank of Armenia
Workshop in Dilijan, Armenia, 11-12 June 2018

November 2018



BANK FOR INTERNATIONAL SETTLEMENTS

Contributions in this volume were prepared for the IFC-Central Bank of Armenia Workshop in Dilijan, Armenia, 11-12 June 2018. The views expressed are those of the authors and do not necessarily reflect the views of the IFC, its members, the BIS and the institutions represented at the meeting.

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ISSN 1991-7511 (online)

ISBN 978-92-9259-224-0 (online)

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External Sector Statistics: current issues and new challenges

Overview of the IFC-Central Bank of Armenia Workshop, Dilijan, Armenia, 11–12 June 2018¹

Gagik Aghajanyan, Kaushik Jayaram, Margarit Muradyan and Bruno Tissot²

Introduction

External sector data represent a key element of economic statistics, covering a wide range of topics of interest to statisticians, economists, policymakers and the general public; for instance, to measure the importance of external trade, the role of multinational enterprises (MNEs), the wealth of nations etc. Yet the compilation and use of these data face a number of challenges, such as difficulties in getting information from non-residents, allocating firms' global operations by country, and establishing common statistical concepts and processes across jurisdictions.

The **issues and challenges** associated with external sector statistics are continuously evolving, reflecting ongoing economic developments, new data sources and changing analytical requirements. As regards economic developments, a major trend relates to the globalisation of financial systems and value chains in the production of goods and services. This imposes new requirements for data collection and the measurement/estimation of cross-border activities and financial flows. In regard to new data sources, emerging technologies offer various opportunities to improve data collections in both domestic and external areas. Cases in point include the recent emergence of "big data" sources and associated techniques, the increasing integration of micro- and macro-level data sets and the re-use of administrative data sets for statistical purposes. These developments tap a potentially rich vein of previously unused or underused statistics that can be mobilised to present a more comprehensive picture of a country's international accounts; but they also lead to specific challenges, not least in terms of resources required for handling this new type of information. Lastly, analytical requirements on topics related to external accounts are also evolving. Obviously, the global aspect of the Great Financial Crisis of 2007–09 (GFC) and its spillover across regions have put a premium on the availability of adequate external data to underpin policy analysis by national authorities or

¹ The views expressed here are those of the authors and do not necessarily reflect those of the Bank for International Settlements (BIS), the Central Bank of Armenia (CBA), or the Irving Fisher Committee on Central Bank Statistics (IFC).

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international bodies. Indeed, a significant number of the recommendations of the Data Gaps Initiative (DGI) initiated in response to the GFC and endorsed by the G20 relate to the external sector.³

In view of the importance of the factors mentioned above, the Irving Fisher Committee on Central Bank Statistics (IFC) and the Central Bank of Armenia (CBA) held a joint **workshop on “External Sector Statistics”** in June 2018 in Dilijan, Armenia. This event provided a welcome occasion to revisit the current issues related to external sector statistics and the challenges faced by central bank statisticians in finding appropriate sources, compiling indicators, and making use of them. It was also an opportunity to explore new methodological concepts and techniques and revisit global statistical standards, not least to promote greater harmonisation and cooperation in the international statistical community. The event brought together about 45 statisticians and economists who shared their country’s experiences – all these presentations, as referred to in this overview, are included in this IFC Bulletin.

In his opening remarks, Vakhtang Abrahamyan, Deputy Chairman of the CBA, stressed the importance of external sector statistics for policymakers. This was particularly the case for small open economies like Armenia, given the significant influence of international trade on domestic activity and inflation. More generally, and as noted by Aurel Schubert, Director General of Statistics of the European Central Bank (ECB) and Vice-Chair of the IFC, issues relating to external sector statistics have become a key, recurring theme in international forums since the GFC, reflecting in particular a stronger policy focus on external risks and vulnerabilities.

The discussions were organised along **six thematic sessions**. Session 1 dealt with key issues and challenges in data compilation and discussed various sources and methods used in compiling external statistics. Session 2 focused on quality issues and how different countries deal with data quality improvements, with the presentation of specific use cases. Session 3 explored new data sources and techniques, with a focus on the pros and cons of “big data”. Session 4 highlighted specific measurement problems associated with statistics on balance of payments (BOP)⁴ and international investment positions (IIP), while Sessions 5 and 6 focused, respectively, on global interconnections and on the measurement and analysis of external risks and vulnerabilities. A concluding session summarised the main findings.

1. Sources and methods for the compilation of external sector statistics

The first session, chaired by Robert Kirchner (Deutsche Bundesbank), was devoted to the sources and methods for the compilation of external sector statistics. The first presentation, by the BIS, highlighted some **key issues and challenges of relevance to data compilers** in central banks. It also presented several recommendations to enhance the analysis of the international position of countries. First, central banks statisticians should make a greater use of existing micro-level data sets to complement traditional, macro-level external sector statistics. Second, it was worth

³ See FSB-IMF, “The financial crisis and information gaps”, 2009, for the first phase of the DGI; and IMF and FSB, “The financial crisis and information gaps – sixth implementation progress report of the G20 Data Gaps Initiative”, 2015, for its second phase (2016–20).

⁴ For a description of the BOP statistical framework, see International Monetary Fund, *Balance of Payments and International Investment Position Manual – Sixth Edition (BPM6)*, 2009.

exploring the vast array of “big data” and alternative information sources as well as the powerful emerging technologies that can help to analyse them. Third, one should pay greater attention to the global dimension of financial and non-financial entities and their economic interdependencies, which cross national borders. This third recommendation was key to facilitating the measurement of external exposures, which is a complex exercise and requires various inputs and analyses. For instance, BIS work has emphasised the need to consolidate corporates’ external exposures at the group level,⁵ in turn allowing for a more holistic view of a country’s external position compared with the residency-based approach of the System of National Accounts (SNA) framework.⁶ Certainly, this requires the use of common identifiers, such as the global Legal Entity Identifier (LEI), and adequate parent relationships if the perimeters of global firms are to be identified.⁷

The importance of identifiers was echoed by the Central Bank of Cyprus presentation highlighting the usefulness of **adequate business registers** for the compilation of external sector statistics. The business registers used by the central bank and other stakeholders in Cyprus cover all institutional/legal economic units and are a primary source for the sectoral classification of firms’ activities. They can be mobilised to construct surveys to directly collect financial information from selected business entities involved in external sector activities. Registers can also be used for various other purposes, for instance to distinguish resident and non-resident groups, track MNEs’ activities, and provide granular information on foreign direct investment (FDI), portfolio and other investment flows.⁸ In fact, business registers appear to be in increasing demand in many countries, and there are ongoing initiatives to better link these domestic records to cross-border registers, especially in the European context.⁹

A complementary approach to having comprehensive registers is to rely on selected samples of firms. This was illustrated by the CBA contribution, which highlighted **the use of surveys** as an important source of information for estimating foreign remittances, a key element of the BOP statistics for a small open economy like Armenia’s. Indeed, inward remittances are a major source of foreign exchange, and it is important for the central bank to obtain a full picture – including an estimation of the flows and details on the profile of remittance senders and recipients. Unfortunately, data collected from commercial banks are not sufficient to yield this information. Nor do they account for informal and in-kind remittances, leading to a potentially large underestimation of Armenia’s BOP position. To address these gaps,

⁵ For the specific case of national banking systems, see for instance P McGuire and P Wooldridge, “The BIS consolidated banking statistics: structure, uses and recent enhancements”, *BIS Quarterly Review*, September 2005, pp 73–86. For a more general discussion on nationality-based statistics, see B Tissot, “Globalisation and financial stability risks: is the residency-based approach of the national accounts old-fashioned?”, *BIS Working Papers*, no 587, October 2016.

⁶ See European Commission, International Monetary Fund, Organisation for Economic Cooperation and Development, United Nations and World Bank, *System of National Accounts 2008*, 2009.

⁷ See Legal Entity Identifier Regulatory Oversight Committee, “Collecting data on direct and ultimate parents of legal entities in the Global LEI System – Phase 1”, 10 March 2016.

⁸ The international accounts’ functional categories comprise five items: FDI; portfolio investment (which will generally include investment below the FDI 10% threshold); financial derivatives (other than reserves) and employee stock options; other investment; and reserve assets (2008 SNA, #26.80).

⁹ A noteworthy example is the Euro Groups Register (EGR) pilot project, launched by Eurostat in 2006 for the creation of a European Business Register on MNEs; see ec.europa.eu/eurostat/statistics-explained/index.php/EuroGroups_register.

the CBA has developed specific surveys and is using this information as a complement to administrative data sets and banks' customer reports. These data provide policymakers with a more granular understanding of the flow of external remittances, which would not be otherwise known from the aggregated BOP accounts.

The importance of blending various data sources for BOP compilation was underscored by the Central Bank of Malaysia's presentation of the country's external sector statistics data collection framework. This **integrated framework** provides a unified source for the consolidation of external sector statistics and relies on several administrative data sets and surveys – eg a dedicated IIP survey, reports on cross-border flows, customs records of goods and services. In addition, specific efforts have been undertaken to limit the reporting burden, improve data quality and reduce turnaround time. This framework has proved instrumental in ensuring the dissemination of external statistics to key stakeholders, including policymakers.

2. Data quality issues and improvement initiatives

This session, chaired by Jacek Kocerka, Narodowy Bank Polski (NBP), dealt with data quality issues, which cover several aspects: the consistency, frequency and timeliness of the data collected; the process for deriving final estimates from primary information; errors and omissions; and data revisions. Additional quality challenges reflect ongoing structural changes, such as globalisation, the greater availability of bilateral data, and the need to harmonise data concepts and definitions across countries. Hence, data quality issues touch on a wide array of statistical as well as methodological questions, as highlighted by the four country experiences presented in the session.

A first challenge presented by the NBP relates to the **handling of primary sources of information** to compute BOP statistics, with a particular focus on company records from accounting statements.¹⁰ The related balance sheet and profit and loss information can be very useful to allow companies to report directly from accounting system in accordance with BOP rules. Yet there are several methodological issues, especially as regards the valuation of business entities and the fact that accounting data are not always consistent with the SNA/BOP framework. These difficulties call for careful verification and adequate transformation of primary data into compiled external sector statistics.

A second key challenge analysed by the CBA is due to **errors and omissions**, which have been a perennial issue in BOP statistics. In theory, such errors should not exist in the framework supporting the SNA and BOP statistics, because of their underlying "quadruple-entry bookkeeping" accounting system.¹¹ However, in practice, BOP compilation relies on multiple sources of information and there are important reconciliation issues due to the various errors and omissions across the

¹⁰ See in particular Inter-Agency Group on Economic and Financial Statistics, "Consolidation and corporate groups: an overview of methodological and practical issues", IAG reference document, October 2015.

¹¹ The "quadruple-entry bookkeeping" accounting system underlying the SNA (2008 SNA, #3.112) combines two elements, ie the vertical double-entry bookkeeping principle used in business accounting and the horizontal double-entry bookkeeping convention, which ensures the consistency of relationships between different institutional units; for a presentation, see B Tissot, "Development of financial sectoral accounts: new opportunities and challenges for supporting financial stability analysis", *IFC Working Papers*, no 15, November 2016.

data sets involved. In Armenia, for instance, statistics on remittances, dividend payments and trade invoicing are among the common sources of BOP discrepancies. Significant efforts are under way to address these data quality issues, by enhancing the comprehensiveness of the information collected and by refining estimation techniques, for example through the conduct of ad hoc surveys.

A third challenge is to **access foreign information** to enhance the consistency of external statistics, as emphasised by the Central Bank of Luxembourg. This is particularly important for a small open economy like Luxembourg's, whose financial sector is large, open and diversified. Asymmetries in FDI reporting as well as sizeable errors and omissions are key obstacles when calculating the country's external position. To enhance the consistency of BOP/IIP, a harmonised survey strategy has been developed to monitor stock/flow across sectors. This work has also greatly benefited from the sharing of more granular data with foreign jurisdictions, especially in the context of the data collections put in place by Eurostat and the ECB. The development and use of unique identifiers, such as the global LEI, will also facilitate this task in the medium term.

A last key challenge relates to the **measuring of domestic economic activities of non-residents**, as highlighted by the Bank of Spain presentation focusing on the specific area of real estate. Non-resident real estate investment has increased significantly in Spain, particularly in relation to secondary dwellings in major tourist locations. The provision of accurate data on foreign ownership of domestic real estate was thus a key objective, not least to analyse regional economic developments, monitor fiscal positions and assess external flows (eg imputed rents) and positions (eg value of the stock of properties) so as to enhance the computation of BOP and IIP statistics. To do so, the Bank of Spain is relying on various administrative data sets collected by different public agencies.

3. New data sources and techniques

The third session, chaired by Aurel Schubert, ECB, was devoted to the emerging landscape of new data sources and technologies, ie "big data". The ongoing information revolution offers a lot of promise, with an access to new data sets that can be more extensive in terms of statistical coverage, as well as possibly offering higher quality and greater timeliness. In addition, associated "big data" software and artificial intelligence techniques can provide new and innovative ways to compile and analyse statistics.¹² The four papers presented in this session dealt with these aspects, shedding light on both the new statistical sources and the innovative techniques associated with "big data".

As regards **new "big data" sources**, recent country experiences have shown the usefulness of capturing the very granular information they provide for the compilation of external sector statistics and the analysis of cross-border connections. This was confirmed by the work presented by the CBA on incorporating e-commerce data into BOP statistics. For a small economy like Armenia's, e-commerce – that is, the use of online platforms to buy and sell goods – has grown rapidly and now represents a sizeable share of external trade. But e-commerce can relate to a wide range of transaction types (eg non-resident transactions, small value transactions)

¹² For an overview of central banks' ongoing initiatives in the use of big data techniques, see IFC, "Big data", *IFC Bulletin*, no 44, September 2017.

and involves various countries and payment systems, making it difficult to capture with the existing statistical apparatus. The CBA tried to overcome these problems by using various, complementary sources, including administrative data (eg customs), enterprise surveys and commercial banks' customer and payment records. While these efforts have helped to better capture the associated external flows, which can be quite volatile, the degree of quality of these new sources has proved challenging.

This was echoed by two cases reported by the Central Bank of the United Arab Emirates. The starting point was the recognition that "traditional" main sources for the compilation of BOP data – eg ITRS,¹³ surveys and administrative data sets – have significant limitations in terms of timeliness, identification of transactions, and quality. To address these challenges, the central bank has embarked on the collection of **complementary data at a granular level**, covering two "big data" areas. First, the collection of SWIFT¹⁴ transaction-by-transaction data: each SWIFT message, incoming and outgoing, is captured by the central bank's statistical system and aggregated for BOP compilation as well as for analytical purposes. These new data help in particular to better measure the origin, destination, currency, volume, value and purpose of external transactions. The second "big data" area relates to plastic card transactions, which provide a wealth of information covering the transactions of tourists (both incoming and outgoing), with detailed breakdowns by amount, activity and region.

Another big data source of growing interest to central banks in general, and to the Bank of France in particular, relates to **derivatives transactions**.¹⁵ But this information is difficult to capture for statisticians compiling IIP/BOP aggregates, given the complexity of these data: ie the variety of derivatives contracts (eg equities, interest rates, FX), the geographical distribution of the trades, their organisation (ie whether they are traded over-the-counter (OTC) or in exchanges), their valuation, stocks/flows adjustments etc. However, important efforts have been made since the GFC to improve information on the size and structure of the derivatives market, especially with the data collections led by the BIS in surveying the OTC market¹⁶ and the guidelines developed by the Financial Stability Board (FSB).¹⁷ In the case of France, the reporting framework has been significantly strengthened and provides regular information on derivatives transactions and their associated attributes (eg notional

¹³ A key component of the external data collection framework of many economies is the international transactions reporting system (ITRS), formerly known as foreign exchange record system. The ITRS differs among countries but has many common features described in particular in Chapter 4 of the Balance of Payments and International Investment Position Compilation Guide; see www.imf.org/external/pubs/ft/bop/2014/pdf/BPM6_04F.pdf. For an example of country experience with ITRS, see for instance "International Transactions Reporting System (ITRS): challenges and opportunities to support monetary policies in Indonesia", presented on the occasion of the Regional Seminar for Asian Countries on "Recent Developments in Central Bank Statistics" co-organised by the BIS, Bank Indonesia and the ECB on 20–21 March 2017; see www.bis.org/ifc/events/ifc_ecb_bankindonesia/regsemasiancountr_42.pdf.

¹⁴ The network provided by the Society for Worldwide Interbank Financial Telecommunication (SWIFT) allows financial institutions to share information about financial transactions in a controlled environment. For information on countries' participation in SWIFT, see for instance Committee on Payments and Market Infrastructures (CPMI), "Methodology of the statistics on payments and financial market infrastructures in the CPMI countries (Red Book statistics)", August 2017.

¹⁵ See IFC, "Central banks and trade repositories derivatives data", IFC Report, October 2018.

¹⁶ For an overview of the BIS contribution on the monitoring of the derivatives market, see B Tissot, "Derivatives statistics: the BIS contribution", Invited Paper Session 089, International Statistical Institute World Statistics Congress, 2015.

¹⁷ See for instance FSB, "Implementing OTC Derivative Market Reforms", October 2010.

amounts, counterparties), which have proved useful for the compilation and analysis of external sector statistics.

Apart from the opportunity of collecting new types of information, BOP compilers are also looking at **new IT techniques and systems** in order to process bigger data sets when compiling external sector statistics, as underscored by the Bundesbank presentation. Technological advances allow for a fully integrated system centralising all the relevant data and meta data, with improved stocks/flows integration, real-time updates, and the possibility to “drill down” and look beyond aggregated reports into the most fundamental, micro pieces of information.

On balance, central banks’ experience with “big data” suggest that the increased availability of sophisticated IT software and hardware can be instrumental in both capturing and analysing a more extensive range of external sector statistics, including non-traditional ones. The trend is to develop integrated systems and frameworks to produce harmonised and internationally consistent data. However, it is also important to proceed cautiously in collecting new “big data” sources and implementing innovative IT solutions, using well thought-out use cases. One risk is that this might consume excessive resources in exploring areas that may prove less useful than expected. Another is to pay too much attention to collecting data, and not enough to making use of it – it is very important to separate information from noise.¹⁸

4. Specific IIP/BOP measurement issues

The session, chaired by Bruno Tissot (BIS), was devoted to measurement aspects that are quite specific to the BOP/IIP framework. Indeed, in addition to the issues covered in the other sessions and that relate to general external sector statistics (eg dealing with errors and omissions, data quality and countries’ asymmetries), this framework is quite complex and poses a variety of challenges, some of them country-specific – for instance, for small open economies facing increased globalisation of financial systems and production chains. The presentations in this session focused on four particular topics in this regard, namely the measuring of financial intermediation services, the identification of FDI, “pass-through” activities and round-tripping transactions.

As regards the first issue, the challenges posed by **the measurement of financial intermediation services** were illustrated by a CBA presentation of Armenia’s external accounts. The main data sources include reports on financial institutions’ balance sheets, loan statistics, and the BIS international banking statistics¹⁹ (used for service import estimations). Given that Armenia is a highly dollarised economy, with the US dollar representing around two thirds of the foreign currency liabilities of the financial system, the estimation of intermediation services requires an appropriate external reference interest rate to be selected, as well as the collection of data on private sector’s external liabilities, and the integration of all this varied information into a consolidated, comprehensive framework.

¹⁸ For the need to “connect and not just collect the dots”, see for instance A Carstens, “Are post-crisis statistical initiatives completed? Taking stock”, Opening remarks at the Ninth IFC Conference, Basel, 30 August 2018.

¹⁹ For an overview presentation, see BIS, “Introduction to BIS statistics”, *BIS Quarterly Review*, September, 2015, as well as the data available on www.bis.org/statistics/about_banking_stats.htm.

The second issue, ie **FDI²⁰ measurement**, was highlighted by the Bank of Italy's presentation of imputation techniques used to determine the nationality of foreign shareholders in Italian firms. The problem is that this information, required to estimate the FDI component of the Italian BOP and IIP positions, is missing in the administrative data sets available. A machine learning algorithm has therefore been developed to match the names of foreign firms collected from a large data base of foreign and domestic names, and in turn to automatically establish a clear distinction between foreign and domestic firms when compiling BOP/IIP statistics.

The estimation of "**pass-through activities**"²¹ in FDI statistics is another significant issue. In the case of Finland, such activities reflect the fact that substantial FDI inward funds (recorded as the country's liabilities) are passed through Finnish enterprises and transformed into FDI outward funds (recorded as assets). It is thus important to distinguish these different types of flow, which is currently done by (i) calculating FDI according to the directional principle and (ii) isolating pass-through entities as special purpose entities (SPEs).²² The method presented by the Bank of Finland allows for pass-through flows to be calculated using weights to estimate FDI liabilities against FDI assets at a granular level; in turn, the data can be aggregated across enterprises and groups to arrive at country estimates, without requiring additional data collections.

The last issue highlighted by the National Bank of Ukraine presentation relates to the estimation of **round-tripping transactions**.²³ Round-tripping reflects the fact that entities can move funds in and out of the economy for a variety of reasons, including tax optimisation, exchange rate hedging, operational aspects etc. This can result in erroneous BOP/IIP estimates, especially as regards estimates of FDI flows, as many and various entities can be involved in the chain of related transactions. Estimates of round-tripping are captured through a variety of sources including the country's trade reports (ITRS), surveys to determine the ownership structures of enterprises, and sectoral analyses. The results can vary significantly both across financial instruments and over the years.

5. Global interconnections

This session, chaired by Mher Barseghyan (CBA), was devoted to the impact of global interconnections for external sector statistics and presented a number of recommendations for statistical compilers in order to address the associated challenges. From this perspective, the three papers presented emphasised the need

²⁰ See OECD Benchmark Definition on FDI, fourth edition (OECD (2008)).

²¹ See 2008 SNA Chapter 21, especially #21.41: "Pass through funds' or 'funds in transit' are funds that pass through an enterprise resident in one economy to an affiliate in another economy, so that the funds do not stay in the economy of the affiliate. These funds are often associated with direct investment".

²² See 2008 SNA Chapter 4, especially #4.55-6: "There is no common definition of an SPE but some of the following characteristics may apply (...). Such units often have no employees and no non-financial assets. They may have little physical presence (etc.)".

²³ Round-tripping is a business practice consisting of selling an asset with an agreement to buy it back later on. In the case of FDI, round-tripping often relates to domestic funds channelled through offshore centres back to the local economy in the form of direct investment; for a recent analysis, see D Aykut, A Sanghi and G Kosmidou, "What to Do When Foreign Direct Investment Is Not Direct or Foreign – FDI Round Tripping", *World Bank Policy Research Working Paper*, no 8046, April 2017.

to (i) have a comprehensive statistical framework covering the external sector; (ii) make use of so-called mirror data; and (iii) monitor large global groups at the entity level.

As regards first the **need for a comprehensive statistical framework**, a telling example has been the ECB road map developed for the euro area external statistics since the establishment of the monetary union in the late 1990s. This project went through several phases, with the production, over time, of bilateral data, monthly BOP, detailed breakdown of counterpart trading partners by geography, sectors and instruments and, later, breakdown into stocks and flows as well as by trade and services. Despite this significant progress, there are still several areas for potential improvement for European statisticians, such as linking micro and macro data sets, measuring cross-border inter-linkages, and assessing the associated risk exposures and vulnerabilities. To this end, the ECB has defined a medium-term strategy focusing on the development, production and dissemination of external sector statistics. Development involves providing fit-for-purpose data, with long series, comprehensive coverage, and granular breakdowns. Production relates to the treatment of information asymmetries and better-quality data in terms of timeliness and consistency. Finally, dissemination of comprehensive data is key to supporting analysis by policymakers and other users.

A second lesson in order to address the statistical issues posed by global interconnectedness is to reconcile the positions between a country's BOP/IIP account and its mirror image in the Rest of the World (ROW) account.²⁴ The **use of mirror statistics** to reconcile differences between countries' reports has been facilitated in recent years with increased international cooperation and greater harmonisation in statistical reporting, not only in the European region but also more globally. Yet, as highlighted by the Bank of Portugal experience, there are many difficulties when reconciling these two approaches. While some of the differences arise due to the "traditional" quality issues of errors and omissions in external accounts (see Section 2 above), there are also more fundamental issues. Structurally, the BOP/IIP accounts are balanced as mirror accounts with the ROW, with assets on one side being liabilities on the other and vice versa. However, due to methodological differences in accounting treatment, these items may not always balance. One example is that monetary gold is recorded as an asset of the central bank in the IIP, while it is not recorded as a liability in the ROW account vis-à-vis the central bank.²⁵ Another is that financial derivatives are recorded on gross basis on the IIP side while they are counted on a net basis on the ROW account. And there are various definitional issues and errors that lead to discrepancies when calculating net lending/net borrowing of the ROW (mirror of BOP) and the net worth of the ROW (mirror of IIP). One way to deal with these difficulties is to set up a comprehensive data compilation framework, introduce more granularity in the estimates, and incorporate the ROW perspective of the country's external accounts when compiling the BOP.

²⁴ The account showing the stock levels of assets and liabilities originating in the total economy held by non-residents and of foreign assets and liabilities held by residents, called the IIP in BPM6, is drawn up from the point of view of residents whereas in the SNA it is drawn up from the point of view of the ROW (2008 SNA, #13.2).

²⁵ Monetary gold is gold to which the monetary authorities have title and is held as a reserve asset: it comprises gold bullion, which can be a financial asset only for the central bank or central government (2008 SNA, #11.45).

A third recommendation is to better assess the **activities of individual global groups**. This was highlighted by the presentation of a joint project by the Bank of France and Deutsche Bundesbank to measure intra-group flows of complex MNEs operating in France and Germany. The cooperation involved regular meetings and exchanges of information between the external statistics divisions of the two institutions. The aim was to better understand how MNEs' global supply chains span over various countries, with the associated cross-border flows of goods and services, the transfer of claims between headquarters and affiliates, as well as internal pricing mechanisms. From this perspective, the project has been successful in streamlining statistical reporting as well as in harmonising the conceptual treatment across borders. At the same time, its costs in terms of resources and institutional arrangements have been significant.

6. Measurement and analysis of external risks

The last session, chaired by Gagik Aghajanyan, CBA, dealt with the measurement and analysis of external vulnerabilities. A key objective supporting the compilation of external sector statistics is to provide policymakers with high-quality and timely data on the risks associated with external flows so that they can formulate effective policy responses. This was of particular importance for small open economies, which are for instance very vulnerable to adverse changes in external financial conditions. The range of risks potentially associated with the external sector can be quite large.

A first type of risk relates to the **influence of external conditions** on the domestic economy. As highlighted by the NBP's presentation, it is important to identify such potential vulnerabilities with sufficient granularity. For instance, the impact of external macroeconomic and financial conditions can vary depending on the sectors considered in the domestic economy. Using a probability of default model for a panel of non-financial firms in Poland, the study found that the risk of bankruptcy due to stress in system-wide financial conditions was higher for small and medium-sized enterprises, especially in the services sector, while export-oriented firms with a stronger financial position performed better. Another example was that the larger enterprises in the IT, communication and mining sectors would be more at risk in case of an external demand shock.

A second source of external vulnerabilities is the **impact of foreign capital flows** on the domestic economy.²⁶ As emphasised by the Central Bank of Chile's presentation, accurate measurement of FDI flows is particularly important when assessing external vulnerabilities in a globalised economy. This puts a premium on the availability of high-quality and timely data to support policy decisions. Yet the experience of an open economy such as Chile's is that the measurement of FDI is uncertain especially when dealing with MNEs, given the cross-border nature of their operations and financing (see Section 5 above). In particular, these multinationals use diverse channels and vehicles to transfer funds across countries. To better capture these aspects and measure both FDI flows entering into the country and outward investments made by Chilean nationals, the central bank carries out an annual survey of FDI. The advantage of this survey is to be able to "zoom in" in specific sectors where the influence of FDI is important. This granular information is further validated with

²⁶ For a general discussion on these statistical issues related to global capital flows, see "Assessing international capital flows after the crisis", *IFC Bulletin*, no 42, February 2017.

other sources, such as administrative records, companies' financial statements and regional economic information.

A third source of external vulnerabilities relates to the **foreign exposures taken by domestic entities**. BIS data have highlighted the increased importance of the international global bond market in providing funding to emerging economies – the so-called second phase of global liquidity, following the initial phase during which most cross-border funding took the form of bank loans.²⁷ To capture this phenomenon, the BIS statistics provide two important sources of information. First, the global liquidity indicators (GLIs),²⁸ which give an overview of the ease of financing in global markets and of the size of total foreign credit (ie including bank lending and debt financing) to specific economies. Second, the BIS statistics measuring the global issuance of international debt securities,²⁹ which are defined as securities issued in a market that is not located in the jurisdiction where the issuer resides. These international securities are distinguished from securities issued in the domestic market, using four criteria: the currency of issuance, the location of the security's primary market, the location of its secondary market, and the law governing the issue. The data offer an opportunity to assess the risks associated with countries' external debt in a granular way, providing in particular useful information on its currency breakdown and maturity, in turn highlighting potential solvency/liquidity issues. In addition, BIS debt issuance statistics are available on both a residency and a nationality basis. The first concept is in line with the BOP framework, while the second provides information on the debt exposure of domestic groups associated with their direct issuance in global markets as well as by the indirect issuance of their (non-resident) affiliates located outside the country, especially in offshore centres.

Conclusion

The workshop concluded with a panel discussion which highlighted several lessons. First, the compilation of external sector statistics can greatly **benefit from the use of micro data sets** – eg administrative data sets, registers, surveys, big data sources – to complement traditional macro-level statistics. Indeed, micro data provide a wealth of granular information on external accounts and offer new opportunities to support macroeconomic analysis and policy in this area.³⁰

Second, **new "big data" statistics and analysis techniques** are important developments, on which the central banks should keep a close watch. Central bank statisticians have also to be mindful of the implications of the growth of crypto assets and digital currencies³¹ from this perspective. Big data and machine learning techniques should be explored, not only to work on the "internet of things" and the

²⁷ See H S Shin, "The second phase of global liquidity and its impact on emerging economies", keynote address at Federal Reserve Bank of San Francisco Asia Economic Policy Conference, November 2013.

²⁸ See also the BIS statistics on GLIs at www.bis.org/statistics/about_gli_stats.htm.

²⁹ See BIS debt securities statistics available at www.bis.org/statistics/about_securities_stats.htm.

³⁰ For a general discussion on the integration of micro and macro data, see IFC, "Combining micro and macro statistical data for financial stability analysis", *IFC Bulletin*, no 41, May 2016.

³¹ See "Cryptocurrencies: looking beyond the hype", *BIS Annual Economic Report*, Chapter V, 2018.

related unstructured data sets, but also on more “traditional” large and complex structured data sets.

Third, there is an urgent need to **address information asymmetries** in external sector statistics and to improve data quality. This puts a premium on the expansion of common identifiers such as the LEI and on using mirror data to validate domestic records, fill the gaps in the related data sets and reconcile differences in BOP and IIP reports. To improve data quality, enterprises and statisticians need to work together to better understand the different concepts of bookkeeping and statistics and to overcome conceptual and practical problems.

Fourth, specific efforts should be made to better **assess the impact of globalisation**, in particular the role played by MNEs and global value chains. Ongoing BIS work in developing nationality-based statistics to complement traditional residency-based frameworks was a key contribution from this perspective.³²

Lastly, the various challenges faced by those compiling and using external sector statistics call for **greater international cooperation and data exchanges**, especially among central banks. This indeed underscores the role that bodies such as the IFC can play in focusing the attention of the international statistical community. Further efforts should be also made to promote data-sharing,³³ both nationally and internationally, in line with the DGI recommendations.

³² See B Tissot (October 2016), op cit.

³³ See IFC, “The sharing of micro data – a central bank perspective”, December 2016.

IFC - Central Bank of Armenia Workshop on "*External Sector Statistics*"

Dilijan, Armenia, 11-12 June 2018

Compiling external sector statistics: challenges and opportunities¹

Kaushik Jayaram,

Bank for International Settlements

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.



BANK FOR INTERNATIONAL SETTLEMENTS

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 (ie 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).



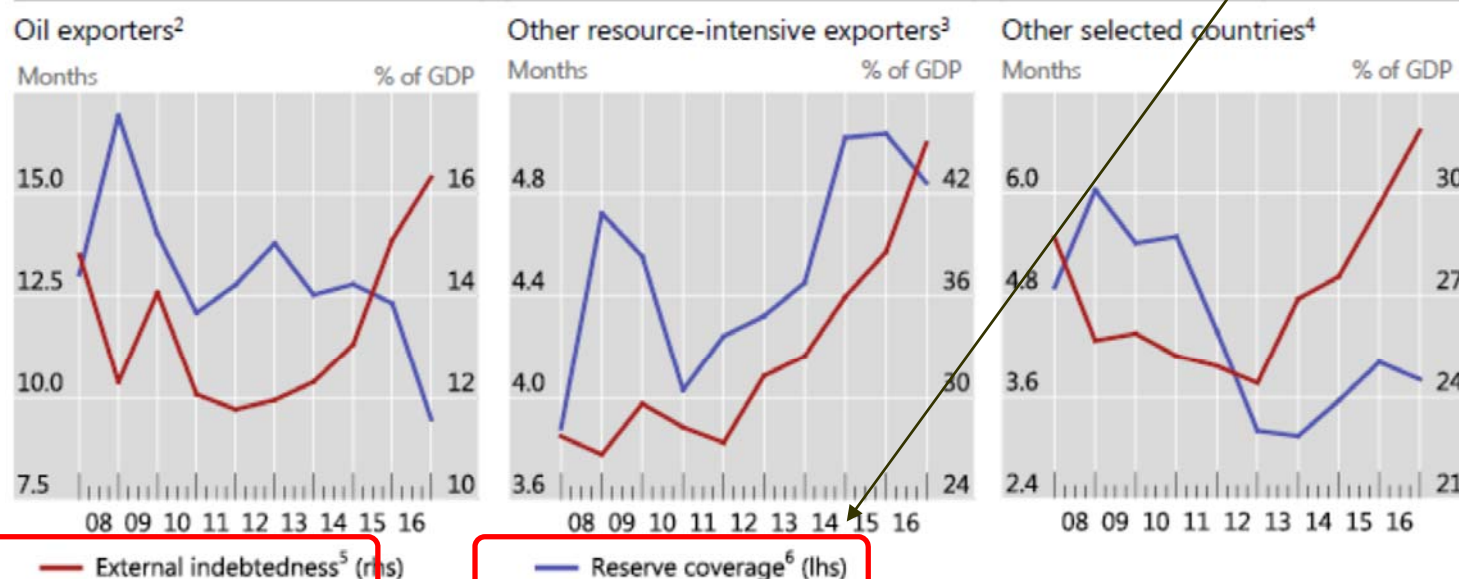
Data Quality and the challenges of globalisation: Problems of residence level data

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?

Rising external indebtedness and worsening reserve coverage¹

Graph 3



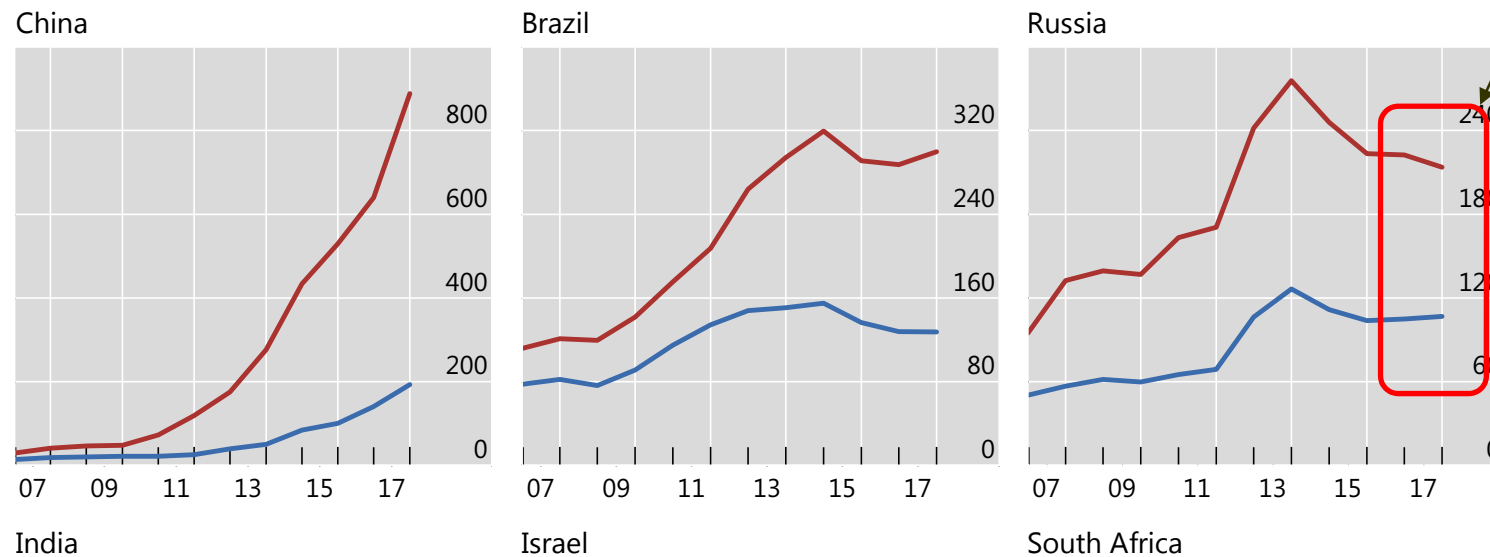
¹ Weighted averages across listed countries based on rolling GDP and PPP exchange rates. ² Algeria, Angola, Cameroon, Chad, Republic of Congo, Equatorial Guinea, Gabon, Nigeria and Sudan. ³ Resource-intensive non-oil exporters: Botswana, Burkina Faso, Central African Republic, Democratic Republic of the Congo, Ghana, Guinea, Liberia, Mali, Namibia, Niger, Sierra Leone, South Africa, Tanzania and Zambia. ⁴ Other 27 economies. ⁵ Total external debt in percent of GDP. ⁶ Calculated as reserves in months of next year's imports.

Sources: IMF, *World Economic Outlook*, April 2017; BIS calculations.

Data quality and measurement : BIS nationality based debt security liabilities

International debt securities¹ amounts outstanding

National vs resident issuers², in billions of US dollar, at the end of year



Measures
diverge because
firms issue
bonds using
offshore affiliates

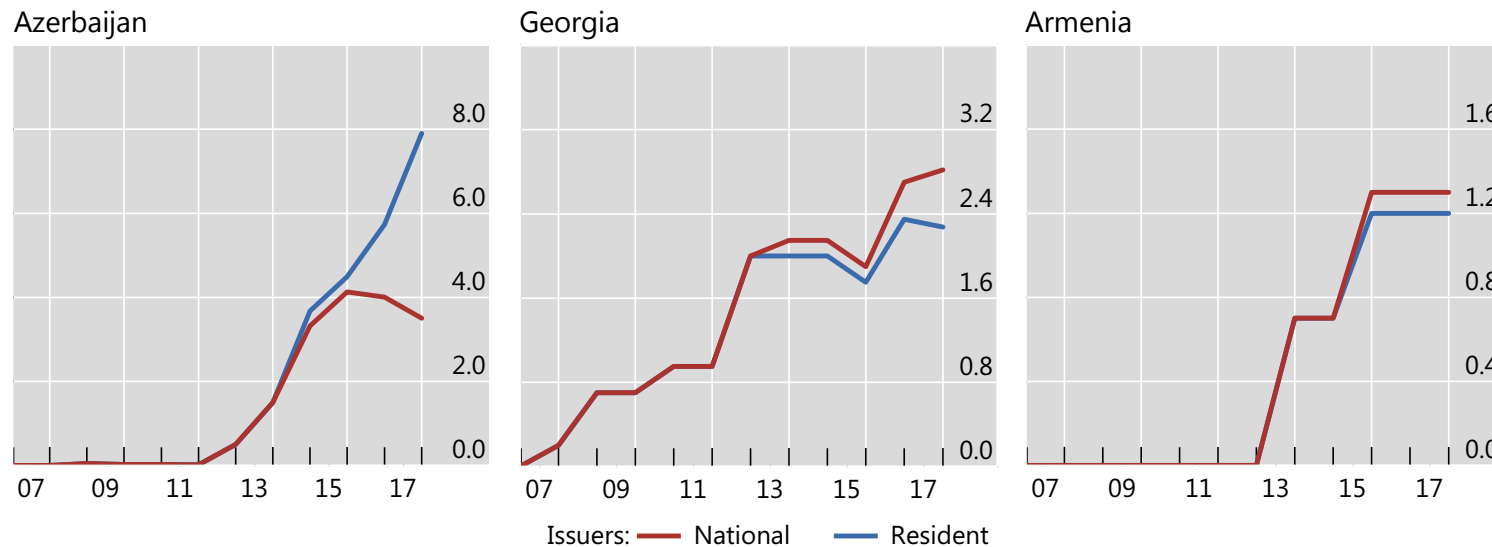
¹ All issuers and all maturities. ² Nationality basis refers to issuers with headquarters in the selected countries. Residence basis refers to issuers resident in the selected countries.

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

Data Quality and measurement: BIS nationality based debt security liabilities

International debt securities¹ amounts outstanding

National vs resident issuers², in billions of US dollar, at the end of year



Not an issue in
Armenia, or
neighbor
countries (at
least to date)

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

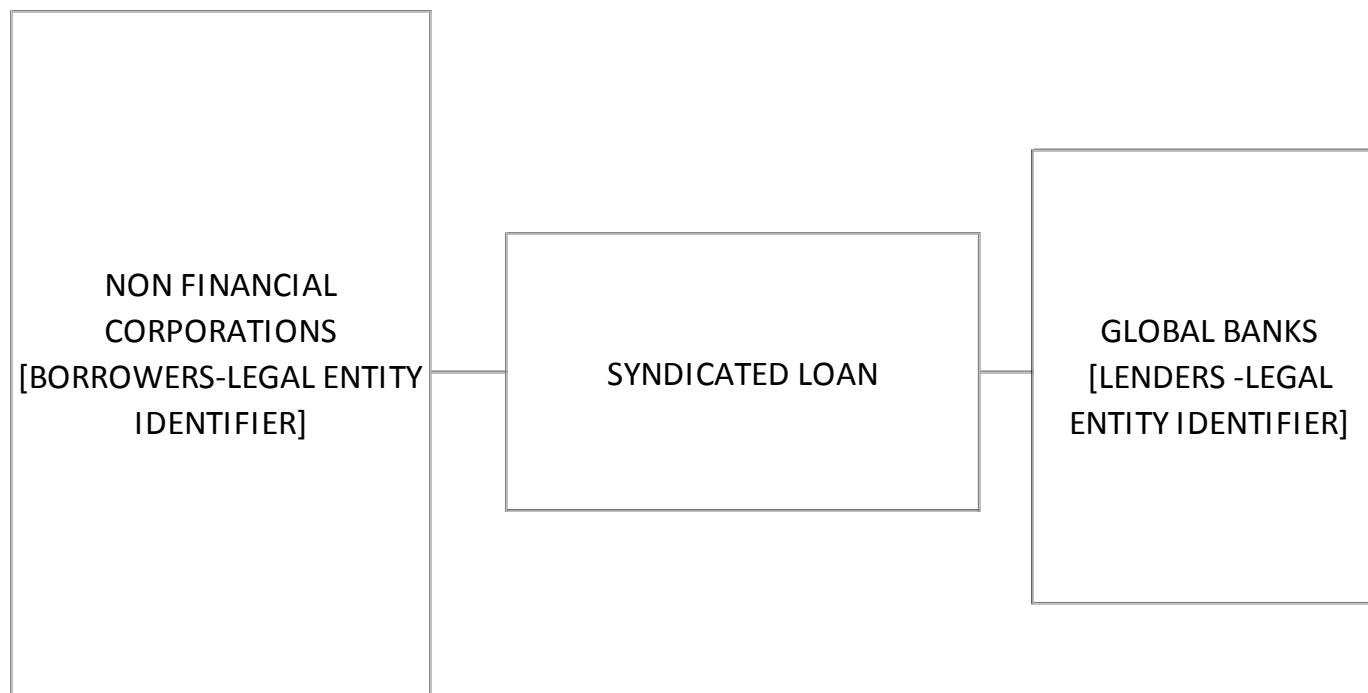
- Ability to combine structured, semi-structured and unstructured information as innovation in official statistics;
- Opportunities to extract economic signals and leading sentiment indicators on a real-time basis;
- Using machine learning and AI techniques to gauge, refine and simulate indicators to 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 ENTITY 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.**



LEGAL ENTITIY IDENTIFIER (LEI) and BUSINESS ID

- It is possible to link LEIs to other identifiers (ISIN, CUSI, SEDOL, ticker); importance of linking LEIs to administrative IDs. There is ongoing work.

Company	CUSIP	ISIN	SEDOL	Legal Entity Identifier	Ticker	Business ID
Zillow Group Inc	98954M200	US98954M2008	BYXJF62	.	Z	
ZAGG Inc	98884U108	US98884U1088	B1BYGH6	.	ZAGG	
Zayo Group Holdings Inc	98919V105	US98919V1052	BRJ3H07	.	ZAYO	
Zimmer Biomet Holdings Inc	98956P102	US98956P1021	2783815	2P2YLDVPES3BXQ1FRB91	ZBH	
Zebra Technologies Corp	989207105	US9892071054	2989356	PO0I32GKZ3HZMMDPZZ08	ZBRA	
Zendesk Inc	98936J101	US98936J1016	BMH0MR7	549300SLI6BN94BKKO36	ZEN	
Zillow Group Inc	98954M101	US98954M1018	BVYJBR3	.	ZG	
Zogenix Inc	98978L204	US98978L2043	BYTJZL1	54930089H3HF4C32SK78	ZGNX	
Zions Bancorp	989701107	US9897011071	2989828	YYQWUR1Z2BCX32HQS333	ZION	
Intrexon Corp	98973P101	US98973P1012	B0HZZ46	.	ZIOP	
Zynga Inc	98986T108	US98986T1088	B79PX49	.	ZNGA	
Zoetis Inc	98978V103	US98978V1035	B95WG16	549300HD9Q1LOC9KLJ48	ZTS	

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.

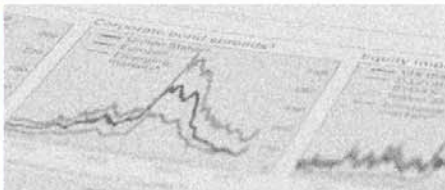
Conclusion

- 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.



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THANK YOU FOR YOUR ATTENTION



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IFC - Central Bank of Armenia Workshop on *"External Sector Statistics"*

Dilijan, Armenia, 11-12 June 2018

Business registers as a source for the compilation of External Sector Statistics¹

Alexia Vassiades,
Central Bank of Cyprus

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.



11 June 2018

Business Registers

As a source for the compilation of External Statistics Sector

Alexia Vassiades

Central Bank of Cyprus

External, Economic & Government Finance Statistics



- Need for a Business Register (BR)
- Objectives of a BR
- Usefulness for the users
- Contents of BR
- Data sources
- Enhancements



- Use by all departments/divisions of CBC
- Consistency of definitions/methodology/classifications
- Sample selection
- SPE identification
- Fulfilment of statistical obligations



Multi-purpose register:

- Quality
- Completeness
- Reliability
- Reduction of production costs
- Samples Selection
- Grossing up



User usefulness

INTERNAL:

- CBC departments

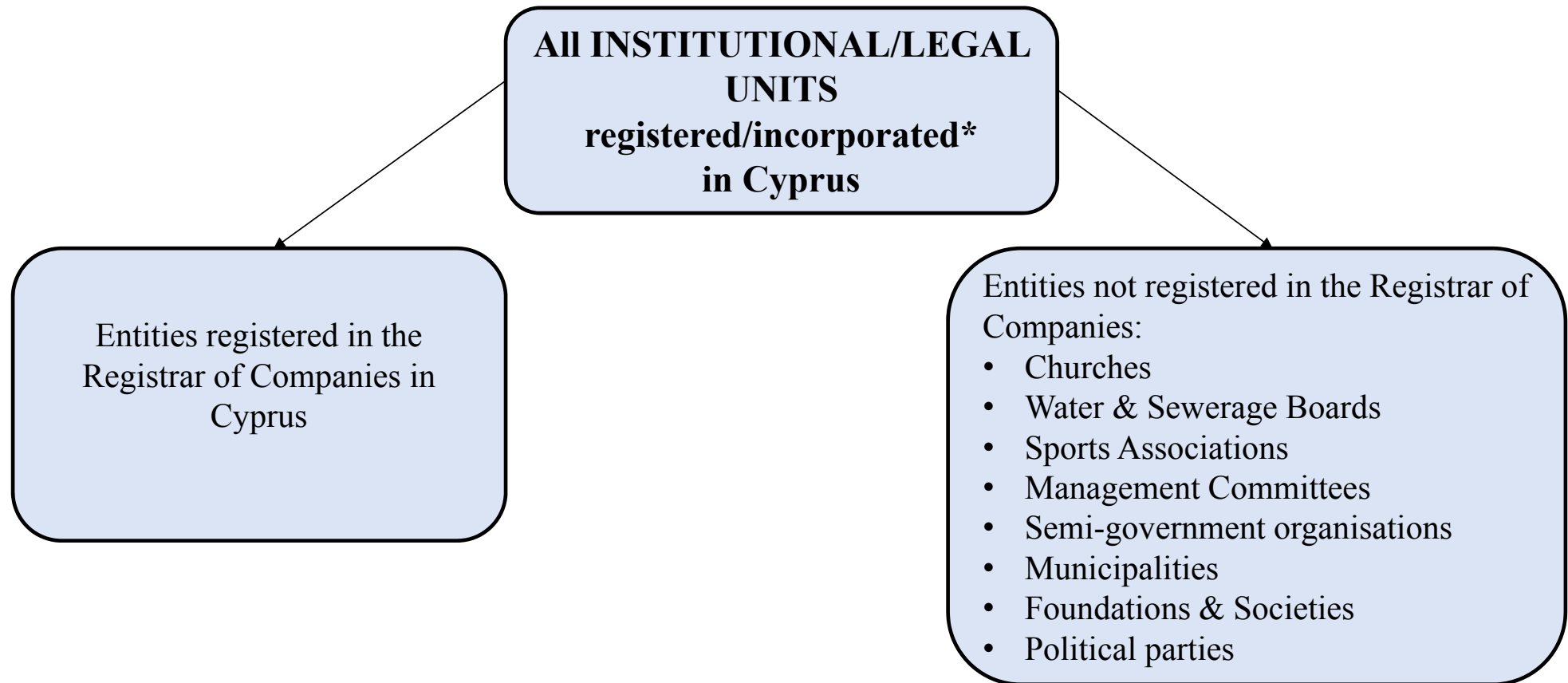
EXTERNAL:

- Statistical Service of Cyprus (CyStat)
- Reporting agents i.e. MFIs
- Government/Administrative Departments
- Researchers/analysts



- **Quality** – improve the efficiency of the statistical information, regular maintenance & ongoing updating
- **Completeness** - coverage of all institutional/legal units in the economy; measurement of the national economic activity
- **Reliability/Authority** – primary source of business population and demography; set up of the sampling frame, correct sectoral classification of units

- Source of information for **statistical/economic analysis** of the business population and its demography;
- Tool for the **preparation and co-ordination** of surveys;
- **Identification and construction** of institutional/legal units;
- Establishment of **links with governmental/administrative sources (confidentiality clause)**



*It also includes International organisations and non-residents engaged in FDI relationship with residents

➤ Identification characteristics	Name (current & previous)
	Registration no. (if applicable)
	Address
	Code/No. VAT /SS /TIC/LEI/RIAD/Other
➤ Demographic information	Country of residence
	Date of commencement/cessation
➤ Operational Status	SPE classification
	Artificial subsidiary
	Branch/ Head office
➤ Economic information	Economic activity (NACE)
	ESA sector
	Legal form
➤ Information on control/ownership	Name of legal unit
	% of holding
	Type of control

Sources of information/updates



Primary :

- CyStat
- Government/Administrative Departments



Supplementary:

- Statistical Register Information (SRI) Survey
- Other Surveys conducted by the CBC
- Audited Financial Statements & Legal documents
- Other Databases & Registers

PRIMARY

- All enterprises registered in Cyprus (active & inactive), irrespective of their size $\approx 478k$
 - *Statistical Service of Cyprus – synergies for the creation of common/consistent BR*
 - *Government/administrative departments:*
 - *Registrar of Companies*
 - *Tax Department, VAT Service, Social Insurance Services*
 - *Department of Land & Surveys*
 - *Deputy Ministry of Shipping*
 - *Cyprus Securities & Exchange Commission*
 - *Embassies of Cyprus abroad/ Foreign embassies in Cyprus*

➡ Aim for high Coverage, Completeness & Consistency

SUPPLEMENTARY

- From various databases and registers; *SHS, CSDB, AnaCredit, RIAD, FDI network, IHS Fairplay, etc.*
- Investigations through:
 - *Statistical Register Information (SRI) Survey*
 - *Other Surveys conducted by the CBC*
 - *Audited financial statements*
 - *Articles of Association*
 - *Cyprus Stock Exchange information*
 - *Internet information (ie. websites)*
 - *Direct Contacts with entity representatives*
- If multiple sources, choose the most reliable for each variable



Aim for high quality and reliable data

THE WAY FORWARD

- Incorporation of the *shareholding structure/group of resident entities* for the purposes of FDI, Portfolio, Other Investment Statistics & Activities of MNEs
- Incorporation of more financial data (ie. profits, turnover, total assets)
- Links with other Registers (CY & abroad)
 - AnaCredit
 - Eurogroup Register



Thank you!

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IFC - Central Bank of Armenia Workshop on *"External Sector Statistics"*

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Surveys as an important source of information for external sector statistics in Central Banks: the case of Armenia¹

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¹ This paper 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.

Surveys as an important source of information for external sector statistics in Central Banks: the case of Armenia

Diana Afyan

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Abstract

This paper presents a general description of the use of surveys by the Central Bank of Armenia (CBA) to compile external sector statistics. Central Bank usually collects financial sector primary data by reporting system, but data for corporations and households is either collected by National Statistical Service or by sample surveys. By doing surveys, Central Bank could acquire some specific information needed to improve data for external sector statistics what is not available from administrative records. Survey among others is classified as an important tool to gather information and it is acknowledged that surveys have supported economist to assess not only the numbers but also the behavior driven behind that numbers.

CBA has several surveys in this field: Survey of Money Transfers from Abroad, Seasonal Workers Survey, Survey of Workers' Remittances, cross checking surveys. As there are some errors and biases in the survey's results that make some puzzles of economic condition, CBA consistently and periodically reviews the surveys methodology and technical parts to minimize the errors and face the challenges, particularly in the quality of the survey and their optimum utilization.

The aim of this paper is to analyze the benefits of conducting surveys in order to get valuable information to improve external statistics and formulate policy decision. This paper discusses and analyzes the use and the organizing processes of surveys undertaken by CBA, the weaknesses and challenges that it faces.

The organization of the paper is as the following. The first section explains statistics collection process through surveys, including the definition of the surveys made by CBA and its role. Part two describes the surveys based on the theory and local methodologies. Section three gives an overview of the issues, errors and bias in the surveys conducted by CBA. The final part discusses conclusion of the paper.

Keywords: sample surveys, survey methodology, balance of payment, external sector statistics, remittances, money transfers

JEL classification: C10, C18, C82, C83, D10, D31, E58, F22, F24, I30, R23

Contents

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External sector statistics surveys conducted by the Central Bank of Armenia	6
General Methodological issues, errors and bias in surveys.....	8
Conclusions.....	9
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Introduction

Central Bank of Armenia (CBA) with the objective of maintaining price and financial stability has core functions in monetary, financial stability and payment system. Notwithstanding CBA has acquired primary data from reporting, it is insufficient to understand the real state of economy, the factors behind the numbers, and the behavior of economic agents.

When implementing a statistical compilation system, decisions have to be made about some of its specific features: type of data to collect (administrative vs. statistical data), the level of detail (aggregated vs. transaction-by-transaction), type of information (both stocks and flows vs. deriving flows from stocks or vice versa), collection method (census vs. sample survey) and reporting channel (indirect vs. direct reporting). In general, administrative data has low costs and allows the reuse of an existing dataset – either as a direct input for statistics or as a tool for data quality control. However, for the compiler, possible drawbacks may exist in terms of its coverage (targeted population), timeliness, frequency and lack of harmonization with existing statistical classifications and definitions. On the contrary, data collected specifically for a given statistical purpose will ensure adequate coverage and frequency, as well as compliance with statistical methodologies and concepts, but will imply a limited use of the data and potentially larger data collection costs. For respondents, the use of administrative data lowers their response burden and avoids the need to be aware of statistical methodologies and concepts.

Definitions and an overview of the use of the surveys done by Central bank of Armenia

Central Banks usually collect primary data by reporting system: Central Bank of Armenia is the only institution compiling monetary and financial statistics in Armenia. It is responsible for collecting, finalizing, and promulgating monetary and financial statistics. CBA's Statistics Department directly receives the data from financial institutions operating in the country (including banks, credit organizations, insurance and investment companies, stock exchange, etc.). From 2011 to present CBA is also responsible for the BoP compilation; from mid-1990s to 2011 it was made by the National Statistical Service (NSS), BPM6 methodology implemented from 2011.

Data for corporations and households is either collected by National Statistical Service (NSS) or by sample surveys. It is acknowledged that surveys has supported economist to assess the real path of economy growth and inflation to support policy decision making process, so CBA needs to conduct

surveys, particularly in corporations and households not only for external statistics but also to support policy making decision process. Since 2003 CBA has done up to 15 types of surveys.

Survey is a way to obtain information regarding future condition, including the behavior and the expectation of market. By knowing this information and data, central bank could track its objective achievement, establish more appropriate policy adjustment, and acquire some specific information needed since data movement in reporting system does not reflect the behavior driven behind the number. Moreover, flexible information needed could be tailor-made by central bank by conducting surveys to dig up deep information of preferences, reaction, reason, planning, and other forward looking actions of specific situation. Surveys are the tools to track economic trend and other indicators.

It is undeniable that there are some advantages and disadvantages of different ways in conducting the surveys. Yet, there is no such the best way that fit to every survey. Surveyors should tailor the ways of survey based on their need in terms of the objective, respondent sampling, information collected, time, and budget constraint. Sometimes there is a trade-off between the cost and the quality. For example, the written survey by mail is easier and less costly, yet it usually has low response and is difficult to communicate the missing part.

The main pros of face to face surveys are that the surveyor could achieve a 100% response rate of the questions, decide on follow up question and hear far more than just what the interviewee tells. Cons for the face to face surveys are that this kind of surveys require considerable training, are time consuming and costly to conduct and unless strictly controlled, interviews can easily meander from the main subject.

International experience shows that there are very few central banks that are not involved at all in the collection of external sector Statistics (Argentina, Canada, Hong Kong, Norway and Australia) and some are only involved to a limited extent (Denmark, Finland, Iceland, India, Italy, Turkey and the United States). More than two-thirds of the central banks are either responsible for the full BOP and IIP statistics or at least for the financial accounts of the BOP and the IIP (including external debt). In terms of collection techniques used, ITRS or a variant of this method is used by the central bank in India, Israel, Latvia, Luxembourg, Macedonia, the Philippines, Portugal, Russia, Slovakia, Spain, and Thailand. Even in these countries, balance sheet data from banks or financial institutions are typically collected through a regular census or cut-off the tail reporting. Surveys are used to collect information on travel or tourism (Estonia, Germany, Greece, Italy, Mexico, Portugal, Russia),[□] trade in services (Israel, the Philippines, Russia, Sweden), transfer payments (list countries: BIS, Data Bank Services),[□] foreign direct investment (Austria, Chile, the Philippines, Sweden, Turkey), trade credit (Belgium, Chile, Czech Republic), corporate sector foreign assets and liabilities (India, the Philippines, Portugal, South Africa, Turkey), derivative transactions (Sweden), and remittances (Israel).

It should be noted that the use of surveys varies significantly from country to country. There seems to be a general trend towards an increased use of surveys in the compilation of external sector statistics. The extent to which surveys are used also depends on national contexts and on the institutional relationship and sharing of statistical competence between the statistical offices and the central banks.

With increasing globalization and developments timely compilation of external sector statistics as per the international standards, has become extremely important from the point of monitoring and analysis of external sector vulnerability and taking appropriate informed decisions. External sector statistics are the key economic indicators for central banks and monetary authorities. They shed light on the size and composition of a country's external trade in goods and services as well as its financial transactions with the rest of the world. They also provide information on the nation's international asset and liability position, including its external liquidity and debt. All these are crucial variables in order to assess current and prospective developments in exchange rates and the country's vulnerability to external shocks.

For all these reasons, it is not surprisingly that in many countries the central bank is responsible for the compilation of the external sector statistics, i.e. the balance of payments (current and financial accounts), the international investment position, and external debt statistics. Even where the central banks are not directly involved in the production of these statistics, they need to ensure that they are coherent and compatible with other statistics such as money and banking, national and financial accounts.

There are two complementary sources for collecting information of external statistics: indirect and direct reporting. Both sources complement each other. Examples of indirect reporting sources are: data from the National Customs, the Internal Revenue Service, and the International Transactional Reporting System.

The choice of data collection methods and sources is an important strategic decision as it will impact a large number of aspects, including IT architecture, response burden imposed, data availability and implementation and running costs. The selection of the actual reporting scheme will depend on national specificities, like the size of the targeted population, the reporting practice and the institutional sector (e.g. a collection system designed for banks or non-financial companies may not bring good results in the case of households).

For direct reporting, the CBA uses surveys. It is acknowledged that primary data from the report is not sufficient to tell the story behind the numbers. Therefore, economic intelligence by survey is expected to support the factual information to identify the actual current economic condition and to forecast the future state of economy. Surveys are fundamental input for the compilation of the BOP and the IIP. They provide information to the national accounts, are the base for other economic surveys and provide information for economic research.

In Armenia BOP follows Balance of Payments Manual, sixth edition (BPM6) by the IMF and data gathering is as follows:

External trade statistics (ETS) based on the customs declarations and special sources for electricity and gas. Quarterly balance of payments statistics produced from a variety of sources (customs, CBA, Ministry of Finance, and Department of Migration).

Foreign direct investment statistics is based on a quarterly survey of non-financial companies conducted by the NSS. The enterprises are identified from the business register and from the media. CBA provides the data on banking sector and financial companies; Ministry of Finance provides information on the public sector.

International investment position statistics is based on the BOP, data from CBA, data from the Government, and the NSS calculations. Market prices are not used for external debt because there is no exchange for many of the instruments.

Data on tourists are available from hotels and from the Department on Migration. CBA compiles data on financial services of the banking sector.

Data for trade in services is largely based on expert assessment and partly informed by business surveys. The NSS conducts quarterly surveys of private non-financial companies covering communication, transportation, computing, and other services.

From a perspective of the CBA the most important surveys for external sector statistics to measure remittances are Seasonal Workers Survey, Survey of Households' Remittances and Survey of Money Transfers from Abroad/from banks. For remittances, there is now a good basis for correcting the data from the banking system and for splitting the private transfers and identifying the part of investment.

Remittances surveys typically focus on several key issues like the determinants of remittances sending, the impact of remittances on poverty, the ways in which migrant households use remittances, methods of sending and the differences between how domestic and international remittances impact poverty and development. These issues are addressed through questions in the following categories: basic demographic information, characteristics of remittance senders and recipients, patterns of sending and extended questions on use of transfers, financial integration and transnational issues. Remittances surveys are critical to obtaining information on channels of transfer and spending structure of remittances and their development impact.

In literature personal remittances are equal to personal transfers plus compensation of employees. Personal transfers refer to the transfers between resident and nonresident households and compensation of employees refers to the income of border, seasonal, and other short-term workers who are employed in an economy where they are not resident and residents employed by nonresident entities.

For Armenia remittances are the funds sent by migrant workers to their relatives in home countries. This data is an increasingly important source of external finance for such a developing country as Armenia and experts in this field believe that informal flows of remittances areas are as large as formal flows.

BoP as source of data on remittances allows to monitor dynamics of remittance flows on the regular quarterly basis by countries of origin and destination, to calculate an average amount of a non-cash transfer sent through an official channel, to make projections regarding future trends on remittances based on the evaluations of the current macroeconomic situation and available data on remittance flows and to compare data on remittances across countries using the same methodology of Balance of Payment Manual 6.

BoP data does not allow to define migrant status of a sender: long-term, short-term or seasonal migrant/worker, to learn the target allocation of the transfer and its actual spending, to estimate non-monetary remittances, to learn gender differences of remittance sending patterns, to judge about the development impact of remittances and to learn about those who benefit from remittances.

Several cross checking surveys such as random panel surveys of travelers at the borders, in airports, rest areas on motorways or by mail/internet are also compliment external sector statistics. In the future there are plans to cooperate with National Statistical Committee to start surveys for TSA compilation. Ad hoc surveys have been used to collect specific economic intelligence, particularly when the economic diagnostic indicates there is a certain issue. To confirm the fundamental issues, by interviewing related respondents, surveyor could gain in depth insights of economic condition and the expectation of business agents.

Remittances surveys are categorized by the unit of analysis: the household (households getting money transfers) and the individual (seasonal workers). These approaches differ in terms of the kinds of information that can be obtained, the resources necessary to implement them, and in some cases, in terms of philosophical approach. The household surveys are extended household and head of household (or non-extended household), both of which are used to obtain information about remittances flows at the macro level and are among the most resource intensive methods. Targeted individual surveys are place-based and point of presence or group surveys, which are used to obtain information directly from known remittance senders and recipients.

External sector statistics surveys conducted by the Central Bank of Armenia

As it was mentioned above surveys for external sector statistics to measure remittances are Seasonal Workers Survey, Survey of Households' Remittances and Survey of Money Transfers from Abroad/from banks¹.

There are some pre-conditions to start **Survey of households getting money transfers from abroad**: limitation of the official statistics from the beginnings of 2000s, discrepancy between official statistics and the real situation and high level of non-official money transfers by that time. The main purpose of the survey is assessing the real level of money transfers, especially transfers made by non-official channels, evaluating the level of transfers, main channels, currency, frequency and seasonality, data about the residency of people who send money transfers, their residence country and so on.

It is also important to analyze the distribution of money transfers by the sending country and by sector of employment of transfer senders, to have the duration of stay of migrants abroad, the minimum acceptable wage for work in Armenia, the proportion of the funds received in total household income, the areas of remittances spending, duration of sending and receiving of remittances.

The population includes both urban and rural households (sampling units) that received remittance at least once in the year. In urban areas (Yerevan and other cities) single-step stratified sampling method is used. In rural areas two-stage stratified sampling method is used. On the first level villages in each region are chosen by the method of probability proportional to the population. At the second level required number of households selected by random sampling. The sample includes all the urban areas (city) and 40 villages in all regions and should include households with emigrants and non-migrant households. Non-response rate was 40%. For ideal case households surveys should be conducted both in all parts of a country and in selected regions with high migration turnover.

Survey of seasonal workers is conducted to identify the level of seasonal workers, to define the main areas and countries of employment, to measure the level of income earned abroad and so on. Sample is non statistical, based on expert judgments. Non-response rate was 30%

The population includes both urban and rural households (sampling units) that have seasonal worker. Three-stage stratified sampling design method is used: defining strata (e.g. urban-rural, districts), selecting clusters or primary sampling units – PSUs (e.g. villages, blocks), selecting households. Expert sampling plus snowball sampling to catch more returned seasonal workers is used. Stratification, e.g. by geographical areas, splits a single survey into multiple surveys and guarantees in advance that there will be enough observations for each area for estimations. Statistical advantage is that stratification reduces the variance of estimates by using prior information. Clustering reduces costs and makes it worthwhile to collect village or community information. Statistical disadvantage is that clustering increases the variance of estimates.

Sampling errors arise due to looking at a sample only, and not the entire population, decrease with sample size (though not proportionally) and can be reduced by adequate sample plan and accounted for by using weights.

Each survey require a clear statement of objectives and a clear conception of the population, or survey universe, that will be studied in order to determine how in-depth the survey will need to be and what types of questions it will include.

¹ See sample size and other parameters in annex.

In designing the questionnaire of each survey, CBA gathered all the needs of analyst, economist, and researcher in the central bank. All of surveys are designed not only for BOP Statistics but also to support the analysis and recommendation to the policy maker or board of governor.

Demographic information is essential for understanding remittances trends and priorities along specific corridors or regions. Groups and sub-groups have different characteristics of sending that provide information on how gender and age; countries of origin and migration; length of time sending; income and educational levels of senders and receivers; influence the amounts sent, mechanisms of sending, and use of funds.

Questionnaires include additional information on transnational issues, alternative payments, detailed gender issues, and living conditions. Transnational issues measure the degree to which a migrant stays involved, financially or otherwise, with their home town or country. Questions to find out if remittances may be sent as a form of insurance or to improve chances of receiving an inheritance; to be invested in the home country; to pay back loans received for the initial migration; simply to maintain linkages with the home country; as a reflection of the intention to return to the home country; or out of pure altruism.

Survey of commercial bank clients getting money transfers conducted among individuals (clients of banks) receiving remittances from abroad and sending those abroad. The survey currently includes all 17 banks in Armenia and 2-3 lending organizations that cover almost 94-96% of transfers. A short questionnaire of 5-8 questions is provided by the bank to clients to fill. Banks collect and pass the completed questionnaire to the CBA. The structure of the questionnaire is as follows:

- Currency, amount
- Where/from where the funds are sent/received
- Residency of the sender
- Residency of the receiver
- The type of the transfer
- Purpose of the transfer

This surveys allows to break down the total volume of transfers by the purposes of transfer (current or capital), separate money transfers sent for real estate transactions, evaluate capital transfers and direct investment, assess transfer levels by the residency of the senders, get better data on the share of non-residents in non-commercial transfers received/sent from abroad and cross-check the data on remittances providing by official reporting forms.

The main output ratios from these 3 surveys are:

- cash/non cash ratio,
- Seasonal worker/migrant ratio
- the share of services for seasonal workers
- the share of nonresidents in noncommercial transfers
- the share of capital transfers

- The share of direct investments
- Other ratios upon requests

General Methodological issues, errors and bias in surveys

Survey basically is intended to identify the population/group behavior or condition, not individual characteristics. Based on the statistics measured, analyst could draw inferences about the characteristics of the group or specific population.

Groves et al (2004) stated that there are two requirements to achieve true inference: answers of the survey must accurately describe the characteristics of respondent and the respondents must have characteristics similar to those of the targeted population/group observation.

When this prerequisite is not met, then survey statistics will contain error. Error is defined as deviation of what is expected in the survey than what is gained. To understand why error occurs in a survey we need to go through the procedure of conducting a survey. The methodology of the survey identifies the design; collection, processing, and analysis of survey in the framework of benefit and cost constraint. Each step has an effect on the quality of the survey and involves cost implication. Poor design and execution in each step in the survey; will generate bias and error. The fundamental challenge in the survey is how to minimize error so as to achieve the objective. So identification of errors is necessary to minimize its gap and get more objective data.

There are some possibilities of errors evolved such as errors related to questionnaire design (e.g. difficult questions) and data collection (e.g. interviewer bias), respondent bias (e.g. sensitive topics, recall bias, incentives to understate or overstate), poor record, processing mistakes, inappropriate/missing sampling, coverage error (e.g. interviewers miss households), faulty frame, non-response error, adjustment error, measurement error and processing error. In building the survey design, surveyor has to minimize error in survey statistics by minimizing gap between successive steps. Random errors are not a big problem as they tend to cancel out with increasing sample size.

The design and process of survey should be thoroughly prepared as it is difficult to step back when the survey has begun. Nonetheless, the refinement of the survey is usually done when there is bias in result. Some of the huge surveys need to be tested through the pilot project so that fine tuning in questionnaire and in sampling could improve the quality of the result and its effectiveness.

There are several strategies to minimize errors in each step of conducting survey. For example during planning and interpretation process the errors can occur because of the inadequate definitions of concepts, terms or populations. So it is important to ensure all concepts, terms and populations are defined precisely through consultation between data users and survey designers.

Survey always relates to a sample selection of population. Sampling error usually occurs to a particular group selection which does not represent the targeted respondents and sample size that creates low response rate. So inadequate list from which sample is selected is also could be a source of bias. To minimize it survey designer must check list for accuracy, duplicates and missing units; use appropriate selection procedures.

It is also important to choose an appropriate method (face to face, mail, telephone or other type of survey) and test thoroughly, use plain language, clear questions and logical layout in questionnaires, provide clear interviewer instructions and appropriate training, including exercises and field supervision.

To avoid or minimize these kinds of errors CBA evaluate the survey and its results periodically. Weaknesses and challenges among others are low response rate, bias sampling, discontinue response of panel data respondents, refusal, misinterpret questionnaire, and bias answers. Even though, there is a legal basis in the act of central bank for the surveys undertaken, hitherto there are a lot of refusal and discontinued response of respondents. Central bank has no authorities to penalize or enforce respondents to participate in the surveys.

In dealing with obstacles in surveys, CBA always makes efforts in building engagement with the respondents. The most difficult thing is in maintaining the panel data of the survey. To fill the missing respondents of panel data, Central Bank always replaces respondents to persistently maintain appropriate structural sampling. Inappropriate respondents in panel data might also create biases in results. Therefore, CBA refreshes the respondents periodically, particularly respondents with high bias result.

Conclusions

- Remittance statistics based on BoP data produced by national banks has limitations in what concerns characteristics of the flows and remittance senders/recipients, informal and in-kind remittances, as well as spending structure.
- Households' surveys can fill in this information gap by obtaining the missing information directly from migrants and migrant households
- BoP remittance data and Households' survey data should be considered as complementary rather than alternative sources.
- Using BoP statistics, development impact of remittances/dependency of economies on remittances can be calculated at the macro level (remittance share in GDP, etc.).
- Households' survey allows investigating the actual impact of migrants' transfers on the receiving households' wellbeing, i.e. micro level.
- Surveys can provide information about individuals and/or about transactions, whereas official BoP statistics focus on aggregate amounts.

Central Bank of Armenia is continually working to improve its entire data collection systems, and provide strong support to the areas in charge. In the specific case of external statistics, a combined system to collect data is used. However, in the past few years, data quality issues and new statistical requirements have increased the use of surveys as a method to collect information. Currently, some of these surveys are undertaken directly by the CBA, while some are run by other institutions. In addition, the burden on respondents is closely monitored by data collectors, as well as the use of any new request of information.

As there are some errors and biases in the survey's results that make some puzzles of economic condition, CBA consistently and periodically reviews the surveys methodology and technical parts to minimize the errors and face the challenges, particularly in the quality of the survey and their optimum utilization.

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Annex

Data for Seasonal Workers and Households' Remittances Surveys

Year	Sample Size	Minimum number of respondents for representative sample	Margin of error	Confidence interval
2010	1800	1691	2%	90%
2014	2020			
2016	2367			

Sample size was calculated

$$S = (z^2 (d(1 - d)) / e^2)$$

Where` S is sample size,

z-score = 1.645, for 90 % confidence interval,

e = 2 %, margin of error

d = 0.5, standard deviation:

IFC - Central Bank of Armenia Workshop on *"External Sector Statistics"*

Dilijan, Armenia, 11-12 June 2018

Surveys as an important source of information for external sector statistics in Central Banks: the case of Armenia¹

Diana Afyan,
Central Bank of Armenia

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.

Surveys as an important source of information for external sector statistics in Central Banks: the case of Armenia

**Diana Afyan
Central Bank of Armenia**



The aim of this paper is to analyze the benefits of conducting surveys in order to get valuable information to improve external statistics and formulate policy decision

This paper discusses and analyzes the use and the organizing of surveys undertaken by Central bank of Armenia (CBA), the weaknesses and challenges that it faces



Contents

- The role of surveys in external sector statistics
- Definitions and an overview of the use of the surveys done by CBA
-
- Modern challenges; Surveys vs other sources
- Conclusions



General overview

Statistics in CBA:

- Legal and institutional framework
- The organizational structure of the Statistics Department

External sector statistics

- Sources and uses of data
- Definition of surveys and its role
- Main goals of the external sector surveys



The role of Surveys in External Sector Statistics: Remittances

- Remittances-funds sent by migrant workers to their relatives in home countries-are an increasingly important source of external finance for developing countries.
- experts believe that informal flows of remittances areas large as formal flows.
- Remittances represent household arising mainly from the temporary or permanent movement of income from foreign economies people to those economies.



Remittances

- Personal remittances = personal transfers + compensation of employees
- Personal transfers refer to the transfers between resident and nonresident households
- Compensation of employees refers to the income of border, seasonal, and other short-term workers who are employed in an economy where they are not resident and of residents employed by nonresident entities.



Characteristics of the BoP as source of data on remittances

BoP data allows:

- To monitor dynamics of remittance flows on the regular quarterly basis by countries of origin and destination
- To calculate an average amount of a non-cash transfer sent through an official channel
- To make projections regarding future trends on remittances based on the evaluations of the current macroeconomic situation and available data on remittance flows
- To compare data on remittances across countries using the same methodology of Balance of Payment Manual 6



Characteristics of the BoP as source of data on remittances

BoP data does not allow

- Define migrant status of a sender: long-term, short-term or seasonal migrant : worker
- Learn the target allocation of the transfer and its actual spending
- Estimate non-monetary remittances
- Learn gender differences of remittance sending patterns
- Judge about the development impact of remittances
- Learn about those who benefit from remittances



Remittances surveys are critical to obtaining information on

- characteristics of remittance senders and recipients,
- channels of transfer,
- spending structure of remittances and their development impact.

Remittances surveys require a clear statement of objectives and a clear conception of the population to be studied in order to determine how in-depth the survey will need to be and what types of questions it will include.



Surveys made by CBA

Measuring Remittances

- Survey of Money Transfers from Abroad/ from banks
- Seasonal Workers Survey
- Survey of Households Remittances

Future plans

- Random panel surveys of travelers at the borders, and airports
- TSA
- Other surveys to improve external sector statistics



Remittances surveys

typically focus on several key issues:

- determinants of remittances sending;
- the impact of remittances on poverty;
- the ways in which migrant households use remittances;
- methods of sending;
- and the differences between how domestic and international remittances impact poverty and development.

These issues are addressed through questions in the categories of:

- basic demographic information and patterns of sending;
- competitive market conditions;
- and extended questions on use of transfers, financial integration, transnational issues, and living conditions of senders and/or receivers.



An overview of the surveys done by CBA

Sample

Questionnaires' and sensitive questions about the amount of remittances

Measurement errors

Challenges

- Selection of survey respondents
- Data quality
- Compilation challenges
- Surveys vs other sources



Sample

stratified random sampling within PSUs

- two phase sampling for urban areas
- tree phase for rural areas

three-stage sample design

- Defining strata (e.g. urban-rural, districts)
- Selecting clusters or primary sampling units – PSUs (e.g. villages, blocks)
- Selecting households



Sample

Countrywide random sampling plus snowball sampling to catch more returned migrants (2011-2012 surveys)

Should include households with emigrants and non-migrant households.

For ideal case households surveys should be conducted both in all parts of a country and in selected regions with high migration turnover.



Surveys Measurement : Sampling errors

- Arise due to looking at a sample only, and not the entire population
- Decrease with sample size (though not proportionally)
- Can be reduced by adequate sample plan and accounted for by using weights (remember stratification and clusters!)



Surveys Measurement : non-sampling errors

- Random errors (are not a problem as they tend to cancel out with increasing sample size)

In contrast, all the following errors are systematic

- Coverage errors (e.g. interviewers miss households), faulty frame
- Errors related to questionnaire design (e.g. difficult questions) and data collection (e.g. interviewer bias)
- Respondent bias (e.g. sensitive topics , recall bias, incentives to understate or overstate)
- Processing mistakes

More problems and possible sources of error arise when the data are analyzed and derivative variables (for example household consumption) are calculated



Main output ratios

Households surveys

- cash/non cash ratio,
- Seasonal worker/migrant ratio

Customers' surveys in banks

- the share of non residents in non commercial transfers
- the share of capital transfers
- The share of direct investments

Survey of seasonal workers

- the share of services for seasonal workers
-



Conclusions

- Remittance statistics based on BoP data produced by national banks has limitations in what concerns characteristics of the flows and remittance senders/recipients, informal and in-kind remittances, as well as spending structure.
- HH surveys can fill in this information gap by obtaining the missing information directly from migrants and migrant households
- BoP remittance data and HH survey data should be considered as complementary rather than alternative sources.



Conclusions

- Using BoP statistics, development impact of remittances/dependency of economies on remittances can be calculated at the macro level (remittance share in GDP, etc.).
- HH survey allows to investigate the actual impact of migrants transfers on the receiving HH wellbeing, i.e. microlevel.
- Surveys can provide information about individuals and/or about transactions, whereas official BoP statistics focus on aggregate amounts.



Thank you for your attention





IFC - Central Bank of Armenia Workshop on *"External Sector Statistics"*

Dilijan, Armenia, 11-12 June 2018

Compilation of External Sector Statistics: Malaysia's Experience¹

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¹ This paper 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.

Compilation of External Sector Statistics

Malaysia's Experience

Norhayati Razi¹

Abstract

This paper provides details on the compilation of External Sector Statistics (ESS) in Malaysia. The compilation of Malaysia's ESS is supported by strong legal and institutional framework. While the Department of Statistics, Malaysia (or DOSM, the national statistics office) remains the official compiler of the Balance of Payments (BOP), International Investment Position (IIP) and Coordinated Direct Investment Survey (CDIS), Bank Negara Malaysia (BNM, the Central Bank) is the official compiler of the External Debt Statistics (EDS), Coordinated Portfolio Investment Survey (CPIS) and International Banking Statistics (IBS). The legal framework outlines the data collection responsibility of both agencies, and Malaysia's compilation of the external sector statistics is aligned with the standard and requirements of the Balance of Payments and International Investment Position Manual, Sixth Edition (BPM6) and Special Data Dissemination Standard (SDDS). In particular, Malaysia has adopted an integrated approach to collect the financial account transactions and positions at granular level to produce the various data sets, namely BOP, IIP, EDS, CPIS, CDIS and the IBS, which are consistent. An institutional arrangement (MOU) was established between DOSM and BNM to facilitate the data collection, i.e. via a Joint-Survey, and granular data collected are being shared between the two agencies to facilitate data compilation and dissemination.

Keywords: data collection, external sector statistics

JEL classification: C8

¹ This paper was prepared for the IFC – Central Bank of Armenia Workshop on “External Sector Statistics” held at Dilijan, Republic of Armenia on 11-12 June 2018. The author is grateful to Chareeyan Chang, Low Ai Loon and Toh Hock Chai for their contributions towards the completion of this paper. The views expressed here do not represent those of Bank Negara Malaysia.

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Introduction

Despite relatively small in size as compared to other countries in the South-East Asia region, Malaysia is an open economy with strong external position. In 2017, Malaysia's Current Account (CA) of BOP recorded a surplus of MYR40.3 billion or 3.1% of Gross National Income (GNI), 20th consecutive annual surpluses since 1998 reflecting a favourable external trade performance, particularly in the manufacturing and mining sectors. At the same time, the Financial Account (FA) recorded a net inflow of MYR2.3 billion and international reserves, remained at a comfortable level of MYR414.6 billion. In terms of the IIP, Malaysia registered a marginal net liability position as at the end of 2017, due mainly to the appreciation of exchange rates which resulted in lower external assets valuation in ringgit. Malaysia's external debt position remained manageable, with the outstanding debt of MYR883.4 as at end-Dec 2017 (USD1=MYR4.1001). More importantly, more than a third of the external debt are in local currency, mainly the ringgit debt securities held by non-residents and the foreign currency debts are mainly by the banking institutions as well as the corporations which are monitored and regulated to ensure prudent management and supported by hedging arrangement. In addition, two-third of the Malaysia's external debt covers instruments of long and medium terms.

The external sector statistics (ESS) play a major role as key economic indicators and determinants for policy formulation by the Central Bank and the Malaysian Government. ESS provides an overview and comprehensive information on the size and composition of Malaysia's external trade in goods and services, financial transactions of Malaysia with the rest of the world, and Malaysia's international asset and liability position, covering external liquidity and debt obligation of the nation. ESS are also crucial in order to assess current economic developments, relative strength in the nation's currency in relation to others, and the country's vulnerability to external shocks. These signify the importance of external sector statistics which requires sophisticated statistical systems, and comprehensive reporting requirements and methodologies, which are in compliance to the international standards as outlined by the International Monetary Fund (IMF), World Bank and Bank for International Settlements (BIS). With the rapid development in global economic landscape following the rapid technological advancement, deregulation and privatisation of the financial markets, and globalisation, cross-border economic and financial activities in most countries are experiencing fast growth and greater contribution towards the domestic economy. This rapid advancement leads to a number of challenges to compilers and analysts of external sector statistics with issues on data quality and accuracy remaining at the fore-front, resulting in gaps in the balance of payments statistics, and miss-matched in the global asymmetries. This creates greater needs for robust statistical systems and new reporting methodologies, to encompass all possible scenarios under the external sector statistics.

Compilation Practice in Malaysia

The compilation of external sector statistics in Malaysia is managed jointly by Bank Negara Malaysia (BNM, the Central Bank) and the Department of Statistics, Malaysia (DOSM, the national statistics office), through the formal institutional arrangement and the Memorandum of Understanding (MOU) signed between the two agencies.

Each institution carries out its respective roles and responsibilities, guided by the MOU and legal frameworks, namely BNM through the Central Bank of Malaysia Act, 2009 (CBA 2009) and DOSM through the Statistical Act 1965. This legal provision provides clear guidance for the compilation and dissemination of the external sector data, with DOSM being designated as the official compiler of the BOP, IIP, and CDIS, while BNM is designated as the official compiler of the EDS, CPIS, and IBS.

In Malaysia, data on goods transactions is sourced mainly from the custom records maintained by Malaysia Royal Customs Department and data on goods procured in ports is compiled by DOSM's International Transactions on Services (ITS) Survey of Transportation. For services data, the main data sources are the Quarterly Survey of ITS conducted by DOSM and the aggregated Cash BOP data provided by BNM. Apart from that, travel services are estimated by using data model on both credits and debits based on information supplied by the Immigration Department and Tourism Malaysia and Government Services are provided by the Ministry of Foreign Affairs, and various government departments and statutory authorities. Meanwhile, data on other services transactions are mainly sourced from Cash BOP, which is compiled by BNM. For Income Account, the primary data sources are from the Quarterly BNM-DOSM Joint IIP Survey, as well as Immigration records for compensation of employees. For Current Transfers and Capital Transfers, the data sources are mainly from administrative records of various government agencies as well as Cash BOP. As for FA and its other related statistics, the primary data source is from the Quarterly BNM-DOSM Joint IIP Survey, while BNM also provide data for reserve assets and data on Monetary Authority. Below is the summary of data sources for ESS in Malaysia:

Data Sources

Official Publication of ESS in Malaysia

Table 1

BOP Components	Data Source
1. Current Account (Goods, Services and Income)	a) Malaysian Royal Customs Department b) Quarterly Survey of International Trade in Services c) Tourism Ministry d) Immigration Department e) Cash BOP f) BNM-DOSM Joint IIP Survey
2. Capital Account	a) Cash BOP b) Other Government Agencies
3. Financial Account (Direct Investment, Portfolio Investment and Other Investment)	BNM-DOSM Joint IIP Survey
Other Reports	Data Source
IIP, EDS, CPIS, CDIS and IBS	BNM-DOSM Joint IIP Survey

Throughout the years, developments have been made towards achieving a more integrated approach in compilation of external sector data by both agencies. Prior to the BNM-DOSM Joint IIP Survey in 2008, the compilation efforts were duplicated with external sector data being compiled through the Quarterly Survey of International

Investment and Services by DOSM and the Survey of External Assets and Liabilities by BNM, which covers similar data scope and reporting institutions. The Joint-Survey was then introduced to reduce reporting burden, better coordination in the compilation effort and streamlining the methodologies and standards used by both compilers. This effort was successful in producing more robust and accurate datasets, with shorter time in data processing and quality checking, as well as timely and high frequency data dissemination. Through the MOU and the data compilation governed by legislations of both agencies, this has enabled the sharing of detailed information for the publication of ESS by the respective agencies.

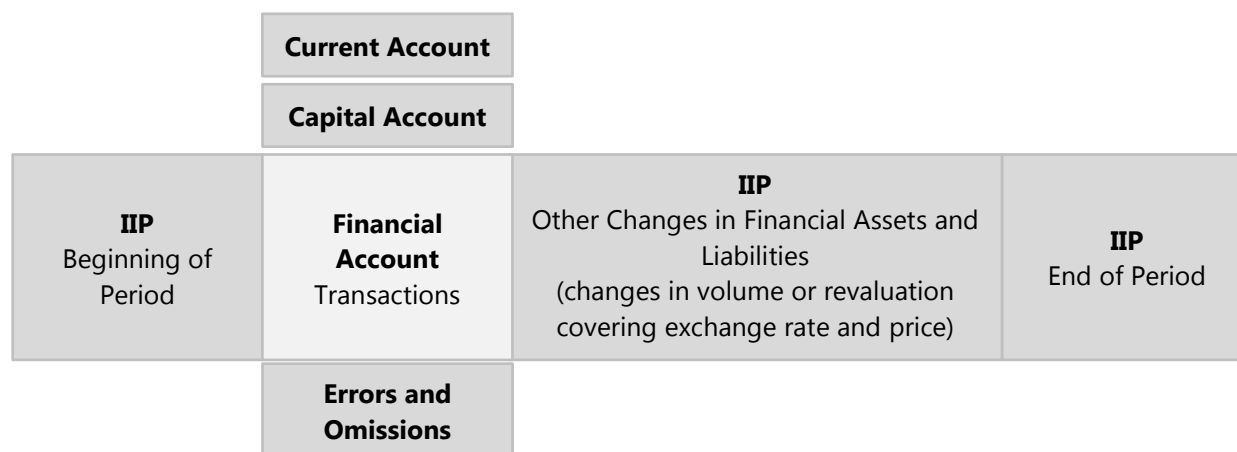
BNM-DOSM Joint IIP Survey

In view of data consistency among the Financial Account (FA) of the BOP, IIP and EDS, BNM has implemented an integrated IIP Framework to fully explain the changes in stock position resulting from FA transactions, revaluations (separately identifying price and exchange rate changes) and other changes in volume of assets (OCVA) since 2002. Data on the table are of intrinsic value in themselves, and to support the assessment of the various measures included in the integrated IIP. Based on the BPM6 implemented in 2009, IMF has strongly recommended this approach be adopted by compilers to facilitate the production of the BOP and its other related statistics including IIP, EDS, CPIS, CDIS and IBS from a single source in order to ensure data quality and consistency throughout these datasets.

Integrated IIP Framework

Compilation Practice

Diagram 1



Note: Transactions reported in the integrated IIP framework provides BOP flow, closing position is the IIP statistics while EDS is derived from stock position of non-equity liability instruments. CDIS and CPIS refer to stock position of direct and portfolio investment respectively while IBS is the IIP of banking sector.

The quarterly BNM-DOSM Joint IIP Survey collects data based on item-by-item reporting, where the items reflect the financial instruments and are reported in the dimensions of the country of the counterparty, currency of transactions and maturity structure for selected financial flows. There are 36 data items which are identified by

unique purpose of transactions, namely equity capital, retained earnings, equity securities, debt securities, loans, deposits and etc. and these items are reported with further details based on each individual counter party, which are crucial identity to determine the types of investment for BOP classification. Additional details such as name, relationship, percentage holdings of investors and affiliated companies are collected to facilitate more in-depth analysis, particularly in the areas of foreign investments in Malaysia as well as Malaysia's investment overseas.

Coverage of the quarterly IIP Survey

The IIP Survey is conducted on quarterly basis via online submission for non-banks and data transfer through secured network for the banking institutions. The survey coverage encompassed all financial institutions, identified non-bank enterprises, custodians managing on behalf of foreign funds in Malaysia as well as residents' funds for investment overseas, and relevant government agencies for the purpose of statistical compilation for the country's financial external assets and liabilities. Of significance is the inclusion of aggregated data of Labuan offshore entities as part of the data coverage through the online submission, which is managed by Labuan Financial Services Authority (Labuan FSA).

Data quality checking mechanism

Data quality assurance remains one of the major targets among compilers as it is crucial to the usefulness of economic and financial statistics. Based on the IMF Data Quality Assurance Framework (DQAF), emphasis has to be given to (1) reliability, that is, not subject to many substantial revisions; (2) accuracy, that is, the approximation of "true" figures; (3) timeliness; (4) consistency with other statistical measures and (5) international comparability. Given the importance of the Survey as a source for Malaysia's official external statistics, it is therefore, of importance to ensure data collected are accurate and consistent. Data submitted by reporting entities are checked, evaluated and cross-examined thoroughly with both internal and external sources to ensure significant transactions are well-captured, in order to produce high quality outputs.

Cross-check against internal and external sources

There are various internal sources which the data can be validated with. The main benchmark is the Cash BOP data, which record detailed transactions by transactions effected through the banking system and are classified according to the balance of payments purposes. As detailed information are made available to BNM, it served as lead indicator to the quarterly data as well as contributing significantly to the selection of quarterly survey frame.

Additionally, the banking system's external flows and position of currencies and deposits are compared with a more coherent source, i.e. Statistical Mart for Analysis and Reporting (STATsmart) which captures the monthly balance sheet information on overall position of banking institutions' domestic and external exposures. Other

internal sources used are the Real-time Electronic Transfer of Funds and Securities System (RENTAS) data which represent the foreign holdings of domestic debt securities issued by residents as well as the resident holdings of debt securities issues by non-residents in Malaysia. Notwithstanding the internal sources, external source such as BURSA information where end-quarter non-resident holdings of equity securities reported in the survey will be validated against the counter-by-counter information provided by BURSA to BNM to ensure consistency between these data. Other than that, the compilers are monitoring closely any market news as one of indicators for BOP statistics

Using various benchmarks, any significant difference in data submitted in the Survey can thus be identified, checked and validated to ensure accurate and consistent outputs.

Regular engagement with reporting entities

While reporting entities are expected to submit accurate data, in reality this ideal situation is unlikely to be achieved. In an effort to promote higher accountability of the reporting entities in ensuring submitted reports are carefully checked, several measures have been introduced by the compilers. Regular engagement program with surveyed respondents through various platforms are being carried out to ensure good understanding on the reporting requirements as well as to place greater emphasis on online reporting to expedite the data submission. These measures have resulted in tremendous improvement in the respond rate to almost 100 percent every quarter, as compared with around 80% prior to the BNM-DOSM Joint IIP Survey implementation. With that, companies are better equipped and informed in conducting data checking processes to ensure that right information are submitted to the compiler. This could in turn help to reduce burden of re-submission by the respondents arising from queries to correct potential data errors resulting to significant data quality improvement as well as synchronised submission deadline with the timeframe set by BNM.

Benefits of Integrated Approach in Compiling ESS

The BNM-DOSM Joint IIP Survey has successfully reduced the reporting burden of respondents from two submissions to only one. In view of the favourable responses from the reporting entities, the submission deadline was shortened to 15 days after the end of each reporting quarter, compared with 20 days previously. This was made possible as the reporting entities have better understanding on the definitions, concepts and methodologies outlined in the reporting guidelines as well as standardised explanation for clarification and assistance. The on-site engagement program by the compilers is an effective tool to broaden the networking with the reporting entities as well as served as a feedback platform for check-and-balance in the data compilation.

As for the compilers, the close collaboration between the BNM and DOSM has improved the efficiency and eliminated the duplication of work in collecting and processing the external sector data. As the data compilation is governed by both Central Bank of Malaysia 2009 and Statistics Act 1965, and logo of both institutions

are posted in the submission portal, greater integration and data sharing up to individual details between the two agencies have increased tremendously.

The single repository to produce ESS has helped to ensure the consistency of various statistics related to the balance of payments namely, the IIP, EDS, CDIS, CPIS and IBS, and in accordance with the BPM6 and compliant with the SDDS requirements. This in turn has facilitated the publication and cross-country comparisons of similar data for users. The output are also comprehensive due to the item-by-item reporting required from the reporting entities. Furthermore, the joint survey has also improved the publication of these reports as time lag in the IIP publication has shortened significantly to six months, from nine months and the publication of quarterly BOP by 7th week, release simultaneous with quarterly GDP starting from 3Q 2011, as compared with 10th week previously.

Data Sources

ESS Official Publication

Table 2

Method	Survey Coverage	Outputs
Quarterly IIP Survey	i. All banking institutions ii. Corporations (listed and unlisted) iii. Labuan offshore entities iv. Government agencies v. Fund custodians	i. BOP Income and Financial Accounts ii. International Investment Position iii. External Debt Statistics iv. Coordinated Portfolio Investment Statistics v. Coordinated Direct Investment Statistics vi. International Banking Statistics
Dissemination		
Statistics are published in BNM Monthly Statistical Bulletin (MSB), DOSM website and international organisations namely IMF, World Bank and BIS		

ESS Compilation Scope and Coverage

The main sources of ESS compilation by BNM are the reporting of the Quarterly BNM-DOSM Joint IIP Survey on external assets and liabilities (EAL) vis-à-vis non-residents as follows:

- Data on EAL of banking institutions;
- Data on EAL of selected resident companies, which include credit facilities from non-residents, investment abroad and foreign investment in Malaysia;
- Data on portfolio investments reported by custodians, which include holding of Malaysian securities by non-residents and portfolio investments of residents abroad;
- Data on EAL of offshore entities in Labuan, managed by the Labuan Financial Services Authority; and
- Data on the government sector, obtained from the administrative records of the Treasury Department of the Ministry of Finance, Malaysia.

In addition, BNM continues to collect data on the Cash BOP for all cross-border transactions effected through the banking system as well as inter-company and overseas accounts maintained by selected resident companies with their non-resident

counterparts. The Cash BOP data, which has been put in place since 1991, are used mainly as a benchmark by DOSM to complement data sourced from the Customs Department, surveys and other administrative records, particularly for the Services and Capital Accounts. On the other hand, BNM uses the data mainly as an early indicator for the flow of funds and preliminary statistics for analyses on monthly basis, as well as for other surveillance and monitoring purposes.

BNM also submitted International Banking Statistics (IBS), in compliance with the Bank for International Settlement (BIS) requirements. Thus far, Malaysia has been submitting the IBS by "Locational" and "Nationality" and targets to submit the "Consolidated Banking Statistics" once the compilation system and the statistics are stabilised. Towards this end, BNM also collects the following statistics to ensure the comprehensiveness of the IBS submission to BIS:

- i. Data on assets and liabilities (AL) of all banking institutions vis-à-vis residents;
- ii. Data of Malaysian banks' on:
 - Ultimate risks transfers;
 - Foreign branches and subsidiaries; and
 - Consolidated financial position.

The external data compiled is then consolidated into various reports for surveillance, policy assessment and formulation, research and analysis, as well as dissemination in various publication and international organisation.

The System Architecture

The Integrated Statistical System - External Sector Statistics (ISS-ESS) is envisioned to enable expansion of scope and coverage of the external sector data compilation to facilitate ease of production of various ESS outputs, to meet the diverse and changing data demand across internal and external users and as a compilation system that adopts best practices based on national and international reporting standards. The main objectives of the implementation of ISS-ESS are as follows:

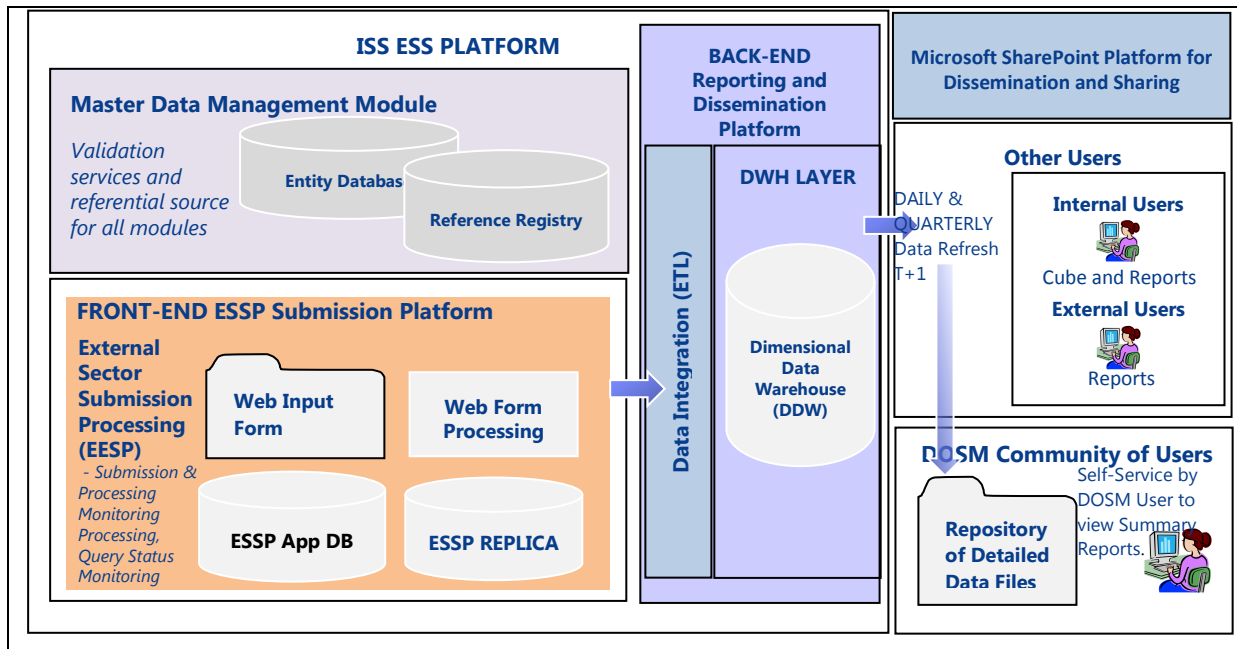
- i. Centralisation and harmonisation of the collection of ESS within BNM, with expanded data scope and granularity;
- ii. Integrate relevant databases and data sources to ensure comprehensiveness and quality of information;
- iii. Flexible dissemination platforms to allow data sharing across national agencies i.e. DOSM and Labuan FSA; and
- iv. One-stop and user-friendly business intelligence tools (SSRS, SharePoint and Excel-driven Cubes) for internal users' access to ESS Reports.

The system architecture of the end-to-end solution for the ESS compilation is as illustrated in the diagram below:

ISS-ESS System Architecture

Data Compilation System

Diagram 2



Through the front-end (Submission) modules, the respondents are required to report their external financial assets and liabilities exposures vis-à-vis their non-resident counterparties following an accounting approach, whereby the reporting is done similarly to a financial statement with further categorisation by direct investment, portfolio investment, financial derivatives and other investment. In addition to the compilation notes and manual, the front-end modules are also equipped with build-in business validation rules to prevent and/or alert both the respondents and compilers on possible misreporting. A secured communication channel i.e. the Query Module, is also established as a medium between the respondents and compilers to rectify and obtain confirmation on issues relevant to data accuracy.

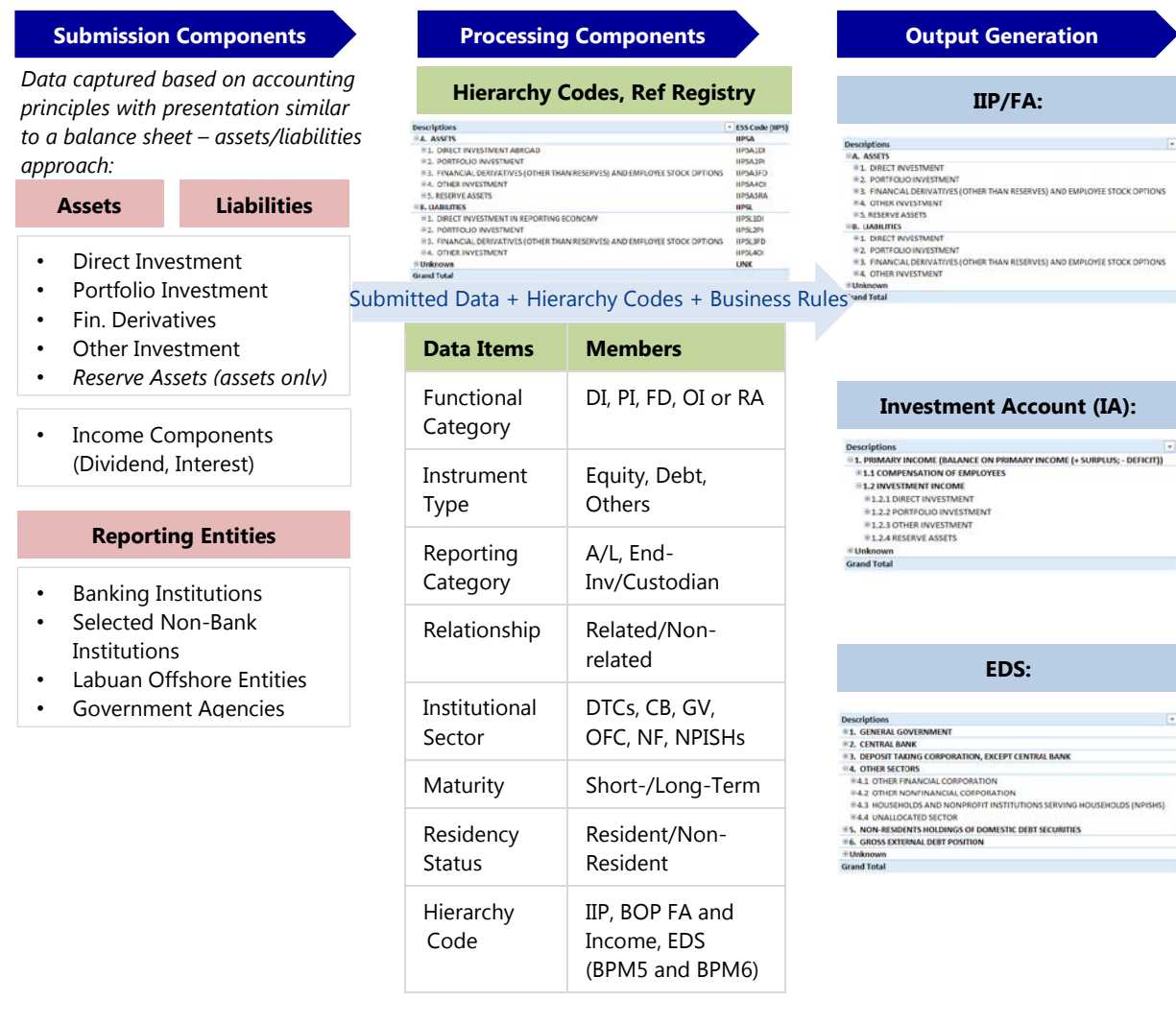
The front-end modules will process all survey submissions by respondents to prepare data required by the back-end (Dissemination) modules. Once this processing is completed, data is then transmitted to the back-end modules for further processing by the end of the day. During this transmission, data integration programs (Extract, Transform and Load or ETL) are initiated in two stages, with the first stage focusing to harmonise and link the survey data to the Master Data Management (MDM) module (standard codes, reference entity information and ISIN profiles) and second stage to map the data according to the business rules to produce the required ESS outputs.

The overall processing workflow are represented in diagram below:

ISS-ESS System Process Flow

End-to-end Data Processing Lifecycle

Diagram 3



In view of the complex structures of ESS and users' changing needs, the MDM is designed to allow maintainability of business rules and centralised storage for reference data such as standard codes, entity information and ISIN profiles to cater for any new development in the international reporting standard. The MDM is also integrated directly with the data sources such as registrars (National Registration Department and Company Commission of Malaysia) for entity information and the bonds data warehouse for profiles of locally-issued debt securities. Additionally, profiles of domestic equity securities are obtained from Kuala Lumpur Securities Exchange (KLSE), which is managed by Bursa Malaysia, on a regular and timely basis. The integration with the bond data warehouse, which are the back-end of the debt securities trading platform of RENTAS, facilitate the cross-checking of data on debt securities issued in domestic market that are reported by the custodian agencies, as the aggregated exposures by each custodian are transparent to BNM. Moreover, integration with these data sources eases respondents' reporting burden as information required for submission are limited to registered identification number

and ISIN codes, without compromising the needs to obtain granular data on entity and security profiles for users and publication of statistics as these information will be derived from the MDM.

After the ETL completes linking survey submissions to the master data, the system will proceed with the mapping of granular data to the hierarchy codes, which are assigned based on business rules to produce the ESS outputs. The hierarchy codes are reflective of all the ESS structures, complying with the international guidelines as follows:

- i. IIP/BOP FA/BOP Income – Balance of Payments and International Investment Position Manual, Fifth (BPM5) and Sixth (BPM6) Editions;
- ii. CPIS – Coordinated Portfolio Investment Guide;
- iii. EDS – External Debt Statistics: Guide for Compilers and Users; and
- iv. IBS – BIS Guidelines for Reporting IBS.

Compilation Challenges and Moving Forward

Malaysia has made a significant progress in the ESS compilation. Currently, Malaysia publishes the Quarterly BOP statistics 7 weeks after the end of the reporting period, based on data collected from the primary sources. Nevertheless, as often faced by other ESS compilers world-wide, Malaysia continued to face challenges in the ESS compilation, and more so towards improving the quality of data for official statistics.

Sustainable Compilation System

The ESS compilation requires system design to meet the long-term statistical needs in order to continuously comply with the international standard as outlined by International Monetary Fund, World Bank and the Bank for International Settlements. In this regard, Malaysia adopted the integrated compilation system to address end-to-end requirements for the ESS compilation, which provided flexible data submission system (front-end) for detailed reporting, expandable data items that follow closely the accounting principle to facilitate REs familiarisation, as well as data dissemination platform (back-end) to transform data into the BOP, IIP, EDS and IBS statistics. Of significance, the flexibility in MDM allows Malaysia to incorporate changes by or additional requirements from IMF and BIS without having to undertake major enhancement to the compilation system.

The above requirements have to be strongly supported by financial resources as well as adequate talents with both in-depth ESS knowledge and the IT expertise to develop and manage the entire compilation and system infrastructure.

Expansion in Scope and Coverage

The Quarterly BNM-DOSM Joint IIP Survey reporting covers all banking institutions as well as survey of companies. Since the inception, the number of entities covered under the survey increased significantly by more than threefold, which encompassed across all sectors, reflective of Malaysia's economic composition. Additionally, the team also faced constant challenges in handling high volume of data records due to

granular data compilation to comply with national and international standards, as well as to facilitate analysis for surveillance and monitoring purposes. In this regard, BNM leverages highly on technology and has developed the system that equipped with infrastructure to facilitate validation and data quality processes for the compilers as well as adoption of suitable BI tools to facilitate data mining for users. The flexible data sharing platform for daily micro data sharing facilitates effective handling of Joint Survey between BNM and DOSM.

Ever-changing Financial System

Rapid technological advancement in the Financial System such as FinTech and Cryptoassets introduces new and complex scenarios in statistical reporting. In order to address this issue, the compilers are to ensure the guidelines issued to reporting entities are comprehensive and cover all scenarios based on the fundamentals of ESS compilation. Among others, continuous review of the compilation guidelines as well as the issuance of "Frequently Asked Questions" through the reporting portal have been put in place, to provide further clarity on the reporting.

Data Accuracy

Data accuracy has always been the biggest challenge faced by the ESS compilers and as experienced by many countries that have had to cope with an increasing level of errors and omissions (E&O) in the BOP data compilation. In this regard, significant efforts are required to maximise the accuracy on data compilation and ensure the E&O level to be within an acceptable range, by working towards having more granular analysis for data quality checking. In addition, regular engagement with reporting entities are essential to ensure accurate understanding on reporting requirements. New methodology for estimating missing data is also carried out by incorporating model-based estimates to manage limitations of the existing data compilation.

Conclusion

In order to address the increasing users' demand for more granular data, BNM adopted a concept of external sector statistics proactively through the integrated compilation approach. The integrated model would enable the compilers to optimise the compilation of various reports, namely the BOP, IIP, EDS and IBS through a single platform to ensure consistency across all statistics. This facilitates the compilers in striking a right balance between the requirements for consistency in concept, the need to capitalise on existing investment and practices, as well as allowing sufficient flexibility to adjust to users' requirements to reflect the evolving economic development. Additionally, the formal institutional framework by the compilers has enhanced the data quality as well as facilitated the dissemination and publication of the official BOP and IIP statistics by DOSM and the EDS and IBS by BNM respectively.



IFC - Central Bank of Armenia Workshop on "*External Sector Statistics*"

Dilijan, Armenia, 11-12 June 2018

Compilation of External Sector Statistics: Malaysia's Experience¹

Norhayati Razi,
Central Bank of Malaysia

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.

Compilation of External Sector Statistics: Malaysia's Experience

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Norhayati Razi
Statistical Services Department



BANK NEGARA MALAYSIA
CENTRAL BANK OF MALAYSIA

Presentation Outline

- i. Overview of Malaysia's external sector
- ii. ESS compilation practice in Malaysia
- iii. Integrated approach in compilation of external sector statistics
- iv. ESS Compilation Scope and Coverage
- v. The System Architecture
- vi. Challenges and Mitigation Plan



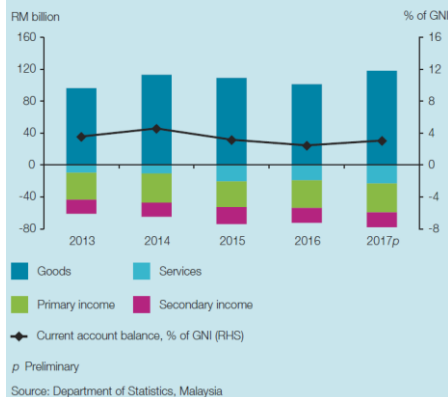


Key External Sector Statistics (ESS) of Malaysia

... an open economy with strong external position

Balance of Payments (BOP):

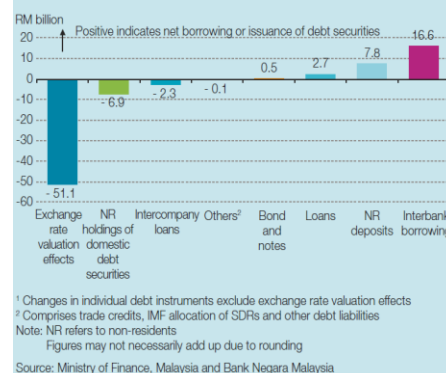
Higher current account surplus in 2017 attributable mainly to a larger goods surplus



- In 2017, the BOP remained strong with Current AC registering a surplus of RM40.3b and Financial AC recording a net inflow of RM2.3b
- Current AC bal. has been in surplus since 1998
- As at end-2017, reserves amounted to RM414.6b, sufficient to finance 7.3 months retained imports

External Debt Statistics (EDS):

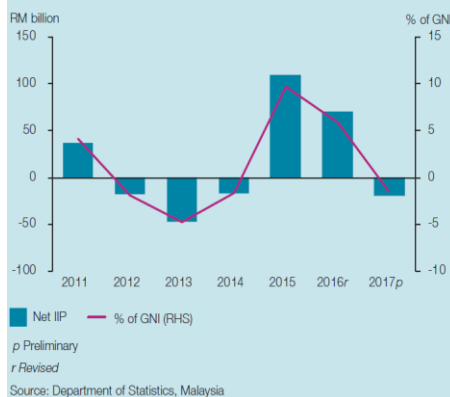
Lower external debt in 2017
Net change¹: -RM32.8 billion



- As at end-2017, total external debt amounted to RM883.4b
- More than a third are in local currency, mainly MYR debt securities held by NR
- The FC debts are mainly by banking institutions & corp. which are subjected to prudent management and hedging requirements
- Two-third of ED are long & medium term debt

International Investment Position (IIP):

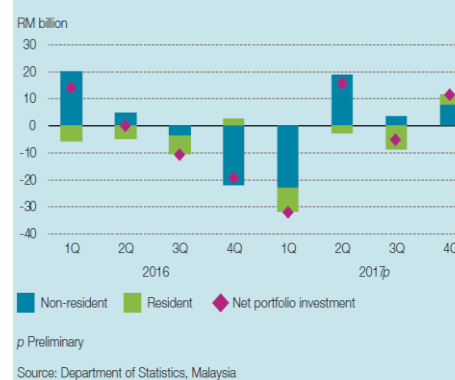
IIP registered a net liability in 2017



- As at end-2017, IIP registered a marginal net liability position
- Appreciation of the exchange rate was the main cause of the reversal in Malaysia's net IIP which reduced the country's external assets valuation in ringgit

Portfolio Investment Statistics (CPIS):

Resumption of portfolio investment inflows by non-residents



In 2017, the *portfolio investment* account registered a net outflow of RM9.2b, reflecting net acquisition of foreign portfolio assets by residents of RM16.5b, which were offset partially by the net inflow of portfolio investments by NR of RM7.3b



Malaysia's ESS Data Compilation Framework

Collaborative effort in compilation, quality assessment and dissemination in accordance to SDDS :



BANK NEGARA MALAYSIA
CENTRAL BANK OF MALAYSIA

- ✓ Financial Account and Income via BNM-DOSM Joint IIP Survey
- ✓ Cross border flows of funds via Cash BOP reports

- ✓ Central Bank of Malaysia Act 2009
- ✓ Financial Services Act 2013



COMPILERS



Department of Statistics Malaysia (DOSM)

Goods and Services Accounts via customs records, surveys and administrative records

Statistics Act 1965

INSTITUTIONAL FRAMEWORK

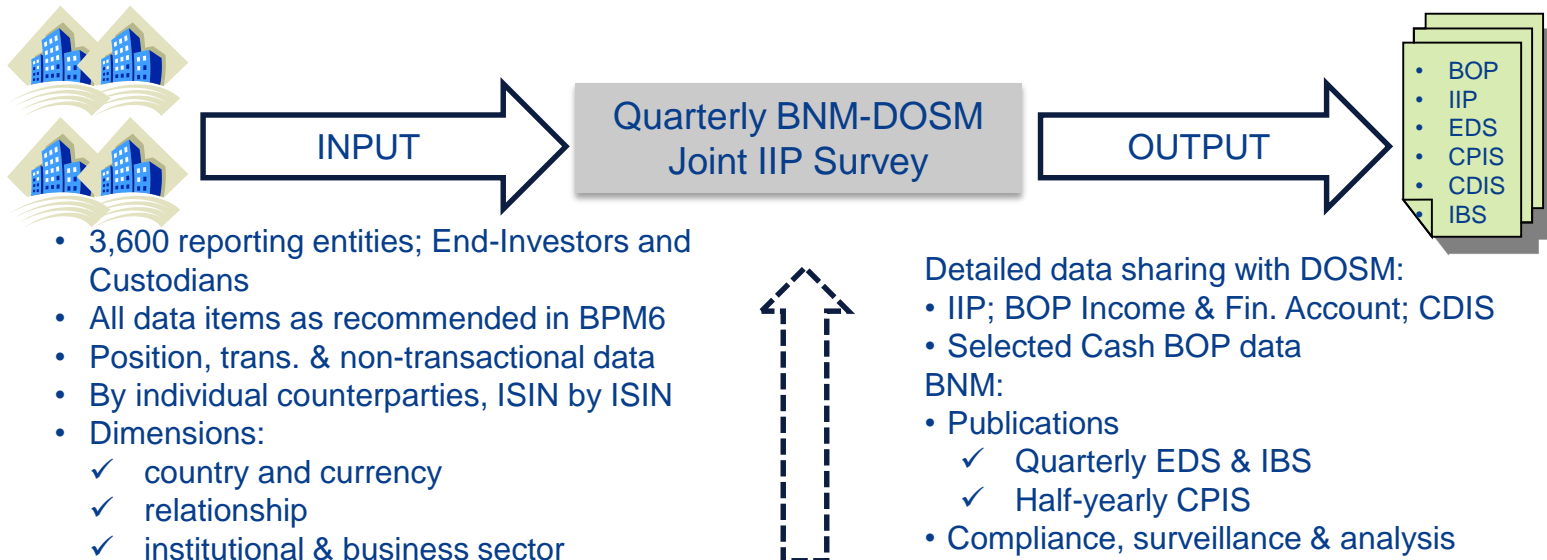


LEGAL PROVISIONS

BOP	Data Source
Current Account Goods, Services and Income	i. Customs Department ii. Quarterly Survey of International Trade in Services iii. Tourism Ministry iv. Immigration Department v. Cash BOP vi. BNM-DOSM Joint IIP Survey
Capital Account	i. Cash BOP ii. Other Government agencies
Financial Account Direct, Portfolio and Other Investment	BNM-DOSM Joint IIP Survey
Other Reports	Data Source
IIP, EDS, CPIS, CDIS, IBS	BNM-DOSM Joint IIP Survey

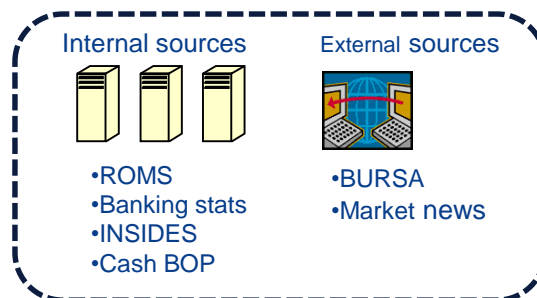
BNM-DOSM Joint IIP Survey Frame

... BNM-DOSM joint effort in compilation to reduce reporting burden, improve quality and turnaround time



Validation

- Reporting frequency: Quarterly basis
- Submission deadline: 15 days after end of reporting period
- 100% response rate;
- Online submission;
- Final data 3 weeks after deadline
- Publish quarterly BOP/EDS/IIP: 7 weeks after reference period (together with GDP)



- Cross-check against internal and external sources
- Data quality assessment by both BNM and DOSM
- Inter-agency technical discussion
- Regular engagement with reporting entities



BNM-DOSM Joint IIP Data Quality Framework

... joint effort in compilation to reduce reporting burden, improve quality and turnaround time

Data Quality Assurance Process

Data Provider	System	Data Compiler	Data Quality Review Panel	Policymakers /Researchers/Analysts
<ul style="list-style-type: none"> Comply with the reporting guidelines provided by Bank Negara Malaysia Understand system functionalities and reporting requirements Conduct internal validation to ensure data accuracy and consistency Rectify data errors identified or rejected by system 	<ul style="list-style-type: none"> Develop validation rules in submission system Perform data validation check Establish integration with other data sources where possible to facilitate data collection (e.g. ISIN codes) Generate data processing and validation result Return data errors (reject) to reporting entities 	<ul style="list-style-type: none"> Comprehensive understanding on BPM6 and transform into reporting requirements Perform data quality checks via micro and macro analysis Cross check IIP data against internal and external sources Engage and train reporting entities on reporting requirements Data Quality Checking Framework for REs to ensure accurate reporting. 	<ul style="list-style-type: none"> BNM-DOSM Technical Meeting on overall BOP and IIP statistics Ensure consistency of data with other indicators and economic/financial developments following the market news and trends Ensure data align with international reporting standards such as BPM6, EDS Guide and BIS Guidelines 	<ul style="list-style-type: none"> Highlight outliers in data compiled during analysis and research Provide independent assessment on data quality

Data Dissemination in Accordance with BPM6 and Complied with SDDS

Compiler	Report	Periodic	Timeliness	Compiler	Report	Periodic	Timeliness
By BNM	EDS	Quarterly	7 th week after end of quarter (Released together with GDP)	By DOSM	BOP	Quarterly	7 th week after end of quarter (Released together with GDP)
	IBS	Quarterly	12 th week after end of quarter		IIP	Quarterly	7 th week after end of quarter (Released together with GDP)
	CPIS	Semi - Annual	6 months after reference period		CDIS	Annual	9 months after reference year

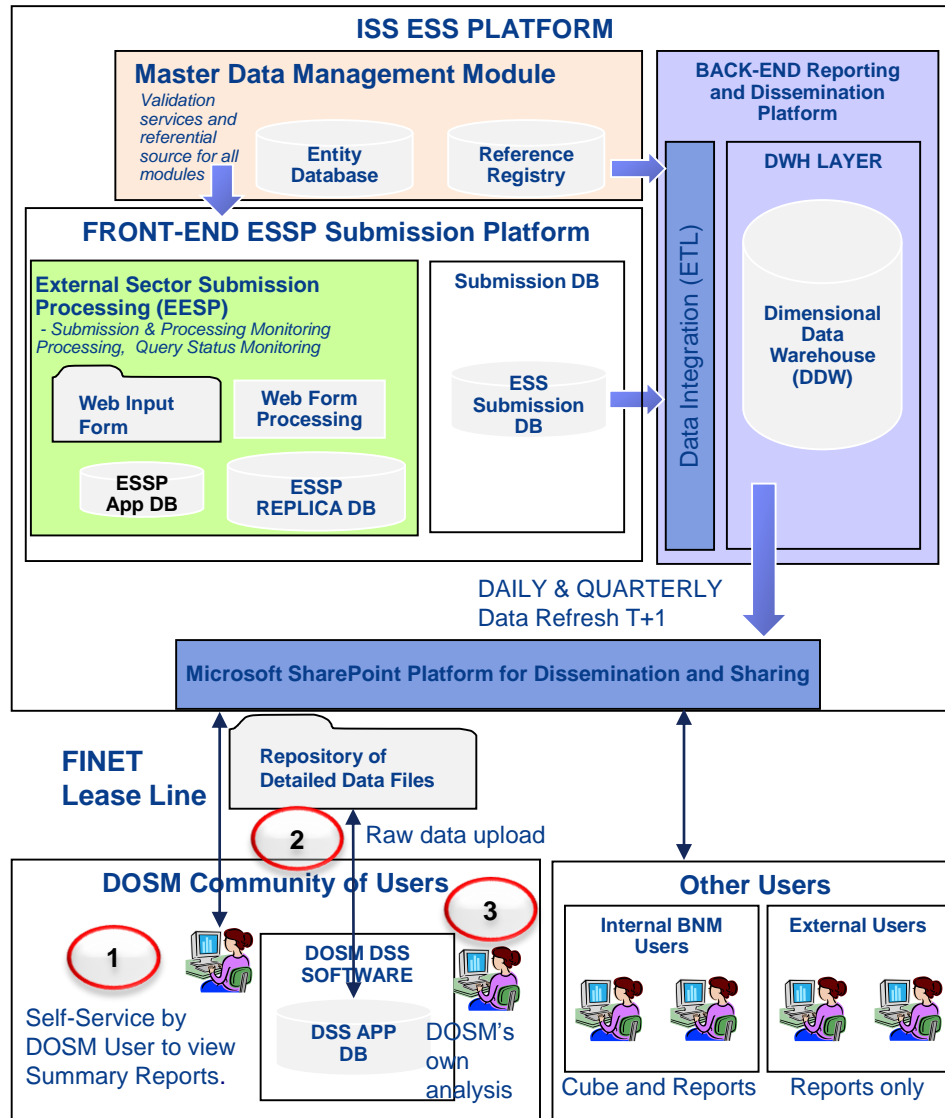


Reporting by Financial Institutions/Surveyed Companies

Quarterly IIP					Daily/Monthly Cash BOP
Assets and Liabilities				Consolidated Financial Position	1. Individual report on payments/receipts for transactions between R to NR of RM200,001 and above, with the following details: a) Remitter/beneficiary b) Country c) Currency d) Amount 2. Aggregated reporting for transactions between R to NR below RM200,001.00 3. Reporting by purpose of transactions as follows: a) Goods b) Services & Transfers c) Income d) Capital and Financial Transactions
Vis-à-vis Non-resident (NR)			Vis-à-vis Resident (R)	1. Preliminary Consolidated Financial Position 2. Position at total level: a) Total Assets b) Total Equity c) Total Liabilities: • Debt securities • Derivatives • Other and unallocated liabilities <i>Applicable to Local Bank only</i>	
Own Exposure	Custodian Report on Portfolio Investment	Foreign Branches and Subsidiaries	Assets and Liabilities (A&L)		
1. Type of Data Item 2. NR Counterparty (NRCP) Profile 3. ISIN Profile 4. EAL Profile 5. EAL Transaction and Position 6. <i>Ultimate risk transfers (where applicable)</i>	1. Type of Data Item 2. ISIN Profile 3. EAL Profile 4. EAL Transaction and Position 5. <i>Ultimate risk transfers (where applicable)</i>	1. Type of Data Item 2. EAL Profile 3. EAL Transaction and Position <i>Applicable to Local Bank only</i>	1. Type of Data Item 2. EAL Profile with Position by Currency 3. EAL Transaction and Position 4. <i>Ultimate risk transfers (where applicable)</i>		
Official Statistics			Official Statistics		Inputs
1. BOP Income and Financial Accounts 2. International Investment Position 3. External Debt 4. Coordinated Direct Investment Statistics 5. Coordinated Portfolio Investment Statistics			1. Locational Banking Statistics by Residency 2. Locational Banking Statistics by Nationality 3. <i>Consolidated Banking Statistics</i>		1. BOP statistics 2. Surveillance and monitoring 3. Early indicator on flow of funds



Overview of Integrated ESS Data Compilation System



System Infrastructure of ISS ESS:

Front-End Components

- Submission Platforms:
- a) ESS Portal (ESSP)
 - b) ESS Data Submission System (ESS DSS)
- Online reporting via
 - ✓ ESS Portal (internet base) for NB entities; and
 - ✓ ESS DSS (client application – installed at banking institutions)
 - Covers validation of submitted records through the query module, validation against entity data and ISIN profiles stored in Entity Database.

Report Generation Module (FE SSRS) and Submission Database

- Flexible platform to allow raw data extraction based on the data submitted by reporting entities
- Once submission completed, data will be harmonized to prepare for processing at DDW in Submission Database

Master Data Management Components

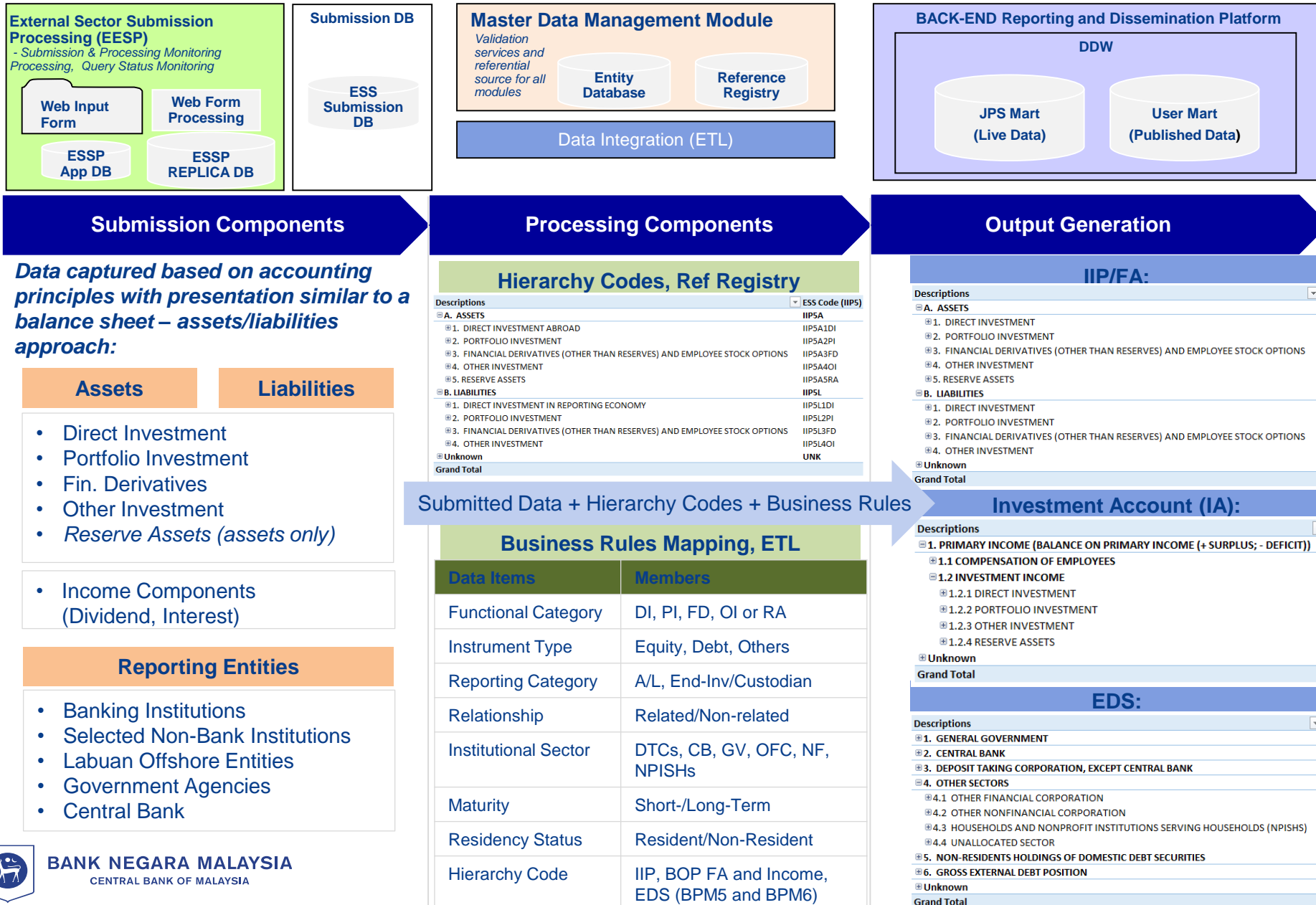
- Entity Database**
 - Centralised repository for entity data and securities profile (ISIN issued in domestic and international market) used throughout the ISS ESS platforms
- Reference Registry**
 - Centralised repository for storage of reference codes used throughout the ISS ESS platforms

Back-End Components

- Integrated Cubes and Dynamic Reports**
 - Cubes built based on the ESS subject areas i.e. IIP, FA, EDS, Income Account, and Cash BOP
 - Interlinked cubes to ensure consistency of data across all ESS subject areas.
 - Excel-base reports for users with active cube connection to allow for dynamic analysis
- Data Sharing Platform**
 - Daily and Quarterly data transfers to DOSM to support the BNM-DOSM Joint-IIP Survey
 - Allow for data sharing between both organisations through secured channel



ISS ESS System Workflows in IIP, BOP, and EDS Production



BANK NEGARA MALAYSIA
CENTRAL BANK OF MALAYSIA

Submitted Data + Hierarchy Codes + Business Rules



ESS Data Compilation Challenges and Mitigation Plan

Challenges

1 Sustainable Compilation System

- System design to meet long-term statistical needs
- Simplified compilation approach that facilitate understanding by reporting entities
- Institutional knowledge among both compilers and reporting entities
- Adequacy of resources, talent and IT

2 Expansion in Scope and coverage

- Mandatory reporting by all banking institutions
- Increase in the number of non-bank reporting entities from 2,449 in 2008 to 3,600 in 2018 to ensure representable of economic structure
- Short compilation period of within 4 weeks
- High volume of records due to granular data compilation to comply with national and international standards and facilitate analysis

3 Ever-changing Financial System

- Rapid technological advancement in the Financial System such as FinTech and Cryptoassets introduces new and complex scenarios in reporting.

4 Data Accuracy

- Maximise the accuracy on data compilation and ensure the E&O to be within acceptable range.

Mitigation Plan

1 Integrated Compilation System

- Centralised and maintainable reference registry to cater for changes in standard codes
- Flexible data submission system (front-end) for detailed reporting, expandable data items and adopt accounting principle for REs familiarisation.
- Data dissemination platform (back-end) to transform data into BOP/IIP/EDS/IBS statistics via maintainable business rules

2 Improve Data Compilation Methods

- System equipped with infrastructure and BI tools to facilitate validation and data quality processes
- Flexible data sharing platform for daily micro data sharing to facilitate effective handling of Joint Survey between the Central Bank and DOSM
- Regular engagement with reporting entities to ensure accurate understanding on reporting requirements

3 Comprehensive Reporting Guideline

- Ensure guideline to reporting entities are comprehensive and covers all scenarios based on main principles and fundamentals of ESS compilation
- Continuous review of reporting guidelines

4 Micro-level Data Quality Checking

- More granular analysis on the data during quality checking
- New methodologies for estimating missing data
- Incorporating model-based estimates into data compilation

Thank you

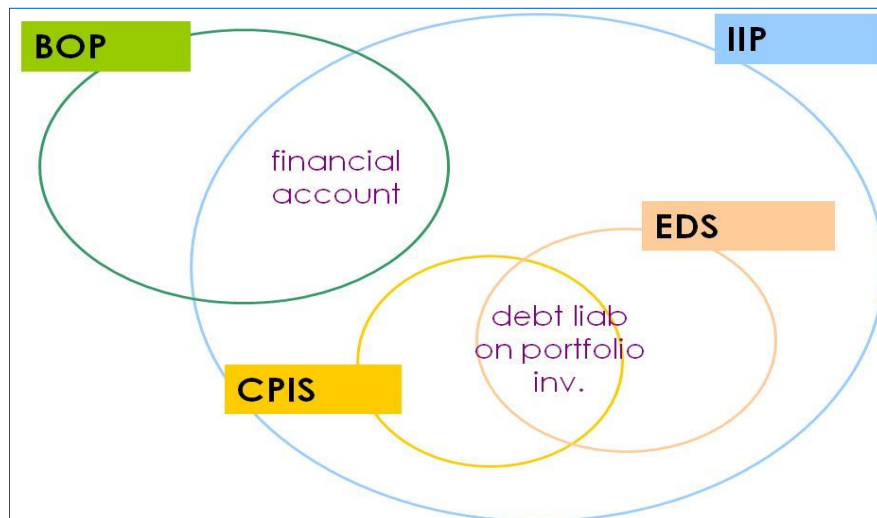
norhayati@bnm.gov.my





IIP as Framework for ESS Interlinkages

		BOP					IIP
		1. Current Account					
		2. Capital Account					
Items	Opening Position	Transactions	Other Changes			Closing Position	
			Price Changes	Exch Rate Changes	Other Adj		
<u>Assets</u>		3. Financial Account					
1. Direct Inv							
2. Portfolio Inv							
3. Fin. Derivatives							
4. Other Inv							
5. Reserves							
<u>Liabilities</u>							
1. Direct Inv							
2. Portfolio Inv							
3. Fin. Derivatives							
4. Other Inv							
Net IIP							



- Integrated approach facilitates productions from a single source to ensure quality and consistency
- From the IIP framework:
 - ☐ Flow Transactions: BOP Fin AC
 - ☐ Interest and Dividends: BOP Primary Income
 - ☐ Closing Position: IIP
 - ☐ Non-Equity Liabilities: EDS
 - ☐ Direct Investment: CDIS
 - ☐ Portfolio investment: CPIS
 - ☐ IIP of banking institutions: IBS
- As SDDS subscriber, Malaysia complies with international requirements on all ESS reports
- These include BOP, IIP, EDS, CPIS, CDIS, and IBS



IFC - Central Bank of Armenia Workshop on *"External Sector Statistics"*

Dilijan, Armenia, 11-12 June 2018

Accountancy records of companies and reporting for the external statistics needs¹

Jacek Kocerka and Marcin Dwórzniak,

Narodowy Bank Polski

¹ This paper 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.

Accountancy records of companies and reporting for the external statistics needs

Jacek Kocerka, Marcin Dwórzniak

Abstract

The article shows that with the use of information stored in accounting systems of companies, it is possible to obtain reliable data for the needs of balance of payments statistics. Narodowy Bank Polski's experience in designing a reporting system where special attention is paid to the cases where economic operations are recognized for accounting needs differently than it is required in external statistics is shown. Authors use leasing, results from operating activities, Current Operating Performance Concept and valuation of business entities as examples of areas that require special attention due to inconsistencies between statistical requirements and accounting framework. The article also proves that the structure of the reporting system based on data obtained from the accounting system can help central bank to get good quality data defined, among others, in the ESCB Public Commitment on European Statistics.

Keywords: accounting systems, leasing, results from operating activities, Current Operating Performance Concept, valuation of business entities, quality criteria

JEL classification: M41 (Accounting), C82 (Methodology for Collecting, Estimating, and Organizing Macroeconomic Data; Data Access)

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1. Introduction

The article raises the subject of collecting data necessary for the compilation of the balance of payments and international investment position statistics. It may be assumed that data which may be used in balance of payments compilation can be derived from accounting records of economic entities. In this context, it is important the reporting system is understandable for reporting entities. Receiving data directly from accounting systems of entities should enable better adjustment to the country's balance of payments requirements.

Data derived directly from the accounting systems of business entities should be in our opinion more accurate.

2. Accounting systems of business entities and the balance of payments

Data necessary for compilation of the balance of payments and the international investment position may be obtained, among others, from accounting records kept by business entities. It is important that the collected data make possible to distinctions between assets and liabilities (sources of financing of assets), broken down into those related to residents and non-residents. According to the guidelines set up by the Manual of Balance of Payments Statistics and International Investment Position (IMF 2009), the essence of the creation of a business operation is the change in its result of "economic ownership" of the subject of the transaction.

In order to facilitate the reporting process, the main focus of reporting forms should be the division of data into assets and liabilities. On the assets side, one can distinguish, just as in the entity's balance sheet: real estate, loans granted, owned shares, trade receivables and deposits as well as investments in securities as well as financial derivatives. Layout of forms on the liabilities side may mirror the layout of assets forms, and contain information on equity (mainly non-resident equity), loans and credits received, trade liabilities as well as liabilities resulting from financial leasing. Figure 1 presents balance sheet positions in which one can find information useful for compilation of the balance of payments statistics.

ASSETS		LIABILITIES
NON-CURRENT ASSETS (FIXED ASSETS)		EQUITY
Real estate	Intangible assets	Share capital
Financial assets	Tangible fixed assets	Supplementary capital
Stocks and shares	Long-term receivables	Other reserve capitals
	Long-term investments	Net profit (loss)
CURRENT ASSETS		LIABILITIES AND PROVISIONS FOR LIABILITIES
Trade receivables	Inventories	Provisions for liabilities
Deposits	Short-term receivables	Long-term liabilities
Other assets	Short-term investments	Short-term liabilities
		Credits and loans
		Trade liabilities
		Other liabilities

Figure 1 Typical balance sheet of business entity and information needed to compile b.o.p./i.i.p.

Figure 1 shows the universality of reporting forms used by Narodowy Bank Polski allowing business entities to apply either national (so-called National Generally Accepted Accounting Principles (nGAAP)) or international (the most popular in Europe are the International Accounting Standards (IAS)/International Financial Reporting Standards /IFRS/)) accounting and financial reporting standards.

The balance sheet structure is similar in both national and international regulations. Differences in balance sheets prepared on the basis of nGAAP and IFRS are related to organizing of assets and liabilities as well as individual positions. These differences, however, should not have significant influence on the country's balance of payments. Moreover, it is possible to link items in "simplified" balance sheet with individual reporting forms. Therefore, a company which distinguishes assets and liabilities while recording transactions with non-residents may provide data for the purposes of compiling the balance of payments in a more "automatic" manner (i.e. without involving additional resources).

Reporting entities apply national accounting standards as well as (or) international standards, therefore it is important to maintain consistency of definition for each reporting category (see also Yoon 1996). It is worth noticing that the problem of the definitional approach does not occur only at the interface between national and international regulations, but also within national rules on the basis of which business entities keep their accounting records.

The accounting systems may vary depending on whether the entity applies national accounting standards or international accounting standards. Potential differences in the records may result from the manner in which particular business transactions are recognized (including valuation rules) in the accounting system and the method of presentation of assets and liabilities. Our co-operation with entities reporting to Narodowy Bank Polski allowed us to identify three categories in which there may be definitional differences in terms of accounting and balance of payments:

- Leasing
- Gross profit (loss) from current activity/Current Operating Performance Concept (COPC) and
- Valuation of business entities

3. Leasing

Leasing is an important example of a concept which is not clearly defined by legal regulations. There are two types of leasing: financial and operational. The main difference between these two is the manner in which the owner (lessor) transfers the leased asset to the lessee. It is assumed that in case of financial leasing together with the possibility to use the leased asset, the lessor transfers to the lessee not only the right to use the leased asset but also all risks associated with its use. This situation is similar to purchase of an asset, and the return of funding is regarded as loan repayment. The same approach should be used for reporting for the needs of balance of payments. In the case of operating leasing, ownership and responsibility for the leased asset (i.e. all risks) remains with the lessor. In balance of payments statistics, operating leasing is treated as a lease agreement, which is simply a type of commercial transaction, and leasing fees are recorded in services account. If it is assumed that the data transferred should be consistent with the accounting records kept under the accounting law at the national level (nGAAP), there should be no doubt about how to classify the lease that the company has. The problem arises when the subject of leasing is classified differently under national and international law. The new international standard for financial reporting – IFRS 16 is currently being implemented. According to the new standard, all leasing contracts should be treated as financial leasing (on the side of the lessee). The reclassification of existing contracts from operating leasing to financial leasing will, in the case of lessees, cause financial account statements to appear in reporting forms instead leasing fees in the current account. In addition, the difference will be visible when two entities have signed identical leasing agreements, content-wise. In the case of one entity keeps records in accordance with national law and classifies leasing as an operating lease, and the other entity keeps records in accordance with international law and classifies leasing as a financial lease. In that situation leasing items will be visible in various items of the balance sheet.

4. Gross profit (loss) from current activity/Current Operating Performance Concept (COPC)

The second concept, where the definition is ambiguous in the accounting system is the result on operating activities. In macroeconomic statistics Current Operating Performance Concept should be used (BPM6 11.43). Depending on the entity, it may be equated with the result on sales or result after considering other operating revenues and expenses. In the balance of payments statistics, operating result is understood as the result after taking into account other operating revenues and expenses. In order to calculate gross profit (loss) from current activity the result on operating activities should be adjusted for: gains or losses from the revaluation, any gains or losses arising from valuation changes, such as inventory write-offs, write-downs, or write-ups, realized gains or losses from the disposal of assets, result on extraordinary events. In the case of further calculation of the result (profit/loss) on current operations, the operating result calculated for the purposes of statistics should be further adjusted for financial income on dividends received, net income on interest and the value of retained earnings and losses incurred by direct investment

entities. Figure 2 illustrates the abovementioned methodology of calculating gross profit (loss) from current activity for BOP/IIP purposes.

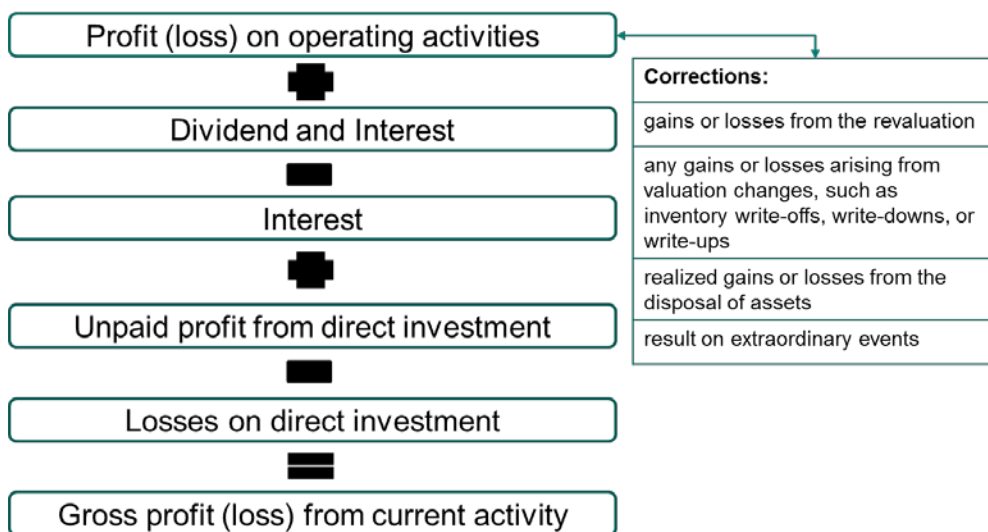


Figure 2 Gross profit (loss) from current activity –calculation for IIP purposes

The second method is to calculate current operating concept (COPC). Definition of COPC earnings consists of income from normal enterprise operations before non-recurring items (such as write-offs) and capital gains and losses are accounted for the earnings of direct investment enterprises reported using the "Current Operating Performance Concept" (COPC) should exclude: any gains or losses arising from valuation changes, such as inventory write-offs, write-downs, or write-ups; gains or losses on plant and equipment from the closure of part or all of a business; writing-off of intangible assets, including goodwill, due to unusual events; writing-off of research and development expenditures capitalised in a prior period; provisions for losses on long-term contracts; exchange rate gains and losses incurred by the direct investment enterprise both from its trading activities and from its holdings of foreign currency assets and liabilities; unrealised gains or losses from the revaluation of fixed assets, investments and liabilities; realised gains or losses made by the enterprise from the disposal of assets or liabilities. It should be noted that until 2005 the definition of COPC had been included in IAS 8 (accounting law). Since then, it can be found only in OECD materials - benchmark definition ("statistical law").

5. Valuation of business entities

In the case of providing information on the market valuation of equities (for sale-purchase transactions) and the balance sheet of the economic entity for balance of payments statistics, the problem is determining the moment up to which the market valuation of equities is reliable. This problem has not been explicitly resolved in accounting regulations. In fact, it is stated in the accounting law that the valuation of assets and liabilities should be carried out periodically (mostly at the end of the accounting year). The practice, however, allows to presume that, especially in the case of valuation of equity, the above valuation may have some objections. In line with the

above approach, the entity's value measured on the basis of the market valuation carried out as part of the sale-purchase transaction should be valid until the end of the annual reporting period. After this date, the valuation of the entity based on equity (OFBV) should be considered more reliable.

6. Data quality

Reporting system based on data derived directly from the company's accounting system can provide certain level of quality. Quality criteria set out, among others, in Public Commitment to on European Statistics by the ESCB, can be used to assess quality of accounting information used in bop/iip context.

Receiving data adapted to the needs of BoP statistics allows for accurate and reliable statistical output. In the Public Commitment on European Statistics it means ESCB statistics must provide accurate and reliable information on the phenomenon that they measure. Harmonized definitions for the needs of BoP and accounting allows to collect specified data. It's also important to emphasize cooperation with reporting entities. Each reporting entity has a dedicated contact person in NBP regional branch who provides explanations on the reporting procedure both in methodological and technical (IT) area. Should there be a methodological problem that cannot be addressed within the contact person's capacity experts from Department of Statistics take over. NBP also organises specialist training sessions tailored for the needs of reporting entities which focus on all aspects related to reporting i.e. legal, technical and methodological. All explanation is given in clear and accessible terms. Usually there are three to five sessions a year, with ca. 100 representatives of reporting entities altogether. Meetings with reporting entities not only allow NBP to provide guidelines to business entities but also give the NBP staff an opportunity understand the needs of entities involved in operations with abroad. During training sessions, reporting entities are instructed on legal regulations in which the reporting requirement is stipulated and are given detailed explanations illustrated with real-life examples e.g. on links between different reporting forms. There is also consulting process established when change in reporting regulation is expected.

Direct contact with data providers allows for verification of data. Data can be verified either through receiving additional explanations and/or direct access to the company's accounting system. It helps to have accuracy and reliability (stability) of the statistical output.

Data derived from accounting systems of companies which are under obligation to comply the basic accounting principles, allows NBP to fulfil the consistency and comparability of the statistical output criterion. Companies should also pay attention to keeping data presented between reporting periods consistent and comparable.

Data in accounting systems should be recorded on an ongoing basis (which is in line with one of the basic accounting principles) which should allow for timeliness (and punctuality) of the statistical output. All described actions allow NBP to get response rate of 98% for monthly reports and 96% for quarterly ones.

One of the quality criterions is also cost-effectiveness meaning that the costs of producing ESCB statistics must be in proportion to their merits and that resources must be used optimally. In this area there is a need to minimise the burden on

reporting entities. Possibility to use data directly and automatically from accounting record of companies minimise the workload from the respondent point of view.

7. Summary

Summing up, with the appropriate construction of accounting systems in companies, it should be possible to obtain reliable (of sufficient quality) data for the needs of balance of payments statistics. However, particular attention should be paid to the issues of unification and a certain degree of standardization of the concepts used in the case of data transferred for the purposes of compiling the balance of payments.

Recently, the statistical community made a lot of effort to unify regulations for National Accounts and balance of payments statistics. Currently both SNA 2008 and ESA 2010 are consistent with Balance of Payments and International Investment Position Manual. In our opinion there is a need to achieve greater consistency between National Accounts and national accounting, as data described by accounting law are important data source for macroeconomic statistics.

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IFC - Central Bank of Armenia Workshop on *"External Sector Statistics"*

Dilijan, Armenia, 11-12 June 2018

Accountancy records of companies and reporting for the external statistics needs¹

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Narodowy Bank Polski

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.

Jacek Kocerka, Marcin Dwórzniak / Department of Statistics

Accountancy records of companies and reporting for the external statistics needs

IFC – Central Bank of Armenia workshop on “External sector statistics”
Dilijan, 11-12 June 2018



Source of data

- The data submitted to NBP pursuant to the “Regulation of the minister of economic development and finance of 9 August 2017 on providing Narodowy Bank Polski with data necessary for the compilation of the balance of payments and the international investment position”^{*} and the data used or the calculation of the total amount of assets, liabilities and equity capital, the exceeding of which results in the occurrence of reporting obligations, hereinafter referred to as the "reporting threshold", should result from:
 - company's accounts or registers kept pursuant to separate provisions, or from source documents presenting the actual state of affairs, in the case of entities keeping account books;
 - source documents presenting the actual state of affairs, in the case of other entities not keeping account books.

^{*}Pursuant to Article 30(3) of the Act of 27 July 2002 – Foreign Exchange Law (Journal of Laws (Dziennik Ustaw) 2017, item 679)

Common balance sheet and information about data to b.o.p.

	ASSETS	LIABILITIES	
	NON-CURRENT ASSETS (FIXED ASSETS)	EQUITY	Equity
Real estate	Intangible assets	Share capital	
Financial assets	Tangible fixed assets	Supplementary capital	
	Long-term receivables	Other reserve capitals	
Stocks and shares	Long-term investments	Net profit (loss)	
	CURRENT ASSETS	LIABILITIES AND PROVISIONS FOR LIABILITIES	
Trade receivables	Inventories	Provisions for liabilities	Credits and loans
Deposits	Short-term receivables	Long-term liabilities	Trade liabilities
Other assets	Short-term investments	Short-term liabilities	Other liabilities

Leasing

- In practice, we have two types of leasing: operating leasing and financial leasing.
- Operating lease is similar to a rental agreement.
- In the case of operating leasing, we are dealing with trade liabilities.
- In the case of financial leasing, we have a transfer of economic ownership to the lessee.
- In accordance with the new IFRS 16, any lease should be treated as a finance lease.
- In the case of financial leasing, we have financial obligations.

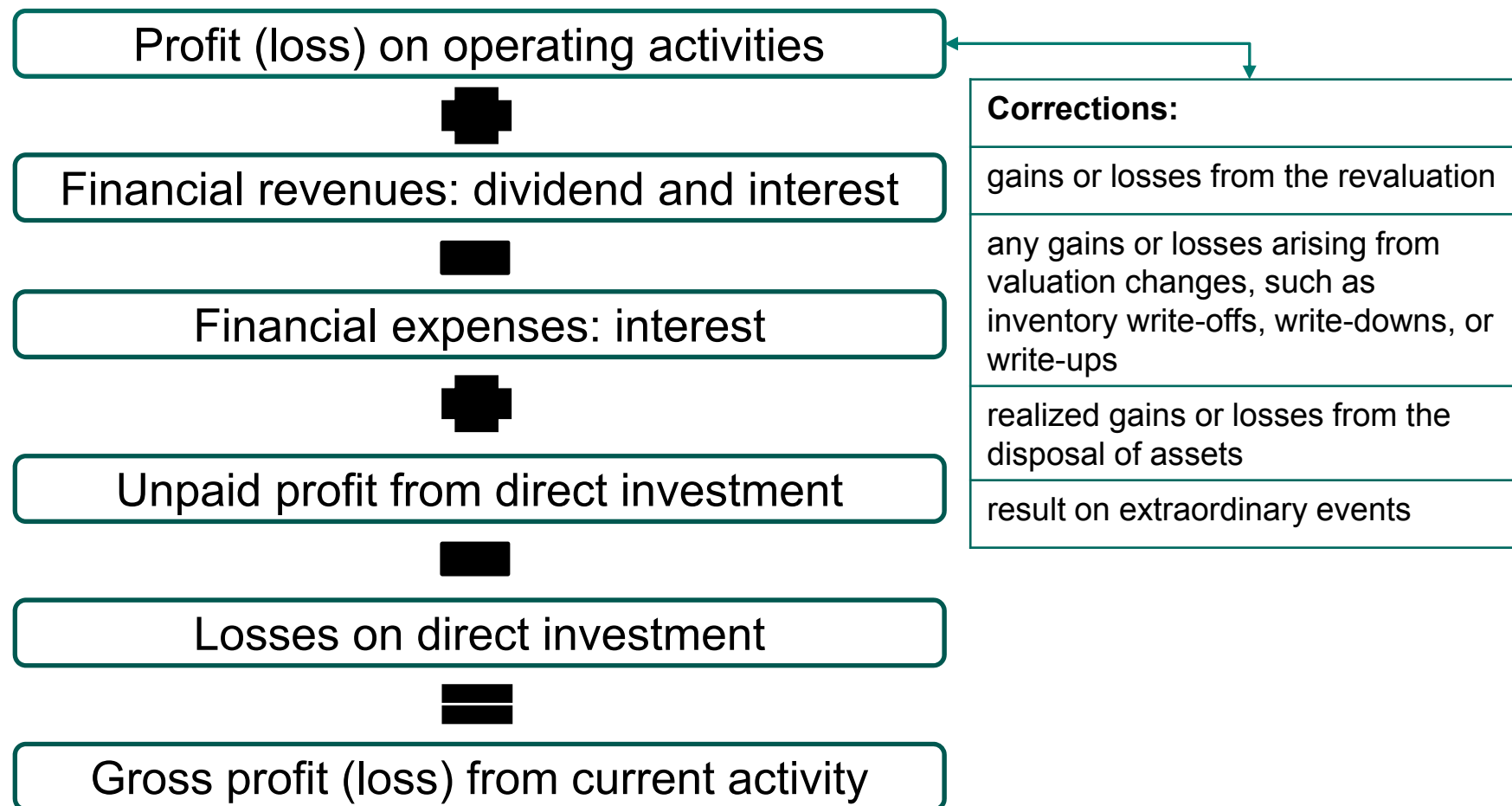
Leasing

- The problem is that there is no uniform definition of leasing.
- The leasing categorization differs depending on whether we have to do with nGAAP or IFRS. Similarly, within one country, there may be different definitions depending on whether we are dealing with accounting or tax law.
- Important is a change in ownership from an economic point of view means that all risks, rewards, and rights and responsibilities of ownership in practice are transferred – we have such a situation in the case of financial leasing.

Profit (loss) from current activity... Profit and loss account

No.	Item
A	Net revenues from sales and equivalent, including revenues:
B	Operating expenses
C	Profit (loss) on sales
D	Other operating revenues
I	Gain on disposal of non-financial fixed assets
II	Subsidies
III	Extraordinary gains
IV	Other operating revenues
E	Other operating expenses
I	Loss on disposal of non-financial fixed assets
II	Revaluation of non-financial assets
III	Extraordinary losses
IV	Other operating expenses
F	Profit (loss) on operating activities
G	Financial revenues
I	Dividend and profit sharing
II	Interest
III	Gain on disposal of investments
IV	Revaluation of investments
V	Other
H	Financial expenses
I	Interest
II	Loss on disposal of investments
III	Revaluation of investments
IV	Other
I	Profit (loss) on business activities
J	Gross profit (loss)
K	Income tax
L	Other statutory reductions in profit (increases in loss)
M	Net profit (loss)

Gross profit (loss) from current activity.. IIP purposes



Current Operating Performance Concept (COPC)

Definition of COPC earnings consist of income from normal enterprise operations before non-recurring items (such as write-offs) and capital gains and losses are accounted for the earnings of direct investment enterprises reported using the “Current Operating Performance Concept” (COPC) should exclude:

- i. any gains or losses arising from valuation changes, such as inventory write-offs, write-downs, or write-ups;
- ii. gains or losses on plant and equipment from the closure of part or all of a business;
- iii. writing-off of intangible assets, including goodwill, due to unusual events;
- iv. writing-off of research and development expenditures capitalised in a prior period;
- v. provisions for losses on long-term contracts;
- vi. exchange rate gains and losses incurred by the direct investment enterprise both from its trading activities and from its holdings of foreign currency assets and liabilities;
- vii. unrealised gains or losses from the revaluation of fixed assets, investments and liabilities;
- viii. realised gains or losses made by the enterprise from the disposal of assets or liabilities.

Valuation of business entities

- The problem is what to adopt when the company's market value is known or should it be accepted or the value of equity?
- In accordance with accounting law, the company can not make its own valuation; a certain approximation of the company's value is the value of its equity.
- The market value of the company results from the transaction carried out on the company's shares.

High output quality

- Relevance of the statistical output
 - Received data are adapted to the needs of BoP statistics
 - Definitions for the needs of BoP and accounting should be closely related
 - Data come straight from companies
 - Accounting regulations on the basis of which data are collected on an ongoing basis are adapted to the expectations of recipients

High output quality

- Accuracy and reliability (stability) of the statistical output
 - Received data are underestimated by unnecessary distortions (resulting, among others, from their coding)
 - Thanks to contact with data providers, it is possible to verify data
 - Data can be verified by obtaining additional explanations and / or direct access to the company's accounting system

High output quality

- Consistency and comparability of the statistical output
 - Data comes from the accounting systems of companies in which they should comply with the basic accounting principles that are the same for everyone
 - Companies should care about consistency and comparability of the data presented between periods

High output quality

- Timeliness (and punctuality) of the statistical output
 - Data in accounting systems should be recorded on an ongoing basis (which is in line with one of the basic accounting principles)

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Errors and omissions in Armenia's balance of payments: possible reasons and solutions¹

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¹ This paper 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.

Errors and omissions in Armenia's balance of payments: possible reasons and solutions

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For recent years balance of payments of Armenia records relatively large errors and omissions. Sometimes errors and omissions exceed current account, which leads to serious criticism by users. The nature of data collection and compilation system itself can cause some systematic errors. Central bank of Armenia collects data from many sources, and then tries to bring together pieces of "puzzle". The development of international trade and transition from basic external transactions to complex system of cross border movement of goods and capital makes more and more difficult to solve this "puzzle".

Small size of economy means that households play a strong role in external transactions, which is another source for errors. The high level of dollarization, shadow turnover of foreign exchange also bring to imbalances in balance of payments.

The paper will cover potential sources of errors in Armenia's BOP, including those coming from data compilation practices, data coverage gaps, or possible particular unrecorded transactions.

Keywords: errors and omissions, data gaps, balance of payments, trade misinvoicing, remittances.

JEL classification: C82, F39.

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Introduction

The nature of errors and omissions in balance of payments is thought to be unpreventable. Theoretically, accounting principles ensure that the BOP will be balanced, all credits should equal debits (in BPM 5 accounting principles), or credit and debit entries will be balanced with net acquisition of assets and net incurrence of liabilities. The same double entry system ensures that the balance sheet of enterprise will be “balanced”. The difference is that an accountant has access to all information necessary for compilation of balance sheet, while BOP compiler should not just build puzzle, but also find the pieces of the puzzle.

Armenia is a small open economy with population about 3 mln and GDP 11.5 bln USD. Import exceeds export about 2 times, and the major source for financing current account are remittances. The current account deficit was volatile during 2004-2017. From 2.2 % in GDP in 2004 it rose to 16.5 % in 2009 and then decreased back to 2.8 % in 2017. Generally, households play significant role in economy, which leads to several challenges in BOP statistics that we will describe further in the paper. Considerable diaspora also has a strong economic impact, which is another challenge for official statistics.

The statistics of balance of payments of Armenia started in 1994, a few years after the country gained independence. Compilation of IIP began in 1998. Initially the Statistical committee (SC) was in charge for external accounts compilation. In 2009 government of RA decided to transfer the responsibility for compiling external accounts from SC to Central bank of Armenia (CBA). CBA started to compile and publish BOP statistics from 2011 according to both BPM6 and BPM5 principles, while historical data was only on BPM5 basis. Starting from June 2014 CBA compiles and publishes statistics only on BPM6 basis. For national accounts needs there was a short parallel compilation of current account according to BPM5. The historical data revision was done up to 1994. Starting from 2004 data are compiled within “consistent” statistical framework in sense that main components are being compiled using the same methodological approaches and the same data sources.

Compilation system is based on administrative data, surveys and some estimation models. International transactions reporting system (ITRS) was never used.

SC compiles and provides data to CBA for main components of external trade. For trade in goods major data source is administrative database of State revenue committee based on custom’s declarations. Data is processed in SC using several surveys, particularly survey on CIF-FOB transformation and survey on processing services. Adjustments are made for goods acquired in transportation stations and shuttle trade. Services are compiled using different surveys, expert evaluations and models.

SC also collects data on external financial transactions of non-financial corporations, including income paid/received. SC provides data on humanitarian aid received in form of goods.

CBA has a remittance calculation model, using banking statistics on households’ international transaction and adjustments based on number of surveys. CBA also compiles data on its own transactions, government external debt and related transactions, public transfers and external transactions of financial corporations.

Generally, data on each BOP item is collected and recorded separately. Major exceptions are public transfers, some entries in insurance and pension schemes items, and some entries in cash, where double recording is used.

Errors and omissions description

For the purpose of this paper, we looked into figures of annual E&O from 2004-2017. We discuss only annual figures, though we can see that there are also some problems in quarterly data. Quarterly data may have strong impact of timing lags, which means that in annual figures most of these lags may be eliminated. Of course, there are still transactions that fall in IV quarter and I quarter of next year, so the timing lags issues may still exist in annual figures but in a lesser degree.

Nevertheless, the aim of this paper is to present a sidelong look instead of covering all aspects of Armenia's E&Os. We would prefer to focus on major reasons that could cause E&O.

Some countries have errors and omissions studies, focusing on own vision of problem rather than on unique aspects and general solution. For example the errors and omissions are explained by foreign cash assets accumulated by tourism income of Croatia (Goran Vukšić, 2009). Boris Kilibarda (2013) took into account that errors and omissions is a net indicator in BOP and can accumulate positive and negative errors.

In his dissertation Tómas Örn Kristinsson (2016) compared errors and omissions in 70 countries. He applied several statistical methods to discover whether there were trend, seasonality and randomness in historical data of errors and omissions. He also conducted a survey among BOP compilers and collected their opinions about errors and omissions.

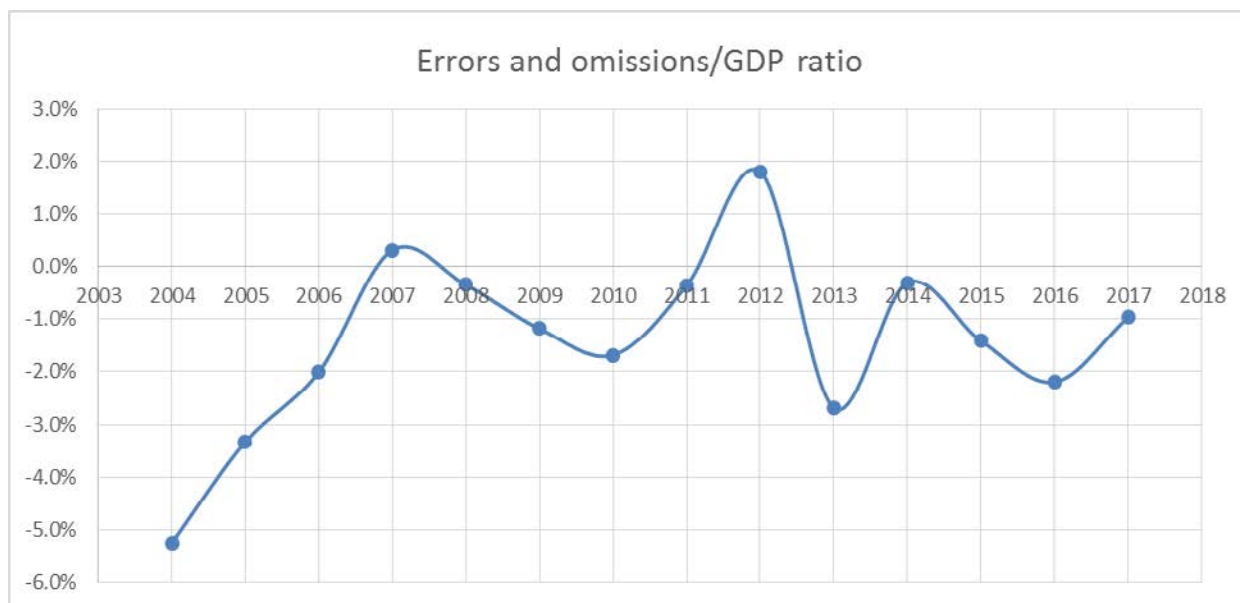
Several reasons can create errors and omissions. Timing gap, poor coverage or methodological problems can cause imbalances.

Table 1. Errors and omissions in BOP of Armenia and selected indicators

USD mln	2004	2007	2012	2017
Errors and omissions	-188	28	191	-112
Current account balance	-79	-677	-1,058	-400
FDI, net	248	654	481	223
GDP	3,577	9,206	10,619	11,560

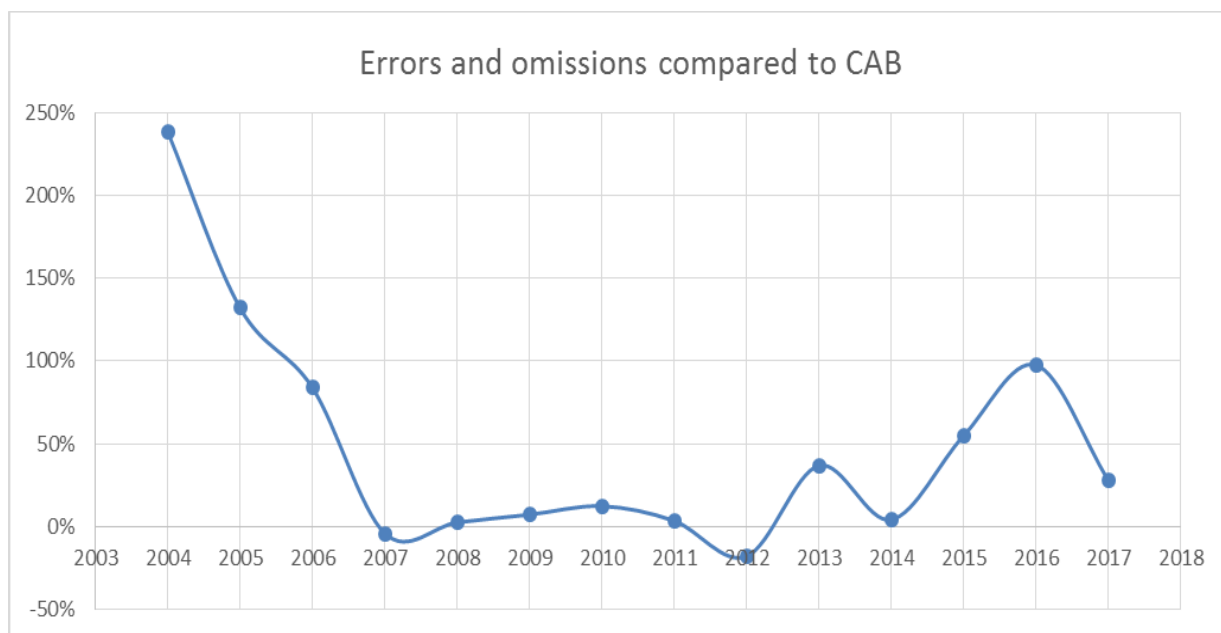
Source* Central bank of Armenia, Statistical committee of RA

Errors and omissions in BOP of Armenia are presumed to be huge. However, they are not too big compared to GDP. They are very volatile, for example if in 2012 BOP recorded 191 mln USD positive errors and omission, in 2013 it recoded 299 mln USD negative errors and omissions. In 2004-2017 BOP statistics recorded -1,426 mln USD cumulative errors and omissions, mainly with negative sign (14 times), and only 2 times with positive sign.



Source* Central bank of Armenia, Statistical committee of RA

Nevertheless compared to Current account balance they are quite sizable and as a result users expressed their concerns about this for several times. Taking into account that CAB is very important performance indicator it is important to understand whether imbalances come from current account or financial transactions sides.



Source* Central bank of Armenia

These imbalances were discussed with different purposes by various users for several times. In case of statisticians the size of difference between CAB and errors was pointed out with the aim to make several changes to data compilation system. At the same time there were also divergent interpretations of errors and omissions by other organizations. For example, an NGO called Global integrity finance treated negative errors and omissions as illicit financial outflow (at the same time a relevant question raises why it did not consider positive Errors and omissions as illicit inflow).

As the major part of errors and omissions is negative, it looks logical to look for uncovered or miscalculated "outflow" or overestimated "inflow". Even though E&O is a net figure, and there also might be uncovered credit transactions, the overall negative sign indicates that there are even larger debits missed out from official statistics.

Coverage problems

Last part of term "errors and omissions" refers to simplest explanation of large imbalances. Poor coverage or absence of data might cause large imbalances. The most obvious and problematic issues in BOP statistics are households external transactions and investments abroad. As it was mentioned before, individuals play strong role in Armenian economy. Control over companies usually belongs to an individual or a group of individuals rather than to holding corporations. This is also true for some part of foreign direct investment enterprises controlled by individuals from Armenian diaspora. There are many publications in mass media about investments of rich individuals abroad, some of them were even reflected in BOP data after several procedures to insure accuracy of the information. However, the media publications cannot cover all transactions and it is impossible to rely only on publications to compile statistics.

On the other hand, not only very rich individuals invest abroad. Another case is investing in real estate abroad. There are also many investments in real estate abroad that are poorly covered. In 2010-2017 in average more than 500 mln USD were transferred abroad annually by individuals for commercial purposes. These transactions are too large compared to import by households. It contains transactions in purpose of acquiring real estate, establishing business or transfer of financial means. It is very difficult to collect detailed data on such transactions and they may cause imbalances in external accounts statistics.

The problem of poor coverage of investments in real estate and in small and medium business projects exists not only in outward FDI statistics but also in inward FDI statistics. These investments are made due to large diaspora. The peak of investments of diaspora is considered to fall in 2006-2008, when the construction was growing rapidly. If we look at E&O, we will see that one of positive peaks falls in 2007, which can be result of large investments in real assets that were not covered properly in BOP statistics. Nevertheless, we should mention that at the same time outflow of individuals' transfers recorded its maximal values during these years (2006-2008), which gives strong evidence that the problem of outward investments was compensated by problem of inward investments. This is an example of how netting hides the real coverage issues.

Data quality problems

Quality of data collected for BOP compilation purposes is one of the reasons that can create non-systematic errors. Financial sector's external transactions seem to be covered properly. CBA collects many reporting forms, including detailed balance sheet from commercial banks, credit companies and other financial corporations. There are cross checks between different reporting forms. Banking supervision also checks the data periodically so the quality of data on financial sector is high. Central bank's own transactions and government external debt transactions are covered duly as well. Public transfers are one of few items in BOP that is recorded using double entry system, so they cannot be a source of errors and omissions.

On the other hand, non-financial corporations' external accounts statistics has large space to be improved. One of major problems with the non-financial corporations' reporting is reflection of dividends and interests accrued or paid in reporting forms. The reporting form requires to show the accrued interests during the reporting period as well as the interests accrued and not paid at the end of the reporting period. The same is required in case of dividends declared, as well as declared and not paid. After comparison of data with

other sources available including officially published financial statements of some enterprises CBA found considerable empty data in reporting forms. Later, CBA got the response that there is misunderstanding of term “declared” which respondents did not want to show because the dividends were paid on the previous year results and did not belong to the period covered by the report. In case of interest payments, the problem was that many of the enterprises attracted loans on favorable terms with rare interest payments, so they do not see the necessity of accruing interest every quarter.

Not going further into details we should state, that there are problems in data collected from non financial corporations, that may lead to non-systematics errors and omissions.

Correlation

Within the framework of this paper we also tried to check whether there is a correlation between different items in BOP and E&O. For that purpose we used SPSS Statistics software. Several items in BOP were found that are correlated with the E&O. However, some of them are examples of spurious correlation. For instance we have found out that the reinvested earnings are correlated with errors and omissions, while we know that they cannot cause imbalances as each transaction in current account is recorded in financial account at the same value. There are also some other correlations between errors and omissions and several items in BOP, but the amounts in these items are very small to explain even small part of E&O. For example, there is a strong correlation between E&O and portfolio investments of other deposit-taking corporations in debt securities, while the largest value recorded for the years analyzed does not exceed 6 mln USD. The same situation is with net issuance of liabilities of other sectors.

We have found a correlation between loans attracted by other depository corporations and E&O. We do not consider such possibility for the reason that was discussed earlier. The quality and the coverage of data provided by financial corporations is very high. It does not seem feasible that banks finance transactions are not covered and are source of E&O.

The same situation is with the loans liabilities of other sectors. It is difficult to explain why there is correlation between these two data series. Non-financial companies’ external financing usually is translated through commercial banks or import of equipment. A small portion may go to services. There might be an assumption that these investments do not come to Armenia, but are kept in form of foreign assets. It is very hard to believe that the major part of such liabilities was formed to finance corporations’ foreign activities. Some of enterprises financed externally are large mining companies and we have caught out corresponding import of special equipment and growth of mining sector.

The last but most important correlation was found between E&O and foreign exchange cash and deposits held abroad by other sector. Correlation between two indicators is 0.73, significant at level 0.01 (actual value is 0.003). This case will be examined below in a separate chapter.

Table 2. Correlation between errors and omissions and several BOP items

	Reinvested earnings, credit*	Reinvestment of earnings, assets*	Currency and deposits, Other sectors, NAFA**	Loans, ODC, NIL, long term*	Loans, Other sectors, NIL, long term *	Other accounts receivable/payable, Other *
Pearson Correlation	-0.537	-0.537	0.738	0.565	-0.561	0.564
Sig. (2-tailed)	0.048	0.048	0.003	0.035	0.037	0.036
N	14	14	14	14	14	14

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Special cases

We looked into several cases that can have an impact on E&O in Armenian balance of payments statistics. The selection of topics is based on possible concerns about quality of selected items that have been discussed between BOP compilers and data users.

Trade misinvoicing

External trade can be a single source that explains all errors and omissions. Import according to BOP was above 3 bln USD in average for 2004, and export was 1.3 bln for the same period. Thus, only 5 % variation in both indicators can cause proportionate imbalances. Therefore, the case of external trade should not be ignored.

As we discuss cases explaining negative E&O, we should examine underestimation of import and overestimation of export.

Import valuation is one of most discussed issues in economy. On the one hand, there are a lot of informal opinions and blames that import is underestimated. We will use here the term "kitchen" analysts, which is very popular Soviet time expression in Russian language to describe a discussion about something serious by people who are not even close to the topic. So "kitchen" analysts say, that there is at least part of import that is not registered or registered at lower value. The other "kitchen" analysts supported by business community tell that the import is overestimated, because customs authority is pressing on importers to collect more taxes. The same applies for import implemented by individuals. Anyway, we cannot evaluate these gossips. However, recent publications in mass media about liberating policy in custom were about using invoice price in custom declarations instead of control price, which would decrease costs for business (which means that invoice prices are lower than control prices). Taking into account that custom authorities often value import by control prices (when custom thinks that the control price is more reliable than invoice price), this can support the hypothesis that the import is not underestimated.

Discussions on export valuation is not as hot as for import. It is limited by the opinion of different economists and experts. The problem with overestimating export may be supported by the fact that a company receives back VAT paid for production or purchase of goods that it exports. At the same time Ministry of finance checks VAT refund with the VAT paid in its databases, which means that simple overestimating export invoice does not mean refund of certain amount. Therefore, we cannot bring any serious argument for overestimating invoices for export.

The same opinion about import and export have local business unions and some NGOs. For example Global Integrity Finance, an NGO mentioned above, made several calculations based on IMF's Direction of trade statistics database and concluded that the data for import is overvalued.

We made the same comparison using DOTS database. Difference between Armenia's import (adjusted for FOB price) and partner countries' export is always positive, which means that according to DOTS database Armenia's import is not underestimated.

For the export the difference between national and partners' data is always positive, which means that there might be some overestimation. Of course, we should not mix together all differences, because each country has its own story. For Iran, for example, the major item of export is electricity, which is exchanged for natural gas, and we are sure that the figures are correct and cannot create misbalances. Several countries

with major differences are main destinations of mining products export. We incline to the view that there is trade misclassification issues between countries rather than mining sector overvalues its export figures. We have not recorded any dividends in mining sector in 2014-2017, which means that companies do not look for opportunities to optimize their tax payments transferring their profit from Armenia.

Nevertheless, the differences between national data of export and partners' data should be further investigated.

Table 3. Foreign trade of Armenia and partner country data

	2010	2011	2012	2013	2014	2015	2016	2017
Import from Armenia¹	829	1,124	1,236	1,335	1,485	1,416	1,847	2,125
Export from Armenia²	1,041	1,334	1,428	1,480	1,519	1,487	1,797	2,243
Difference between national and partner country data³	311	345	341	306	212	241	173	373
Export to Armenia¹	2,244	2,512	3,053	3,277	3,400	2,639	2,453	3,130
Import of Armenia²	3,749	4,145	4,265	4,477	4,402	3,254	3,227	4,183
Difference between national and partner country data⁴	1,055	1,135	700	663	473	224	387	551

Source: IMF Direction of trade statistics database

1 partner country data, 2 national data, 3 Difference was calculated taking into account CIF-FOB adjustment for partner country data, 4 Difference was calculated taking into account CIF-FOB adjustment for national data

Remittances overestimation case

Remittances are the other major component in BOP of Armenia. Calculation is based on a complex model, which uses individuals' transfers through commercial banks, surveys of households, seasonal workers, individuals receiving remittances in commercial banks, expert judgments. One of key elements of calculation model is adjustment of remittances received through informal channels. The ratios are calculated based on household survey results. Household surveys are conducted every 3-5 years. Usage of out of date ratios may cause some imbalances. We made several calculations to see how the increase or decrease of informal ratio could theoretically change E&O.

Table 4. Effect of changing informal channels ratio on errors and omissions

	2010	2011	2012	2013	2014	2015	2016	2017
Informal channels -5 p.p.	-59	76	308	-185	72	-72	-160	-32
Informal channels -2 p.p.	-105	21	250	-252	9	-117	-202	-79
Actual size	-156	-37	191	-299	-36	-149	-232	-112
Informal channels +2 p.p.	-171	-59	166	-349	-84	-183	-263	-147
Informal channels +5 p.p.	-226	-124	98	-429	-160	-237	-314	-203

There is a clear picture that diminishment of ratio for informal channels decreases negative errors and omissions. We should state that as the reduction of the ratio of informal channels decrease the inflow of remittances, it improves the misbalance. However, it cannot be a proof that there are miscalculations in this item. Each reduction of credits in current account automatically improves the E&Os. So this exercise should be considered as just an *additional* argument to conduct more surveys and use more precise calculations, as each p.p. may seriously increase or decrease E&Os.

Foreign cash holdings

As it was mentioned above, there is a strong correlation between E&O and foreign currency and deposits of other sectors. It consists of two parts. For the deposits held abroad in BOP statistics the data from BIS locational statistics is used. The second part represents household holdings of foreign exchange cash.

Data on foreign exchange cash held by households comes from remittance model and uses a lot of expert judgments. If we eliminate foreign exchange cash completely from calculations, we will get the following picture:

Table 5. Errors and omissions with and without foreign exchange cash holdings estimations

	2010	2011	2012	2013	2014	2015	2016	2017
Actual Size	-156	-37	191	-299	-36	-149	-232	-112
Adjusted size	-187	-69	102	-321	40	-18	-86	-41

If we look at complete table in appendix, we can see that elimination of FX cash improves E&O in seven cases and worsens in other seven cases. If we look "closer" we can see that it improves continuously during last three years and become worse during 2008-2009 years, when the calculation model was established. This can mean that the model worked for previous years, but it needs to be adjusted to reflect new realities.

Of course there is also other explanation. The cash and deposits data also includes transactions from locational banking statistics of BIS. The data of BIS is broken down by countries using the citizenship of the depositor and not the residency criteria. It can also cause imbalance, because many Armenians can have deposits in the reporting countries, without being the residents of our country any more in statistical concept.

FDI assets

The fact of foreign investments of Armenian residents abroad is widely discussed. There are many publications in mass media about acquisition of real estate or investment in business projects. The term "widely discussed" means, of course, that there is not any official confirmation of such investments. The only proof is large amount of transfers of individuals abroad through banking system. Even if we take into account the import value by individuals (average annual amount is 150 mln USD) the value of transfers of individuals abroad through banking sector is too high. We can assume that some portion of these flows might be invested in businesses or real estate acquisition.

One of the best options of getting information on this issue is available source for partner country FDI is IMF's CDIS database. We compared outward investments data for 2016 (latest available data). The difference between national and partner country stock data was about 150 mln USD. This is very low level, even if we assume that the counterparty data is entirely reliable.

Table 6. Outward FDI

	2009	2010	2011	2012	2013	2014	2015	2016
National data	77	83	119	169	154	215	228	150
Partner country data	202	199	273	363	276	209	141	299

Source: IMF CDIS database

The issue of valuation of foreign assets is sometimes complicated because of double citizenship opportunity for Armenian residents. In case they acquire real estate or make an investment abroad using their foreign passport, it will make almost impossible to track the transactions.

Conclusion

We examined several cases to show where large potential white spots in BOP statistics may be. As BOP compilers, we understand that there may be also situation, where many small imbalances can be real reason of errors and omissions. Nevertheless, FX cash movements, remittances and outward investments seem to explain notional part of errors and omissions.

The more challenging question is what can be done to test hypothesis and improve the quality of statistics. One of contradictory solutions could be an introduction of International transactions reporting (ITRS) system in Armenia. The best international experience on which we rely is inclined to move from ITRS to direct reporting systems. However, countries, that moved from ITRS used the system for many years, they have high level of reporting culture. They also have transmission period when made it possible to compare the data from ITRS statistics and direct reporting. In Armenia there are several arguments to support of using ITRS as a *supplementary* source of information at least for some period.

First, ITRS system covers individuals' transactions, which otherwise can be covered quite poorly. It is doubtful that wealthy individuals may wish to answer to surveys referring to their international transactions. Even more, many transactions of individuals do not form their own financial assets but may result in foreign assets of their relatives, remaining de facto their own assets.

Second, ITRS system may be a tool for cross checking with non-financial corporations' reports. It may dramatically reduce the risk of missing large transactions. This may be too optimistic notion, but our viewpoint is that ITRS can help to catch all transactions through banking sector.

ITRS may also be very helpful to update register of companies with foreign investments.

However, ITRS cannot cover all questionable areas. Most challenging areas are those involving household transactions. In case of remittances, surveys and inclusion of new data sources may solve some part of problem. For other transactions it is unrealistic to collect data. For example, foreign investment of households will be difficult to cover. Some transactions may be caught by ITRS system, but still it will be difficult to cover transactions. Additional data sources, partner countries' and international organizations' data may help to reduce some portion of imbalances.

Nevertheless, there will remain significant part of transactions by households that will not be possible to cover. Compilers and users should get used to the fact that errors and omissions will remain in BOP statistics.

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Errors and omissions with and without foreign exchange cash holdings estimations

	Actual Size	Adjusted size
2004	-188	-152
2005	-163	-131
2006	-128	-164
2007	28	-2
2008	-41	-218
2009	-102	-138
2010	-156	-187
2011	-37	-69
2012	191	102
2013	-299	-321
2014	-36	40
2015	-149	-18
2016	-232	-86
2017	-112	-41

Foreign trade of Armenia and partner country data

	Import from Armenia	Export from Armenia	Difference between national and partner country data	Export to Armenia	Import from Armenia	Difference between national and partner country data
2004	619	724	180	1,162	1,348	24
2005	994	976	102	1,372	1,801	213
2006	890	984	201	1,658	2,191	270
2007	1,134	1,152	155	2,320	3,268	556
2008	969	1,057	204	2,813	4,426	1,082
2009	622	698	151	1,941	3,304	967
2010	829	1,041	311	2,244	3,749	1,055
2011	1,124	1,334	345	2,512	4,145	1,135
2012	1,236	1,428	341	3,053	4,265	700
2013	1,335	1,480	306	3,277	4,477	663
2014	1,485	1,519	212	3,400	4,402	473
2015	1,416	1,487	241	2,639	3,254	224
2016	1,847	1,797	173	2,453	3,227	387
2017	2,125	2,243	373	3,130	4,183	551

IFC - Central Bank of Armenia Workshop on "*External Sector Statistics*"

Dilijan, Armenia, 11-12 June 2018

Errors and omissions in Armenia's balance of payments: possible reasons and solutions¹

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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.



Errors and omissions in Armenia's balance of payments: possible reasons and solutions

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IFC-CBA Workshop on External Sector Statistics,

Armenia, Dilijan, 11-12 June 2018



BOP compilation practices in Armenia

- BoP compilation
 - From mid-1990s to 2011 National statistical service
 - From 2011 to present Central bank of Armenia
 - BPM6 methodology implemented from 2011
- Compilation system based on different sources. ITRS has never been used.
- Individuals' transactions play significant role in economic relations.



Errors and omissions origin

- Double entry system theoretically insures “zero” balance of BoP
 - It would work only if a single source is used, i.e. closed ITRS system
 - Requires recording each transaction twice, while in practice major part of entries are collected separately
- Practically most items in BoP of Armenia are collected separately.

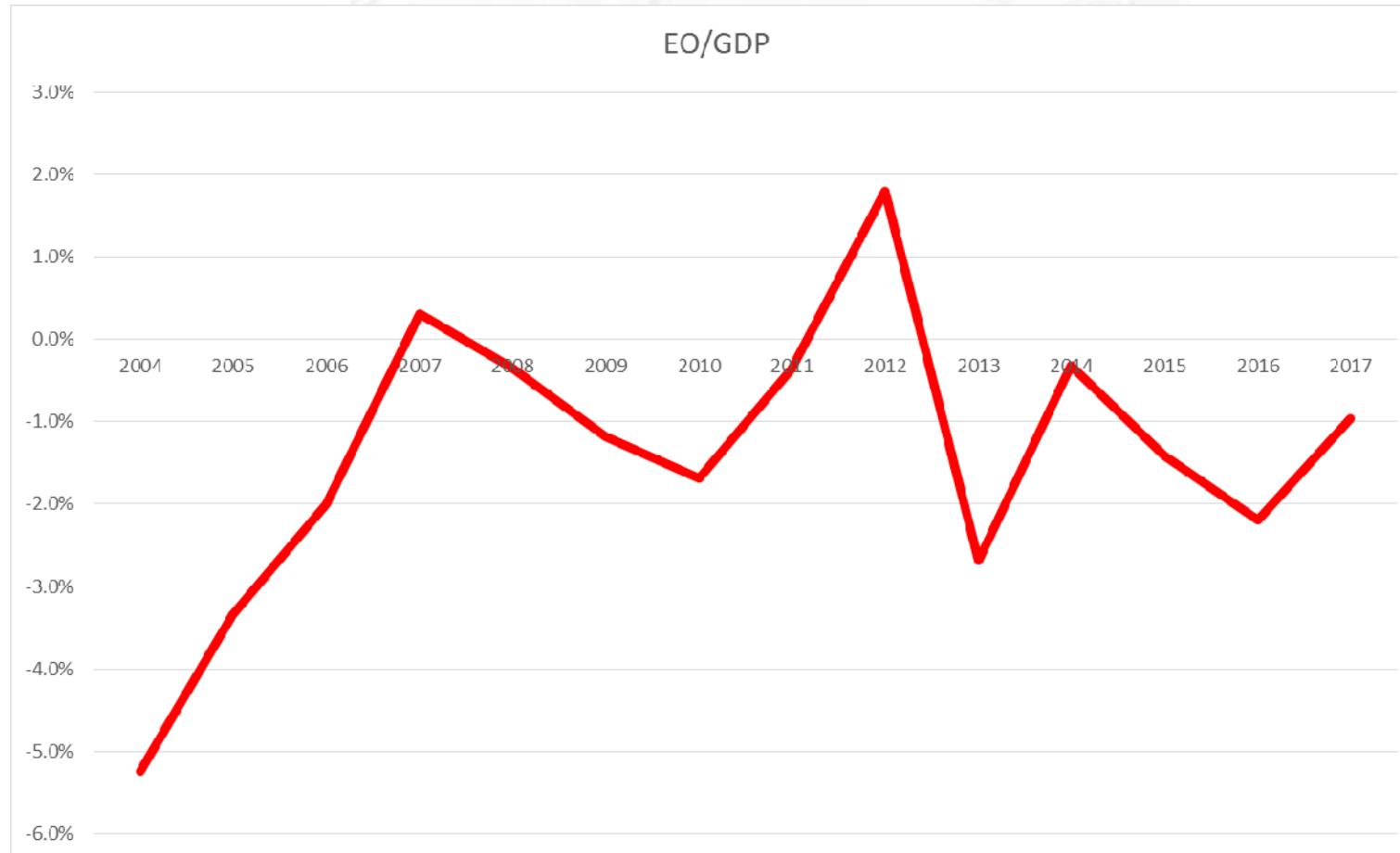


Errors and omissions: general overview

- Very volatile, without any pattern (but generally negative)
- Total 1,422 mln USD for 2002-2017
 - 3 times positive (223 mln), 13 times negative (-1,645 mln)
 - Significant compared to CAB (up to 238 % in 2004)



Errors and omissions: share in GDP



Errors and omissions: Possible reasons

- Trade misinvoicing
- Tourism
- Remittances
- Dividends
- Investments abroad
- Investments in real estate assets
- Foreign currency cash
- International cooperation with NPISH



BOP problems: coverage and quality

- Quality of data received from nonfinancial corporations
 - Dividends (significant revisions)
 - Data on loans and other foreign assets
- Outward FDIs
 - Investments of wealthy individuals abroad cannot be covered properly
- Foreign commercial transactions of households
 - More than 500 mln USD average in 2010-2017



Correlation

- Significant false correlations between some items of BOP and E&O
 - Reinvested earnings (can't be a source of errors by definition)
 - Portfolio investments of ODC, other sectors other liabilities (very small amounts)
- Strong correlation between E&O and Currency and deposits assets of other sectors
- Other sectors net incurrence of liabilities of loans (false?)
 - There might be a supposition that loans were not factually received by any available method (bank account, import or cash) but are kept outside.



Trade misinvoicing case

- Over invoicing of export and under invoicing of import can result in continuous negative E&O
 - Some analysis state the opposite trend
 - Local expert opinion is more or less the same
- DOTS data shows
 - National import data is always bigger than partner data
 - National export data is volatile compared to partner data



Remittances overestimates case

- Currently an estimated ratio is used
 - Ratio is derived from household survey
- Changing the ratio by 2 or 5 percent brought significant changes to EO

mIn USD	2010	2011	2012	2013	2014	2015	2016	2017
Cash +5 p.p.	-59	76	308	-185	72	-72	-160	-32
Cash +2 p.p.	-105	21	250	-252	9	-117	-202	-79
Actual size	-156	-37	191	-299	-36	-149	-232	-112
Cash -2 p.p.	-171	-59	166	-349	-84	-183	-263	-147
Cash -5 p.p.	-226	-124	98	-429	-160	-237	-314	-203



Cash inappropriate calculation

- Cash and deposits data is compiled using of two components
 - BIS data on foreign deposits held in BIS countries
 - Cash calculation model depending from remittance data
- Strong correlation with errors and omissions
- Eliminating cash estimates significantly decrease errors and omissions

mIn USD	2010	2011	2012	2013	2014	2015	2016	2017
Actual Size	-156	-37	191	-299	-36	-149	-232	-112
Adjusted size	-187	-69	102	-321	40	-18	-86	-41

FDI and other outward investment case

- About 150 mln USD difference in stock data of CDIS with partner countries' data
- Large amount of unknown 'commercial transactions' of individuals (compared to individuals external trade data)
- Very difficult to estimate due to residency criteria problem (large diaspora and double citizenship)



General conclusions

- Remittances, FX cash and outward investment can explain notional part of systematic errors and omissions
- Nevertheless there are some other large transactions uncovered that can result in both negative and positive Errors and omission in BoP



What can be done

- Continuous efforts to improve remittances statistics
- Efforts to improve FX cash movement statistics
- Cooperation with other compilers to improve outward FDI statistics (major projects)
- Improving non financial corporations external transactions statistics

Introduction of ITRS will create a strong source for covering major part of missing transactions through commercial banks.



What can't be done

- As a permanent problem it is impossible to handle with the significant role of households in economy
 - Financial transactions of households
 - Full coverage of foreign exchange cash held by households and resident “entrepreneurs”
 - Residency criteria problem of household





IFC - Central Bank of Armenia Workshop on *"External Sector Statistics"*

Dilijan, Armenia, 11-12 June 2018

Enhancing internal consistency of Luxembourg External Statistics,¹

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Central Bank of Luxembourg

¹ This paper 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.

Enhancing internal consistency of Luxembourg External Statistics¹

The case for a semi aggregated and sectoral analysis of Financial Account

Paul Feuvrier, Banque centrale du Luxembourg

Luxembourg financial industry is highly diversified: Deposit Taking Corporations, Investment Funds, Securitisation Vehicles, Insurance Corporations and Captive Financial Institutions. Banque centrale du Luxembourg (BCL) collects detailed quarterly Balance Sheets completed by monthly Security by Security reports (positions), but the picture is different from one sector to another. Indeed, the collection of granular information on liquid financial instruments (e.g. standard debt securities, listed shares, both with known price) does not pose major problems other than those quality issues inherent to any statistical survey. Yet unlisted equities and hybrid instruments issued and held by Captive Financial Institutions are difficult to assess exhaustively and accurately (valuation of unlisted shares) in the short run. In addition, the lines between transactions and price effects are sometimes blurred. The underlying uncertainty possibly generating ex ante both errors and omissions and other volume changes, BCL not only corrects for non-response but also performs ad hoc analysis both at detailed and semi aggregated level. Last, data sharing is a part of the answer: BCL uses mirror transactions (counterpart country), and provides the ECB and European partner countries with information on large FDI transactions involving Luxembourg.

Keywords: Errors and omissions, External Statistics, Foreign Direct Investment.

¹ This presentation should not be reported as representing the views of the BCL or the Eurosystem. The views expressed are those of the author and may not be shared by other research staff or policymakers in the BCL or the Eurosystem.

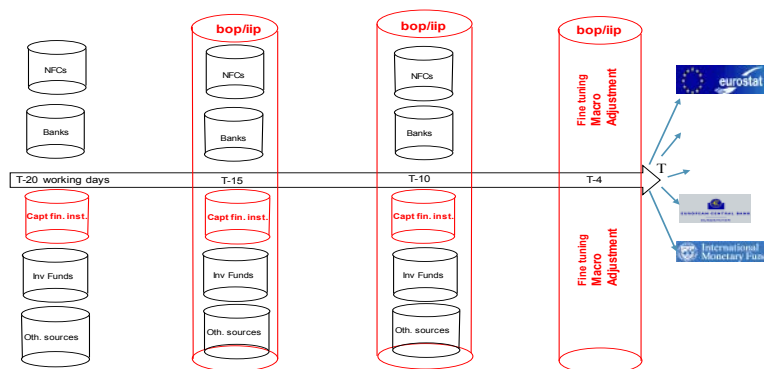
“Moment of truth” for External Statistics

Quality is a universal issue in official statistics but quality problems may be more or less hidden whenever a single source is used. This is not the case in external statistics, with asymmetries on the one hand, errors and omissions on the other hand. Asymmetry in FDI statistics is not a new phenomenon, yet International Organisation have significantly increased the detail of FDI figures released in the recent period. The IMF, for instance, releases bilateral FDI positions (Coordinated Direct Investment Survey database), thus two (possibly diverging) sources exist for Direct Investment from country A to country B (FDI asset reported by A and FDI liability reported by B).

Another “objective” traditional quality indicator related to External Statistics is errors and omissions, which can be observed at both national and regional level: Even small national errors and omissions can bring about large regional ones because of possible uncertainty on the counterpart country (inside or outside the region, e.g. euro area). How does BCL address those quality issues?

Simplified workflow on quarterly Luxembourg bop/iip

The integration of various sources in Luxembourg bop/iip is summarised below. At early stages of the production process, the priority is to monitor the quality of each sectoral dataset. Later on, those various sectoral datasets are integrated in a dedicated External Statistics database (as for their assets and liabilities vis-à-vis the rest of the world). This integration gives a first estimation of net i.i.p. and quarterly errors and omissions, which may be quite high and warrant “end of pipe” adjustments (described later in this note).



Institutional sectors are often interrelated, which also impacts external statistics. Let's take the instance of an investment fund held by a foreign investor and ultimately granting a loan to a foreign company. Three different patterns are possible:

- A – The investment fund directly holds the loan, which is recorded on the asset side of the investment fund: liability of S.124, asset of S.124.
- B - The investment fund holds the loan through a resident securitization vehicle (S.125), which is the institutional unit holding the loan: liability of S.124 but asset of S.125.
- C - The investment fund holds the loan through a resident captive financial institution (S.127) which is the institutional unit holding the loan: liability of S.124, asset of S.127.

Survey strategy on Luxembourg financial sector

BCL harmonised survey strategy towards Luxembourg financial industry is based on three principles:

- To directly collect balance sheets (direct reporting system) instead of relying on custodian data (those custodian data remaining useful for government entities, households and NPISHs),
- To collect positions only (much easier to report from the reporters perspective),
- To derive transactions by correcting monthly variations of positions from forex and price effects and by using auxiliary sources.

Accordingly, Luxembourg financial institutions provide BCL with two harmonized reports:

- A quarterly full balance sheet, without any detail on security positions,
- A monthly security by security form for ISIN and non ISIN securities.

The largest sectors (in terms of aggregate Balance Sheet) are Investment Funds and Captive Financial institutions. The reporting forms are harmonized but remain somewhat targeted to each institutional sector they refer to, especially on the capital side:

- Investment funds shares issued for money market and investment funds,
- Technical reserves for insurance companies,
- Equity capital for remaining sectors.

Direct reporting of Luxembourg financial institutions in a nutshell

Mi = monthly Security by Security, overall ISIN

Mn = monthly Security by Security, overall non ISIN

Q = quarterly full balance-sheet, without any detail on security items

	Dep.-tak. Corp	Mon. mark. Funds	Inv. funds	Sec. vehicles	Captive fin. Instit.	Ins. corp.
SNA 2008	S122	S123	S124	S125	S127	S128
Ag. Balance Sheet bn euros 31/12/2017	746	292	4 253	249	8 947	186
Switch from custodian to direct reporting	2008	2008	2008	2010	2011	2015
1-Assets						
1-Loans to affiliated	Q				Q	
1-Securitized loans						
1-Deposits	Q	Q	Q	Q	Q	Q
1-Bonds and bills	Mi q	Mi q	Mi q	Mi q	Mi q	Mi q
1-Equities	Mi q	Mi q	Mi q	Mi q	Mi q	Mi q
1-Participations in affiliated	Q	Q	Q	Q	Mn	Q
1-Fixed assets	Q	Q	Q	Q	Q	Q
1-Remaining assets	Q	Q	Q	Q	Q	Q
1-Technical reserves						Q
1-Financial derivatives	Q	Q	Q	Q	Q	Q
2-Liabilities						
2-Borrowing from affiliated	Q	Q	Q	Q	Q	Q
2-Borrowing from banks		Q	Q	Q	Q	Q
2-Deposits	Q					
2-Debt securities	Mi q	Mi q	Mi q	Mi q	Mn q	Mi q
2-Short sales of securities	Mi q	Mi q	Mi q	Mi q	Mi q	Mi q
<i>2-Capital, reserves, provisions and results</i>	Q			Q	Mn	Q
<i>2-Investment funds shares</i>		Mi	Q	Q		
<i>2-Technical reserves</i>						Q
2-Remaining liabilities	Q	Q	Q	Q	Q	Q
2-Financial derivatives	Q	Q	Q	Q	Q	Q

Source: Banque centrale du Luxembourg

B.o.p./i.i.p. consistency by sector

Functional categories are the cornerstone of External Statistics but Luxembourg Financial institutions typically contribute to several of them. For instance, a bank would issue bonds and bills (Portfolio Investment) and lend the proceeds to banks, households and NFCs (Other Investment). In Luxembourg, a sectoral analysis is more relevant to assess the overall quality and spot possible mistakes. It also makes it easier to monitor the consistency between bop/iip and national accounts. We give below a few instances on flow/stock reconciliation for some sectors and how to read them. Positions and transactions are completed with forex, price effects and other volume changes.

Sectoral analysis – Deposit taking corporations

Many Luxembourg banks are held by foreign investors (Direct Investment liabilities). Unsurprisingly, Deposit taking corporations overall take deposits, grant loans and hold bonds. In the instance below (2016 Q2), deposit withdrawal (Other Investments) is financed by the issuance of a bill (Portfolio Investment).

LU flow/stock reconciliation
Deposit taking corporations except the central bank
Billions of euros

	Assets						Liabilities					
	Position 2016 Q1	Trans.	FX	Price effect	Oth. Vol. Ch.	Position 2016 Q2	Position 2016 Q1	Trans.	FX	Price effect	Oth. Vol. Ch.	Position 2016 Q2
Total - Dep. taking corp. / RoW	586	4	4	3	-1	596	486	0	3	2	0	491
Direct investment	3	0	0	0	0	3	33	0	0	0	0	33
Portfolio investment	138	-2	1	0	0	137	39	6	0	-1	0	44
Equity	3	0	0	0	0	3	0	0	0	0	0	0
Investment fund shares	1	0	0	0	0	2	0	0	0	0	0	0
ST debt securities	11	-1	0	0	-3	7	15	5	0	-1	0	19
LT debt securities	122	-1	1	0	3	126	23	1	0	0	0	25
Financial derivatives	22	0	0	3	0	25	36	0	0	3	0	39
Other investment	423	7	3	0	-1	432	378	-7	3	0	0	374

Source: Banque centrale du Luxembourg

Sectoral analysis – Investment funds

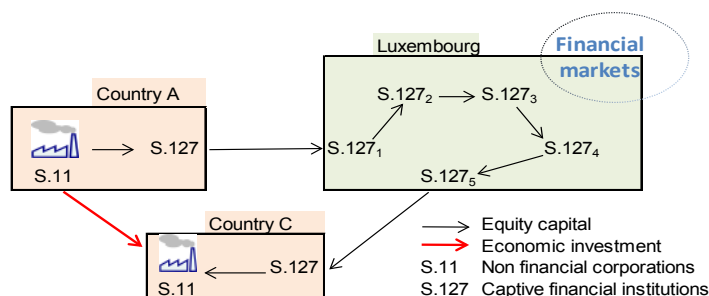
Most investment funds are equities, bonds or mixed funds, holding liquid securities (listed shares or bonds), which are identified by an international standard (ISIN) and for which market price and other relevant information (coupon rate, etc...) is readily available. Against this backdrop, the derivation of transactions, FX and price effects does not pose major issues. In the instance below, investment funds shareholders purchase shares, and the funds invests in equities, bonds and deposits. Besides, drop in share prices is reflected on the liability side (along with negative FX).

LU flow/stock reconciliation												
Investment funds												
Billions of euros												
	Assets					Liabilities						
	Position 2015 Q2	Trans.	FX	Price effect	Oth. Vol. Ch.	Position 2015 Q3	Position 2015 Q2	Trans.	FX	Price effect	Oth. Vol. Ch.	Position 2015 Q3
Total - Investment funds / RoW	3 011	42	-39	-140	3	2 878	3 198	56	-18	-185	3	3 053
Direct investment	20	0	0	0	1	20	0	0	0	0	0	0
Portfolio investment	2 748	25	-38	-131	2	2 609	3 011	35	-13	-182	3	2 853
Equity	1 211	17	-21	-110	-1	1 098						
Investment fund shares	191	0	-1	-7	1	185	3 011	35	-13	-182	3	2 853
ST debt securities	108	1	-1	0	0	107	0	0	0	0	0	0
LT debt securities	1 237	7	-13	-14	1	1 219	0	0	0	0	0	0
Financial derivatives	148	-6	0	-9	0	133	121	0	0	-3	0	118
Other investment	96	23	-3	0	0	116	66	21	-5	0	0	82

Source: Banque centrale du Luxembourg

Sectoral analysis – Captive Financial Institutions

The sector of Captive Financial Institutions is both the biggest (foreign assets and liabilities) and the most challenging to cover. As for the business model, in a nutshell, foreign Multinational Enterprises set up Captive Financial Institutions in Luxembourg to channel funds. Some entities raise funds on financial markets on behalf of the mother company, yet the majority of the population is made of so-called “pure holdings”, which have no access to financial markets. Some institutions have all their assets and liabilities vis-à-vis other resident institutions. (S.127₂ to S.127₄ below), yet each “group of Captive Financial Institutions” theoretically display a “small” contribution to Luxembourg net i.i.p.. Besides, reporters value the companies using Luxembourg GAAP, US GAAP or IFRS accounting standards. Some positions may therefore be valued at market price and corresponding assets at OFBV or the other way round. This warrants “semi aggregated” adjustments at “group” level with a view to reducing those imbalances.



As far as Balance Sheet movements are concerned, it is often difficult to distinguish transactions from price effects: perception/distribution of a super dividend (to be recorded as a financial account transaction), issuance of a share premium, the number of shares being unchanged (transaction), impairment (price effect), etc... Thanks to an ad-hoc editing system, BCL edits and checks large transactions and variations of positions. BCL shares large transactions with European counterpart countries (“FDI network”) with a view to reducing asymmetries.

In the instance below, we have large transactions on both asset and liability side, but also some large Other Volume Changes reflecting above-mentioned necessary adjustments.

LU flow/stock reconciliation												
Captive financial institutions												
Billions of euros	high quality items						medium/high quality items					
	Assets						Liabilities					
	Position 2017 Q2	Trans.	FX	Price effect	Oth. Vol. Ch.	Position 2017 Q3	Position 2017 Q2	Trans.	FX	Price effect	Oth. Vol. Ch.	Position 2017 Q3
Total - Captive fin. Inst. / RoW	5 632	-217	-109	-5	-34	5 267	5 665	-238	-109	-18	-2	5 298
Direct investment	5 256	-218	-103	6	-34	4 906	4 632	-241	-90	-16	-8	4 278
Equity	3 093	-179	-77	6	-20	3 615	3 087	-200	-57	-16	0	2 815
Loans	1 363	-39	-26	0	-6	1 291	1 546	-41	-33	0	-8	1 463
Portfolio investment	154	4	-2	0	0	156	738	11	-16	8	5	746
Equity	82	1	-1	0	0	82	21	3	0	2	0	25
Investment fund shares	11	3	0	0	0	14	0	0	0	0	0	0
ST debt securities	5	1	0	0	0	6	14	-3	0	1	0	12
LT debt securities	56	-2	-1	0	0	53	704	11	-15	5	5	709
Financial derivatives	30	0	0	-11	0	19	34	0	0	-10	0	24
Other investment	191	-2	-4	0	1	185	281	-9	-3	0	1	250

Source: Banque centrale du Luxembourg

Adjustment procedures

BCL spots five "bop items" T1 to T5 candidates for adjustments, corresponding to the largest contributions of Captive Financial Institutions in External Statistics: Direct Investment equities and loans Assets and Liabilities and Portfolio Investment Liabilities. In other words, it is of high probability that large ex ante Errors and Omissions (EO) and Other Volume changes (OVC) reflect uncertainties in T1 to T5 (transactions). Last, FX is for forex change and PR for price effects.

Captive financial institutions

	high quality items					medium/high quality items				
	Assets					Liabilities				
	Position Q-1	Trans.	FX	Price effect	Oth. Vol. Ch.	Position Q-1	Trans.	FX	Price effect	Oth. Vol. Ch.
Total - Captive fin. Inst. / RoW										
Direct investment										
Equity		T1 = T A eq			OVC1		T3 = T L eq			OVC3
Loans		T2 = T A lo			OVC2		T4 = T L lo			OVC4
Portfolio investment										
Equity										
Investment fund shares										
ST debt securities										
LT debt securities										
Financial derivatives										
Other investment							T5 = T L Debt			OVC5

Source: Banque centrale du Luxembourg

First situation

EO ex ante > 0

The purpose of the adjustment is to reduce net financial account transactions, ie:
To reduce T1, T2 (A) or to increase T3, T4 and T5 (L)

Second situation

EO ex ante < 0

The purpose is to increase net financial account transactions, ie:

To increase T1, T2 (A) or to reduce T3, T4 and T5 (L)

Besides, OVC being calculated as a residual, we have for $i = 1$ to 5 :

$$\text{Pos}_{i,t} = \text{Pos}_{i,t-1} + \text{Tr}_{i,t} + \text{Fx}_{i,t} + \text{Pr}_{i,t} + \text{OVC}_{i,t}$$

$$\text{Pos}_{i,t} = \text{Pos}_{i,t-1} + \text{Tr}^*_{i,t} + \text{Fx}_{i,t} + \text{Pr}_{i,t} + (\text{OVC}_{i,t} + \text{Tr}_{i,t} - \text{Tr}^*_{i,t})$$

$$\text{OVC}^*_{i,t} = \text{OVC}_{i,t} + \text{Tr}_{i,t} - \text{Tr}^*_{i,t}$$

Large OVC being undesirable, the adjustment should produce $|\text{OVC}^*_{i,t}| < |\text{OVC}_{i,t}|$

To sum up we switch from $(\text{Tr}_{1,t}, \dots, \text{Tr}_{5,t})$ to $(\text{Tr}^*_{1,t}, \dots, \text{Tr}^*_{5,t})$ with both:

$$|\text{EO}^*_t| < |\text{EO}_t| \text{ and}$$

$$|\text{OVC}^*_{1,t}| < |\text{OVC}_{1,t}|, \dots, |\text{OVC}^*_{5,t}| < |\text{OVC}_{5,t}|$$

Conclusion

Above-mentioned «objective» external statistics quality issues require bold reactions from official statisticians. BCL managed to cover the large, diversified and open financial industry through a harmonised and efficient survey strategy. BCL systematically collects and checks micro data, some of them being shared with counterpart countries and International Organisations. Many Luxembourg or foreign captive financial institutions cannot be identified by a Global Legal Entity Identifier (GLEI) so far. Yet the efficiency of the data sharing process will improve, in particular for direct investment transactions, when this GLEI is in force in the whole financial industry, probably in the medium run.

IFC - Central Bank of Armenia Workshop on "*External Sector Statistics*"

Dilijan, Armenia, 11-12 June 2018

Enhancing internal consistency of Luxembourg External Statistics,¹

Paul Feuvrier,
Central Bank of Luxembourg

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.



Enhancing internal consistency of Luxembourg External Statistics

IFC workshop, Dilijan, June 2018

Paul Feuvrier, Banque centrale du Luxembourg



Enhancing consistency of Luxembourg External Statistics

- **1 - Disclaimer**
- **2 - “Moments of truth” for External Statistics**
- **3 - Simplified workflow on quarterly Luxembourg bop/iip**
- **4 - Survey strategy on Luxembourg financial sector**
- **5 - B.o.p./i.i.p. consistency by sector**
- **6 - Adjustment procedures**
- **7 - Conclusion**

1 - Disclaimer

This presentation should not be reported as representing the views of the BCL or the Eurosystem.

The views expressed are those of the author and may not be shared by other research staff or policymakers in the BCL or the Eurosystem.

2 – “Moments of truth” for External Statistics

1 - FDI asymmetries

- US Dir. Inv. equities in LU
- IMF web site
 - Source LU
 - 640 \$ billions
 - Source US
 - 472 \$ billions

2 – Errors and omissions

- National
- Regional level
 - e.g. euro area
 - Reflecting asymmetries

Table 1-i: Inward Direct Investment Positions, as of end-2015
Reporting Economy: Luxembourg
US Dollars, Millions

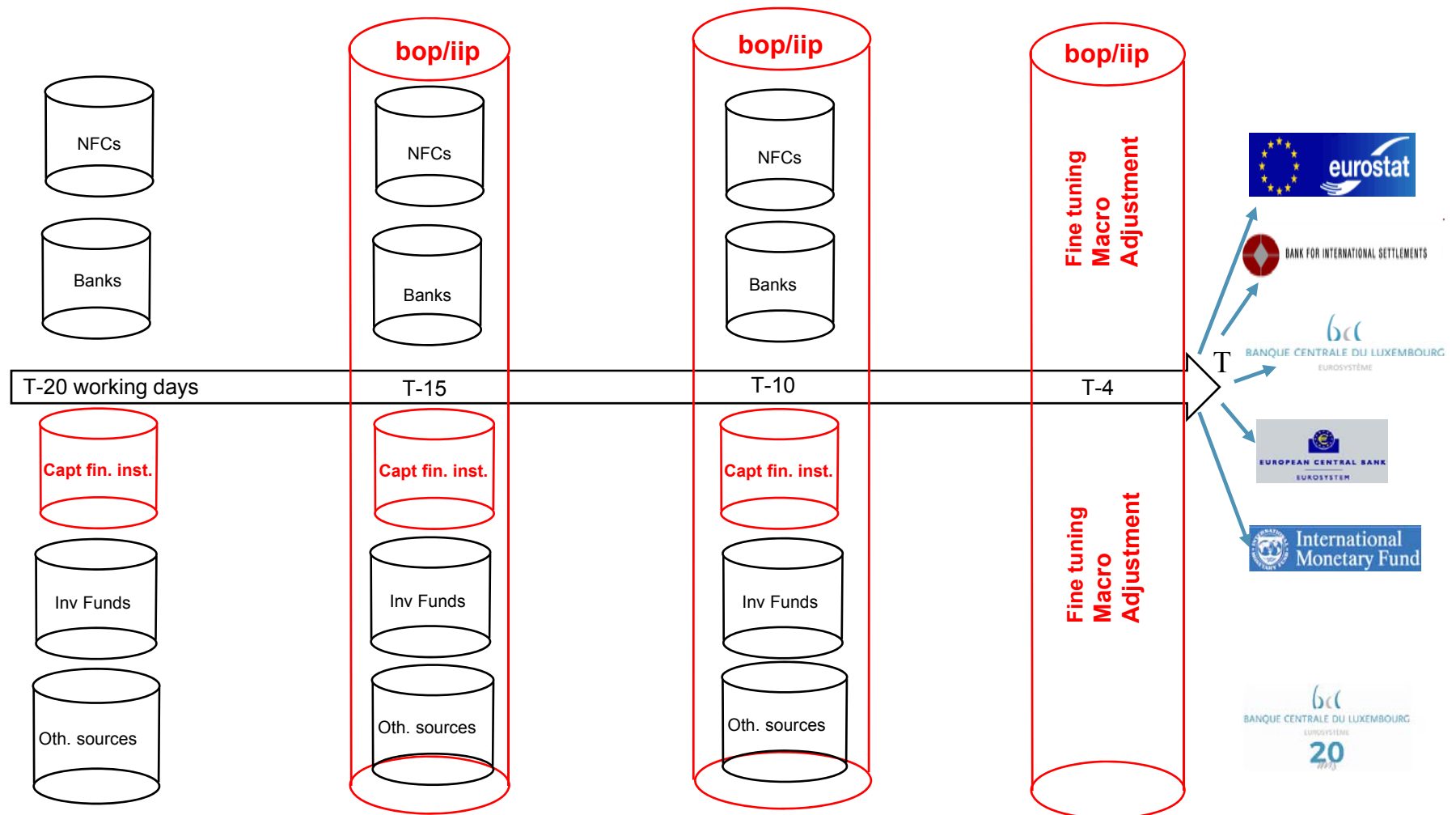
Investment from:	Inward Direct Investment Positions	Inward Equity Positions (Net)	(Net)	Inward Debt Instruments Positions				of which:
				Net Debt		Gross Debt Instruments		
				Inward Debt: Resident Financial Intermediaries (Net)	Inward Debt: Resident Enterprises that are not Financial Intermediaries (Net)	Inward Debt Instruments Liabilities (Gross)	Inward Debt Instruments Assets (Gross)	(Net)
United States	736,318	639,607	96,711					
Uruguay	C	C	C					
US Pacific Islands	C	C	C					
US Virgin Islands	0	0	0					
Uzbekistan	0	0	0					
Vanuatu	0	0	0					
Vatican	0	0	0					

Table 1-o: Outward Direct Investment Positions, as of end-2015
Reporting Economy: United States
US Dollars, Millions

Investment in:	Outward Direct Investment Positions	Outward Equity Positions (Net)	(Net)	Outward Debt Instruments Position				of which:
				Net Debt		Gross Debt Instruments		
				Outward Debt: Resident Financial Intermediaries (Net)	Outward Debt: Resident Enterprises that are not Financial Intermediaries (Net)	Outward Debt Instruments Assets (Gross)	Outward Debt Instruments Liabilities (Gross)	(Net)
Luxembourg	502,998	471,573	31,425	C	C	70,377	38,952	
Macedonia, FYR	17	C	C	C	C	C	C	
Madagascar	170	C	C	C	C	C	C	
Malawi	-3	C	C	C	C	C	C	
Malaysia	13,959	12,158	1,801	C	C	4,849	3,048	
Maldives	C	C	C	C	C	C	C	
Mali	1	C	C	C	C	C	C	

3 - Simplified workflow on quarterly Luxembourg bop/iip

- **Financial account only**
 - LU current and capital account not dealt with in this presentation



4 – Survey strategy on Luxembourg financial sector

Direct reporting of Luxembourg financial institutions in a nutshell

Mi = monthly Security by Security, overall ISIN

Mn = monthly Security by Security, overall non ISIN

Q = quarterly full balance-sheet, without any detail on security items

	Dep.-tak. Corp		Mon. mark. Funds		Inv. funds		Sec. vehicles		Captive fin. Instit.		Ins. corp.	
SNA 2008	S122		S123		S124		S125		S127		S128	
Ag. Balance Sheet bn euros 31/12/2017	746		292		4 253		249		8 947		186	
Switch from custodian to direct reporting	2008		2008		2008		2010		2011		2015	
1-Assets												
1-Loans to affiliated		Q								Q		
1-Securitised loans								Q				
1-Deposits		Q		Q		Q		Q		Q		Q
1-Bonds and bills	Mi	q	Mi	q	Mi	q	Mi	q	Mi	q	Mi	q
1-Equities	Mi	q	Mi	q	Mi	q	Mi	q	Mi	q	Mi	q
1-Participations in affiliated		Q		Q		Q		Q	Mn	Q		Q
1-Fixed assets		Q		Q		Q		Q		Q		Q
1-Remaining assets		Q		Q		Q		Q		Q		Q
1-Technical reserves												Q
1-Financial derivatives		Q		Q		Q		Q		Q		Q
2-Liabilities												
2-Borrowing from affiliated		Q		Q		Q		Q		Q		Q
2-Borrowing from banks				Q		Q		Q		Q		Q
2-Deposits		Q										
2-Debt securities	Mi	q	Mi	q	Mi	q	Mi	q	Mn	q	Mi	q
2- Short sales of securities	Mi	q	Mi	q	Mi	q	Mi	q	Mi	q	Mi	q
2-Capital, reserves, provisions and results		Q						Q	Mn	Q		Q
2-Investment funds shares			Mi	Q	Mi	Q						
2-Technical reserves												Q
2-Remaining liabilities		Q		Q		Q		Q		Q		Q
2-Financial derivatives		Q		Q		Q		Q		Q		Q

Source: Banque centrale du Luxembourg

5 – b.o.p./i.i.p. consistency / by sector

"Traditional" presentation by functional category

Simplified presentation

Total - Financial account

Direct investment

- NFCs
- Banks
- Government
- Other sectors

Portfolio investment

- NFCs
- Banks
- Government
- Other sectors

Financial derivatives

- NFCs
- Banks
- Government
- Other sectors

Other investment

- NFCs
- Banks
- Government
- Other sectors

Reserve assets

- Central Bank

Presentation by (resident) institutional sector - more relevant to enhance consistency

Simplified presentation

Total - Financial account

NFCs

- Direct investment
- Portfolio investment
- Financial derivatives
- Other investment

Banks

- Direct investment
- Portfolio investment
- Financial derivatives
- Other investment

Government

- Direct investment
- Portfolio investment
- Financial derivatives
- Other investment

Other sectors

- Direct investment
- Portfolio investment
- Financial derivatives
- Other investment

5 – b.o.p./i.i.p. consistency / Deposit taking corporations

- **Net issuance of bills** offset by
- **Withdrawal of deposits**

LU flow/stock reconciliation

Deposit taking corporations except the central bank

Billions of euros

	Assets						Liabilities					
	Position 2016 Q1	Trans.	FX	Price effect	Oth. Vol. Ch.	Position 2016 Q2	Position 2016 Q1	Trans.	FX	Price effect	Oth. Vol. Ch.	Position 2016 Q2
Total - Dep. taking corp. / RoW	586	4	4	3	-1	596	486	0	3	2	0	491
Direct investment	3	0	0	0	0	3	33	0	0	0	0	33
Portfolio investment	138	-2	1	0	0	137	39	6	0	-1	0	44
Equity	3	0	0	0	0	3	0	0	0	0	0	0
Investment fund shares	1	0	0	0	0	2	0	0	0	0	0	0
ST debt securities	11	-1	0	0	-3	7	15	5	0	-1	0	19
LT debt securities	122	-1	1	0	3	126	23	1	0	0	0	25
Financial derivatives	22	0	0	3	0	25	36	0	0	3	0	39
Other investment	423	7	3	0	-1	432	378	-7	3	0	0	374

Source: Banque centrale du Luxembourg

5 – b.o.p./i.i.p. consistency / Investment funds

- Issuances of Investment Fund shares
- Purchase of equities and LT debt securities
- Deposits
- *Price effects > transactions on equities and IF shares*

LU flow/stock reconciliation

Investment funds

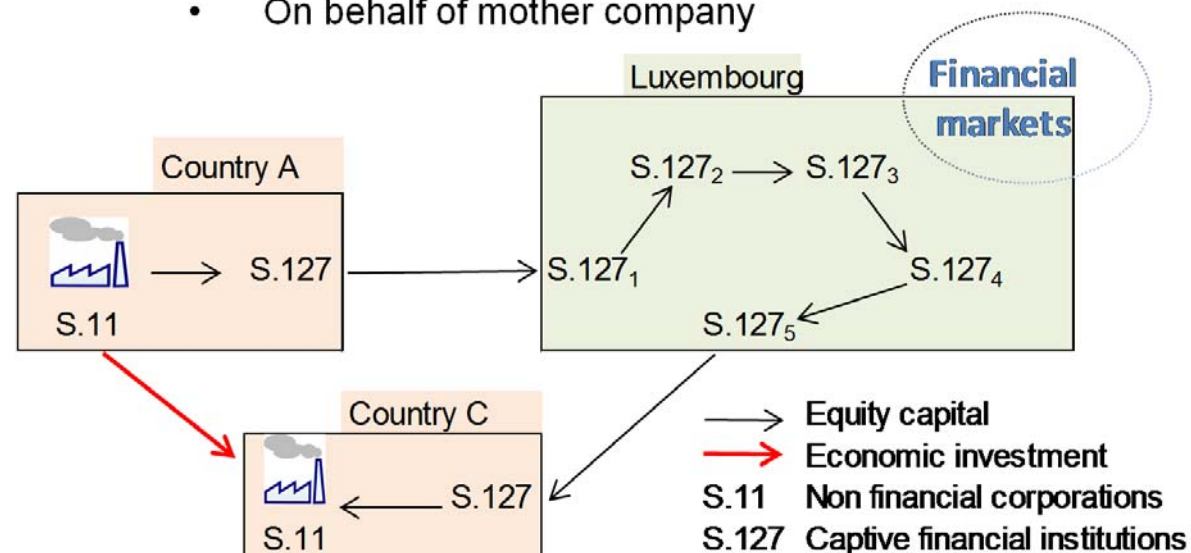
Billions of euros

	Assets						Liabilities					
	Position 2015 Q2	Trans.	FX	Price effect	Oth. Vol. Ch.	Position 2015 Q3	Position 2015 Q2	Trans.	FX	Price effect	Oth. Vol. Ch.	Position 2015 Q3
Total - Investment funds / RoW	3 011	42	-39	-140	3	2 878	3 198	56	-18	-185	3	3 053
Direct investment	20	0	0	0	1	20	0	0	0	0	0	0
Portfolio investment	2 748	25	-36	-131	2	2 609	3 011	35	-13	-182	3	2 853
Equity	1 211	17	-21	-110	-1	1 098	3 011	35	-13	-182	3	2 853
Investment fund shares	191	0	-1	-7	1	185	0	0	0	0	0	0
ST debt securities	108	1	-1	0	0	107	0	0	0	0	0	0
LT debt securities	1 237	7	-13	-14	1	1 219	0	0	0	0	0	0
Financial derivatives	148	-6	0	-9	0	133	121	0	0	-3	0	118
Other investment	96	23	-3	0	0	116	66	21	-5	0	0	82

Source: Banque centrale du Luxembourg

5 – b.o.p./i.i.p. consistency / Captive Financial Institutions

- Foreign MNEs setting up institutions in LU to channel funds
 - “small” contribution of each “group of CFIs”
 - to net i.i.p.
 - to net financial account transactions
 - Pure holdings: no access to markets
 - Some CFI raise funds on financial markets
 - On behalf of mother company



5 – b.o.p./i.i.p. consistency: Captive Financial Institutions

- Issue capital / hold controlling level of equity
- Take / grant inter company loans
- Issue debt securities / often hybrid instruments
- Blurred lines between
 - Equity trans. / price effect (price increase / impairment)
 - Transactions / Other Volume Changes

LU flow/stock reconciliation

Captive financial institutions

high quality items

medium/high quality items

Billions of euros

	Assets						Liabilities					
	Position 2017 Q2	Trans.	FX	Price effect	Oth. Vol. Ch.	Position 2017 Q3	Position 2017 Q2	Trans.	FX	Price effect	Oth. Vol. Ch.	Position 2017 Q3
Total - Captive fin. Inst. / RoW	5 632	-217	-109	-5	-34	5 267	5 665	-238	-109	-18	-2	5 298
Direct investment	5 256	-218	-103	6	-34	4 906	4 632	-241	-90	-16	-8	4 278
Equity	3 893	-179	-77	6	-28	3 615	3 087	-200	-57	-16	0	2 815
Loans	1 363	-39	-26	0	-6	1 291	1 546	-41	-33	0	-8	1 463
Portfolio investment	154	4	-2	0	0	156	738	11	-16	8	5	746
Equity	82	1	-1	0	0	82	21	3	0	2	0	25
Investment fund shares	11	3	0	0	0	14	0	0	0	0	0	0
ST debt securities	5	1	0	0	0	6	14	-3	0	1	0	12
LT debt securities	56	-2	-1	0	0	53	704	11	-15	5	5	709
Financial derivatives	30	0	0	-11	0	19	34	0	0	-10	0	24
Other investment	191	-2	-4	0	1	185	261	-9	-3	0	1	250

Source: Banque centrale du Luxembourg

6 - Adjustment procedures

- 5 bop items T1 to T5 candidate for adjustments
- Position better known
 - First objective = reduce EO
 - Second objective = reduce |OVC1| to |OVC5|

Captive financial institutions	high quality items						medium/high quality items					
	Assets						Liabilities					
	Position Q-1	Trans.	FX	Price effect	Oth. Vol. Ch.	Position Q	Position Q-1	Trans.	FX	Price effect	Oth. Vol. Ch.	Position Q
Total - Captive fin. Inst. / RoW												
<u>Direct investment</u>												
Equity		T1 = T A eq			OVC1			T3 = T L eq			OVC3	
Loans		T2 = T A lo			OVC2			T4 = T L lo			OVC4	
<u>Portfolio investment</u>												
Equity												
Investment fund shares												
ST debt securities												
LT debt securities												
<u>Financial derivatives</u>												
<u>Other investment</u>												
								T5 = T L Debt			OVC5	

Source: Banque centrale du Luxembourg

6 - Adjustment procedures

- **$EO = FA - (CA + KA)$**
- **$EO \text{ ex ante} > 0$**
 - To reduce net financial account transactions
 - To reduce T1, T2 (A)
 - To increase T3, T4 and T5 (L)
- **$EO \text{ ex ante} < 0$**
 - To increase net financial account transactions
 - To increase T1, T2 (A)
 - To reduce T3, T4 and T5 (L)

6 - Adjustment procedures

- Position (previously validated) usually left unchanged
- Adjustment on Transactions
 - and therefore on other Volume Change
- For $i = 1$ to 5 :
 - $Pos_{i,t} = Pos_{i,t-1} + Tr_{i,t} + Fxi_{i,t} + Pri_{i,t} + OVCi_{i,t}$
 - $Pos_{i,t} = Pos_{i,t-1} + Tr^*_{i,t} + Fxi_{i,t} + Pri_{i,t} + (OVCi_{i,t} + Tri_{i,t} - Tr^*_{i,t})$
 - $OVC^*_{i,t} = OVC_{i,t} + Tr_{i,t} - Tr^*_{i,t}$
 - Large OVC undesirable $\rightarrow |OVC^*_{i,t}| < |OVC_{i,t}|$
- To sum up :
- From $(Tr_{1,t}, \dots, Tr_{5,t})$ to $(Tr^*_{1,t}, \dots, Tr^*_{5,t})$
 - $|EO^*_t| < |EO_t|$
 - $|OVC^*_{1,t}| < |OVC_{1,t}|, \dots, |OVC^*_{5,t}| < |OVC_{5,t}|$

7 - Conclusion

- **«Objective» external statistics quality issues**
 - **Require bold reactions from official statisticians**
- **Luxembourg financial industry**
 - **Large, diversified and open**
 - **→ Challenging b.o.p./i.i.p. compilation**
 - **Harmonised survey strategy**
 - **Sectoral analysis**
 - **Monitoring of flow/stock consistency**
 - **Reducing errors and omissions**
 - **Monitoring of cross border consistency**
 - **Shared micro data**
 - **At European level Eurostat / ECB**
 - **Global Legal Entity Identifier in the medium run**

7 - Conclusion

Thank you for your attention !

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IFC - Central Bank of Armenia Workshop on *"External Sector Statistics"*

Dilijan, Armenia, 11-12 June 2018

Stock of non-resident owned dwellings in Spain¹

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Bank of Spain

¹ This paper 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.

Stock of non-resident owned dwellings in Spain¹

Work in progress to measure the stock of non-resident owned housing in Spain

Esther Martín, Elena Nieto, Gregorio Portillo

Abstract

The investment in real estate by non-residents has been a rising phenomenon during the past couple of decades, especially across European countries. Tourist destinations have been particularly affected, as is the case of Spain, where around 10% of total house purchases is currently by non-residents. Nevertheless, this phenomenon is not easy to measure, and the entry into force of the Single Euro Payments Area made Spain abandon the methodology in place to identify these transactions. New reporting standards, geared to corporations' operations, made it difficult to capture real-estate stocks and flows with significantly lower values. Therefore, data collection schemes had to be complemented with other sources that are not free from difficulties either. Our current investigation pivots on Tourism primary statistics that identify owners by the number of travellers staying at their own dwellings; the valuation is made through administrative records. The methods considered are examined in the context of the International (Balance of Payments and International Investment Position) and National Accounts framework.

Keywords: residential real estate, household housing wealth, dwellings, non-residents, international investment position, balance of payments, Spain

JEL classification: C82; E01; R21; R31

¹ This paper was prepared for the Workshop on External Sector Statistics, held in Dilijan on 11th June 2018 and organised by the Irving Fisher Committee (IFC) and the Central Bank of Armenia. 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.

1. Introduction

The purchase of a house in a country other than that of residence is a phenomenon that has risen in recent decades, encouraged by the improvement in economic well-being and worldwide labour mobility, which is especially relevant in the European Union. In Spain this market has developed significantly, it has been revitalised in recent years and is closely related to the demand for tourist homes.

This paper presents the work in progress to measure the value of the stock of residential real estate located in Spain and owned by non-resident households based on Tourism primary statistics. The research is motivated by the lack of specific information on the phenomenon, given the relevance that it has acquired.

The work required the elaboration of a thorough inventory of the related available data sources, and was developed in close collaboration with the National Statistics Institute (INE by its Spanish abbreviation), in respect of the advice on the sources and methods to be used, following principles of efficiency and consistency of the Spanish statistical infrastructure. In this respect, the method described makes an intensive use of the primary statistics available and guarantees consistency between International (IA) and National Accounts (NA).

The paper is organised as follows. Section 2 reviews the statistical treatment of non-resident owned dwellings. The third section presents some figures on the significance of this type of investment in Spain. Section 4 summarises the compilation of the Balance of Payments and International Investment Position Statistics in Spain, with a focus on this specific topic. Section 5 compiles an inventory of the related data sources. The sixth section explains the estimation method under study. And finally, section 7 draws some conclusions and offers some reflexions.

2. Statistical treatment

The recording of stocks and flows related to ownership of second homes abroad in the IA and NA framework should be discussed on the basis of fundamental macroeconomic concepts. Firstly, the economic values involved: the dwelling, the provision and consumption of services, and the related income flows. Secondly, the actors involved: the owner and the occupier, who are often the same. And finally, the related transactions or processes: buying, selling, rental and occupation.

To summarise, any **dwelling** is regarded as an economic asset or factor of production in its capacity to contribute to the production of dwelling services consumed by its occupiers, and this output is supposed to be allocated to the country where the house is physically situated. Thus, this asset will be recorded in the National Balance Sheet of the country of location in any case and, whenever the rest of the world is involved, it will also give rise to a liability in the International Investment Position (IIP).

Focusing on non-resident owners of dwellings, two cases can be distinguished:

- The dwelling is owned by the non-resident through a legal entity that is resident in the country where the house is situated. In this case the ownership is represented by holdings in the capital of the legal entity in hands of the non-resident and it is recorded in the IIP as a financial asset of the owner, either as Direct investment or as Portfolio investment, depending on the economic motivations and patterns of behaviour.
- The dwelling is directly owned by a non-resident. In this case it should be noted that, according to international statistics standards, non-residents do not directly own homes located in another country and a notional unit is deemed to exist that owns the house. In general, if a non-resident unit has a long-term lease on an immovable asset such as a building, this is associated with it undertaking production in the economy where it is located. The non-resident unit is treated, therefore, as the owner of the notional resident unit and not of the building, which is owned by the economy where it is located. In this case, the asset would be recorded in the IIP of the owner as Direct investment abroad.

As regards the **provision and consumption of dwelling services**, there could be two possible situations depending on the occupier of the dwelling. It is assumed that the dwelling is situated in country A and the owner in country B:

- The occupier and owner of the dwelling are not the same person. If it is occupied by a resident in country A, the use is recorded as household final consumption expenditure in the NA of country A. If it is occupied by a non-resident in country A, the dwelling services will have to be recorded in the BP as an export of travel services by country A (and an import by the country of residency of the occupier matched by household final consumption in the NA of the same country).
- The occupier and owner of the dwelling are one and the same person. In this case, for the period the dwelling is occupied, a debit in Direct investment income in the Balance of Payments (BP) of country A is imputed (a credit in country B), which in turn is used to pay rental services recorded as an export of travel services in the BP of the same country (an import in country B). This treatment guarantees no impact on the net lending/net borrowing of the nation, as the increase in investment income payments/receipts is compensated by an equivalent increase in travel services receipts/payments.

As already mentioned, the dwelling is considered a factor of production so that it contributes to generating **income** for its owner. Thus, in those cases where the dwelling is owned by a non-resident, an income flow from the country where the property is established to the owner country has to be recorded in the BP and the NA whenever the house is occupied, either by the owner or by another agent. In particular, the country where the property is located will impute a debit in the Primary income (Direct investment income in BP and Property income in NA).

It should be emphasised that, by definition, a second home is not occupied full-time by its owner and in many cases is inhabited for long periods of time. This causes effects in income and consumption. Without production of dwelling services the generation of income to the owner will not be possible, and nor will consumption take place.

It is also worth noting that in this specific case of second homes abroad the implementation of the residency criteria poses many difficulties, because it often involves highly mobile individuals that have close connections with two or more

territories, and because factors such as location of dwellings, employment, citizenship, migration status, income tax status or location of dependent family members may point to different economies. This issue, as we will see in the following sections, is relevant when exploring the approaches available.

3. Investment in real estate in Spain

The real estate sector in Spain has been an engine of the economy for many years, and although the economic crisis greatly affected this sector, the latest indicators show renewed dynamism in this market with the significant participation of international investors.

The housing stock estimates made by the Ministry of Public Works accounted for 25.6 million dwellings in Spain in 2016, of which 26% (6.5 million houses) were non-main dwellings (empty houses or secondary residences). These non-main dwellings are concentrated on the Mediterranean and Southern Coasts (Catalonia, Community of Valencia, Murcia and Andalusia), accounting for more than half of the non-main dwellings.

Statistics compiled by the General Council of Notaries paint a similar picture, with the number of purchases made by foreigners growing at a rate of 10% in both 2016 and 2017, and the purchases made by non-resident foreigners at 9% and 8% in 2016 and 2017, respectively, resulting in a total number of 46,894 transactions by non-resident foreigners, and 53,200 by resident foreigners in 2017.

Two-thirds of the total purchases were made by Community citizens, most notably from the United Kingdom (14.3% of total purchases), France (8.4%), Germany (8.1%) and Romania (6.8%). Outside the European Union (EU) the main buyers were from Morocco (5.7%), China (5.2%) and Russia (3.1%).

Furthermore, according to Tourism basic statistics² 4.9 million travellers that entered our country in 2017 stayed at their own house, 6% of the total. They were mostly from EU countries (27% from the United Kingdom, 19% from France, 13% from Germany, 6% from Belgium, 5% from the Netherlands), and staying in Community of Valencia (31%), Andalusia (19%), Catalonia (17%) and the Balearic and Canary Islands (13% and 8%).

Finally, the Banco de España (BE by its Spanish abbreviation) estimates in its '*housing market indicators*'³ that the number of dwellings in Spain is 25.1 million in 2016, 1.36 per household, of which 77.1% are owner-occupied, 16.3% rented, and 6.5% free-let and other; household real-estate wealth is estimated to represent 425.6% of GDP in 2017 (78% of total household wealth).

² Source: National Statistics Institute (INE), *Tourist Movement on Borders Survey-FRONTUR*.

³ https://www.bde.es/webbde/es/estadis/infoest/si_1_5e.pdf

Time-sharing agreements

The popularity of time-sharing peaked in Spain in the 1990s. Some studies ranked Spain as the country with the second-highest number of time-share units after the USA. On the information provided to us by the EGATUR tourism expenditure survey, which includes a question on the type of accommodation used by tourists, it was observed that in 2016 and 2017 around 400,000 tourists stayed in time-share units, representing around 0.5% of total tourists and 2.5% of those staying in non-market accommodation.

Time-sharing works on the basis of an agreement under which each participant uses a dwelling for a certain period of time. Spanish legislation (Law 4/2012) considers inappropriate the Spanish term “*multipropiedad*” (literally “multiple ownership”), and refers to this phenomenon as “rights to use immovable property in turn, particularly for tourism purposes”. The law stipulates that housing units held in Spain under a time-share scheme must be included in a public deed and registered in the real estate registry. In this registry it must be clearly stated who is the “original” owner (the person who sells that usage right), from which it follows that what is exercised over the housing unit is a usage right, rather than ownership. It is not a case of ownership of real estate, because a housing unit cannot be “purchased” as a time-share scheme.

Based on the above, it is considered that time-sharing should not be included in the stock of housing of non-residents in Spain, since, as mentioned above, what is purchased is a usage right, rather than ownership of the housing unit. According to ‘Table 10.3. Treatment of Alternative Time-Share Arrangements’ in the Balance of Payments and International Investment Position Manual (BPM6), payments for rights to use are equivalent to prepaying for accommodation services (recorded in trade credit and advances); after initial acquisition, the prepayment is drawn down, and imputed accommodation services should be recorded in travel.

4. Balance of Payments and International Investment Position statistics in Spain

The BE has been responsible for compiling the BP since 1991. In the early 1990s a closed data collection system was put in place that covered almost all the transactions with the rest of the world. This system was based on two pillars: data from financial entities registered with BE and direct reporting. In the case of registered financial entities, deposit institutions reported to BE all transactions with non-residents on their own account or that of their customers settled through the entity; and other financial entities reported to BE when they carried out transactions with non-residents on behalf of customers. In the case of external transactions settled through accounts abroad (accounts in credit institutions, mutual accounts, inter-company accounts and cash pooling) and compensation operations, the resident involved is obliged to report the external transactions directly to BE. This practice is commonly known as ITRS – International Transaction Reporting System.

Nevertheless, economic and financial integration led to an increasing number and complexity of transactions, making it more difficult to cover all the information needed without raising the cost of collecting data, both for compilers and reporters, and the quality of settlements statistics began to be questioned. Thresholds to declare individually the transactions were subsequently raised, to €12,500 in 2001 and to €50,000 euros in 2007; and other information sources were progressively added to improve the data reported through ITRS (Foreign Investment Register, Travel Survey, Money Transfer Operator, Depository Entities, etc.). Finally, the entry into force of the Single Euro Payments Area closed down the ITRS, which was replaced by a number

of different sources, with a more intense use of direct reporting and of administrative registers.

The case of residential real estate, together with other international transactions involving households, were particularly affected by the closing down of ITRS. The nature of real-estate operations and their lower transaction value compared to other financial flows made it difficult to capture them in the new reporting system oriented to corporations' operations.

The methodology that followed the ITRS, and that currently in place, relies on administrative data on transactions, taking purchases of real estate made by non-residents from the Ministry of Public Works, and sales from the Tax Authorities. The stock in the IIP is calculated by the accumulation of these transactions.

Nonetheless, the shortcomings of this method (the valuation of the stock at market prices, the lack of any anchor to reference the stock, or the use of fiscal residency, among others) led us to open an avenue of research to reconsider the estimation method, focusing on the stock level from which transactions, revaluations and other changes in volume could be derived.

As regards related income flows and the provision and consumption of accommodation services, explicit receipts and payments are reported to the BE through: a) the general data collection system for financial operations (which, as already mentioned, does not capture correctly household transactions of this kind); and b) the border spending survey EGATUR, which is the basic information source for the travel services recorded in the BP and in the NA. Concerning imputed accommodation services when the property is temporarily occupied by its owner, these flows are estimated by INE – NA Department and provided to BE. NA estimates combine information on overnight stays by travellers in their own home, average household size and average rental expenses in secondary homes. The information sources are the border spending survey EGATUR, data published by Eurostat on the size of households in the EU, the Household Expenditure Survey (EPF, by its Spanish abbreviation)⁴, and data from the Population and housing census and the Continuous Household Survey (ECH, by its Spanish abbreviation).

5 Data sources on real estate

This section offers an overview of the available real estate data sources, including those on which the study is based⁵.

1. General Council of Notaries. Includes information regarding all the purchase and sales carried out by a notary in the national territory on a quarterly basis, of both new and second-hand dwellings, and regardless of the form of payment, whether in cash or with credit. The information available includes the number of transactions, the purchase value, the average surface area and the average price

⁴ EPF data corrected against the purchasing power parity index of the main counterparty countries and the consumer price index.

⁵ Among the sources analysed not included in the estimation, the tax sources are still under analysis with the purpose of integrating them into the described methodology in the near future, either as a lower limit to the estimations, or as a tool to monitor transactions.

per square meter, identifying the location of the real estate, and the nationality and the fiscal residence of the purchaser.

2. Property Register. Provides information on the purchases and sales of residential real estate in the national territory recorded in the Property Register. The information available includes the number of transactions, the purchase value, the average surface area and the average price per square meter, identifying the location of the real estate and the nationality of the purchaser.
3. Ministry of Public Works.
 - a. Housing stock estimates for principal and non-principal dwellings. The main dwellings can be identified with the Labour Survey micro data compiled by INE.
 - b. Real estate transactions by fiscal residency of the buyer, using data provided by the General Council of Notaries.
4. Ministry of Finance.
 - a. Tax Agency. Non-residents, both individuals and entities, are taxed by the Income Tax of Non-residents (IRNR by its Spanish abbreviation). In particular, non-resident taxpayers who are natural persons, holders of urban real estate located in Spain, for their own use, and not affected by economic activities or vacated, are taxed for the imputed income of urban real estate for own use (form 210). The taxable base comprises the cadastral value of the assets, which features on the receipt of the tax on Real Property (IBI by its Spanish abbreviation). The BE requested Tax Agency data on the income from properties reported in form 210 in order to cross-check the information with that which the BE was using in its BP estimates. The steps followed in the study were: definition of the population framework, cross-checking with the cadastral information and breakdown of different groups of interest.
 - b. Real Estate Cadastre. This is an administrative record whose main purpose is to provide information for tax control. The cadastral description of the property includes a physical description of the real estate (location, surface area, use, cadastral value) and legal and economic characteristics of the owner (not including residency).
5. Ministry of Economic Affairs and Competitiveness - Foreign Investment Register. Covers foreign investments and disinvestments, above €1.5 million if Spanish abroad and €3 million if foreign in Spain; this threshold does not apply if their source or destination is a tax haven⁶. Royal Decree 664/1999, the Ministerial Order of 28 May 2001 and the Ministerial Resolution of 21 February 2002 make it compulsory to file the transactions and set a maximum time period of one month from the date of execution of the investment for reporting the information. The parties required to report Spanish investments abroad are natural persons resident in Spain (Spaniards or foreigners with domicile or principal residence in Spain) and legal persons with a registered office in Spain. The parties required to report foreign investments in Spain are natural persons not resident in Spain (Spaniards or foreigners, those domiciled abroad or who have their principal residence abroad) and legal persons with a registered office

⁶ As defined in Royal Decree 1080/91 of 5 July 1991.

abroad, and foreign sovereign government agencies. The Register offers information on: holder of the investment, country of residence of the holder, country of location of the real estate, type of real estate, end-use, right acquired/transferred, area (land or construction), location, cadastral reference, amount of the planned or implemented investment/settlement, type of settlement (full or partial).

6. National Statistics Institute (INE by its Spanish abbreviation).
 - a. Population and housing census 2011. Provides information on the characteristics of dwellings in Spain (average useful surface area of main dwellings).
 - b. Housing Price Index (IPV by its Spanish abbreviation). The IPV is a chained Laspeyres Index that collects information on housing sales recorded in the above-mentioned General Council of Notaries, which contains, among other data, the official prices for all of the purchases and sales occurring in Spanish territory, and correspond to the value of the property deed of the dwelling⁷.
 - c. Tourism primary statistics: described in section 6.1.

6. Estimation

The work in progress to measure the stock of non-resident owned dwellings in Spain pivots on Tourism primary statistics to identify the number of houses, and in particular in the travel surveys described below. The valuation is made through administrative records, which contain price information depending on the location of the dwelling.

This method does not cover commercial investments, which are of less relevance in Spain and are usually channelled indirectly via resident entities (that should not be recorded as investment in real estate in BP/IIP but as investment in equity, under the appropriate heading, which is generally Direct investment).

6.1 Tourism primary statistics

INE compiles Tourist Movement on Borders Survey (FRONTUR) and Tourist Expenditure Survey (EGATUR) with the aim of measuring the number of non-resident visitors who enter or leave Spain each month, disclosing the main characteristics of the trips (destination, accommodation type⁸, country of residence, purpose of travel, etc.) and determining how much tourists and same-day visitors spend.

⁷ All the notarial information is centralised and the Notarial Certification Agency is responsible for providing the data to the different users, among which INE.

⁸ Types of accommodation: Market (paid accommodation fee): (a) Hotel or aparthotel; (b) Lodge, hostel, motel, inn, guest house; Holiday apartments; (c) Full dwelling rental; (d) Rented rooms in private homes, (e) Rural tourism accommodation; (f) Hostel; (g) Camp Site; (h) Cruise ship; (g) Other Collective accommodation. Non-Market (unpaid accommodation): (i) Owner-occupied dwelling; (j) Dwelling of family or friends (free); (k) Shared-use dwelling (timeshare); (l) House-Exchange; (m) Other non-market accommodations

The population under study consists of non-residents in Spain who enter or leave our country whether or not they have stayed overnight, and those who pass through our country in transit. The theoretical population framework consists of people (residents and non-residents) crossing the borders into Spain. There is no framework for selecting the sample in the traditional sense used in sample surveys. Given this particularity, the hypothesis of considering the population scope as matching the sample design population frame was taken as a starting point. When defining the sample design population frame, various sources of information and administrative records are used, according to the means of entering our country (whether travellers arrive by road, airport, port or rail). This is the basis used for estimating flows of entry into Spain. The total of non-resident travellers in Spain is estimated using the FRONTUR survey and this information is in turn used to obtain the population which will be used to calculate data for the EGATUR survey (which provides information on tourism expenditure of non-resident visitors).

Although the information for grossing up the data corresponds to the data on entries into Spain; the surveys are conducted when travellers leave the country (for operational reasons and because more information is available ex-post), thus considering that the population under study is made up of non-resident visitors who leave Spain during the month under study by any of the four entry/departure routes.

This survey has the advantage of having a residence criterion that fits the practical rule recommended by statistical standards, i.e. being present for one year or more in a territory, as opposed to tax and administrative resources with fiscal residence criteria. Moreover, it is important to note that this survey is used by NA for the estimation of imputed accommodation services, and therefore helps provide for consistency between both estimations. Finally, it should be highlighted that Tourism primary statistics fall under an EU regulation that guarantees their quality and availability.

6.2 Number of dwellings

The number of dwellings in Spain owned by non-residents is approximated by the number of travellers that stay at their own house when visiting the country, in any of the stages of their trip⁹.

To this end, some adjustments have to be made in order to move from the number of visitors' entries to the number of dwellings to ensure that every house is only counted once. First, we have to correct for the times the same tourist enters our country (frequency); and second, we have to adjust for the number of tourists staying in the same dwelling (size of the group).

Frequency

The framework for the estimation is the natural year, to ensure that all the population is covered regardless of when they enter the country; therefore, a transformation is needed to convert monthly into yearly data.

To avoid counting more than once the same tourist who enters repeatedly at different times of the year, the number of tourists is divided by the times they say

⁹ If the tourists stay in their own dwelling in more than one stage of their trip, every stage is included as long as they are not in the same location.

they enter the country: the number of tourists visiting Spain quarterly will be divided by 4, those who come once a semester divided by 2, and so on, and those who come once a year would not need any adjustment.

Problems arise when tourists visit Spain for the first time and the future frequency is unknown, in which case they are assumed to visit Spain yearly. When tourists declare they enter Spain less than once a year, it is assumed they come every two years, and a multiple of 2 is applied.

Size of the group

The number of tourists is adjusted for the number of people they travel with, assuming that each group is staying in the same house. Various alternatives were considered, based on what tourists report when asked about the size of the group they travel with or on other statistics: (i) the size of the group reported by tourists resulted in a final adjustment equivalent to a size of 1.8 to 2.1 people per dwelling (final adjustment from 0.48 to 0.55) depending on the year; (ii) the average size of the group, equivalent to a size of 2.07 to 2.7 people (final adjustment 0.37-0.48) depending on the year; (iii) the average size of the group was 2.2 for the whole period 2004-2017 (adjustment of 0.45); (iv) the median group was 2 in every year (adjustment of 0.5); (v) and the average size of the European household was 2.3 people as from 2014¹⁰ (adjustment of 0.43).

The chosen adjustment is the size of the household in the EU published by Eurostat, as this is a more conservative approach (the resulting number of houses would be lower). It is consistent with NA estimates on imputed accommodation services included in travel, it is not subject to abrupt fluctuations, and it is an appropriate measure to characterise the households that tend to buy properties in Spain, i.e. families from the EU.

6.3 Estimated average price of houses

According to international standards, the valuation of dwellings should be made at market prices at each moment in time. Various options were considered, including direct and indirect estimations: a direct estimation by defining the average price per house based on purchase prices recorded by the General Council of Notaries and the Property Register; and an indirect estimation based on average surface area per house and average price per square meter. In all cases the geographical situation of the dwelling was considered in regional (Autonomous Community) terms.

Direct estimation

The General Council of Notaries includes information regarding all the purchase and sales carried out in the national territory on a quarterly basis, of both new and second-hand dwellings, and regardless of the form of payment, whether in cash or with credit.

The Property Register compiles the Real Estate Registry Statistics, which count on the participation of practically all Spanish Property Registries (1,102 offices distributed throughout Spanish territory). It includes in practice all mortgage transfers and originations registered in the Spanish Property Registries. However, although the

¹⁰ Average household size for the European Union current composition (EU28) from EU-SILC survey, 2.3 people since 2014, 2.4 people from 2008 to 2013.

registration of the sale in the property registry is advisable, it is not mandatory; the purchaser need not register it in the registry, or may do so after the deed of sale.

Average residential real estate price

2016 data in euro

Table 1

	Option 1	Option 2	Option 3.1	Option 3.2	Option 3.3	Option 3.4	% of tourists in own dwellings
<i>Surface area data</i>	Notaries	Property Register	Census	Census	Property Register	Property Register	
<i>Price data</i>	Notaries	Property Register	Ministry Public Works	Notaries	Ministry Public Works	Notaries	
Weighted total	144,853	137,743	173,172	160,284	137,504	127,143	
Andalusia	127,833	124,297	148,610	137,861	123,447	114,518	24%
Aragon	103,633	107,169	137,989	108,755	112,298	88,507	1%
Asturias	106,367	103,048	134,565	108,741	109,731	88,673	1%
Balearic Islands	268,184	221,044	270,491	279,702	217,480	224,886	12%
Canary Islands	127,306	120,770	160,091	163,230	113,858	116,090	11%
Cantabria	128,157	131,997	173,079	133,111	136,001	104,595	1%
Castile-Leon	92,955	98,452	129,530	89,592	111,812	77,338	1%
Castile-La Mancha	88,026	83,754	121,664	87,757	107,896	77,826	0%
Catalonia	167,542	165,970	200,756	176,694	162,368	142,907	16%
Valencia	108,103	108,219	146,323	128,069	111,604	97,681	25%
Extremadura	74,786	73,103	112,550	69,420	100,504	61,990	0%
Galicia	106,343	109,393	155,304	112,200	121,882	88,054	1%
Madrid	200,294	202,073	246,169	213,475	206,219	178,830	2%
Murcia	94,065	96,776	124,524	106,207	101,995	86,992	5%
Navarre	135,077	132,207	166,126	153,507	135,551	125,254	0%
Basque Country	195,944	205,046	253,259	231,671	204,550	187,114	1%
Rioja	102,002	93,402	127,354	106,970	106,192	89,195	0%

Indirect estimation

To complement and check the accuracy of the data provided by the General Council of Notaries and the Property Register, a reconstruction through available sources on average surface area and average price per square meter was made.

Combinations 3.1 and 3.2 (see table 1) were based on the average surface area available in the Census conducted by INE in 2011 and average prices per square meter provided by the Ministry of Public Works and The General Council of Notaries.

Combinations 3.3 and 3.4 were based on average surface area reported in the Property Register and prices provided by the Ministry of Public Works and The General Council of Notaries.

Table 1 shows the results of all the approximations for the year 2016. Combinations based on the Census provided significantly higher prices than the alternatives proposed; estimates based on average surface area reported by the Property Register were in line, but below direct estimates. Comparing data from notaries and property registers, both showed similar figures, these being slightly higher in the case of notaries.

Finally, the valuation obtained from the notary register was considered the most appropriate, because it corresponds to the value of the property deed of the dwelling, not the appraisal, it is used by INE to construct the IPV and there is no lag between the formalisation of the operation and the date of registration, as is the case with the Property Register.

5.3 Results

The final calculation of the housing stock assigns to the number of dwellings identified by means of the tourist surveys an average annual value per location of the property.

In the validation process, some volatility was observed in the number of dwellings, reflecting an erratic evolution at certain moments in time. To correct the volatility the reference period for the questionnaire was extended from 1 calendar year to 24 months using moving averages.

Concerning average house prices, the level and evolution of the data provided by the General Council of Notaries was consistent with all the other information sources consulted, and no adjustment was made for the time series.

The results of the exercise with the specifications detailed above showed a final stock of approximately 1 million dwellings in 2017, valued at over €160 billion. Developments in the period under study (2004-2017) and the adjustments made to correct for volatility are shown in table 2.

Results

Considering European household size and General Council of Notaries prices

Table 2

Year	Number of dwellings				Average price (€, weighted)		Stock at market prices (€m)			
	Unadjusted	% y-o-y	24-month moving average	% y-o-y	% y-o-y		Unadjusted	% y-o-y	Based on the moving average	% y-o-y
2004	1,128,441		1,128,441		140,534		158,584		158,584	
2005	1,079,307	-4%	1,103,874	-2%	161,202	15%	175,647	11%	177,946	12%
2006	1,061,571	-2%	1,070,439	-3%	179,523	11%	189,250	8%	192,169	8%
2007	1,093,195	3%	1,077,383	1%	189,430	6%	207,203	9%	204,089	6%
2008	993,055	-9%	1,043,125	-3%	194,102	2%	193,426	-7%	202,473	-1%
2009	1,027,456	3%	1,010,256	-3%	186,500	-4%	194,428	1%	188,412	-7%
2010	989,288	-4%	1,008,372	0%	181,482	-3%	177,804	-9%	183,002	-3%
2011	990,287	0%	989,787	-2%	172,363	-5%	172,929	-3%	170,603	-7%
2012	942,289	-5%	966,288	-2%	162,030	-6%	153,805	-11%	156,568	-8%
2013	1,051,652	12%	996,971	3%	151,914	-6%	156,576	2%	151,454	-3%
2014	1,135,193	8%	1,093,423	10%	147,176	-3%	165,254	6%	160,925	6%
2015	929,163	-18%	1,032,178	-6%	149,973	2%	159,358	-4%	154,799	-4%
2016	1,094,574	18%	1,011,868	-2%	148,037	-1%	188,738	18%	149,794	-3%
2017	1,125,797	3%	1,110,185	10%	149,473	1%	196,730	4%	165,943	11%

7. Conclusions and reflexions

In an attempt to improve the quality of the BP/IIP statistics, the approximation under study could provide a more comprehensive approach to adapt real estate statistics to economic reality, pursuing a direct estimation that would avoid the calculation of the stock by accumulation of flows and focusing on the number of houses in terms of their characteristics and their valuation at market prices.

The calibration of the parameters and accuracy in the house price data sources are essential in the calculation, and any variation in the parameters or in the average prices assigned has a significant impact on the estimates.

This exercise was coordinated with INE, both with the data providers (Tourism primary statistics producers) and with the final users (NA producers). The definition of the parameters coincide with those used by NA when estimating the imputed rent on tourist dwellings. Moreover, the data source on housing prices, the General Council of Notaries, coincides with that used by INE for the estimation of the IPV.

Nonetheless, other works are under way, the results of which have not yet been included in this article, and alternative avenues of complementary research have been considered:

- a. The exchange of information with the tax authorities has continued, although conclusive results have not yet been reached.
- b. An analysis of bilateral asymmetries is under way with the main counterpart countries, for which there are still no results.

Forthcoming future challenges to be tackled:

- a. Fine-tuning of the geographical location of the dwellings moving from the level of Autonomous Community (17 plus two autonomous cities) to that of province (50) in order to better isolate second houses for valuation.
- b. Measurement of commercial investment in real estate and, in relation to this, the phenomenon of investment in tourist apartments to rent on platforms such as AirBnB. The Foreign Investment Register could be explored to this end.

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IFC - Central Bank of Armenia Workshop on "*External Sector Statistics*"

Dilijan, Armenia, 11-12 June 2018

Stock of non-resident owned dwellings in Spain¹

Esther Martín, Elena Nieto and Gregorio Portillo,
Bank of Spain

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.

WORK IN PROGRESS TO MEASURE THE STOCK OF NON-RESIDENT OWNED DWELLINGS IN SPAIN

Esther Martín, Elena Nieto, Gregorio Portillo

Balance of Payments Division, Bank of Spain

IFC – CENTRAL BANK OF ARMENIA WORKSHOP ON EXTERNAL SECTOR STATISTICS

Dilijan, Armenia

11 June, 2018

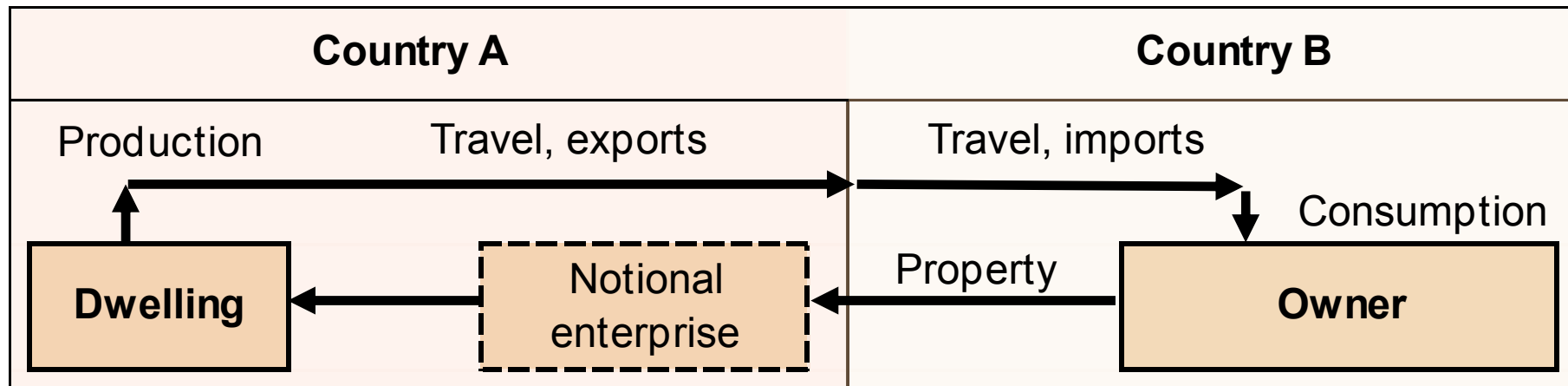
DIRECTORATE GENERAL ECONOMICS, STATISTICS AND
RESEARCH

OUTLINE



- 1 Measurement of real estate in FDI: international standards
- 2 Investment in real estate in Spain
- 3 Current methodology and motivation to search for alternatives
- 4 Available data sources
- 5 Estimation based on tourism statistics
- 6 Challenges ahead

MEASUREMENT OF REAL ESTATE IN FDI: INTERNATIONAL STANDARDS

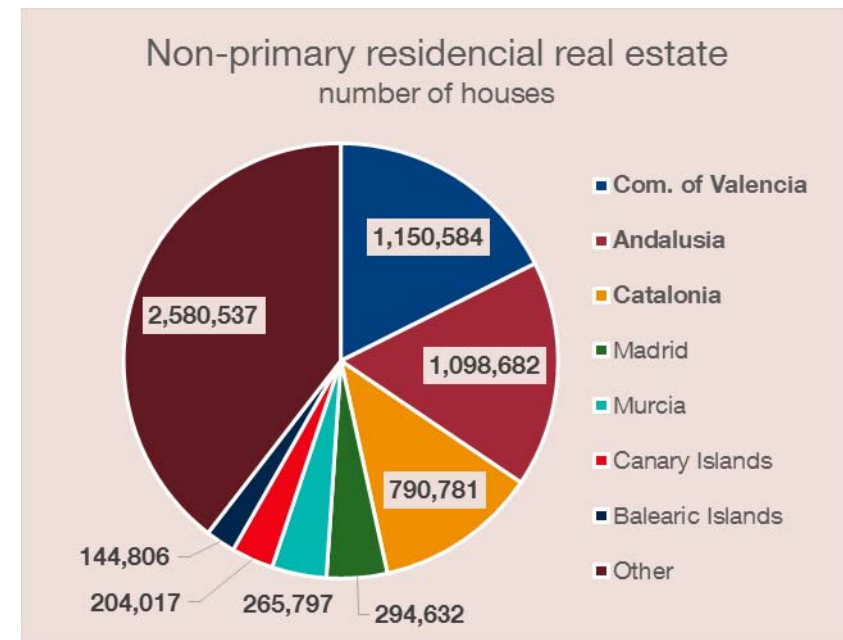
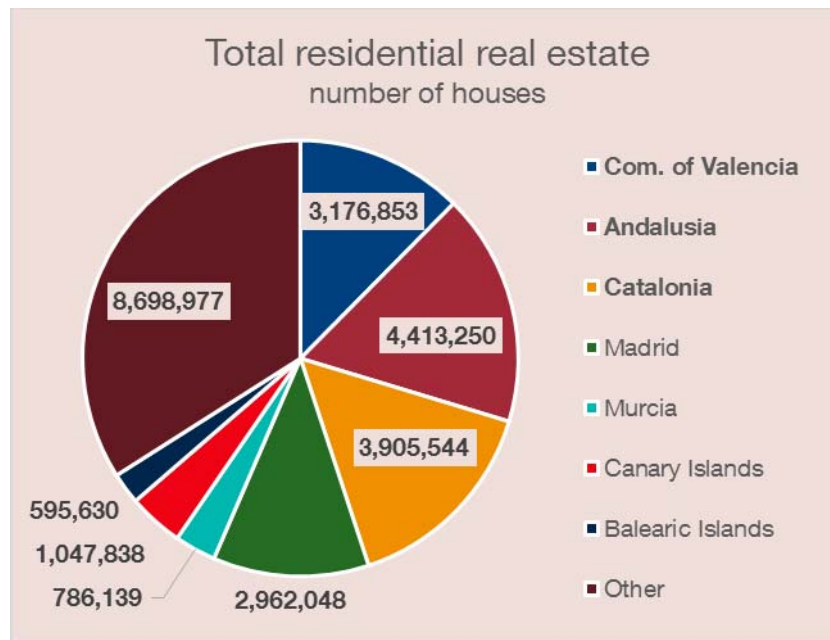


Financial Account / IIP (Country A)	
Net incurrance of financial liabilities	Net acquisition of financial assets
Direct investment (notional unit)	Other investment (currency and deposits)
Current Account (Country A)	
Exports	Imports
Travel (accomodation services provided to the owner, imputed based on market prices)	Primary income (direct investment income)

INVESTMENT IN REAL ESTATE IN SPAIN: HOUSING STOCK ESTIMATES



- **25.6 million dwellings in Spain, 26% non-main dwellings (6.5 million)**
- **Secondary dwellings in main touristic regions**



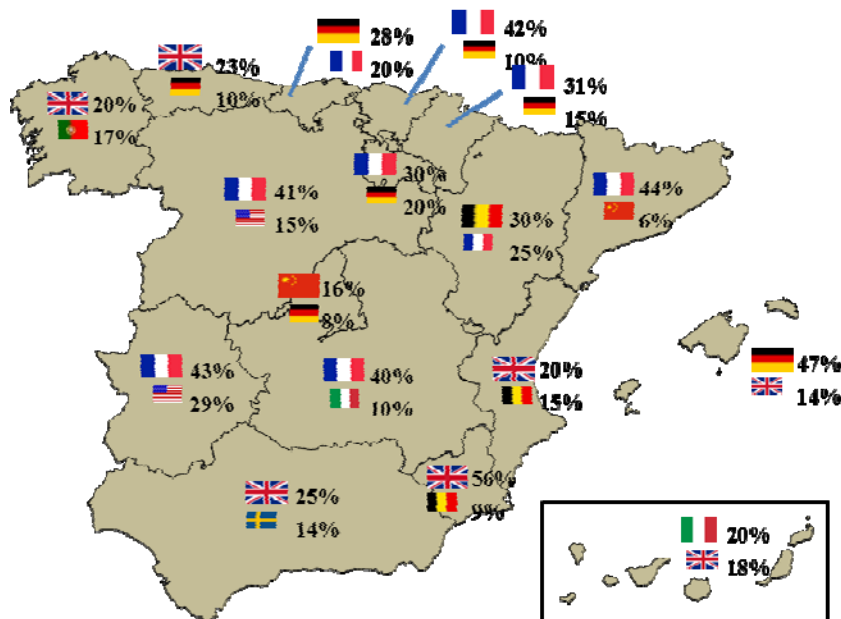
Source: Ministry of Public Works, Housing stock estimates
2016 data

INVESTMENT IN REAL ESTATE IN SPAIN: ACQUISITIONS OF NON RESIDENTS/FOREIGNERS

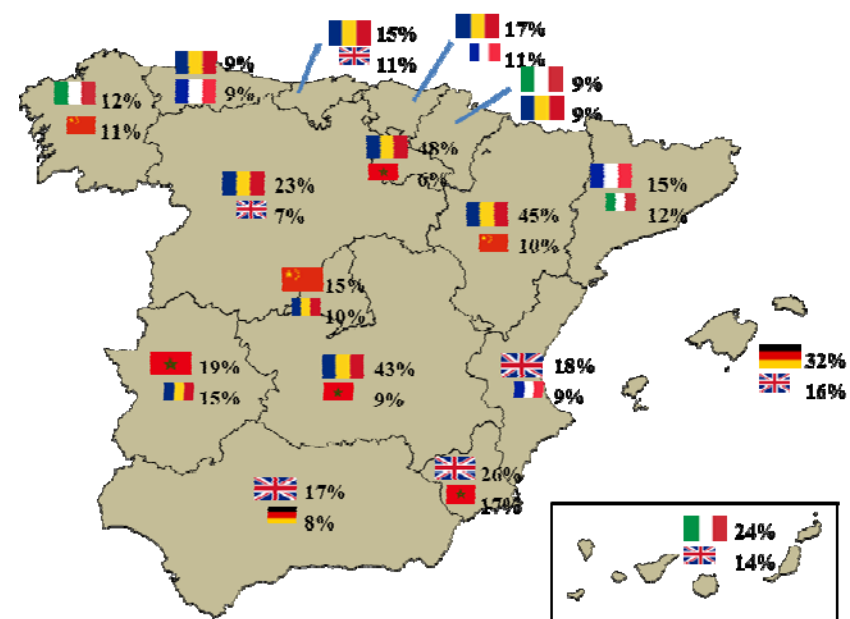


- **2/3 of total purchasers from EU countries:** United Kingdom (14%), France (9%), Germany (8%), Romania (7%), Italy (7%), Belgium (6%)
- **Outside the EU:** Morocco 6%, China 5%, Russia 3%
- **Challenges: residency vs. nationality**

SHARE OF TRANSACTIONS BY NON-RESIDENT FOREIGNERS
2017/S2



SHARE OF TRANSACTIONS BY RESIDENT FOREIGNERS
2017/S2

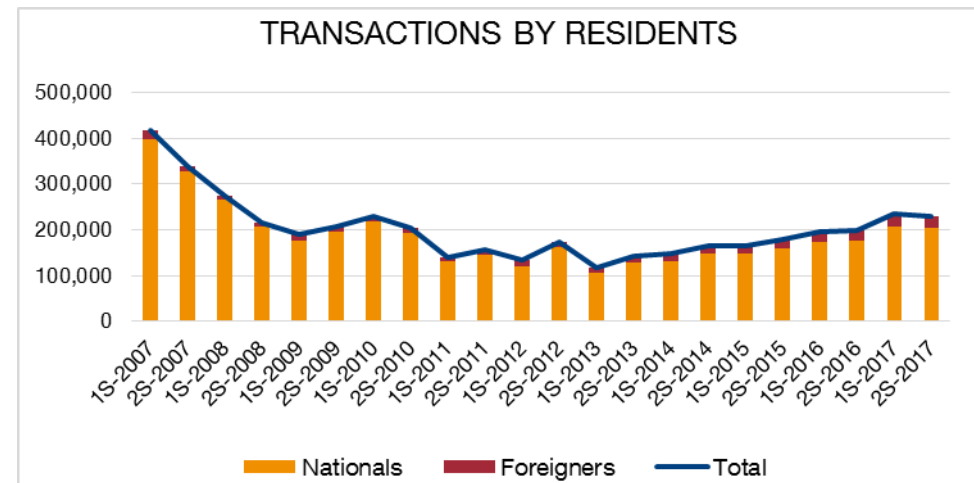
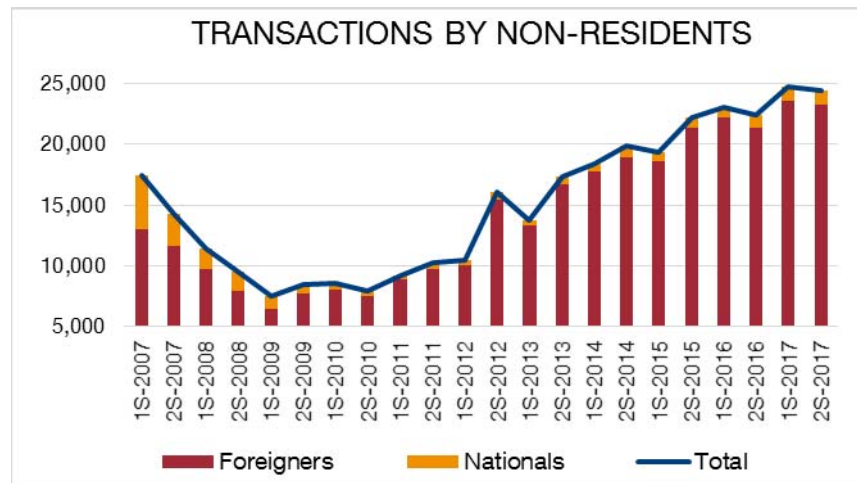


Source: General Council of Notaries and CIEN
Fiscal residency

INVESTMENT IN REAL ESTATE IN SPAIN: ACQUISITIONS OF NON RESIDENTS/FOREIGNERS (II)



- **Foreigners made 100,095 transactions in 2017:**
 - 46,894 by non-residents
- **Nationals made 413,719 transactions in 2017:**
 - 2,257 by non-residents



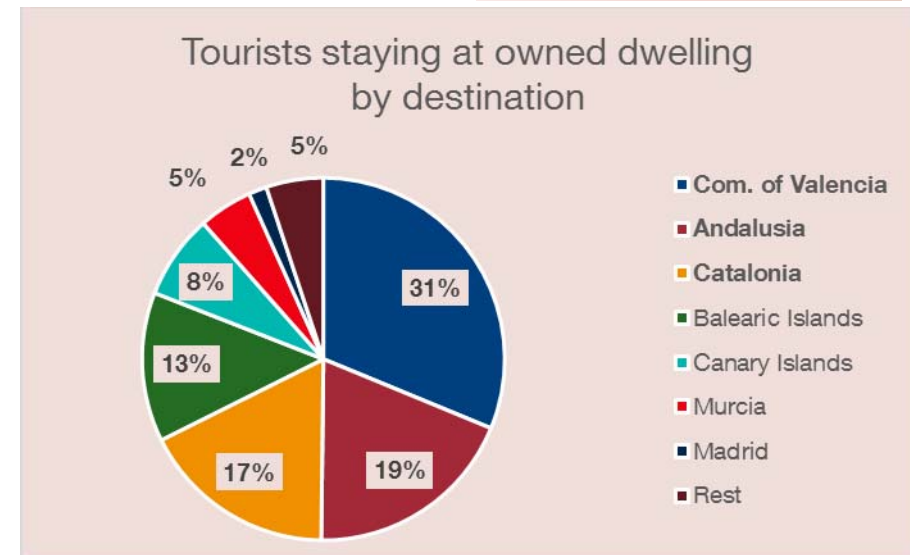
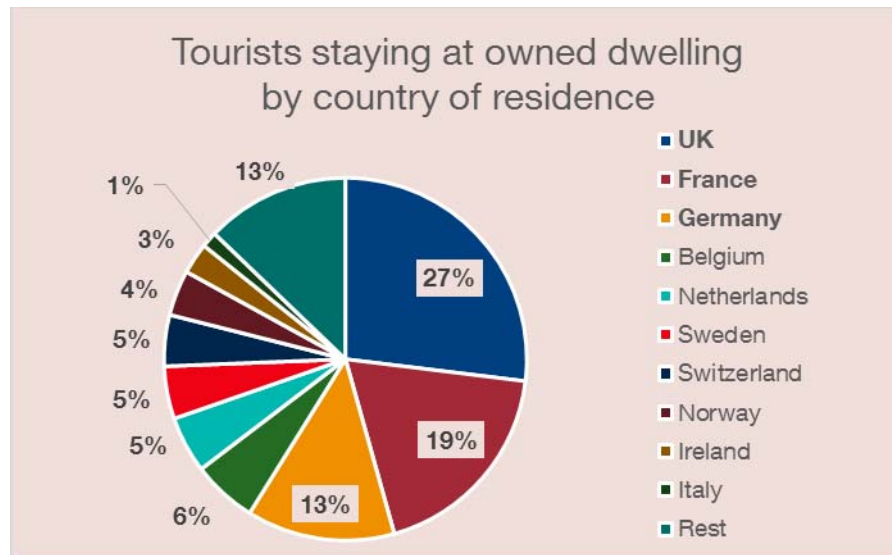
Source: General Council of Notaries and CIEN
Fiscal residency

INVESTMENT IN REAL ESTATE IN SPAIN: TOURISM SURVEYS



- **81.8 million tourist entered Spain in 2017, 4.9 million stayed at their owned dwelling**
- **Concentration by:**
 - Countries of residency: European countries (United Kingdom, France & Germany)
 - Location: Mediterranean Coast (Valencia, Andalusia, Catalonia), and Balearic and Canary Islands

Statistical residence !



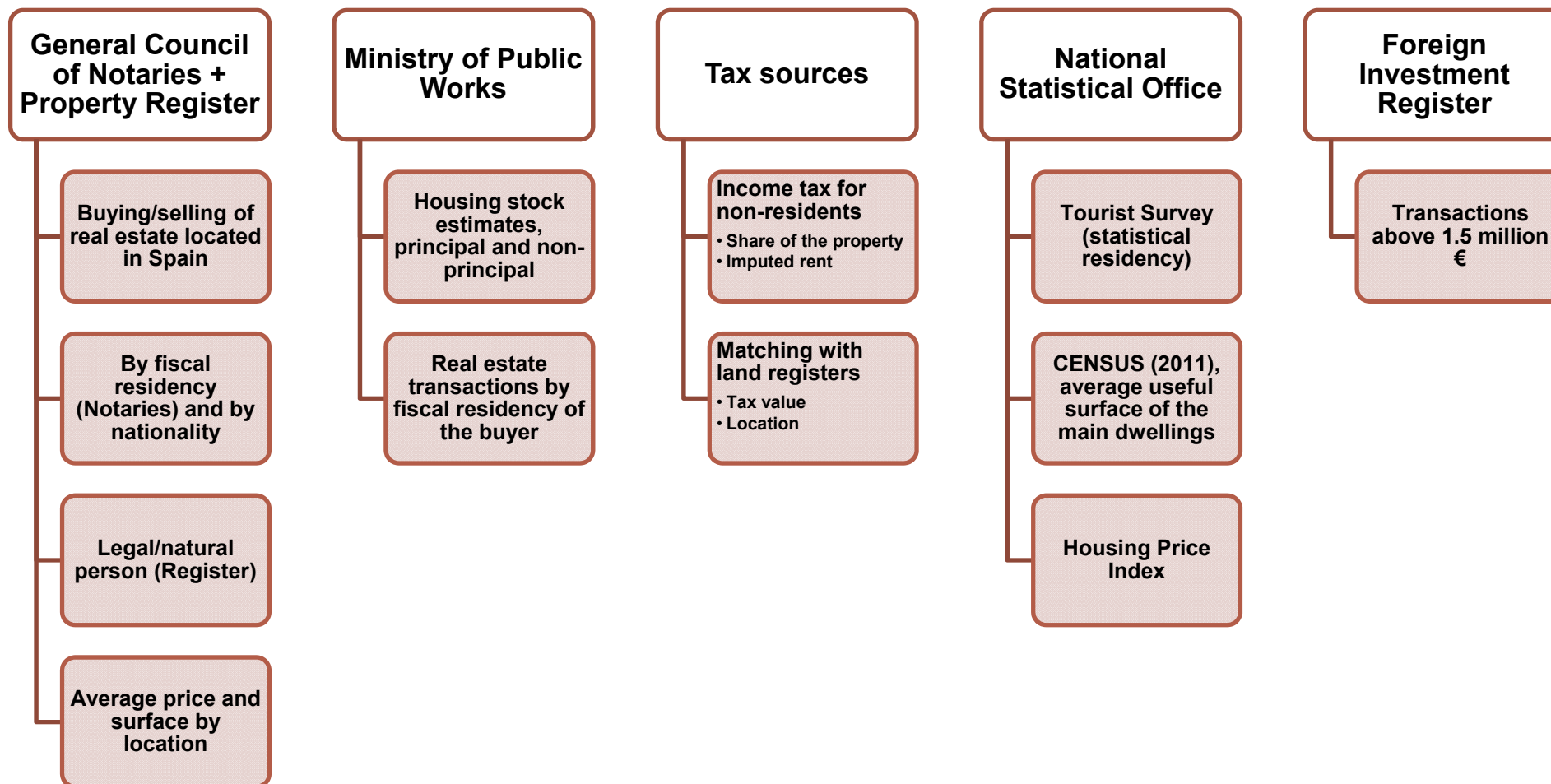
Source: National Statistical Office (INE), Tourist Movement on Borders Survey Frontur
2017 data

CURRENT METHODOLOGY AND MOTIVATION TO SEARCH FOR ALTERNATIVES



- **Current estimates in the Balance of Payments**
 - Until 2014, data from ITRS
 - 2014: entry into force of SEPA, end of ITRS recording
 - From 2014 onwards
 - *Purchases: Ministry of Public Works (fiscal non-residents)*
 - *Sales: Tax Authority (fiscal non-residents)*
- **Current estimates in the International Investment Position**
 - Accumulation of these transactions
- **Motivation to search for alternatives**
 - Valuation of the stock at market prices (which could be corrected with price indices)
 - Lack of anchor to reference the stock

AVAILABLE DATA SOURCES



ESTIMATION BASED ON TOURISM STATISTICS



➤ **Number of houses owned by non-residents:**

- Number of tourists that enter our country and stay in their owned dwelling
- Adjusting for the times they enter, and the size of the group/family
- Breakdown by property location (region) and residence of the tourist
- Statistical residence, regulation (EU) No 692/2011 asks for "tourism nights spent in non-rented accommodation"

➤ **Estimated average price of houses**

- Breakdown by property location (region)
- Sources: General Council of Notaries, Property Register, Ministry of Public Works, Census

ESTIMATION BASED ON TOURISM STATISTICS: NUMBER OF DWELLINGS



- **Number of houses based on the number of tourists that come to our country and stay in their own dwellings:**
 - Adjusting for the times they enter and for the size of the group/household

Frequency of visits to Spain	Numer of times a year	Adjustment
Weekly	52	*0.019 = (1/52)
Monthly	12	*0.083 = (1/12)
Quarterly	4	*0.25 = (1/4)
Semiannually	2	*0.5 = (1/2)
Annually	1	*1
Less frequently	0,5	*2
First time in Spain	1	*1

Size of the group	Size	Adjustment
Size of the group they travel with	Variable with outliers [from 1 to 301]	Variable [final adjustment from 0.48 to 0.55]
Median size of the group	2 people	*0.5 = (1/2)
Average size of the group	Variable [from 2.07 to 2.71]	Variable [from 0.37 to 0.48]
Average size of the group (2004-2017)	2.2 people	*0.45 = (1/2.2)
Average size of the european household	2.3 people	*0.43 = (1/2.3)

Results for 2017

Number of dwellings, millions

Number of tourists staying in their own house	Adjusted by frequency	Adjusted by frequency and group				
		Size of the group they travel with	Median size of the group	Average size of the group	Average size (2004-2017)	European household size
4,7	2,6	1,3	1,3	1,1	1,2	1,1
<i>adjustment ratio</i>	55%	49%	50%	41%	45%	43%

ESTIMATION BASED ON TOURISM STATISTICS: VALUATION



Average residential real estate price

Data referred to 2016, euros

	<i>Option 1</i>	<i>Option 2</i>	<i>Option 3.1</i>	<i>Option 3.2</i>	<i>Option 3.3</i>	<i>Option 3.4</i>	<i>% of tourist in own dwellings</i>
<i>surface data</i>	<i>Notaries</i>	<i>Property Register</i>	<i>Census</i>	<i>Census</i>	<i>Property Register</i>	<i>Property Register</i>	
<i>price data</i>	<i>Notaries</i>	<i>Property Register</i>	<i>Ministry Public Works</i>	<i>Notaries</i>	<i>Ministry Public Works</i>	<i>Notaries</i>	
Weighted total	144.853	137.743	173.172	160.284	137.504	127.143	
Andalusia	127.833	124.297	148.610	137.861	123.447	114.518	24%
Aragon	103.633	107.169	137.989	108.755	112.298	88.507	1%
Asturias	106.367	103.048	134.565	108.741	109.731	88.673	1%
Balearic Islands	268.184	221.044	270.491	279.702	217.480	224.886	12%
Canary Islands	127.306	120.770	160.091	163.230	113.858	116.090	11%
Cantabria	128.157	131.997	173.079	133.111	136.001	104.595	1%
Castile-Leon	92.955	98.452	129.530	89.592	111.812	77.338	1%
Castile-La Mancha	88.026	83.754	121.664	87.757	107.896	77.826	0%
Catalonia	167.542	165.970	200.756	176.694	162.368	142.907	16%
Valencia	108.103	108.219	146.323	128.069	111.604	97.681	25%
Extremadura	74.786	73.103	112.550	69.420	100.504	61.990	0%
Galicia	106.343	109.393	155.304	112.200	121.882	88.054	1%
Madrid	200.294	202.073	246.169	213.475	206.219	178.830	2%
Murcia	94.065	96.776	124.524	106.207	101.995	86.992	5%
Navarre	135.077	132.207	166.126	153.507	135.551	125.254	0%
Basque Country	195.944	205.046	253.259	231.671	204.550	187.114	1%
Rioja	102.002	93.402	127.354	106.970	106.192	89.195	0%

ESTIMATION BASED ON TOURISM STATISTICS: OVERALL RESULTS

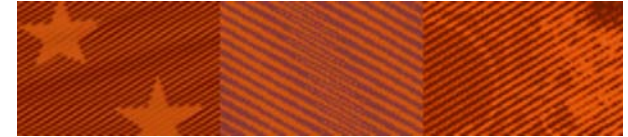


Results

Considering size of European household and General Council of Notaries prices

Year	Number of dwellings				Average price (€, weighted)		Stock at market prices (million €)			
	Unadjusted	% y-o-y	24-month moving average	% y-o-y		% y-o-y	Unadjusted	% y-o-y	Based on the moving average	% y-o-y
2004	1.128.441		1.128.441		140.534		158.584		158.584	
2005	1.079.307	-4%	1.103.874	-2%	161.202	15%	175.647	11%	177.946	12%
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2011	990.287	0%	989.787	-2%	172.363	-5%	172.929	-3%	170.603	-7%
2012	942.289	-5%	966.288	-2%	162.030	-6%	153.805	-11%	156.568	-8%
2013	1.051.652	12%	996.971	3%	151.914	-6%	156.576	2%	151.454	-3%
2014	1.135.193	8%	1.093.423	10%	147.176	-3%	165.254	6%	160.925	6%
2015	929.163	-18%	1.032.178	-6%	149.973	2%	159.358	-4%	154.799	-4%
2016	1.094.574	18%	1.011.868	-2%	148.037	-1%	188.738	18%	149.794	-3%
2017	1.125.797	3%	1.110.185	10%	149.473	1%	196.730	4%	165.943	11%

ESTIMATION BASED ON TOURISM STATISTICS: CONCLUSIONS



- **Significant increase in our liabilities**
- **Relevance in setting the parameters (group size, moving averages...), conservative approach**
- **Coordination with the National Statistical Office (INE)**
 - **National Accounts Department**
 - *Imputed rent on the use of owned dwellings*
 - *Work in progress to measure non-financial assets*
 - **SG for Tourism, Science and Technology**
 - *Coherence with tourism statistics*



- **Defining residency**
 - Administrative sources with nationality or fiscal residency
 - Tourist surveys with statistical residency
 - Problems with retired migrants with ties to their country of origin
- **Non-homogeneous dwellings**
- **Legal units**
 - Out of the scope of the survey
 - Information on flows, but not on stocks
- **Others:**
 - Parallel works with Tax Authorities
 - Bilateral comparisons: United Kingdom, Germany & France



Thank you

BANCO DE **ESPAÑA**
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STATISTICS DEPARTMENT



IFC - Central Bank of Armenia Workshop on *"External Sector Statistics"*

Dilijan, Armenia, 11-12 June 2018

Compilation of e-commerce data for balance of payments statistics¹

Lilit Yezekyan,
Central Bank of Armenia

¹ This paper 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.

Compilation of E-commerce Data for Balance of Payments Statistics

Experience of the Republic of Armenia

Lilit Yezekyan¹

Abstract

E-commerce is burgeoning as a means of doing business and shows every sign of continuing to expand at a rapid rate. However, the volume of digital transactions is hard to estimate and include in official statistics, particularly in the balance of payments. Main issues with e-commerce data is that the dividing line between goods and services is often indistinct, calculation and compilation of transportation expenses included in prices of goods under e-commerce vary from calculation of other transportation expenses, as well as classification of the transactions by principle of residence is hard to obtain from the available resources.

This paper attempts to address the above-mentioned issues for calculation of cross-border e-commerce volume in Armenia for compilation of balance of payments. In the framework of current research, different sources of data are used such as administrative data from payment and settlement organization in Armenia and Customs Service of Armenia. Besides, calculations are supplemented with data obtained from Armenian processing center (ArCa) database.

Keywords: e-commerce, trade, balance of payments, administrative sources, big data, Armenian Card

JEL classification: C80, C81, C82, C89, F19, L81

¹ This paper was prepared for the IFC – Central Bank of Armenia Workshop on “External Sector Statistics” held at Dilijan, Republic of Armenia on 11-12 June 2018.

Disclaimer: The views expressed here are those of the author and do not represent those of Central Bank of Armenia.

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1. Introduction

The Internet and digitalization are fundamentally changing the way people, businesses, and governments interact, including across borders. The growing importance of what is commonly referred to as “digital trade” or “e-commerce” and the emergence of new (and disruptive) players has resulted in increased interest amongst policy makers and from within the statistics community for improved measurement of this phenomenon.

Particular interest for measuring e-commerce is produced for compilation of balance of payments statistics in terms of goods and services. Growing volume of cross-border e-commerce transactions that are not registered in statistics on exports and imports of goods and services, lead to miscalculation of resident-non-resident transactions and influences on considerable figure for errors and omissions.

According to the E-commerce Stocktaking Survey² among 74 OECD and non-OECD³ countries, many of them started to calculate e-commerce data or improve existing statistics on it⁴. Starting from 2016 B2C e-commerce index is calculated for 144⁵ countries, which shows the growing importance for overall evaluation of e-commerce data.

Current research aims to sum up the situation with available data in Armenia and possible improvements for further collection of statistics on e-commerce transactions for better compilation of balance of payments of Armenia. First part presents definition of the e-commerce transaction adopted by OECD and some general statistics on e-commerce. Second part presents possible sources of collecting information on e-commerce transactions in the world. Third part refers to situation in Armenia with potential sources of statistics for calculation of e-commerce. Worth to mention that credit cards transactions data (ArCa database) is accepted as proxy for B2C e-commerce imports on goods for Armenia. Other sources are used to compare the result received from ArCa database. More detailed insight into e-commerce transactions and presentation thereof in balance of payments compilation guide is presented in corresponding annexes.

In conclusion, importance of compilation of overall e-commerce statistics is stressed and suggestion on using data from Customs Service of Armenia, payment and settlement systems’ reports, parcel delivery companies, postal office and credit cards’ transactions is made. In the framework of this research more attention is paid to imports of goods, and though the availability of data on imports of services, further

² OECD, Result of the 2018 WPTGS Stocktaking Questionnaire, February 2018

³ Non-OECD countries are: Algeria, Angola, Argentina, Azerbaijan, Bangladesh, Belarus, Botswana, Brazil, Bulgaria, Cameroon, Hong Kong, China, P.R.: Mainland, Colombia, Costa Rica, Croatia, Cyprus, Ecuador, Egypt, Ghana, Guatemala, India, Indonesia, Jordan, Kazakhstan, Kuwait, Lebanon, Malaysia, Malta, Mauritius, Morocco, Nigeria, Oman, Pakistan, Panama, Peru, Philippines, Qatar, Romania, Russian Federation, Saudi Arabia, Senegal, Serbia, Republic of, Seychelles, Singapore, South Africa, Thailand, Tunisia, Ukraine, Uruguay, Venezuela, República Bolivariana de, and Vietnam.

⁴ Several countries are currently exploring adding additional questions to e-commerce enterprise surveys regarding the breakdown of online purchases and sales into domestic and international transactions.

⁵ UNCTAD, B2C e-commerce index, 2017

research needed to provide conclusions on compilation of e-commerce data on services.

2. Overview of global e-commerce

Digitally related transactions, either in goods or services, have existed for many years, thus the current scale of transactions is significant and presents considerable challenges for policy makers and businesses. For the purpose to incorporate available data in current accounting frameworks (SNA 2008, BPM 6) the Organization for Economic Cooperation and Development (OECD)⁶ developed measurement framework for Digital Trade (see Annex 1 for details) and the definition of e-commerce transaction that commonly used by countries worldwide:

"An e-commerce transaction is the sale or purchase of goods or services, conducted over computer networks by methods specifically designed for the purpose of receiving or placing of orders. The goods or services are ordered by those methods, but the payment and the ultimate delivery of the goods or services do not have to be conducted online. An e-commerce transaction can be between enterprises, households, individuals, governments, and other public or private organisations. To be included are orders made over the web, extranet or electronic data interchange. The type is defined by the method of placing the order. To be excluded are orders made by telephone calls, facsimile or manually typed e-mail."

E-commerce transactions are presented in four main types taking into account the sector involved in transactions: business-to-business (B2B), business-to-consumer (B2C), consumer-to-consumer (C2C) and government-to-business (G2B) (see Annex 1 for further details). Considerable volume of transactions are delivered through B2B e-commerce that involved trade platforms like Alibaba, Amazon, eBay, etc. Interestingly in 2015 global e-commerce volume registered 25 trillion USD. Global leaders of e-commerce market are United States which is by far the largest market, with combined sales of over 7 trillion USD in 2015, Japan and China some distance behind. United States is ahead by some margin in B2B e-commerce, and just behind China in B2C.

Major e-commerce markets: top 10

Table 2.1

	Economy	Total		B2B		B2C
		Billion USD	% of GDP	Billion USD	% of GDP	Billion USD
1	United States	7,055	39%	6,443	91%	612
2	Japan	2,495	60%	2,382	96%	114
3	China	1,991	18%	1,374	69%	617
4	Korea (Rep.)	1,161	84%	1,113	96%	48
5	Germany (2014)	1,037	27%	944	91%	93
6	United Kingdom	845	30%	645	76%	200
7	France (2014)	661	23%	588	89%	73

⁶ OECD, Guide to measuring information society, 2011

8	Canada (2014)	470	26%	422	90%	48
9	Spain	242	20%	217	90%	25
10	Australia	216	16%	188	87%	28
	<i>10 above</i>	<i>16,174</i>	<i>34%</i>	<i>14,317</i>	<i>89%</i>	<i>1,857</i>
	<i>World</i>	<i>25,293</i>		<i>22,389</i>		<i>2,904</i>

¹ Note: Figures in italics are estimates. Missing data were estimated based on average ratios. Converted to \$ using annual average exchange rate.

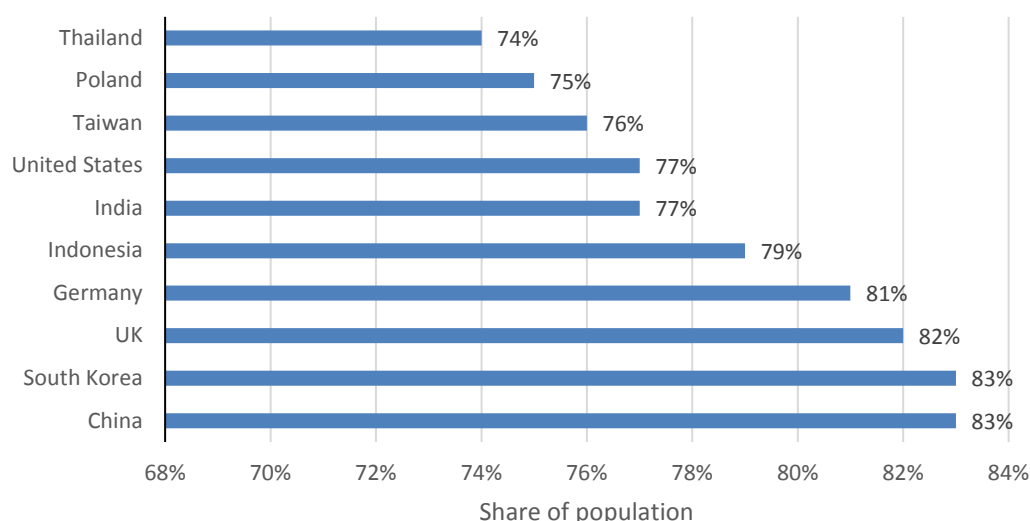
Sources: UNCTAD, adapted from US Census Bureau; Japan Ministry of Economy, Trade and Industry; China Bureau of Statistics; KOSTAT (Republic of Korea); EUROSTAT (for Germany); UK Office of National Statistics; INSEE (France); Statistics Canada; Australian Bureau of Statistics and INE (Spain).

Countries with better access to internet are holding the most part of the online shoppers. More than 80% of share of online shoppers in population (16-64 years) is registered in China, South Korea, United Kingdom and Germany.

Global markets with the highest online shopping penetration rate

As of 2nd quarter 2017

Graph 2.1



¹ Worldwide; GlobalWebIndex; Q2 2017; 16 to 64 years

Sources: GlobalWebIndex © Statista 2018

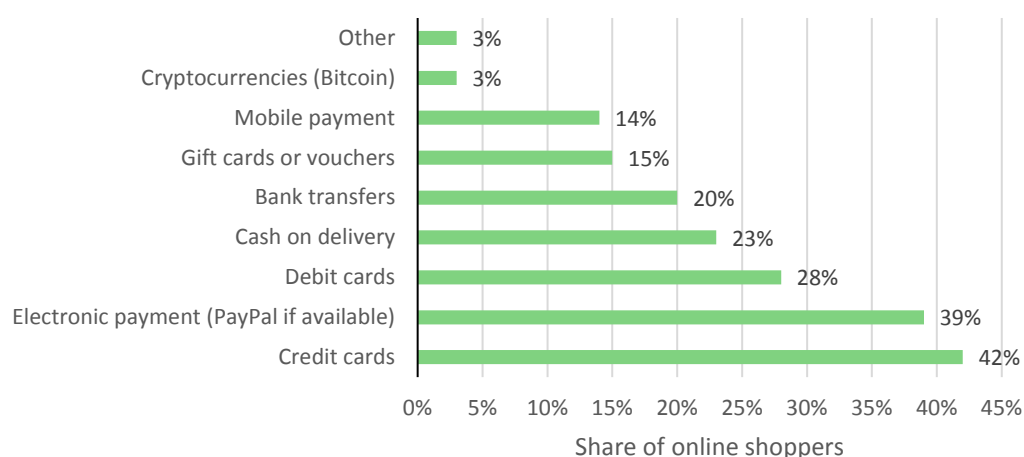
Development of e-commerce was possible through development of online payment systems with secure servers and expanding of the number of cardholders worldwide. According to last year data, payments for online shopping is done mainly by using credit cards and via electronic payment systems. It is worth mentioning that online

shoppers from developed countries⁷ are using mostly electronic payment systems, e.g. PayPal⁸.

Preferred payment methods of online shoppers worldwide

As of March 2017

Graph 2.2



¹ Worldwide; Ipsos; December 23, 2016 and March 21, 2017; 18,551 respondents; online shoppers who buy goods once per month

Sources: CIGI Ipsos © Statista 2018

3. Sources of statistics on cross-border e-commerce⁹

This part presents available sources of official statistics on e-commerce compiled by government agencies and others, and that have some element of cross-border information. There is information from both sides: enterprise survey data (supply side) and consumer survey data (demand side). Enterprise surveys capture e-sales by resident firms to foreign consumers and enterprises (B2B and B2C). Individual surveys capture e-purchases of residents from foreign businesses or individuals (B2C and C2C). Besides, there are two additional official data sources which can be proxies for cross-border e-commerce: balance of payments statistics and statistics on postal shipments.

Private sector data is another big source of statistics that could be used in a larger scale. Most part of the data is available from large companies involved in e-commerce (Amazon, Alibaba, eBay, etc.) and the remaining part could be compiled from other sources, e.g. parcel delivery companies, collecting data on internet traffic, using payments data and data on digitalized products streamed over internet.

⁷ E-commerce Europe, European E-commerce report, 2018

⁸ PayPal is presented in 65 countries worldwide and that could be possible explanation for using this payment system in a large scale in developed countries.

⁹ UNCTAD, In search of cross-border e-commerce, April 2016

3.1 Official statistics

3.1.1 Enterprise survey data

A significant number of countries undertake enterprise surveys, some of which include questions or modules on ICT use. Usually asked questions related to e-commerce are whether enterprises received or placed orders over the Internet. Such orders may relate to both B2C and B2B e-commerce, and include both domestic and international transactions.

Given that B2B accounts have the greatest impact on international trade, enterprise surveys may offer the greatest potential for improving the availability of more reliable estimates of cross-border e-commerce. Enterprise surveys should offer the opportunity to compare data on cross-border e-commerce with data on enterprise exports. This could be achieved by either including e-commerce-related questions in surveys on trade by enterprises or by including a question related to trade in existing e-commerce surveys.

3.1.2 Consumer survey data

Many countries conduct surveys of households and individuals to obtain data on consumption patterns. Where such surveys include data on online shopping, they typically cover B2C and C2C e-commerce, domestic and cross-border. However, they do not capture information on B2B transactions and thus cannot be used as the only source of information for compilation of e-commerce statistics.

3.1.3 Balance of payments statistics

Overseas e-commerce should technically in the balance of payments statistics be captured as either a good or service import or export. However, digital products purchased over the Internet are intangible and often not declared to customs. Shipments below a certain amount may also not be captured in trade statistics.

"Digital trade is a novel term but, most studies that build on balance of payments statistics refer to trade in ICT related or enabled services rather than cross-border exports of digital products"¹⁰. ICT services (i.e., not ICT-enabled services) are captured in the balance of payments with the categories covering communications, computer services and information services. Balance of payments classifications can be hard to interpret with the same item a candidate for multiple categories depending on legal rather than practical use and as noted, data useful for cross-border e-commerce analysis are part of broader categories and rarely broken out. (See Annex 2 for balance of payments corresponding articles)

3.1.4 Postal shipments

There is an important link between postal shipments and e-commerce as many online purchases of goods require delivery. Postal and parcel delivery statistics are granular proxy for analysing cross-border e-commerce involving physical goods. This granularity makes postal tracking data unique compared to other official statistics sources.

¹⁰ http://www.progressivepolicy.org/wp-content/uploads/2014/04/2014.04-Mandel_Data-Trade-andGrowth.pdf.

Although there is operational evidence on international postal flows being increasingly driven by e-commerce transactions, not all international parcel shipments are the result of e-commerce. Moreover, there are a number of other challenges presented by the data which make it difficult to compare statistics from the postal system with those from private providers in the postal market. As a result, the number of parcels being shipped abroad because of e-commerce can only be roughly approximated.

3.2 Private sector data

3.2.1 Data from e-commerce companies

Some data on cross-border activities are available from large companies engaged in e-commerce. These data provide a different perspective than the cross-border purchases or sales reported by statistical agencies.

The e-commerce estimates available vary depending on the types of transactions included (B2B, B2C, C2C), the type of revenue reported, the accounting method used and the globalization strategy of the companies. In general, data reported on international transactions refer to sales by overseas subsidiaries rather than exports.

The internationalization strategies of e-commerce firms can be classified into four categories: i) single standalone web sites, ii) dedicated web sites targeted at overseas buyers, iii) customized web sites in different countries and iv) establishing a market place for foreign retailers.

3.2.2 Other private sector data

This section explores other selected indicators and proxies that might be relevant to analyse trends in cross-border e-commerce. This includes statistics on parcel shipments from private service providers, Internet traffic, payments and services trade.

Parcel delivery

As mentioned before, statistics on parcel shipments are a relevant proxy for analysing trends in cross-border e-commerce. Package delivery firms are particularly accurate about cross-border e-commerce given the higher margins with international shipping.

However, not all international parcel shipments are the result of e-commerce. A number of other data aspects complicate comparability. For example, private sector data sometimes include letters with parcels or letter post could also include small packets; courier firms often use their proprietary names for traffic statistics that are occasionally vague about the nature of shipment; and data are often separated by factors such as whether parcels are insured, whether they are express, etc. As a result, it is difficult to answer how many parcels are shipped abroad because of e-commerce. Except for international postal tracking systems, further bilateral data that would be essential for analysing cross-border ecommerce are rarely available for private operators and when they are, they are generally related to volume (number of parcel items or tonnage) rather than value. Despite these limitations, some inferences might be made about the volume and growth of international parcel shipments. The main carriers of international parcels are national postal agencies and express delivery companies.

Internet traffic

Online shopping is instigated over the Internet so the volume of data traffic generated might provide some indication of e-commerce trends especially with regard to services and digital products. However, ecommerce transactions per se use very little bandwidth.

Despite the relatively minor proportion of online shopping transactions in total Internet traffic, trends in bilateral flows might provide insights into cross-border e-commerce trade. While statistics on bilateral Internet traffic might not be a very good proxy for e-commerce transactions (actual orders conducted online), they might provide a good indication on existing bilateral exchanges of information on goods and services, which typically precede and follow actual e-commerce transactions.

Payments data

For B2B e-commerce transactions, electronic funds transfers are the most important form of payment. Credit card usage might give some indication of B2C e-commerce growth in some markets. The credit card industry uses the term "card not present" to refer to transactions that are made when the card is not physically present. This is the situation when purchases are made over the Internet but can also apply in other cases (giving information over the telephone or by fax).

Payment data can be a proxy for cross-border trade when contrasted with enterprise reported figures on online retail sales.

Payments could be useful as a predictor of overall e-commerce in a country and possibly explain cross-border e-commerce flows. Though a number of countries compile payments data, the granularity is currently insufficient or definitions of what the data mean are vague, thus restricting their usage as an indicator of e-commerce trends.

Trade in digitalised products

Digitized products can be downloaded or streamed over the Internet, e.g. audio, video, print, gaming and computer software products. Digitization has affected the way these types of products are traded with different impacts depending on the industry. It is difficult to obtain trade data on these products, particularly since they are often amalgamated under generic trade categories. It is becoming even more difficult to track trade in digital products as they become electronically downloaded or streamed with bits traversing space from seller to consumer, evading customs and other statistical counting mechanisms. This makes it increasingly important to obtain data from suppliers of such products.

Growth in digital sales somewhat mirrors consumer demand. Unfortunately, there is no information whether the purchases are domestic or cross-border.

There are a range of copyright, licensing and other legal issues with entertainment products affecting legal cross-border sales over the Internet. As a result, in many instances such products are only available for digital online purchase in the country of the purchaser. Given such restrictions, there would appear to be limited legal cross-border but significant illegal trade in digital products.

4. Sources of e-commerce data: Armenian case

Customs Service of Armenia provides data on exports (f.o.b.) and imports (c.i.f.)¹¹ and does not include below-the-threshold¹² goods, thus leading to miscalculation in terms of growing volume of B2C e-commerce in Armenia. Armenia's B2C e-commerce index value (2016) is 47 with improvement of ranking and UPU Postal Reliability Index score¹³ in 2016 compared with 2015 (index value 42). Data on cross-border e-commerce and on e-commerce in general is poorly collected in Armenia and does not incorporated in balance of payments statistics as well as in national accounts. However, above-the-threshold goods that are subject to B2C e-commerce are included in international trade statistics and also in balance of payments. Some information regarding digital trade in services is also available in balance of payments, i.e. postal and courier services, tourist services, etc.

Additional sources of data are available that are not currently in use by official statistics, i.e. below-the-threshold data from Customs Service, payments data, parcel delivery companies' and post office data. In the framework of this research information from above mentioned sources is collected and analyzed. Only B2C imports of goods analysis is presented and compilation of services data is left for further research, as classification of services is subject to complications. It is worth mentioning that B2C imports in goods data in Armenia obtained from 4 sources are different due to methodology differences in compilation of data.

Below presented the potential sources for compilation of statistics for balance of payments with available data and shortcomings of each source.

4.1 Merchandise trade data

One of the potential sources of information for compiling balance of payments statistics on cross-border e-commerce in Armenia is administrative data of Customs Service of Armenia. Part of B2C imports in goods that is above-the-threshold is currently included in international trade statistics.

Customs service obtains information on imports in below-the-threshold goods and is able to provide data based on expert opinion. Due to large diaspora of Armenians worldwide and receiving parcels from relatives abroad, it is difficult to clearly distinguish goods that are obtained through e-commerce. Customs service is able to classify goods having the granular data on type of receiver, but still it can have bias due to including only goods received from large e-commerce companies and through parcel delivery companies. Another possible shortcoming of this source is that it is not possible to distinguish imports by residency due to lack of information on receivers residency. Also there are small envelopes that are counted in the system, but no precise information on whether they are cross-border e-commerce or not.

¹¹ Free on Board (FOB), Cost, Insurance and Freight (CIF)

¹² Goods that are not exceed 2 kilos and/or their value is under 200,000 AMD (352 EUR) are not due to customs duty and are excluded from statistics that is provided to National Statistics Committee and Central Bank of Armenia.

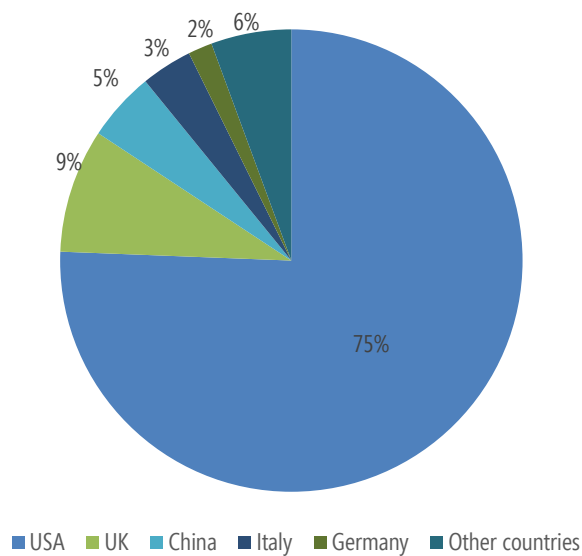
¹³ UNCTAD B2C E-commerce Index 2017

In the framework of this research Customs service provided data on B2C imports in below-the-threshold goods, excluded parcels received from relatives and small envelopes received through e-commerce. However, data is based on Customs service expert opinion and counted as e-commerce those goods that are received from large e-commerce companies or delivered by Armenian parcel delivery companies. It is worth mentioning that classification by countries shows countries where goods delivered from, not the countries where goods are bought from.

Share in total e-commerce by countries

2017

Graph 4.1



¹ Data from Customs service database

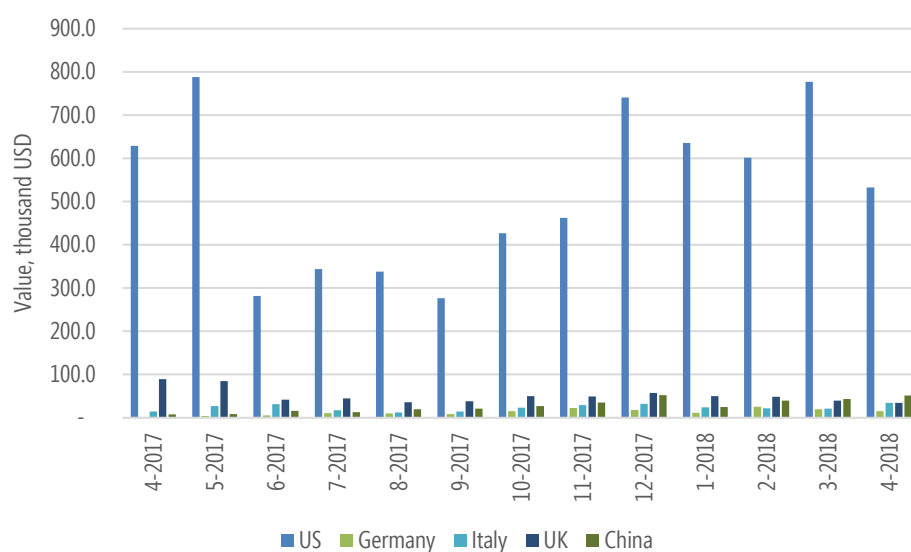
Sources: author's own calculation

According to data received, B2C imports in below-the-threshold goods to Armenia was 5.7 million USD in 2017 and there were mainly imported from the United States.

Monthly share in total e-commerce

2017, monthly

Graph 4.2



¹ Data from Customs service database

Sources: author's own calculation

4.2 Reporting form data

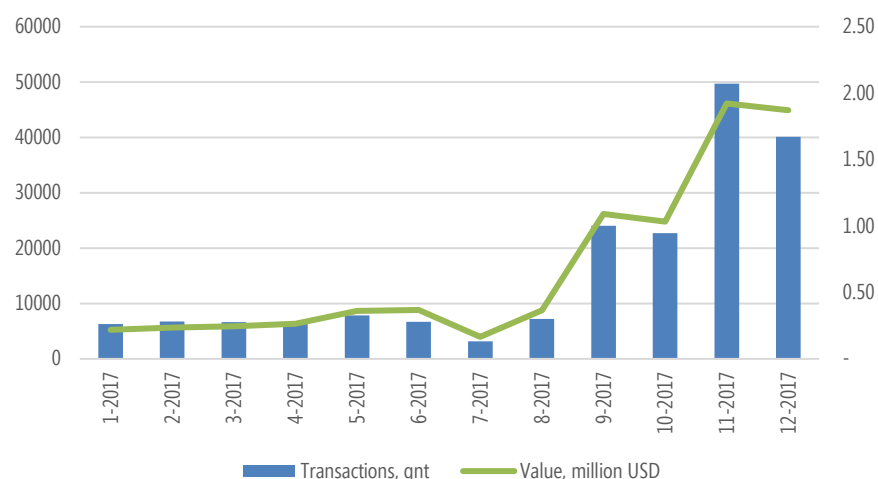
Central Bank of Armenia collects report named "Types of payment cards, payment card servicing equipment, as well as transactions with payment cards" (reporting form 31), where indicated information on transactions of payment and settlement systems. There is Armenian payment and settlement system ArCa which covers processing of transactions of 14 Armenian commercial banks. Other 3 commercial banks have their own processing systems and transactions via cards issued by those banks are registered in ArCa system only if they are done by POS terminals of banks using ArCa system. This report collects information on transaction done by 17 Armenian commercial banks regardless the payment and settlement system used.

With data obtained from reporting form 31 it is possible to derive statistics on cross-border acquisition of goods and services via virtual E-POS. Thus, it is not possible to distinguish goods and services and classification by countries is available started from 2017, which enables classification of cross-border transactions.

Dynamics of e-commerce transactions

2017, monthly

Graph 4.3



¹ Data from reporting form 31

Sources: author's own calculation

According to data obtained from reporting form 31, overseas e-commerce transactions in goods and services in Armenia totaled 8.1 million USD in 2017.

4.3 Payments and settlement system data

ArCa Database

Description of the database

Armenian Card (ArCa) is a payment and settlement system established in Armenia which covers processing of transactions of 14 commercial banks in Armenia. Another three banks are conducting processing of their transactions through own processing systems. Having the information from ArCa, it is possible to compile B2C imports in goods and services by offsetting country, type of POS terminal, as well as to classify transactions by type and see the merchant name. It is possible to distinguish e-commerce transactions abroad with high accuracy, which makes it worth to use for compilation of balance of payments statistics. However, there are several shortcomings due to lack of information on exports in goods and services, i.e. it is difficult to distinguish non-residents' e-commerce transactions in Armenia, no information on transactions out of ArCa system, hard to classify transactions by trade country and consequently statistics for compilation of balance of payments is incomplete. Moreover, identification of e-commerce transactions using information from ArCa database is done based on expert opinion.

Classification methodology

Data obtained from ArCa database is transformed with following steps. Firstly, raw data is cleaned from transactions in Armenia, taking only ones conducted with foreign countries. Online transactions are separated by «card-not-present» criteria and are taken for further analysis to make sure only e-commerce data is used. Merchant

Category Code (MCC) description¹⁴ is used combined with merchant name where it is necessary to classify data into goods and services. It is worth mentioning that classification of PayPal transactions is problematic due to lack of information in merchant name. For those PayPal transactions that were processed through Luxembourg, Ireland and United Kingdom, additional research was done to identify company's residence. Transactions with China were also difficult to identify; those PayPal transactions that contain Chinese surnames were filtered from Luxembourg transactions and were added to China's figures. Classification of transactions by type was done using MCC description.

Quantitative analysis

Analysis of monthly data of 2015-2017 on B2C transactions from Armenia shows that: online purchase of goods and services was 39.1 million USD in 2017 and had 38.8% increase compared to 2016. The most part of transactions – 62% - were purchase of services, and 38% - purchase of goods. Value of transactions for purchasing goods increased by 64.4% and services increase was 26.9% in 2017.

Purchase of goods and services through e-commerce

millions of USD

Graph 4.4



¹ Data from ArCa database

Source: author's own calculation

Monthly purchase of goods and services

thousands of USD

Graph 4.5

¹⁴ MCC is a four-digit number listed in ISO 18245 for retail financial services. MCC is used to classify the business by the type of goods or services it provides.



¹ Data from ArCa database

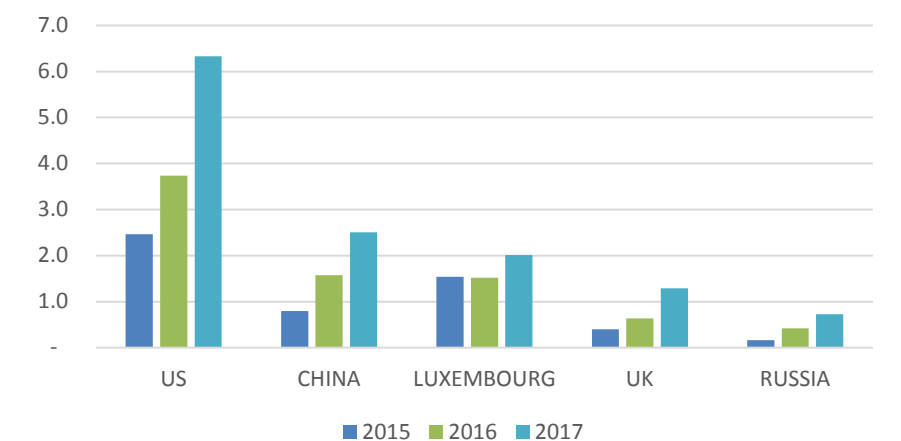
Source: author's own calculation

Purchase of goods from other countries via online transactions was recorded 14.7 million USD in 2017. Main partner is the US – 43.1% of share in total value of trade in goods. Further analysis of online transaction in goods was presented.

Purchase of goods by countries, top 5

millions of USD

Graph 4.6



¹ 99.6% of Luxembourg transactions are PayPal transactions that were not classified due to lack of information on merchant name.

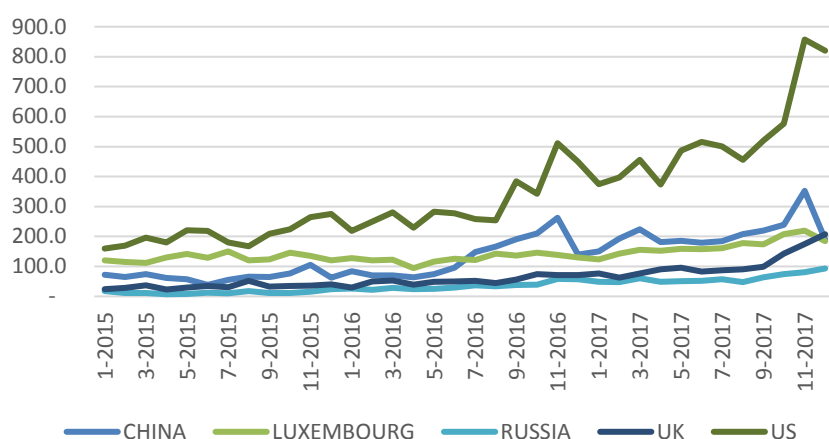
Source: author's own calculation

There was a rapid increase in November and December 2017 due to Christmas sales, almost twice as much as the same months in 2016.

Dynamics of monthly trade in goods by top 5 countries

thousands of USD

Graph 4.7



1

Source: author's own calculation

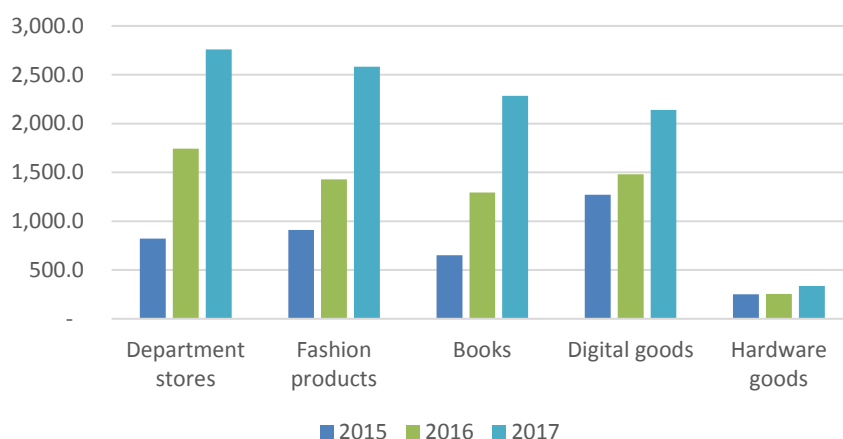
Main 5 directions of online transactions through ArCa system comprised 69% of all transactions directed to:

- department stores - miscellaneous goods from supermarkets, shopping malls, etc.
- fashion products - clothes, shoes and jewelry,
- books¹⁵,
- digital goods – software, games, music, etc.
- hardware goods – computers, camera, etc.

Purchase by type of products

thousands of USD

Graph 4.8



1

¹⁵ Further research needed in figures of books' purchases, as classification was done using MCC description. Main part of the transactions were done through Amazon and there is a possibility that there can be included regular Amazon transactions, not only book purchases.

There was a considerable increase in purchase of fashion products and books in 2017 by 81% and 77% accordingly.

Further work regarding database information

For the purpose of compilation of balance of payments statistics, further work is needed to derive comprehensive statistics from ArCa database. In the framework of this research data provided by ArCa is aggregated in the level of MCC name and for more accurate analysis granular data is needed in regular basis. Having received this information it will be possible to compile e-commerce statistics on goods and services in a detailed subgroup level.

4.4 Parcel delivery companies data

National Postal Offices usually organize delivery of parcels from abroad. In Armenia there are three parcel delivery commercial organizations, one of which established in cooperation with National Post Office of Armenia¹⁶. These companies provide customers with local postal boxes in 5 countries – United States, Russia, Germany, China and United Kingdom. Customers from Armenia have opportunity to purchase goods in above mentioned countries and receive them in Armenia in 10 days.

Current research misses data from National Postal Office – Haypost, due to the change of the system and incorporation of new features that will enable to obtain more granular data on imports and exports of goods. At the end of the improvements of the system it will be possible to have more accurate data on parcels received from China.

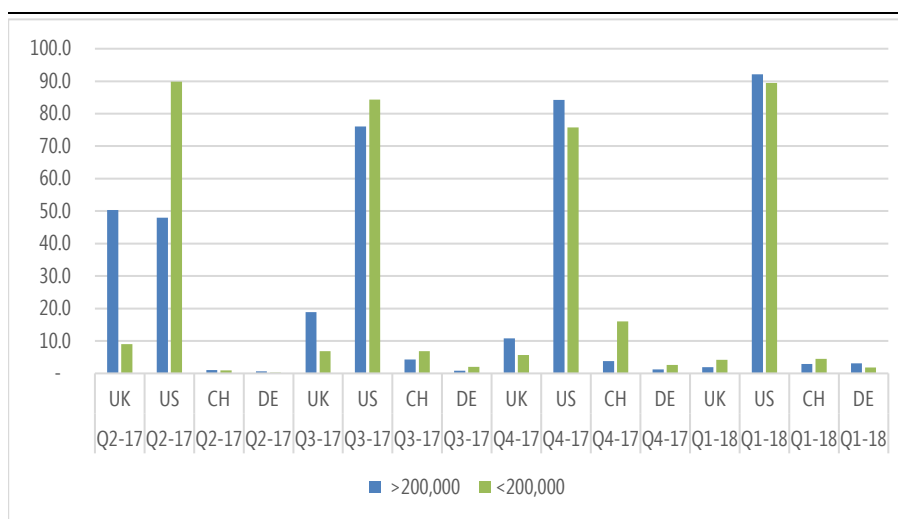
Globbering and Onex obtain data on all parcels they deliver to and from Armenia with mandatory registration of parcels that are above-the-threshold. They cover only their part of the market and there are problems with registration of the parcels from Russia due to customs procedure regarding membership to the Eurasian Economic Union. It is worth mentioning that parcels delivered to the mailboxes located abroad can include transportation expenses and there are transportation expenses included in payment fee to parcel delivery companies. For calculation of transportation services for balance of payments compilation these three companies should be surveyed to reveal the proportion of those services in payment fee.

Share of countries in e-commerce volume by parcels
below/over-the-threshold

%

Graph 4.9

¹⁶ Commercial companies are Globbering LLC and ONEX, and the one that is a part of Haypost CJSC is Shop in America.



¹ Data from 2 of the parcel fast delivery commercial organizations.

Source: author's own calculation

According to data obtained from two parcel delivery companies, B2C imports in goods is 8.1 million USD only from United Kingdom, China, United States and Germany.

5. Conclusions

With growing volume of digital trade, importance of compilation of e-commerce statistics is stressed by policy makers. In Armenia e-commerce transactions within the country, as well as cross-border transactions are not registered neither in national accounts, nor in balance of payments, though there are available sources of official statistics and ones from private sector.

Current paper made an attempt to describe the potential sources of compilation of statistics on e-commerce for balance of payments of Armenia and provided description of current measurement framework and possible sources of data.

There were four sources of data used during the analysis: reporting form 31 of payment and settlement systems currently collected by Central bank of Armenia, merchandise trade data on below-the-threshold imports of goods from Customs Service, data from parcel delivery companies and credit card transactions data from biggest player in Armenian payments and settlement market – ArCa.

There are two sources that provided data on e-commerce of both goods and services. However, reporting form 31 does not distinguish goods from services and ArCa database provided data for more detailed classification of goods and services. Total figures for e-commerce in goods and services are 8.1 million and 39 million USD correspondingly. It is worth mentioning that reporting form 31 covers all payments and settlement systems' data and should have greater value of e-commerce transactions than ArCa database. Difference is due to lack of methodology in classification of overseas e-commerce by payment and settlement organizations. When providing reporting form 31 they do not classify transactions by «card-not present» criteria.

Customs Service and parcel delivery companies provided information on B2C imports in goods: in total 5.7 million and 8.1 million USD correspondingly. Though Customs Service should obtain information on total volume of B2C imports in goods, it is obvious that data based on Customs Service expert's opinion lacks some information, as parcel delivery companies do not cover whole Armenian market and nevertheless have greater value of e-commerce volume.

In conclusion, with new sources of data it will be possible to incorporate part of e-commerce data into balance of payments statistics, thus make it more accurate. Further analysis of presented sources is needed to decide whether there is a need to eliminate some of them and to understand how to obtain data on regular basis.

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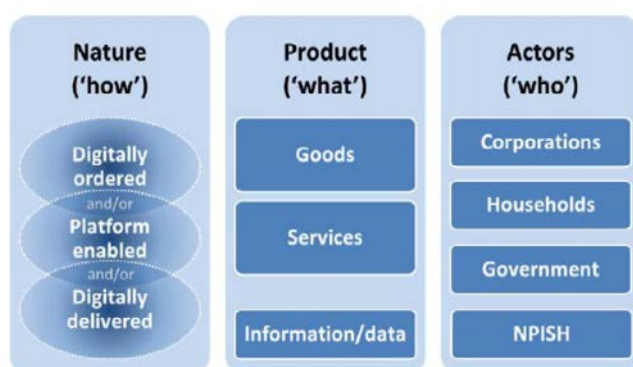
Annex 1. Contours of a measurement framework¹⁷

International trade transactions can be dissected along a variety of dimensions. The distinction between goods and services is the most traditional, as is, in the area of trade in services, the breakdown by mode of supply. The focus on digital trade brings however a variety of new dimensions to the fore. The growth of e-commerce has increased the focus on better understanding and identifying the ordering and delivery process (both of which can be digital), and has also brought attention to the different (institutional) nature of partners involved in international trade.

In the conceptual framework introduced below, a total of three dimensions of digital trade are identified: the nature of the transaction ('how'), the product ('what') and the partners involved ('who'). Figure 1 depicts these dimensions as well as their underlying components. In particular the first column, on the nature of the transaction, determines which transactions are considered part of 'digital trade'. The second dimension, 'product', introduces information, or data, as a separate product to consider in addition to goods and services. The last dimension looks at the actors involved; which is shown for simplicity below as three categories, but in principle could be defined using the institutional sector classification of the SNA, with additional breakdowns possible for the size and sector of businesses, as a means of providing important information on the role (and take-up) of digitalised tools by SMEs for example.

Box 1.1

Dimensions of digital trade



Source: BOPCOM – 17/7

Each of these dimensions is discussed below in more detail. For several of these, it is possible to build upon methodological and conceptual work that has already been developed, which is made explicit below. In others, additional work is very likely

¹⁷ Measuring Digital Trade: towards a conceptual framework, OECD, March 2017

necessary to further operationalize the framework below and make it useful (and practical) for measurement by statistical offices and/or central banks.

1. The digital nature of transactions

The first component of the framework involves the digital nature of the transaction ('how'), distinguishing between those cross-border transactions that should be considered 'digital' and those that should not. It is important to emphasise however, that this is not a question with a simple binary answer. Many digital transactions have a variety of potentially overlapping characteristics, reflecting the ordering process, the role of intermediaries, and the final delivery of the good or service concerned.

1.1 Digitally ordered

The first dimension that helps identify digital trade involves those cross-border transactions that are digitally ordered, that is, international trade in goods and services that reflect e-commerce, which in turn is generally defined as follows:

*"An ecommerce transaction is the sale or purchase of a good or service, conducted over computer networks by methods specifically designed for the purpose of receiving or placing orders. The goods or services are ordered by those methods, but the payment and ultimate delivery of the goods or services do not have to be conducted online. An ecommerce transaction can be between enterprises, households, individuals, governments, and other public or private organizations. To be included are orders made over the web, extranet or Electronic data interchange. To be excluded are orders made by phone, fax or manually typed email."*¹⁸

1.2 Platform enabled

One of the most salient features of the digitalization of international trade is the emergence of intermediary platforms such as Amazon, Uber, Alibaba or AirBnB. While not all digital trade transactions by necessity involve such intermediary platforms, they are clearly changing the economic and competitive landscape nationally as well as internationally.

Transactions involving intermediaries, in turn, include a number of distinct categories, each of which raising different questions for trade/investment policy and measurement: foreign goods or services purchased via a foreign on-line intermediary; foreign goods or services purchased via a domestic on-line intermediary; domestic goods or services purchased by a foreign on-line intermediary; and domestic goods or services purchased by a foreign-owned domestic intermediary. Indeed, one of the most salient measurement challenges involves the identification of not only the international trade transactions, but also some measure of domestic transactions that may be facilitated by a foreign (or indeed foreign-owned) intermediary. To illustrate this point, Box 1 describes the example of an Uber transaction. At its most basic, this involves the purchase of a transport service, but how the service is provided determines whether or not there is a trade transaction and importantly how this transaction is to be measured.

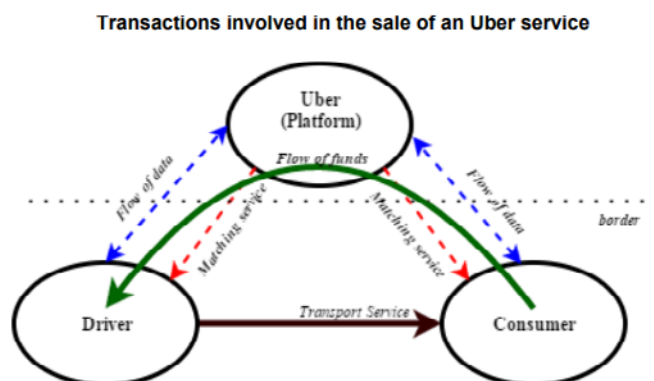
Box 1.2

¹⁸ OECD, Guide to Measuring the Information Society, 2011

Example of transactions via intermediary platforms

Unpacking an Uber transaction

In the “physical world”, a taxi would have to pass in front of a customer who would pay for the ride in cash or card. The Uber application adds a new tradable digital service which enables the transaction by matching the car driver and the customer and managing payment (see the figure below). The transaction between the driver and the rider (consumer) takes place in a particular country, but the supporting transactions, the provision of the matching services, payments and insurance cover, are potentially provided from another country (assuming that Uber is not operating through a mode 3 local presence).



The example illustrates some of the measurement challenges. For example, since Uber owns no cars, should Uber be classified as a transport service or a business service? This has important implications not only for statistics but also for trade policy: If Uber is a transport service, then its operations are subject to the GATS mode 3 commitments; if a business service, then its operation is subject to mode 1 commitments in the business service sector. At the moment, the 2008 System of National Accounts (# 14.126) specifies that the service provided should be recorded as trade in transportation services, with Uber consequentially classified in the transport sector but it is not clear that all countries follow this, nor indeed whether the same rules of classification necessarily govern that used to determine Uber's classification for trade purposes.

Source: STD/CSSP/WPTGS(2017)3

1.3 Digitally delivered

The third dimension is referred to as digitally delivered; in other words, it captures those services and data flows that are delivered digitally as downloadable products. Examples include software, e-books, data and database services. Goods, as physical items, are not very likely to be digitally delivered en masse. However, 3D printing may possibly result in a (future) category of transactions that could possibly classify under digitally delivered goods, if these transactions are deemed to be fundamentally different from trade in services (of 3D blueprints) transactions.

2. The product involved: goods, services and data

Traditional statistics on international trade identify how cross-border transactions involve either goods or services. The notion of digital trade introduces a third category, i.e. the importance of information or data. This distinction differentiates between the types of products being traded, digitally enabled goods, digitally enabled services, digitally delivered services, and digitally delivered information (or data flows), and determines the trade policy environment faced (e.g. GATT or GATS, but potentially also other agreements).

Clearly, perhaps the biggest measurement challenge for digital trade concerns such data flows. In many cases, data flows do not result in a monetary transaction per se, but they may support one (such as generating advertising revenue). For example, a

social networking site such as Facebook offers "free" services to users who, in exchange, provide their data. There is no monetary transaction between Facebook and the user (and in terms of existing international standards, no trade); however, the data collected by Facebook is the basis of the revenue that company receives from advertisers. While the advertising revenue monetary flow is captured in trade statistics, the data flows upon which they depend are not. It is clear that this raises issues concerning consumer surpluses and indeed at the international level who is ultimately financing those surpluses. For example free digital products (such as Facebook) are in general available to all, but the funding model (advertising) does not discriminate between countries. In other words advertisers (and ultimately consumers through paying higher prices) in one country may be indirectly generating consumer surpluses in another.

In a similar manner, and because they are free, the international accounting system does not in general impute transactions related to the use of public goods (such as open-source or free software). Again this raises issues concerning the measurement of consumer surpluses but also potentially policies, such as anti-dumping and competition policies, if the freely available software is designed to gain market share with a view to the introduction of subsequent priced models.

3. Partners

International trade is traditionally considered to take place between enterprises – and to lesser extent between enterprises and governments. Technological change has however provided individual consumers (households) with the possibility to purchase goods and services from foreign suppliers on a scale that was hitherto impossible. Similarly, the possibility to sell online has lowered – or has in any case the potential to lower – the barriers to export, allowing especially smaller firms to market their products abroad. These developments means that new policy attention is given to better understanding the nature of the partners involved in international trade.

While clearly not an exclusive list, the following relationships are among the main categories that are identified in the discussions on for example e-commerce:

- **Business-to-Business (B2B).** Trade transactions that involve two enterprises. This has been the main mode of international trade in the past and initial studies indicate that the bulk of cross-border ecommerce transactions is accounted for by these types of transactions.

- **Intra-firm trade** or transactions between related enterprises. An important sub-set of B2B trade transactions involves the transactions between enterprises that are part of the same enterprise group (multinational enterprise). In the area of trade in services, such trade flows are already identified as transactions between related enterprises (BPM6, MSITS2010).

- **Business-to-Consumer (B2C).** Trade transactions that involve businesses selling directly to households, bypassing traditional retailers. This type of cross-border transaction is thought to have grown substantially with the rise of the internet and ecommerce.

- **Consumer-to-Consumer (C2C).** Trade transactions that involve two consumers (households). While traditionally, such cross-border transactions were rare (even if domestic transactions did occur), information and communication technologies have allowed platforms like AirBnB and ebay to develop and mediate such cross-border transactions.

- **Business-to-Government (B2G).** Trade transactions that involve businesses selling to governments.

The overview above strongly resembles the traditional institutional sectors identified in the national accounts: households, non-financial corporations, government and financial corporations, which group the institutional units with broadly similar characteristics and behaviour. It would therefore be advantageous to use the existing definitions of these institutional sectors when trying to break down the partners involved.

Annex 2. Digital trade in balance of payments¹⁹

Postal and courier services

10.82 Postal and courier services cover the pick-up, transport, and delivery of letters, newspapers, periodicals, brochures, other printed matter, parcels, and packages...Postal services are subject to international agreements, and the service entries between operators of different economies should be recorded on a gross basis.

10.84 Courier services include express and door-to-door delivery...Excluded are the movement of mail carried by air transport enterprises (recorded under transport, air, freight)...

h. Charges for the use of intellectual property n.i.e.

10.137 Charges for the use of intellectual property n.i.e. include: (a) Charges for the use of proprietary rights (such as patents, trademarks, copyrights, industrial processes and designs including trade secrets, franchises). These rights can arise from research and development, as well as from marketing; and (b) Charges for licenses to reproduce or distribute (or both) intellectual property embodied in produced originals or prototypes (such as copyrights on books and manuscripts, computer software, cinematographic works, and sound recordings) and related rights (such as for live performances and television, cable, or satellite broadcast).

10.138 The production of books, recordings, films, software, disks, and so forth is a two-stage process of which the first stage is the production of the original and the second stage the production and use of copies of the original. The output of the first stage is the original itself over which legal or de facto ownership can be established by copyright, patent, or secrecy. The owner of the asset may use it directly to produce copies that give the purchaser a license to use. Alternatively, the owner may issue a license to other producers to reproduce and distribute the content. The payments made by the licensee to the owner may be described in various ways, such as fees, commissions, or royalties...In contrast to temporary rights to use, outright sales of patents, copyrights, and industrial processes and designs are included under research and development services (discussed in paragraph 10.147). Similarly, temporary rights for computer software and audio-visual originals are treated differently from outright sales ...

Computer services

10.143 Computer services consist of hardware- and software-related services and data-processing services... Computer services include:

(c) non-customized (mass-produced) software downloaded or otherwise electronically delivered, whether with a periodic license fee or a single payment;

(d) licenses to use non-customized (mass-produced) software provided on a storage device such as a disk or CDROM with a periodic license fee (non-customized software on storage devices with licenses that convey perpetual use is included in goods; see paragraph 10.17(c) and Table 10.4);

¹⁹ <https://www.imf.org/external/pubs/ft/bop/2007/pdf/bpm6.pdf>

Information services

10.146 Information services include news agency services, such as the provision of news, photographs, and feature articles to the media...Also included are direct nonbulk subscriptions to newspapers and periodicals, whether by mail, electronic transmission, or other means; other online content provision services; and library and archive services. ...Downloaded content that is not software (included in computer services) or audio and video (included in audio-visual and related services) is included in information services.

k. Personal, cultural, and recreational services

10.161 Personal, cultural, and recreational services consist of (a) audio-visual and related services and (b) other personal, cultural, and recreational services. Audio-visual and related services

10.162 Audio-visual and related services consist of services and fees related to the production of motion pictures (on film, videotape, disk, or transmitted electronically, etc.), radio and television programs (live or on tape), and musical recordings.

10.163 Included are amounts receivable or payable for rentals of audio-visual and related products, and charges for access to encrypted television channels (such as cable and satellite services).

10.164 Mass-produced recordings and manuscripts that are purchased or sold outright or for perpetual use are included under audio-visual and related services if downloaded (i.e., delivered electronically). However, those on CD-ROM, disk, paper, and so forth, are included in general merchandise. Similar products obtained through a license to use (other than when conveying perpetual use) are included in audio-visual and related services, as is the use of other online content related to audio and visual media. (See paragraph 10.166 for the treatment of originals.) The principles for the timing for related audio-visual and related services, such as for music and film copyrights and for master recordings, are the same as those for other types of intellectual property, as discussed in paragraph 10.139.

10.165 Charges or licenses to reproduce or distribute (or both) radio, television, film, music, and so forth are excluded from audio-visual and related services and included in charges for the use of intellectual property n.i.e.



IFC - Central Bank of Armenia Workshop on "*External Sector Statistics*"

Dilijan, Armenia, 11-12 June 2018

Compilation of e-commerce data for balance of payments statistics¹

Lilit Yezekyan,
Central Bank of Armenia

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.

Central Bank of Armenia
Statistics Department

COMPILATION OF E-COMMERCE DATA FOR BALANCE OF PAYMENTS

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IFC-CBA Workshop on External Sector Statistics

Dilijan, Armenia
11-12 June



WHAT IS ELECTRONIC COMMERCE?

- OECD definition of an e-commerce transaction:
 - “...the sale or purchase of goods or services, conducted over computer networks by methods specifically designed for the purpose of receiving or placing of orders”.
 - Payment and delivery do not have to be conducted online.
 - Orders made by telephone calls, fax or manually typed e-mail excluded
- Business-to-business (B2B)
- Business-to-consumer (B2C)
- Consumer-to-consumer (C2C)
- Government-to-business (G2B): e.g. e-procurement



MAJOR E-COMMERCE MARKETS: TOP 10

		Total		B2B		B2C
	Economy	\$ billion	% of GDP	\$ billion	% of GDP	\$ billion
1	United States	7,055	39%	6,443	91%	612
2	Japan	2,495	60%	2,382	96%	114
3	China	1,991	18%	1,374	69%	617
4	Korea (Rep.)	1,161	84%	1,113	96%	48
5	Germany (2014)	1,037	27%	944	91%	93
6	United Kingdom	845	30%	645	76%	200
7	France (2014)	661	23%	588	89%	73
8	Canada (2014)	470	26%	422	90%	48
9	Spain	242	20%	217	90%	25
10	Australia	216	16%	188	87%	28
	10 above	16,174	34%	14,317	89%	1,857
	World	25,293		22,389		2,904

Note: Figures in *italics* are estimates. Missing data were estimated based on average ratios. Converted to \$ using annual average exchange rate.

Source: UNCTAD, adapted from US Census Bureau; Japan Ministry of Economy, Trade and Industry; China Bureau of Statistics; KOSTAT (Republic of Korea); EUROSTAT (for Germany); UK Office of National Statistics; INSEE (France); Statistics Canada; Australian Bureau of Statistics and INE (Spain).



AVAILABLE DATA SOURCES FOR COMPILATION OF E-COMMERCE STATISTICS

- Official statistics on e-commerce
 - Enterprise survey data
 - Consumer survey data
- Private sector data on e-commerce
 - Data from e-commerce companies
 - Other private sector data related to measuring e-commerce
- E-commerce estimates
 - Sellers' survey on the amount of overseas sales



SOURCES OF DATA USED FOR THE CURRENT RESEARCH

- Official statistics
 - Customs Service external trade database
 - Reporting form 31 - “Types of payment cards, payment card servicing equipment, as well as transactions with payment cards” provided to the Central Bank of Armenia
- Payments data
 - Armenian Card (ArCa) database
- Data from companies engaged in e-commerce
 - “Haypost” CJSC (postal service) aggregated data
 - “Globbing” LLC aggregated data
 - “Online Express” (ONEX) aggregated data



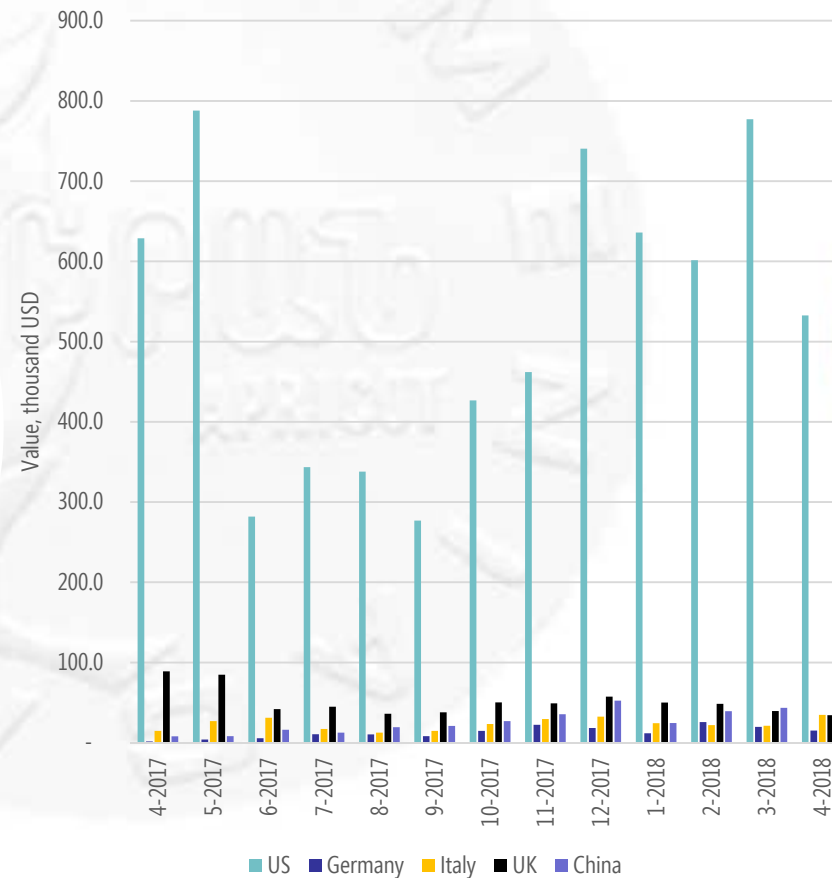
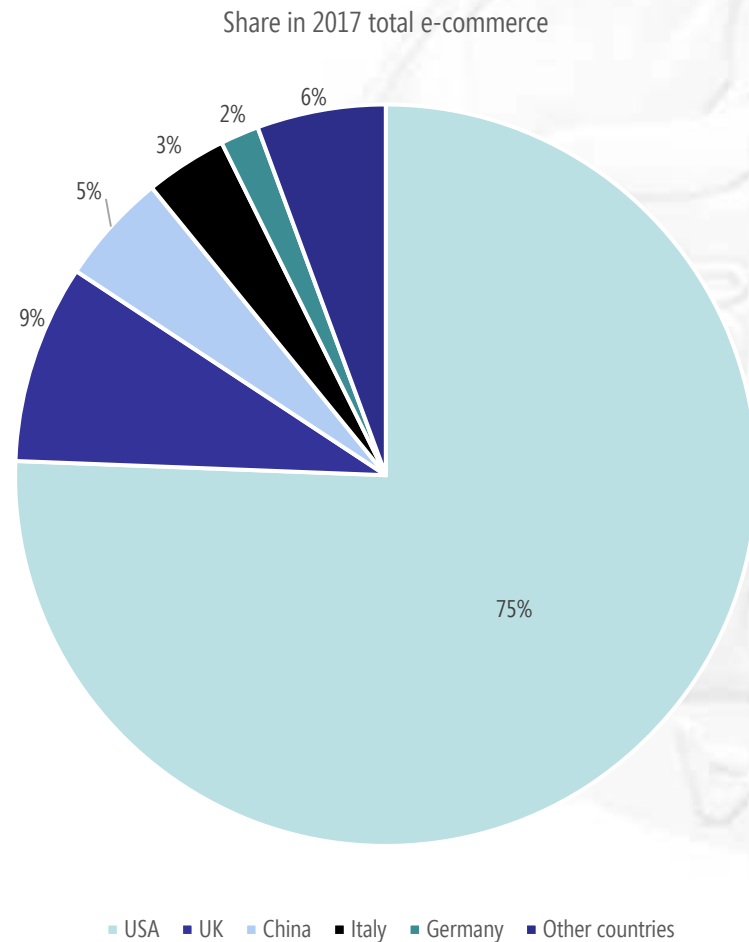
MERCHANDISE TRADE DATA

- Data format
 - Collection of data on goods (customs due over 2 kilos and/or 200 000 AMD (approximately 352 EUR) only exceeding part)
 - 5.7 million USD in 2017
- Shortcomings
 - Data available only on import of goods through e-commerce
 - E-commerce data classification based on Customs specialists' expert opinion
 - Data by countries show the countries from where goods have been imported to Armenia (difficulty to identify countries where goods were bought)
 - No data on small envelopes



E-commerce by countries in 2017

(Merchandise trade data)

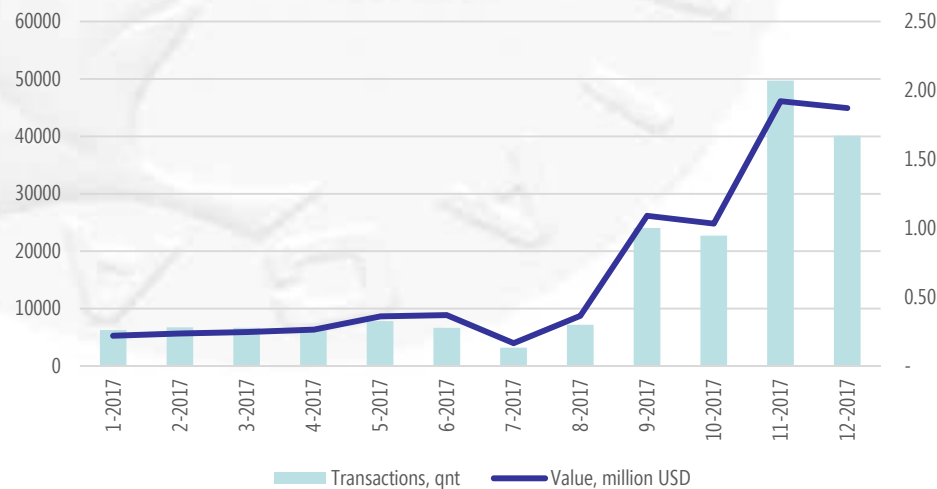


REPORTING FORM 31

- Data format
 - Acquiring goods and services abroad via virtual E-POS
 - Information received from ArCa
 - Possibility to see online acquirement of goods and services abroad
- Shortcomings
 - Classification by country starting from 2017
 - No possibility to distinguish goods and services

• Overseas e-commerce
total transactions in 2017 –
8.1 million USD

Dynamics of e-commerce transactions for 2017, monthly



ArCa DATABASE

- Data format
 - Detailed identification of transactions (by country, type of POS terminal, etc.)
 - Include almost all online transactions in Armenia and from Armenia (except transactions that were done through processing centers of 3 banks)
 - 99% accuracy in distinguishing e-commerce transactions abroad
- Shortcomings
 - Identification of e-commerce is based on expert opinion
 - No possibility to see transactions out of ArCa system
 - No possibility to distinguish non-residents' transactions in Armenia
 - No possibility to assess all e-commerce market in Armenia



E-commerce by countries in 2015-2017 (ArCa database)

- Overseas e-commerce (goods and services) volume in Armenia in 2017 was 39.1 million USD, increased by 39% compared to 2016
- For 3 years in average 29% of transactions concerned buying goods and 71% - buying services
- E-commerce (goods) volume was 12.9 million USD in 2017, increased by 63% compared to 2016
- Average price of one transaction increased by 16% compared to 2016
- 30.3% of transactions were through Paypal (2017)
- 22% of transactions were from Amazon (2017)



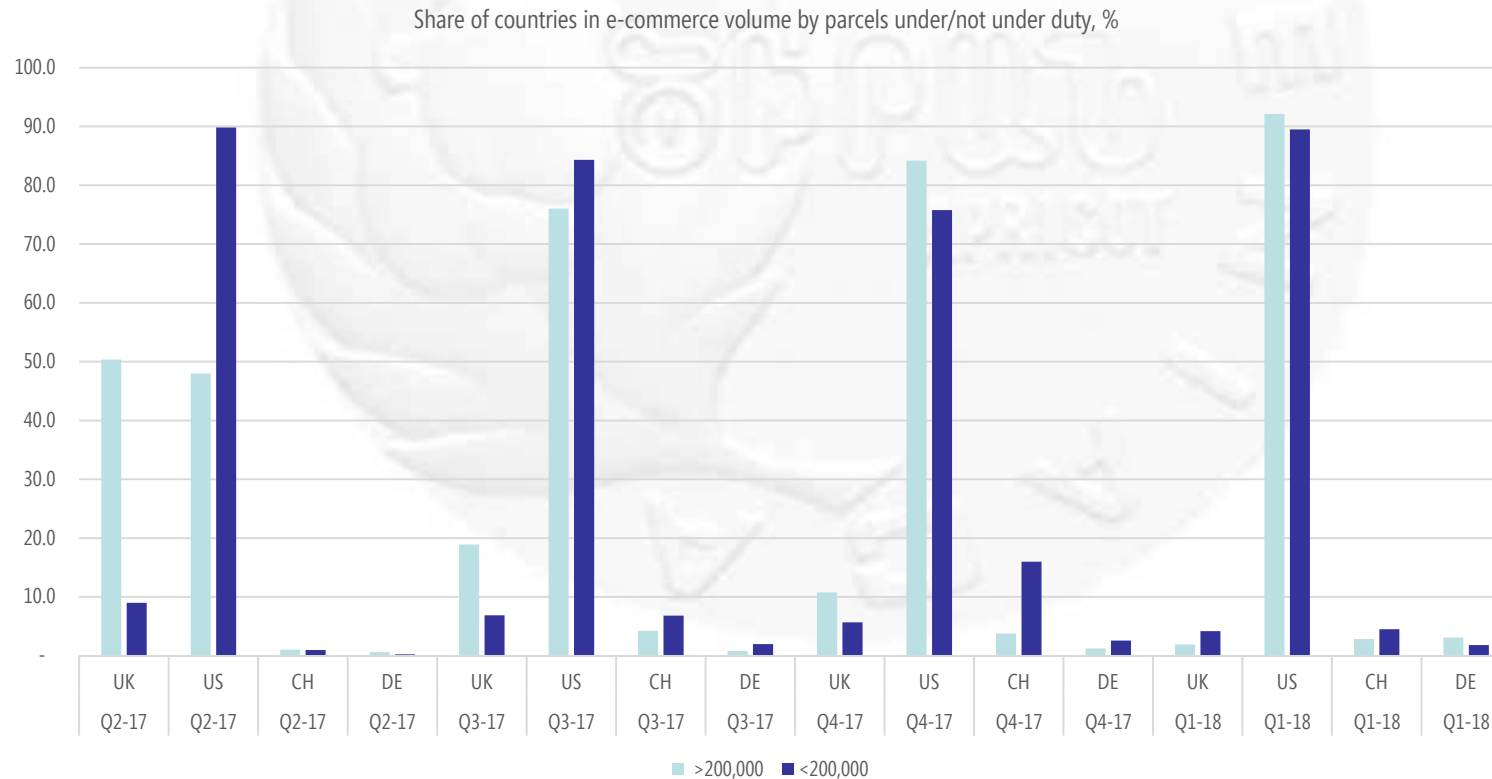
E-COMMERCE COMPANIES

- Data format
 - Presents to Customs Service only goods that exceed 2 kilos and/or 200 000 AMD (approximately 352 EUR)
 - Information on all parcels except small envelopes
 - Market in 5 countries – US, Russia, Germany, China, UK
- Shortcomings
 - Does not cover all overseas e-commerce market of Armenia
 - No information in database about parcels from Russia due to different procedure in Customs Service (reason: membership in EEU – Customs Union)
 - Shipping to the cargo abroad is included in the price of a good
 - Data available from end of March 2017



Figures by e-commerce companies (2017Q2-2018Q1)

- Overseas e-commerce total volume in Armenia for 4 quarters was approximately 8.1 million USD



USE OF E-COMMERCE DATA FOR COMPILATION OF BALANCE OF PAYMENTS STATISTICS

- Possibility to adjust import of goods in current account based on ArCa database
- Use services data to adjust services account, e.g. tourist services, advertising services, etc.

Shortcomings

- Problems with classification by residency
- Difficulties with calculation of transportation expenses to compile current account
- No data on e-commerce transactions of non-residents in Armenia



Conclusions and suggestions

Conclusions

- Only one regular reporting form (form 31) to estimate purchase of goods and services overseas
- Several sources available for compilation of e-commerce data but no regular reporting to public bodies

Suggestions

- Conduct enterprise surveys involved in e-commerce to measure supply side or add few questions on proportion of domestic and overseas e-commerce into existing survey questionnaire
- Additional administrative sources, i.e. reporting forms received on regular basis from Customs Service, ArCa and e-commerce market players in Armenia



Thank you
Q&A



IFC - Central Bank of Armenia Workshop on *"External Sector Statistics"*

Dilijan, Armenia, 11-12 June 2018

UAE Balance of payments: challenges and innovative compilation method¹

Abubaker Al Sayari,
Central Bank of the United Arab Emirates

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.



مصرف الإمارات العربية المتحدة المركزي
CENTRAL BANK OF THE U.A.E.

UAE Balance of Payments Challenges and Innovative Compilation method

Abubaker Al Sayari

**Assistant Director - In charge of the Data and Statistics Center
Research & Statistics Department (RSD)**

Central Bank of The United Arab Emirates

The Data Sources

❖ *As well known the sources of the Balance of Payments Statistics are:*

❖ *International Transactions Reporting System (ITRS)*

Information through the banking system was not satisfactory

Majority of entries were allocated to residual categories

Lack of understanding of the entries by the banks or quality control.

❖ *The Surveys*

- * **Awareness:** Most the population in UAE are not citizens and have no appreciation of related surveys.
- * **Tax Records:** we do not have income tax record helping in getting accurate numbers through surveys
- * **Not same language:** Surveys usually prepared by economists and filled by accountants
- * **Time lag:** For conducting surveys we have to wait until Apr–June when companies have finalized their balance sheet and need another 6–8 months for collecting data, checking, reviewing and finalizing the result (sometimes it needs more that 14 months).
- * **Response** from wide range of stakeholders not satisfactory due to confidentiality concerns.

Innovative Compilation methods



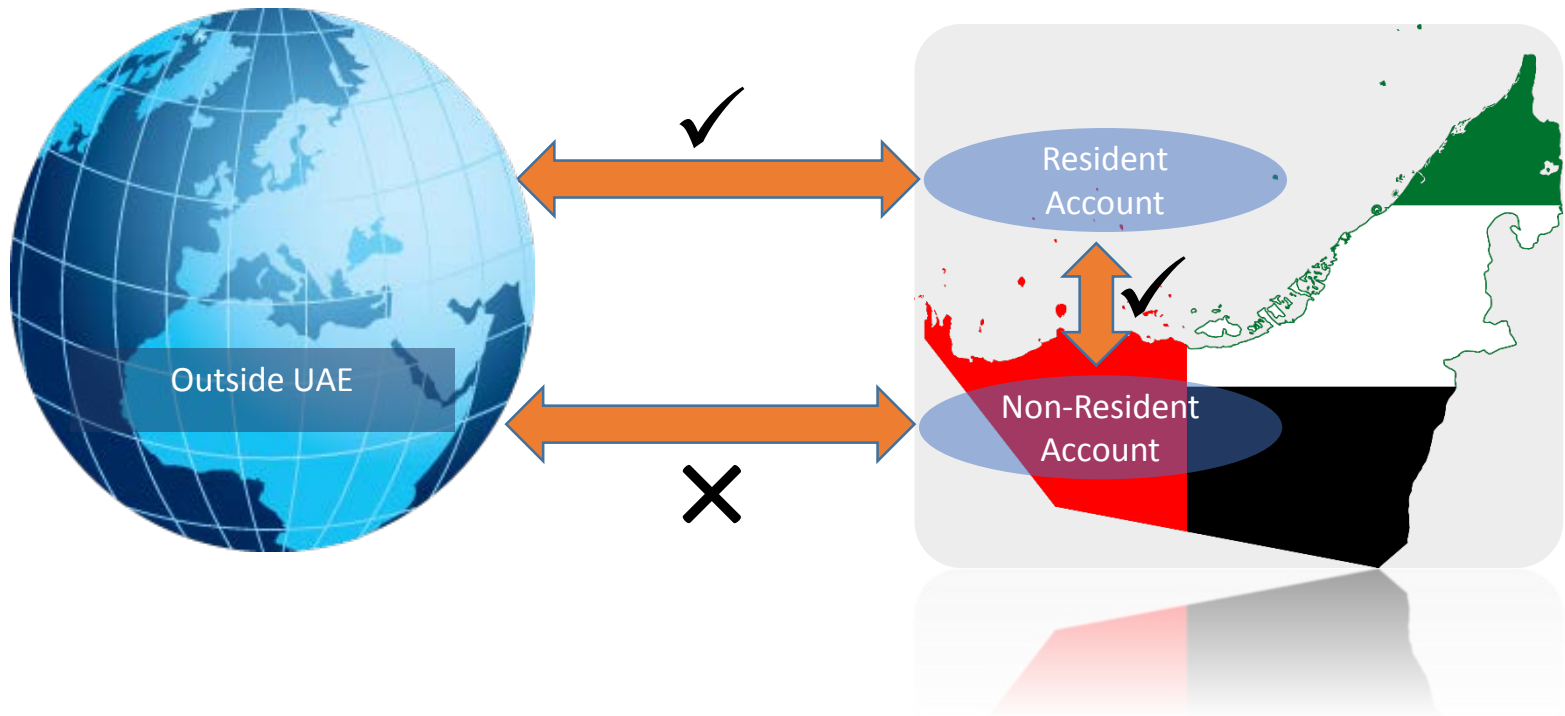
❖ ***SWIFT Scope Project***

SWIFT SCOPE solution helps CBUAE gain insights on the SWIFT international payments traffic for the UAE and enable CBUAE's reporting on the associated flows of this traffic.

**We aim to capture cross border
Transactions (inward and outward)**



How ?



What Needs To Be Done

- ❖ Banks will be required to register to the FIN Inform service
- ❖ Any UAE based banks having BIC code will be required to register to this service.

What is FINInform ?

FINInform

The simple solution to all your message duplication needs



*Ideal for intra
and inter-institutional
copying needs*

Benefits

- Simple
- Flexible
- Secure and reliable

FINInform is a value-added feature of FIN that automatically duplicates a predefined set of message types and forwards it to one or more selected destinations (for instance the head office of an institution, a regulator or an outsourcing agent), or optionally for authorisation and further processing.

The flexibility provided by FINInform makes it an ideal solution to cater for your intra or inter-institutional copying needs in multiple business contexts, such as risk management, outsourcing and resilience.

Key benefits

Simple

FINInform automatically generates one or more copies of a message based on the service parameters defined by the service administrator. Optionally, the delivery of original message to receiver can be a subject to authorisation/ approval of the copy destination. There is no action or internal development required from either the sender or the receiver and no operational impact on them. FINInform avoids the costs involved in developing and maintaining a proprietary copy solution.

Flexible

There are two copy modes available in FINInform: T-copy and Y-copy modes. The parameters defined by the service administrator consist of one or several message types, the copy destinations receiving the copy and the membership pattern applied to service participants. Four membership patterns can be defined:

- Sender: see example in T (graph 1) and Y (graph 2)
- Receiver: exists only in T-copy
- Sender and receiver: See FINCopy factsheet for example in T and Y-copy
- Sender or receiver: exists only in T-copy (graph 3). Y-copy can be applied only to sent traffic.

The service administrator can request specific filtering on the content of messages - such as the currency and value date - to further refine the message copy selection.

The service administrator may also request that only specific fields of the message be copied to the copy destination. This partial copying ensures the confidentiality of sensitive information and improves performance by keeping copied information to a minimum.

Secure and reliable

FINInform is based on standard SWIFTNet FIN security features. SWIFT ensures that the copy is sent to the copy destination at the same time as the original message is sent to the addressee in T-copy mode.

Example: SWIFT MT103

```
{2:..  
{3:..  
{4:..  
:20:  
:23B:  
:26T:TTS  
:32A:  
:33B:AED228250,17  
:36:3,675  
:50K:/
```

57A:
59:

:70:TECHNICAL TRADE-RELATED AND OTHER B
BUSINESS SERVICES
SETTLED USD SALES HOTEL BOOKING
:71A:OUR
:77B: AE//TTS//TECHNICAL, TRADE-
//RELATED AND OTHER BUSINESS SERVIC
//ES
-}

----- Message Trailer -----

P. Code

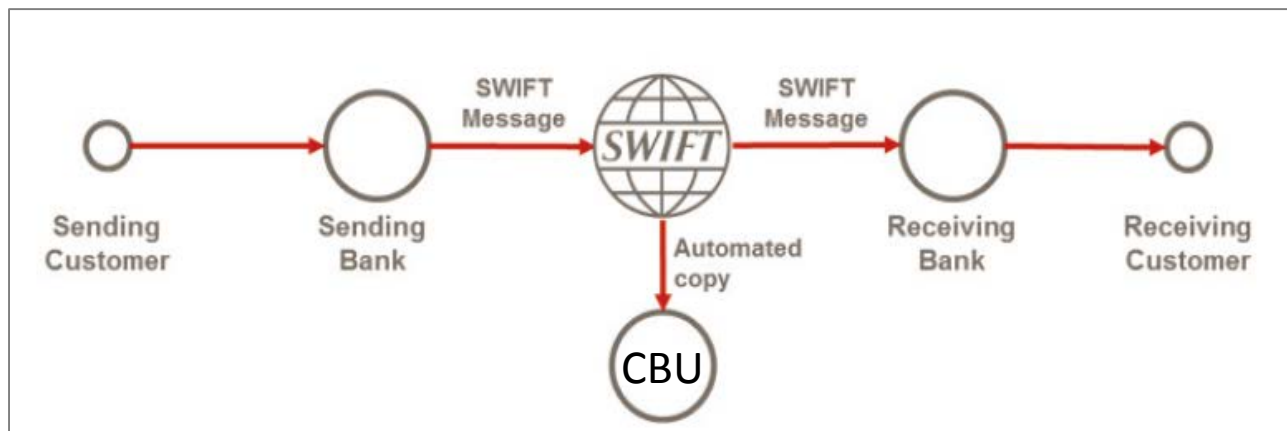
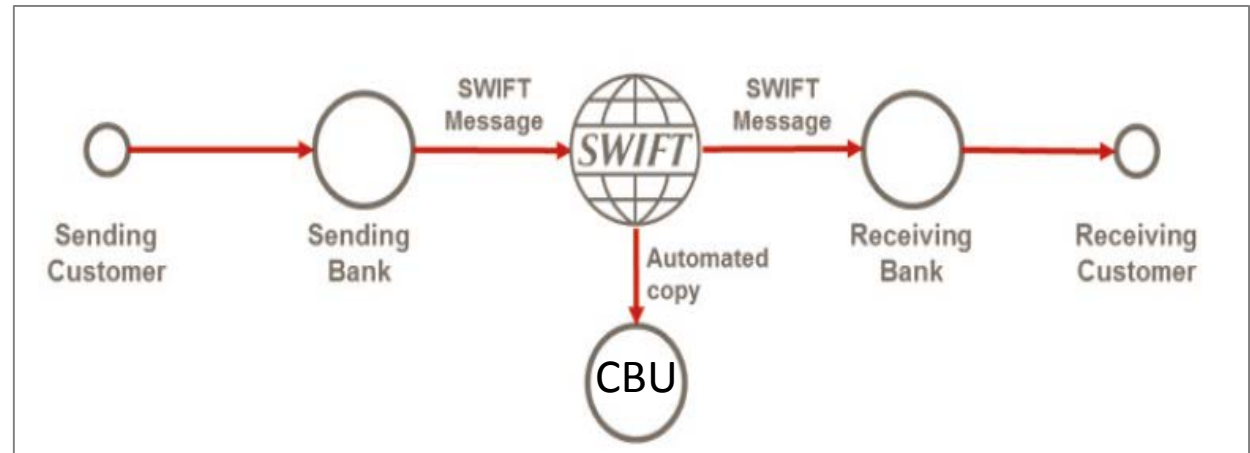
What Have Been Done

- ❖ Notice No. CBUAE/BSD/2018/759 (for Banks)
 - ❖ Workshop on May 28, 2018 @ 11:00 am
- ❖ Notice No. CBUAE/BSD/2018/760 (for Exchange Houses)
 - ❖ Workshop on May 29, 2018 @ 11:00 am
- ❖ Notice No. 191/2018 (**for Correspondent Banks**)
- ❖ Registration in FINInform: on July 24, 2018 (done)
- ❖ Notice No. CBUAE/BSD/N/2018/2101
 - ❖ Workshop on August 15, 2018 @ 10:00 am
- ❖ Implementation started effective on 1 September 2018

The SWIFT SCOPE: Mechanism of the Data Flow

❖ *Balance of Payment Data: The SWIFT SCOPE*

**Solution Design -
Inward Messages to UAE**



**Solution Design -
Outward Messages from
UAE**

Copy of each cross border SWIFT message must include:

❖ *Balance of Payment Data: The SWIFT SCOPE*

Data Copy Automation Process

The solution is composed of the following three main pillars:

✓ **Data Capture:**

The required data for Balance Of Payment statistics is captured from SWIFT messages, the fields are –

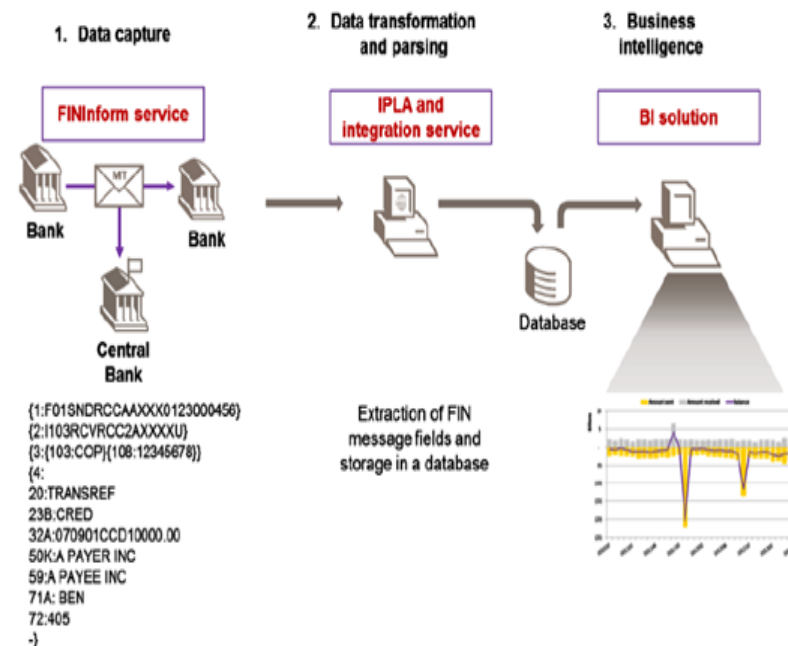
1. Origin / Destination
2. Currency
3. Amount
4. Amount in Local Currency
5. Payment Purpose Code

✓ **Data Transformation :**

The data captured from SWIFT messages are transformed as per the Balance of Payment template and stored in Local database for analysis and further usage.

✓ **Data Visualisation:**

SWIFT's Business Intelligence solution uses the transformed data and provide graphical reports, highlighting different statistics.



How it works?

❖ ***Balance of Payments Data: The SWIFT SCOPE Project***

- ☐ The system will record each financial transaction (in/out).
- ☐ The obtained information will be classified as the following:
 - ✓ Origin / Destination
 - ✓ Currency
 - ✓ Amount
 - ✓ Amount in Local Currency
 - ✓ Payment Purpose Code
- ☐ The data will be used for the Balance of Payment compilation following BoP Guidelines published on the CBUAE website, including:
 - ✓ BoP – Purpose of Payments Codes Table
 - ✓ Technical Notes on Transaction Codes for BoP
 - ✓ Explanatory Notes on Transaction Codes for BoP

Classification	Code	Purpose
I. Goods-Services-Income-Transfers Receipts & Payments		
Import-Export	GDE	Goods sold (Exports in fob value)
	GDI	Goods bought (Imports in cif value)
Transport & Travel	STS	Sea transport
	ATS	Air transport
	OTS	Other modes of transport (including Postal and courier services)
	STR	Travel
Services with abroad	GMS	Processing repair and maintenance services on goods
	SCO	Construction
	INS	Insurance services
	FIS	Financial services
	IPC	Charges for the use of intellectual property royalties
	TCS	Telecommunication services
	ITS	Computer services
	IFS	Information services
	RDS	Research and development services
	PMS	Professional and management consulting services
	TTS	Technical, trade-related and other business services
	PRS	Personal, cultural, audiovisual and recreational services
Interest & Profits with abroad	IGD	Dividends intragroup
	IID	Interest on debt intragroup
	PIP	Profits on Islamic products
	PRR	Profits or rents on real estate
	DOE	Dividends on equity not intragroup
	ISH	Income on investment funds shares
	ISL	Interest on securities more than a year
	ISS	Interest on securities less than a year
	IOL	Income on loans
	IOD	Income on deposits
Government	GOS	Government goods and services embassies etc
	GRI	Government related income taxes, tariffs, capital transfers, etc.
Personal	CHC	Charitable Contributions (Charity and Aid)
	FAM	Family Support (Workers' remittances)
	SAL	Salary (Compensation of employees)
	PPA	Purchase of real estate abroad from residents
	PPL	Purchase of real estate in the UAE from non-residents
II. Assets		
FDI flows - Acquisition and liquidation by residents of equity & securities abroad (above 10% share)	CEA	Equity and investment fund shares for the establishment of new company from residents abroad, equity of merger or acquisition of companies abroad from residents and participation to capital increase of related companies abroad
	DSF	Debt instruments intragroup foreign securities
	REL	Reverse equity share in the UAE
	RDL	Reverse debt instruments in the UAE
Portfolio investment flows - Acquisition and liquidation by residents of equity & securities abroad (below 10% share)	FSA	Equity other than investment fund shares in not related companies abroad
	FIA	Investment fund shares foreign
	DSA	Purchases and sales of foreign debt securities in not related companies - Less than a year
	DLA	Purchases and sales of foreign debt securities in not related companies - More than a year
	FDA	Financial derivatives foreign
Lending-repayments and transfers by residents of loans & deposits abroad	DLF	Debt instruments intragroup loans, deposits foreign (above 10% share)
	AFA	Receipts or payments from personal residents bank account or deposits abroad
	SLA	Loans – Drawings or Repayments on loans extended to nonresidents - Short-term
	LLA	Loans – Drawings or Repayments on loans extended to nonresidents - Long-term
	LEA	Leasing abroad
	RFS	Repos on foreign securities
	TCR	Trade credits and advances receivable
III. Liabilities		

Mapping from the aggregated SWIFT Messages to BOP Template

❖ *Balance of Payments Data: The SWIFT SCOPE Project*

❖ *A mapping Example*

Services (NET)

Credits

Travel

Transport

Ports

Air

Postal & others

Government Services

Other services

Construction

Intellectual property

Information-Computer-Telecommunication

Information

Computer

Telecommunication

Other⁶

Processing repairs and maintenance services on goods

Financial Services

Research and development services

Professional and management consulting services

technical, trade-related and other business services

Personal, cultural, audiovisual and recreational services

Insurance services

STR	Incoming	
-----	----------	--

STS	Incoming	
ATS	Incoming	
OTS	Incoming	
GOS	Incoming	

SCO	Incoming	
IPC	Incoming	

IFS	Incoming	
ITS	Incoming	
TCS	Incoming	

GMS	Incoming	
FIS	Incoming	
RDS	Incoming	
PMS	Incoming	
TTS	Incoming	
PRS	Incoming	
INS	Incoming	

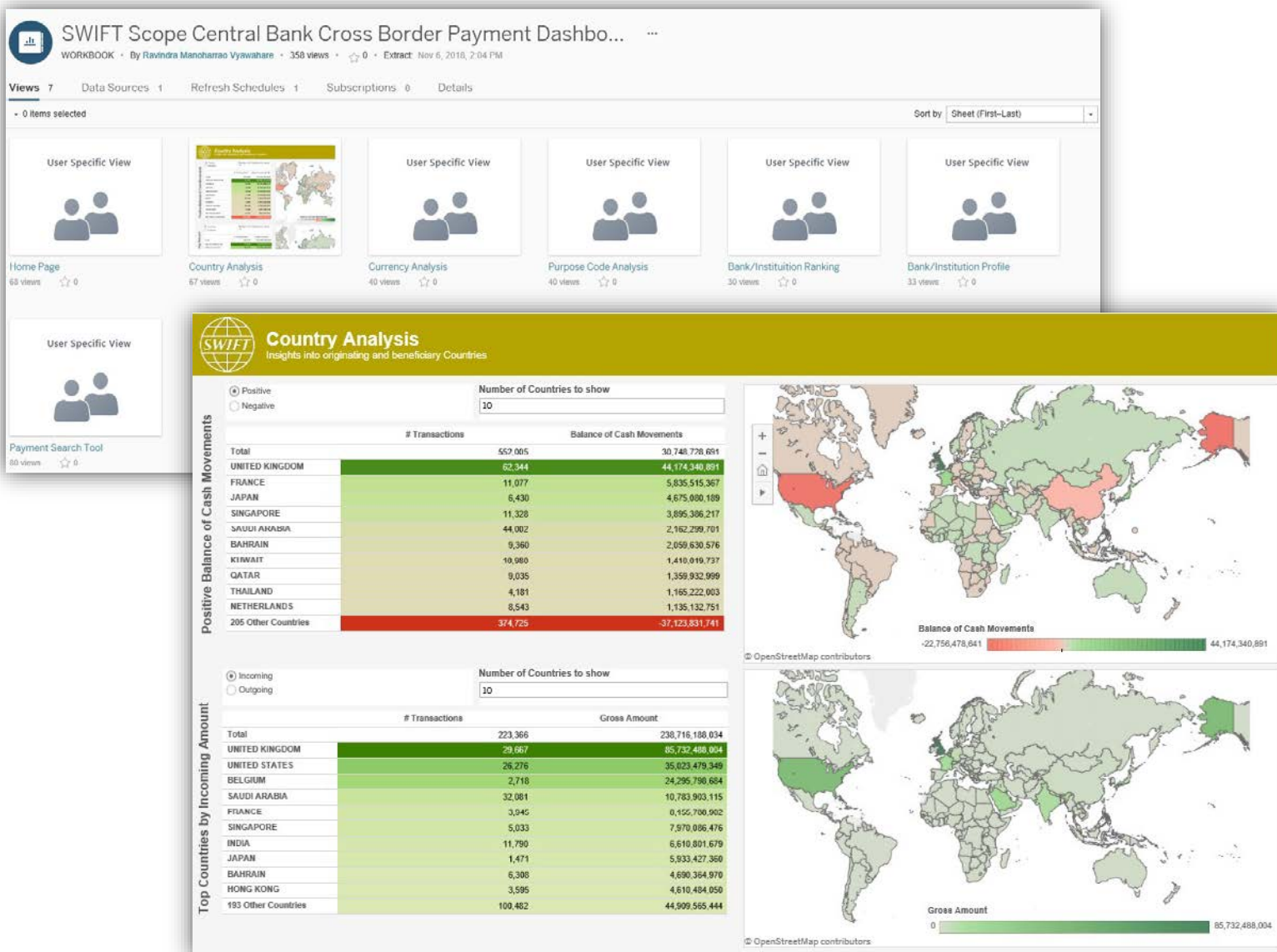
Advantages of using SWIFT Scope

❖ *Balance of Payments Data: The SWIFT SCOPE Project*

❖ *Expected Outcome:*

- ❑ Improve data accuracy and timeliness.
- ❑ Reduce costs generated by the surveys.
- ❑ Reduce data biases stemming from surveys, as reliable results from survey require awareness and cooperation which may not be readily available in many societies. The results of the surveys are less reliable in countries where there is no integrated tax system related to taxes on income and profits
- ❑ Track capital and financial flows for a better understanding of non-oil growth drivers and consequently, activate optimal policies response proactively.
- ❑ The project will benefit the CBUAE and the six local centers in UAE by getting TiS Statistics and BoP Statistics in general (second phase)

CBUAE - SWIFT Scope DASHBOARD



Thank you

IFC - Central Bank of Armenia Workshop on "*External Sector Statistics*"

Dilijan, Armenia, 11-12 June 2018

Plastic cards statistics project for capturing tourism statistics¹

Abubaker Al Sayari,

Central Bank of the United Arab Emirates

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.



مصرف الإمارات العربية المتحدة المركزي
CENTRAL BANK OF THE U.A.E.

Plastic Cards Statistics Project for Capturing Tourism Statistics

Abubaker Al Sayari

**Assistant Director - In charge of the Data and Statistics Center
Research & Statistics Department (RSD)**

Central Bank of The United Arab Emirates



Objective:

Aim to capture Tourism activities internally and externally

Process:

Technical documents and system are ready for transactions related to POS and NON-UAE Switch (ATMs).

How:

Information will be collected from both the issuers and acquirers of cards for cross checking purposes.

The MCC (merchant code) will provide the country and activity details.

We will have the capacity to collect data which belongs to Global Innovation index

The Plastic Card Statistics



1. Resident Plastic Card Transactions outside the UAE

1.A POS Transactions

Cards used outside UAE by Resident -POS Transaction

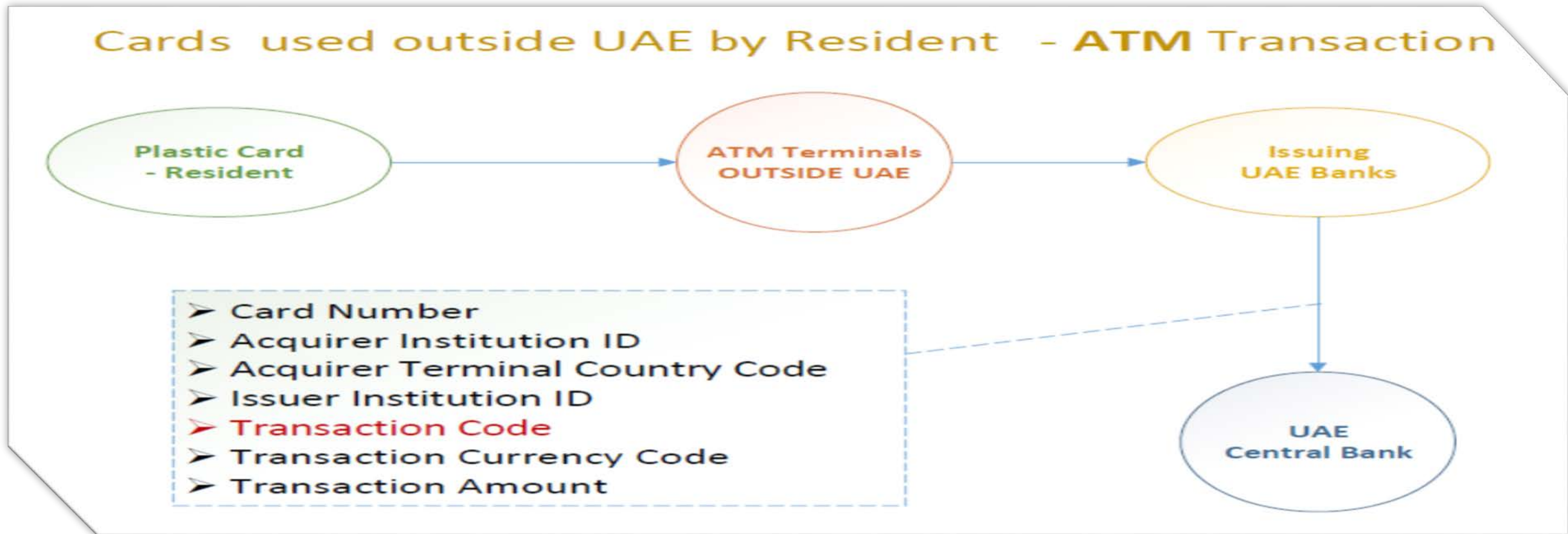


The Plastic Card Statistics



1. Resident Plastic Card Transactions outside the UAE

1.B ATM Transactions



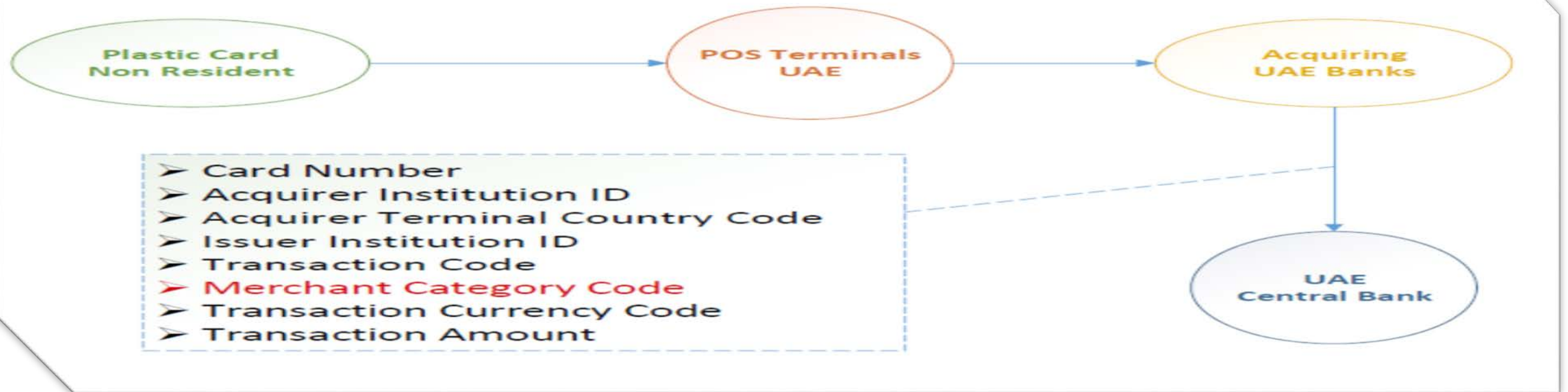
The Plastic Card Statistics



2. Non Resident Plastic Card Transactions in UAE

2.A POS Transactions

Cards used in UAE by Non Resident -POS Transaction

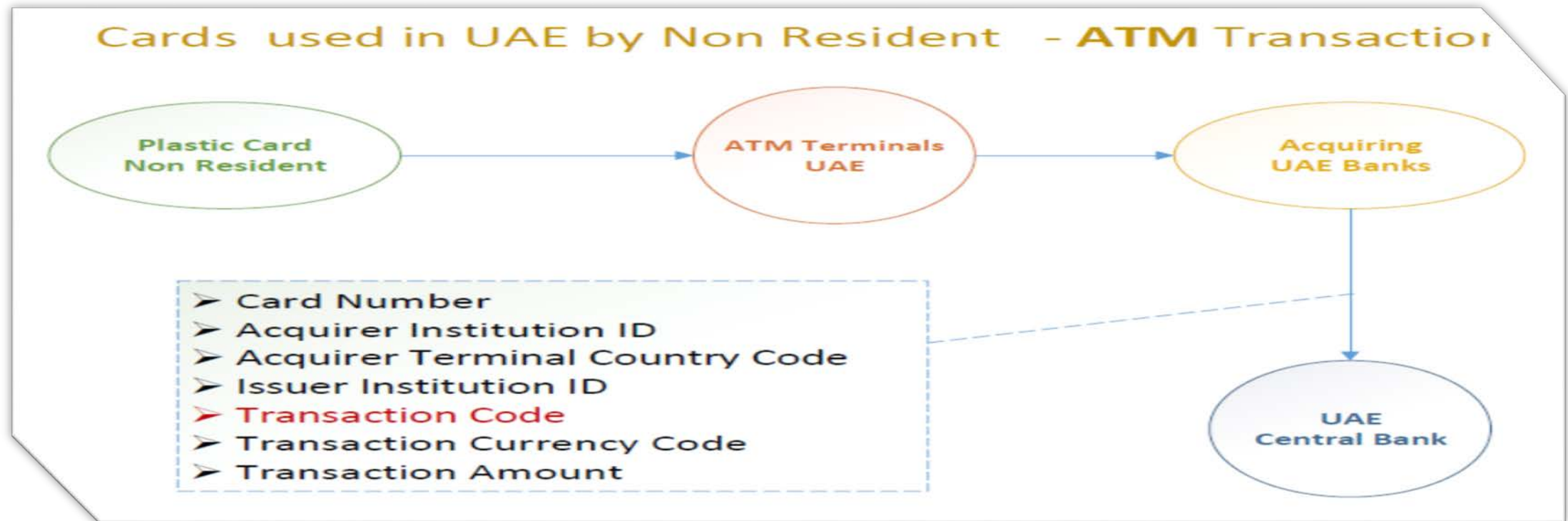


The Plastic Card Statistics



2. Non Resident Plastic Card Transactions in UAE

2.B ATM Transactions



Currency Notes (CASH)

- Sales of Foreign Currency
- Purchases of Foreign Currency
- The (Sales / Purchases) of Foreign Currency should be classified by currency



IFC - Central Bank of Armenia Workshop on *"External Sector Statistics"*

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An assessment of the existing data collection on financial derivative products¹

Hervé Thoumiand,

Bank of France

¹ This paper 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.

An assessment of the existing data collection on financial derivative products

Framework and lessons for a roadmap

Thoumiand Hervé, Head of Financial Intermediaries Division, Balance of Payments Directorate, General Direction of Statistics, Banque de France.

The opinions expressed in this paper do not necessarily reflect the views of the Banque de France.

Improvements in the financial derivatives data collection at the Banque de France

Ten years after the beginning of the financial crisis, international banking statistics allowed for a decisive step forward by providing valuable information on the banking sector. These data, both on a granular and on an aggregated basis, help to monitor closely the trends in the business activity of banks, and to understand for instance the arbitrages on financial markets, or to assess the impact of fiscal regulation changes.

The greatest progress in the understanding of financial flows has been made on the derivative markets: much more information has been collected on options, future/forwards and swaps, beyond the information that was already gathered for the balance of payments (BoP).

However, improvements still need to be made in the collection of the data, for instance for cross border intragroup flows. A better circulation of the data among institutions could also be achieved.

Keywords: banking sector, derivative markets, options, future/forwards and swaps, balance of payments, cross border intragroup flows, international banking statistics, accessibility of data.

Collecting data on derivatives proves to be tricky, as various complex financial instruments are to be handled and as the data collections may differ radically according to their aim.

This article is structured as follows. It first discusses the existing framework at the Banque de France for data collection on derivative products. The concepts and the scopes vary significantly, depending on the purpose of the different collections. The article then identifies possible synergies between these data, though they often remain difficult to compare. Finally, some improvements are suggested in order to maximize the information content of the data and their use by analysts

A large variety of concepts and scopes in the existing framework for data collection on financial derivatives

A first framework set up

When dealing with financial derivatives, we need first to assess specifically which instruments are considered. The 6th Manual of the Balance of Payments published by the IMF (BPM6) defines in its article 5.79 financial derivatives contracts as *"a financial instrument that is linked to another specific financial instrument or indicator or commodity and through which specific financial risk (such as interest rate risk, foreign exchange risk, equity and commodity price risks, credit risk and so on) can be traded in their own right in financial markets"*.

Drawing up an exhaustive list would be worthless, as financial innovation is most of the time leading ahead of the statistical machinery. Consequently, it is preferable to identify hereafter the main families of derivatives, such as Swaps, Forward and Futures, and Options like derivatives¹.

It is also crucial to identify the underlying assets in order to understand movements on financial derivatives markets. The use of large baskets of underlying instruments such as Equity, Fixed Income / Rates, foreign Exchange (Fx), or Commodities proved to be the most efficient way to draw a big picture.

Other dimensions should be taken into account, such as the nature of the transaction market (Over The Counter – OTC vs. organized markets) or the maturity of the instruments; although they may not be as necessary as the two families of information previously exposed.

Statutory accounts as the corner stone of transaction flows

One of the main sources of information on derivatives is the statutory accounts. These data, collected on a social basis (i.e. based on the residence of the unconsolidated business), represent an adequate source to serve the needs of the balance of payments. Article 5.80 and following of the BPM6 stresses that those *"transactions should be treated separately from the values of any underlying items to which they are linked. (...) derivatives contracts are settled by payment of net amounts"*. For instance, premiums on options, forwards bought and sold, non-repayable margins for futures, interest received or paid on swaps are cash settled transactions; all of them are considered as "flows" according to the BPM6 methodology and should therefore be included within the balance of payments.

¹ In accordance with 2008 SNA Financial Instruments Classification, financial derivatives are made of "Forward Type contracts" that includes Swaps, and Options, deferring from Employee stock options (page 84)

These flows show the size of cross-border transactions but provide little information about the risks or benefits associated with such transactions. International Investment Position (IIP) provides more indication on the exposure of a country, in the sense that it shows derivatives contract position, i.e. stocks of derivative contracts, valued at their market value. An articulation of the variation of position is consequently possible, over a period of time. Some indication of the overall exposure is also produced, with the publication of notional amounts, split by currency. However, this overview of the country risk is somehow limited: for instance, neither risk transfer nor the exposure by underlying instrument is requested.

Locational banking statistics (also collected on social basis) should draw more or less the same picture, in which residential risk may also be distorted by intra-group activity that is, in some case, prominent, but so far the recommendation by a Study Group has not been implemented. A first discrepancy between those two sets of data should be underlined here: for the BOP and IIP, about 188 countries are reporting, whereas there are 44 countries reporting for LBS so far.

Although these data are rather homogeneous, the comparison of the different sets of derivatives contracts statistics shows that their approaches vary in concepts and scope; moreover, they proved to be not fully adequate for an overall exposure analysis. For this purpose, banks' consolidated exposures are precious.

Consolidated accounts as the global exposure picture of national banking groups

Discrepancies should be handled when comparing statutory and consolidated accounts. Obviously the perimeter is not the same as the residential criteria is replaced by the nationality criteria; accounting rules also differ (national GAAP vs. IFRS9, newly implemented from the beginning of 2018).

The BIS Consolidated Banking Statistics (CBS) gather valuable information on derivative contracts, on a consolidated basis, and on an immediate risk basis. Derivatives are included among the instruments of banks' funding without additional breakdown. Exposures are also declared on an 'ultimate risk' basis, the gross market value being netted in the case of bilateral agreements. Around 30 countries report for CBS, both on immediate and ultimate risk basis.

CBS data do not provide breakdown by instrument, maturity, currency or counterparty sector (only by counterparty country for ultimate risk). On the contrary, the OTC data collection does, which is very much welcome, though only with a restricted geographical breakdown. To be complete in the description of the derivatives data collections, the implementation of the phase 3 of the Data Gaps Initiative should provide interesting granular information, with crossed dimensions, though limited to the biggest banks (G-SIB).

The purpose of those various statistics is to increase market transparency and thereby help central banks, other authorities and market participants to better monitor activity in the global financial system. Guidelines from the IMF concerning the Balance of Payments and guidelines from the Bank for International Settlements and the Financial Stability Board are however not leaning towards the same purpose: synergies may prove difficult to materialize, as comparability is a challenge when trying to interpret the results.

Synergies between the various datasets of derivatives: the Banque de France experience in compiling data on financial derivatives

A specific organization in order to maximize quality and interpretation

All data collection enquiries that concern banks derivatives are concentrated within the same division of the Banque de France. This allows our analysts to get a comprehensive understanding of the methods and requirements of each data collection. This organization also facilitates the data quality check of the transmitted data.

As previously mentioned, the requested data vary significantly from one data collection to another, in terms of number of reporting entities, scope, periodicity or requested breakdowns. Some data collections are built for very specific table that should be compiled in the Balance of Payments or International Investment Position tables. For example we did not collect until recently overall exposure, i.e. notional amounts, split by foreign currency for instance.

We managed to solve part of this issue, by requesting more information than the basic components each data collection would need: comparisons are in this way facilitated. For instance, we asked, successfully, the financial intermediaries to declare on a voluntary basis the underlying assets for the balance of payments monthly data collection, which is very useful when trying to compare with biannual OTC data collection.

Our colleagues in charge of these data collections can therefore relate and compare movements within the same banking group or the same instrument family, over a comparable period. All in all, one way or another, all or most of the metrics, breakdowns, definition of reporting entities, frequencies, etc., are requested.

This allows us also to carry out analyses that prove to be accurate and useful in describing the derivative contracts markets. Highlights on market movements can be very precise, for instance on the overall evolution of the Credit Default Swaps market, that tended to shrink drastically (we're talking here of notional amounts) over the previous years. Another example would be the standardised Interest Rates Swaps market that is more and more centrally cleared, due to the implementation of a new regulation. However, sometimes, data collections overlap too partially to be comparable.

Many (too many?) sources of data collected for more or less the same goal

Some concepts differ too significantly in our data collections to allow for economies of scale. Progress could be made in this regard. For instance, : the perimeters , could be the same for the balance of payments (BOP) / international investment positions (IIP) supervised by the International Monetary Fund (IMF), or for the International Banking Statistics reported to the Bank for International Settlements (BIS), as they are both trying to assess external vulnerabilities of countries.

In order to illustrate those annoying little discrepancies, let's take the example of the value of a derivative contract. Valuation methods matter less than the various metrics related the concept of "market value": the absolute sum or on a contrary a distinction of the absolute values can be expected in two different data collection, either with positive or negative replacement values; the market value can be netted with the same counterparty, or not, depending on what we ask for; or the market value can be required on a gross basis, or netted after legally enforceable netting (Phase 3 I to A of the Data Gaps Initiative), or netted after legally enforceable netting - Basel rules, but after taking account of legally enforceable bilateral netting agreements (CBS). In the end, although these concepts of market value are similar, that are not quite the same and not quite comparable.

Another example shows that the reporting population, i.e. financial intermediaries, may vary from 10 of the biggest banking group on a consolidated basis, up to 1.800 financial intermediary legal entities. Frequencies and metrics are also different from one reporting formular to another: as a central bank, we gather on a monthly basis transaction flows and on a quarterly basis also revaluation positions, market values and notional amounts for the needs of the balance of payments an international banking statistics; on a biannual basis, notional amounts and market values split underlying asset on a restricted panel of group for the so-called "OTC data collection"; and on a triannual basis pretty much the same information, but for a much larger range of financial intermediaries.

Those methodological mismatches are a path we could collectively go down in order to ease a more efficient way to collect data.

Possible way forward

Improvements in the reduction of datagaps are expected

Simplification and automatization of data processing will be a key driver of the statistical framework in the coming years, as computer science is more and more present in our day to day statistical work. Taking the best from the new information technologies, IT systems will allow to merge dissimilar information but also information coming from various sources. Yet it will remain difficult to handle correctly the different sets of data if they are not comparable from a conceptual point of view.

A clarified and harmonised set of concepts could prove very usefully in avoiding to fall through the net. In the matter, the progressive inclusion of derivatives in statistics by a growing number of countries will provide a global approach, more efficient in terms of allocation per country of derivatives books.

Sharing good practices should be fruitful

Collecting statistical data on derivatives contracts is difficult, but we improve everyday our knowledge on this field, in communicating back and forth with the financial actors present on these markets. They explain us the overall mechanisms as well as the recent trends and innovations on the market.

Our knowledge gets even deeper when we talk with our colleagues, from our institution but also from others. The exchange of good practices is indeed a fundamental element of our capacity to follow on a global basis the flows and the overall risk transfer between actors on this market. A coming European Task Force on the subject could lead to instructive results, in particular in terms of guidance on practical aspects, as different practises between countries may hamper the comparability and consequently reduce the usability of the data.

Improvements in the diffusion of the data

Data sharing between institutions, on a bilateral basis, is something that we do; but it is done most the time on good and services, and less frequently on financial flows, especially derivative. This usage should be encouraged: even if it is very much time consuming, results are in most cases very illuminating, in particular when talking of intra group transactions on derivatives.

Data sharing with researchers should also be promoted. But a specific work on the documentation of the concepts should first be done internally, and second among institutions, in order to improve international comparisons. The International Network for Exchanging Experience

on Statistical Handling of Granular Data (INEXDA) framework is one interesting solution, among others, to address this issue and promote the usage of granular data by researchers.

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An assessment of the existing data collection framework and lessons for a roadmap¹

Hervé Thoumiand,

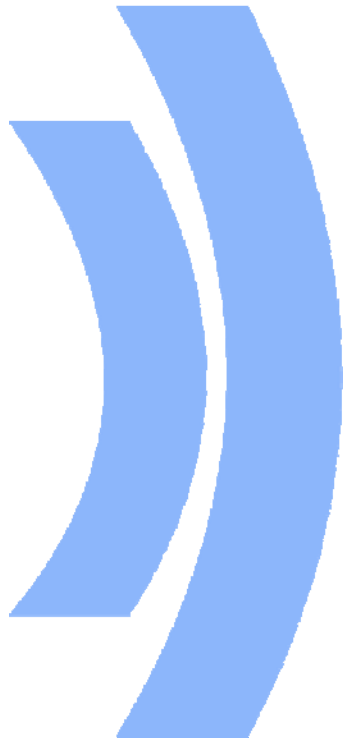
Bank of France

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AN ASSESSMENT OF THE EXISTING DATA COLLECTION FRAMEWORK AND LESSONS FOR A ROADMAP

HERVÉ THOUMIAND
FINANCIAL INTERMEDIARIES DIVISION
BALANCE OF PAYMENTS DIRECTORATE
BANQUE DE FRANCE



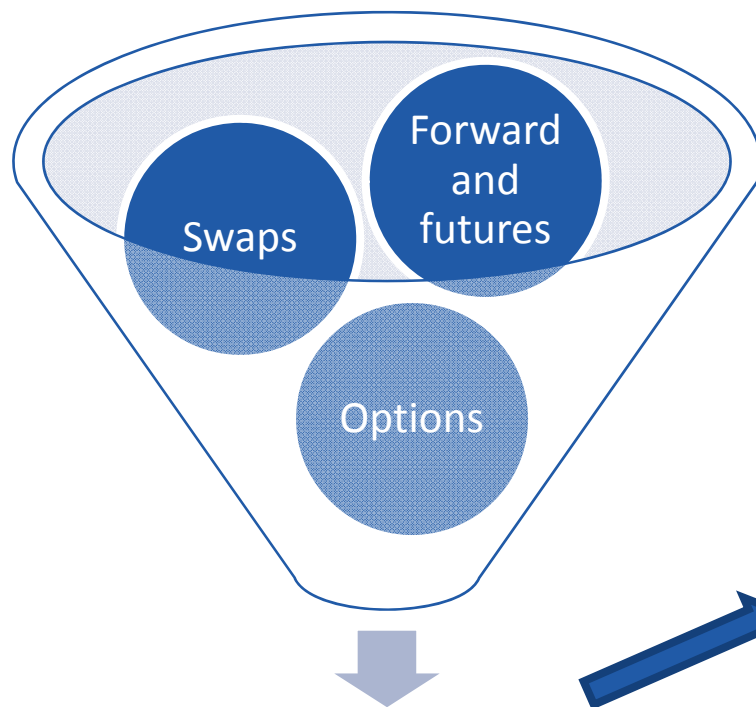
1. Existing framework for data collection on derivatives : a large variety of concepts and scopes
2. Synergies between the different datasets of derivatives : the Banque de France experience in compiling data on financial derivatives
3. Improvements are still to be made



- 1. Existing framework for data collection on derivatives : a large variety of concepts and scopes**
2. Synergies between the different datasets of derivatives : the Banque de France experience in compiling data on financial derivatives
3. Improvements are still to be made



0 – FINANCIAL DERIVATIVES DATA COLLECTION: WHAT IS ABOUT?



DERIVATIVES

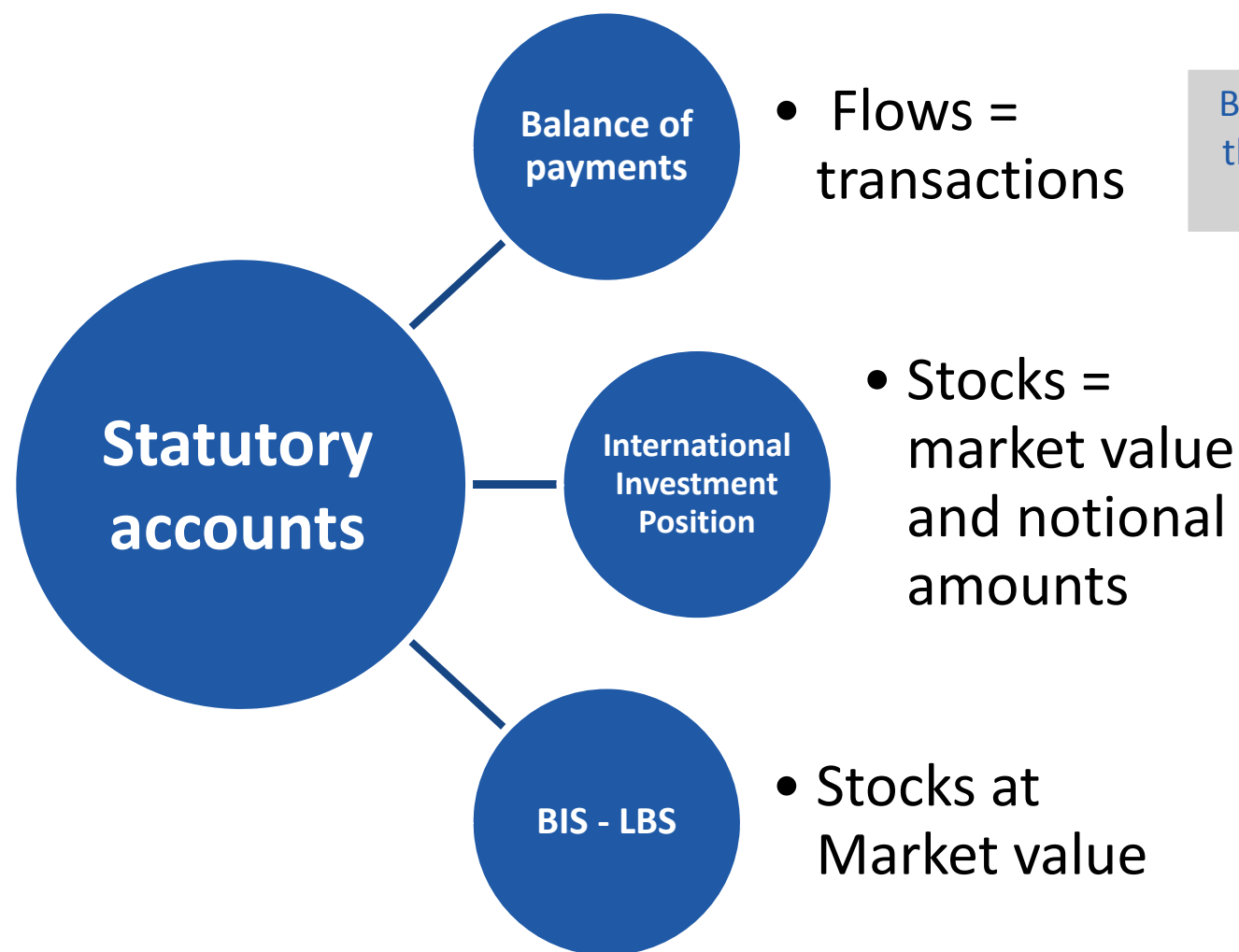
Comparison of the different sets of the derivatives statistics shows that the approaches vary in the concepts and scope

Equity, Rates, Commodities,...

Geographical Breakdown

OTC and Organised markets

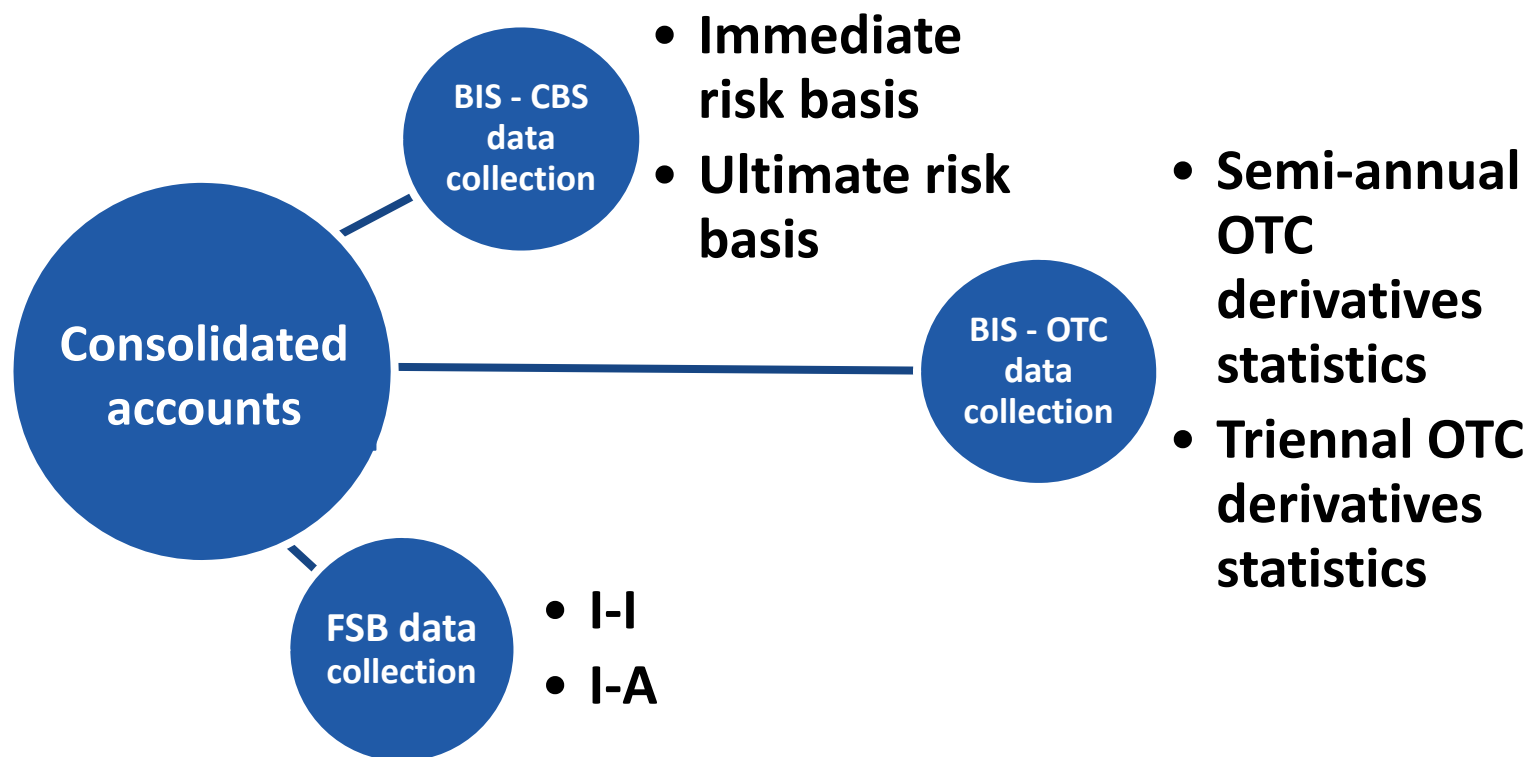
1 - EXISTING FRAMEWORK FOR DATA COLLECTION ON DERIVATIVES : VARIETY OF CONCEPTS AND SCOPE



But no information about the risks nor the benefits underlying

188 vs 44 countries

1 - EXISTING FRAMEWORK FOR DATA COLLECTION ON DERIVATIVES: VARIETY OF CONCEPTS AND SCOPE



The objective of this reporting is “to obtain reasonably comprehensive and internationally consistent information on the size and structure of the OTC derivatives markets”



1 - EXISTING FRAMEWORK FOR DATA COLLECTION ON DERIVATIVES: VARIETY OF CONCEPTS AND SCOPE

■ On a consolidated basis :

— FSB – Institution-to-Institution “I to I”

- On a weekly submission, the transactions of derivatives receivable (assets) : net value market + CDS' notional values
- On a monthly submission, positions on the gross market value and notional amount + exposures on sovereign CDSs

— FSB – Institution-to-Aggregate “I to A” (Data gaps phase 3)

- On a quarterly basis, data on assets and liabilities on an immediate counterparty basis of which all derivatives (exchanged traded derivatives + centrally cleared OTC + bilateral/uncleared OTC derivatives) with a breakdown by instrument.
- Metrics : Gross fair values (MtM) + notional amounts to facilitate cross-country comparison



1 – FINANCIAL DERIVATIVES DATA COLLECTION: THE INTERNATIONAL GUIDELINES

The stages of implementation of the data collection, on a consolidated basis: the Recommendation II.6 on Derivatives

- BIS to review the derivatives data collected for
 - the International Banking Statistics (IBS) and
 - the semi-annual over-the-counter (OTC) derivatives statistics survey,
- the FSB to investigate the legal, regulatory, governance, technological, and cost issues that would support a future FSB decision on the potential development of a mechanism to aggregate and share at global level OTC derivatives data from trade repositories.



1 – FINANCIAL DERIVATIVES DATA COLLECTION: THE INTERNATIONAL GUIDELINES

The stages of implementation of the data collection, on a consolidated basis: the OTC Survey

- The objective of the reporting exercise is to obtain reasonably comprehensive and internationally consistent information on the size and structure of over-the-counter (OTC) derivatives markets.
 - June 1998 : a regular collection of statistics on derivatives
 - December 2011 : 13 reporting countries.

=> Increase market transparency and thereby help central banks, other authorities and market participants to better monitor patterns of activity in the global financial system.

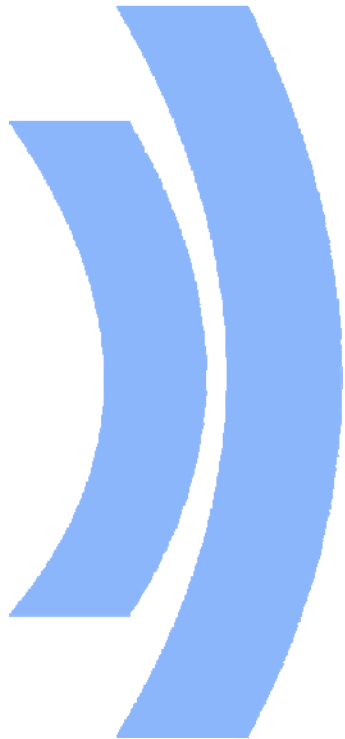


1 – FINANCIAL DERIVATIVES DATA COLLECTION: THE BOP GUIDELINES

The stages of implementation of the data collection, on a statutory basis:

- 2011: a new and specific survey
 - ✓ Market value and reappraisal of the instruments
= on a monthly basis

- 2015 – 2017 : enhancements in the data collection
 - ✓ Underlying instruments = on a monthly basis
 - ✓ Stocks data = on a quarterly basis
 - ✓ Notional values = on a quarterly basis



1. Existing framework for data collection on derivatives : a large variety of concepts and scopes
- 2. Synergies between the different datasets of derivatives : the Banque de France experience in compiling data on financial derivatives**
3. Improvements are still to be made



2 - FINANCIAL DERIVATIVES DATA COLLECTION: THE FRENCH EXPERIENCE

- The existing data vary significantly from one data collection to another :

		Phase II DGI				Phase III DGI
		CBS (quarterly)	OTC Survey (semi annual)	OTC Survey (triennial)		I-A
Perimeter	Entity	Consolidated	Consolidated	part 1: Statutory (turn over)	part 2: Consolidated (amount outstanding) (same as semi-annual OTC survey on a population extended) For the regular , same Template than the semi-annual, li for the nc	Consolidated
	Number of Entities	7 banking groups FR + 3 non-FR	8 banking groups FR	42 Locationnal banks (in 2016)	Regular reporting C regular (
Metrics	Gross Notional Amounts	No only for the CDS held in the banking book	Yes	Yes, pre-novation in april	Yes	
	Gross Fair / Market Value (Stocks)	Net market value, after legally enforceable netting and bilateral netting agreement (basel rules) both in the banking and the trading book	Yes, Gross Fair value reported post novation = id est (CCP usage	No	Yes, Gross Fair va novation = id est (CCP usage	= compensation of assets and liabilities
	Transactions = Margin call, premium (Flows)	Immediate Risk: liabilities (If MV<0) Ultimate Risk : assets (if MV >0 and	No	No	No	No
	Gross Credit Exposure	No	Yes = Derivatives-related counterparty exposures before and after netting arrangements (except CDS)	No	No	No
	Reappraisal	No	No	No	No	No
	Breakdown by market type	Assets: OTC Liabilities: OTC and organised markets	OTC only (incl. Compensated)			Exchange-traded derivatives / Centrally cleared OTC derivatives /Bilateral-uncleared OTC derivatives + sub-categories
	instruments	No	Swaps, Futures/Forwards, Options	Swaps, Futures/Forwards, Options	Swaps, Futures/Forwards, Options, single name or multiline CDS	No
	currency	No	USD, EUR, JPY, GBP, CHF, CAD, SEK and other currencies, in USD equivalent	USD, EUR, JPY, GBP, CHF, CAD, SEK and other currencies, in USD equivalent	24 currencies for FX and 38 currencies for Interest rates	USD , EUR , JPY, GBP , CHF, CNY + other
	residual maturity	No	- one year or less - over one year and up to five years - over five years	- seven days or less - over seven days and up to one year - over one year	- one year or less - over one year and up to five years - over five years	overnight and less than 3 months/ 3 months and less than 1 year / 1 year and over / unknown
	counterparty sector	No	reporting dealers, other financial institutions (and of which CCPs) and non-financial customers	reporting dealers, other financial institutions and non-financial customers, all declined by local/crossborder	reporting dealers, other financial institutions (and of which CCPs) and non-financial customers	No
	underlying asset	No	t rates, equity, Gold, commodity, Credit	Yes (FX, interest rates, equity, Gold, commodity, Credit derivative)	Yes (FX, interest rates, equity, Gold, commodity, Credit derivative)	Yes
	country counterparty	Only for ultimate risk	Yes	No	yes	No

all or most of the metrics, breakdowns, definition of reporting entities, frequencies...are requested



2 - FINANCIAL DERIVATIVES DATA COLLECTION: THE FRENCH EXPERIENCE

Structure and reporting framework

- ❑ **Reporting population** : financial intermediaries (FI): up to 1800 !

- ❑ **Frequency and metrics:**
 - ✓ Monthly: Transactions and Revaluations (other changes in assets and liabilities) of a sample of the main FIs.

 - ✓ Quarterly: Notional amounts, fair value, transactions and stocks (reported in market value) of a sample of the main FIs.

 - ✓ Annually: Stocks of all the others FIs.

Nota Bene : We asked, successfully, the FI to declare on a voluntary basis the underlying asset

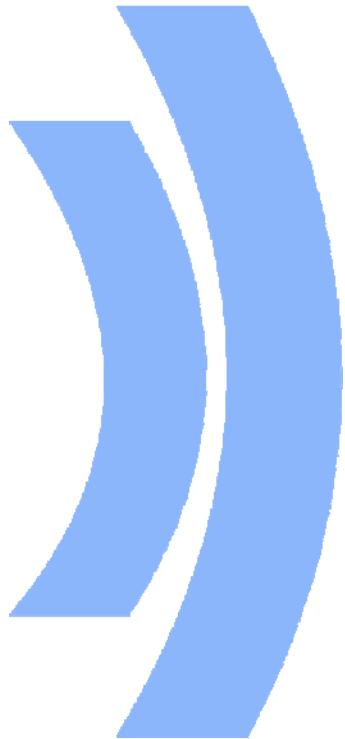


2 - FINANCIAL DERIVATIVES DATA COLLECTION: THE FRENCH EXPERIENCE

Structure and reporting framework

☐ Breakdown by :

monthly flows	<ul style="list-style-type: none">- currency- type of market (OTC or organized markets)- instrument (swap, future, forward, option)- counterpart country- underlying- the direction of the flow (increase or decrease of assets or liabilities)
quarterly stocks	<ul style="list-style-type: none">- currency- type of market (OTC or organized markets)- instrument (swap, future, forward, option)- counterpart country- underlying



1. Existing framework for data collection on derivatives : a large variety of concepts and scopes
2. Synergies between the different datasets of derivatives : the Banque de France experience in compiling data on financial derivatives
- 3. Improvements are still to be made**



3 – IMPROVEMENTS ARE STILL TO BE MADE

- In the collection of data
 - LBS dataset should be a part of the overall framework
 - Enhancements to the CBS on immediate risk basis :
 - Metrics should cover a wider range of concepts
 - Case of the “market values”
- In the diffusion of the data
 - Between institutions
 - To searchers
- In the documentation of the concepts in order to improve international comparisons



IFC - Central Bank of Armenia Workshop on *"External Sector Statistics"*

Dilijan, Armenia, 11-12 June 2018

Changes in the IT landscape of the Deutsche Bundesbank's external sector statistics¹

Joachim Hösch and Jens Walter,

Deutsche Bundesbank

¹ This paper 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.

Changes in the IT Landscape of the Deutsche Bundesbank's External Sector Statistics

Author: Joachim Hösch, Jens Walter

Abstract

In the past, the Deutsche Bundesbank's IT systems have been undergoing an incremental evolution of applications and data bases. To better fulfil new statistical requirements of users which increasingly call for integrated and consistent data the Bundesbank has launched a project to overhaul the existing external sector statistics' IT infrastructure and to create an integrated and automated system. This project is being implemented on a step-by-step basis since 2011.

The paper provides an overview on the key building blocks of the new IT-system based on a suite of integrated but modular software systems for master data, analysis, report processing and communication. The new harmonized IT infrastructure will facilitate integrated analyses for transactions & stocks, streamline statistical work processes and increase automation, and will therefore also reduce time-to-publication in the end.

Background

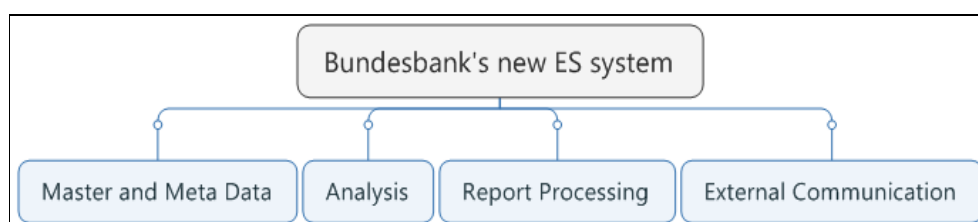
The Deutsche Bundesbank's IT systems for the production of external statistics have been undergoing an incremental evolution in terms of their applications and databases. In the past, the prevailing stovepipe view on external statistics resulted in the development of single-purpose IT solutions using different IT standards for the production of Balance of Payments (BOP), Foreign Direct Investment (FDI) and International Investment Position (IIP) statistics, to name just a few. An IT landscape, which has continued to evolve over a number of decades, exhibits a high degree of complexity, even when it comes to making minor changes. The implementation of conceptual changes, such as the requirement to link transactional microdata to stock data, becomes a very challenging task. A growing technical backlog has therefore emerged in the shape of maintenance-intensive systems, a lack of documentation and a declining number of staff members knowing how to work with the complicated historically grown systems.

However, over the past decade, the integrated view on external statistics has become more and more common and has emerged as the new standard for reporting requirements. Progress in the field of information technology has made enhanced solutions possible. Integrated data models have been developed, which conceptually combine various data sources, thereby streamlining the production process.

Given the new data requirements and the improved IT solutions, the Bundesbank has launched a project to overhaul the existing external sector statistics' IT infrastructure and to create an integrated and automated system. This project is being implemented on a step-by-step basis since 2011.

The strategy for the Bundesbank's new External Sector Statistics (ESS) system

In order to cope with changing international reporting requirements and to develop a harmonised IT infrastructure, an integrated and modular software system was implemented. It comprises the following functionalities:



The chosen modules allow standard software components to be used that are highly customisable and able to accommodate future requirements. This reflects the Division's policy to reduce the in-house IT development of single-purpose IT solutions. It is also intended to be the nucleus of a streamlined statistical work process that exploits automation, thereby reducing time to publication.

By moving towards standard software – in this case with a modern, fast and robust client-server architecture – and having an MS Office (Excel) integration as a GUI, the system's primary usage for analytical and methodical work is well supported. New users have also emerged, who use the system for the Data Quality Management (DQM) process for reporting data. This extended usage is feasible since the new system provides online calculated aggregates, which can instantaneously be drilled-down to the reporting unit, thus allowing flexible analyses.

The use of standard software produced excellent results by taking advantage of user-friendly GUIs that are well established on the market. An intuitive GUI proved to be an ongoing success factor in reducing user training efforts, maximizing the user experience and creating momentum to move from previous DQM approaches with other less integrated and flexible systems towards this new setup.

With the possibility to slice-and-dice in a cube-like body of information, users are able to dive into smaller parts of data or to examine it from different viewpoints. This increases the understanding of the data and enables compilers to receive new information. The greater flexibility also increases the capability to respond to new information needs, such as versioning the data to reproduce previous publication versions for DQM purposes.

Drill down example in SALZA

Drill down from an highly aggregated data level to related reporters and report items

- Other reporting options are likewise available (e.g. branches of the reporters)

Joachim Hösch, S 21-5
May 9, 2018
Seite 9

Berichtsalter	SALZA-REV	Statistikträger / IS	Stab	Ausgaben	Einnahmen
JAN 2014	ZKA34670	ausländische Emissionszertifikate	00002282	170	2.598.835
			00004488	40	40
			00007684	1.462	1.462
			00009811	26.118	26.118
			00011463	43.389	43.389
			00019862	37.211	37.211
			00022278	1.625	1.625
			00017811	24	24
			00012384	30	30
			00001126	229.846	229.846
			00004465	288.044	288.044
			00009123	1.094	1.094
			00146873	22	22
			00146883	47.792	47.792
			00115489	88.541	88.541
			00173723	2917	2917
			00043688	45	45
			00000000	6031	6031
			00002195	50	50
			00181227	5031	5031
			00110162	50	50

Apart from the reporting flexibility, the SALZA project focuses on implementing system-integrated trend and estimation procedures, which means that it automates publication preparatory work and primary and secondary cell suppression as well. Since its implementation, SALZA has become the basis for SDMX (Statistical Data and Metadata eXchange) time series creation and for national and international publication commitments.

Report processing and External Communication approach

As a counterpart to SALZA, the planned report processing system SIMBA will provide an integrated platform and front-end system for report processing for all external statistics' micro data. This will be a major improvement as various processing programs and databases are currently in use for the various ESS.

Apart from centralisation into a single database and a single front-end system, the current manual processing of each reporting line will change in favour of a system-supported data validation process by means of automated plausibility checks. Thus, staff can concentrate on invalid and implausible reports detected by the system using a dashboard approach.

Such dashboard web UIs are a well-known standard for tracking and monitoring transactional data – in this case reports – in real time. Its primary metric will consist of a simple traffic light system, which visualises reports that need correction (marked in red), followed by reports that may need correction or are valid statistical outliers (marked in yellow), and finally flawless and plausible reports that need no attention at all (marked in green). This will save time due to a reduced overall number of reports needing attention and increase the efficiency and productivity of human resources thanks to automation.

The screenshot shows the SIMBA Dashboard interface. At the top, there are filters for 'Anzeigevариante', 'Klassifizierung', 'Zeitraum' (09 / 2016), 'Meldenummer', 'Branche', 'ISIN', 'Sektor', 'Plausi', 'Fehlerkat.', 'Transaktionen', 'Bestände Z5', and 'Bestände K3/K4'. On the right, there are buttons for 'Hinzufügen', 'Speichern', and 'Anzeigen'. Below the filters is a table with the following columns: Meldenummer, Meldepflichtiger, Branche, Transaktionen, Z10, Bestände Z5, and Bestände K3/K4. The table contains 20 rows of data, each representing a different company and its reporting status. The status is indicated by the color of the cells: green for good, yellow for caution, and red for error.

Meldenummer	Meldepflichtiger	Branche	Transaktionen	Z10	Bestände Z5	Bestände K3/K4
00002382	Süddeutsche Versicherung AG	6510	203 (12)	18 (3)	5	56
00005468	SIMBA IT-Solutions GmbH	1300	101 (17)	13 (1)	4	3 (1)
00007654	Reiser KGaA	1200	112 (8)	26 (2)	4	1 (1)
00009811	Metzger GmbH & Co. KG	1000	516	14	3	2
00015463	Cyberdyne Productions SE	2800	1119	11	7	1
00018467	Kinvara Sportsinnovation AG	1400	836	2	2	32
00022239	Bankhaus Sonnenborn - Hot Assets KG	6419	967	8	21	2
00024682	Seitenschmelzer Kosmetik KG	2000	407	7	12	1
00031871	Böllstoff Brauerei GmbH	1100	122	3	13	
00052384	Fiedel Instrumentenbau GmbH	1600	28	1	6	
00063125	Weingut Schluckspecht KG	0100	79			
00084665	Kaventsmann Schifffahrts GmbH	5000	132	3	8	54
00091123	Schorf Optik GmbH & Co. KG	2675	101		13	3
00146233	Hartenberger Verkehrs GmbH	8480	56	4		
00198883	Enrod & Sturz KGaA	3090	12	4		
00245682	Kaiserwetter Technologie AG	2700	241	11	17	16
0025491	Charlie-Bravo International SE	3030	1184	15		51
00373323	Salto Martale e.V.	9310	16		16	36
00442468	Gemeinnützige Wohnungsbau GmbH	6801	5			

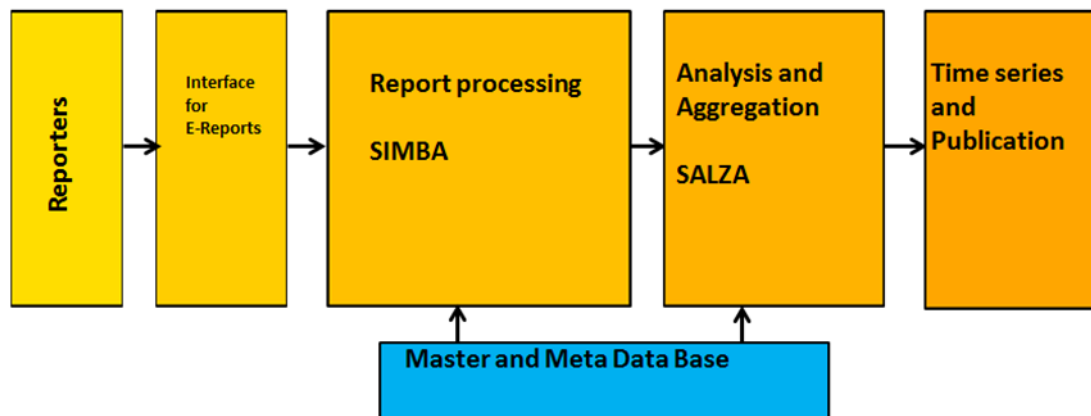
To allow full control of the DQM process, the first step needs to be to build a plausibility – engine-like – technical infrastructure. This is to be followed in a second step by a GUI offering intuitive technology for super users. The GUI should ideally allow technologically affine statisticians to maintain plausibility checks in natural language – irrespective of IT support.

Additional features are planned for the future which allow secure communication with the reporting units and send out reminders regarding missing reports. A further automation of plausibility checks is also envisaged, which will result in the auto-correction of data, ideally using a machine learning approach.

Target structure

The projects SALZA and SIMBA implement the desired target structure from the first submission of a report all the way through to the final publication of the data. The new IT infrastructure guarantees a fully digitalised process for the automated processing, integration and analysis of quality assured primary and secondary statistical data, complemented by an online publication of the data with a user option for customised data requests.

Target structure of the ES IT system



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Changes in the IT landscape of the Deutsche Bundesbank's external sector statistics¹

Joachim Hösch and Jens Walter,

Deutsche Bundesbank

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Changes in the IT landscape for External Sector Statistics of the Deutsche Bundesbank

Background

- Since the 70s, rapid increase of self-contained technical applications and data bases which exist side-by-side
- These isolated solutions made an integrated view on the data difficult (e.g. transactions & stocks)
- Furthermore, the multitude of industry standards (like IMS, DB2, MS & Oracle for DBs) complicated the daily work and led to ..
- **Growing technical backlog**, e.g. lack of documentation, maintenance intensive systems, declining number of staff members knowing to work with the old systems etc.



need for replacement and redesign

Strategy for the Bundesbank's "new" External sector (ES) IT-system

- Development of an integrated, modular software system for:
 - Master and Meta Data
 - Analysis
 - Report Processing and
 - Communication

- In order to create a harmonized IT infrastructure that:
 - Allows integrated analyses for transactions & stocks
 - Streamlines statistical work processes and increases automation
 - Reduces Time-to-Publication
 - Leverages emerging technologies by using industry standards

- The new ES IT-system has been developed in various sub-steps

Starting point: Centralized Master and Meta data base

- In 2011, we started with the development of a centralized master and meta data base with following key features:
 - Harmonization of all reporter master data into one single reference data set (golden copy)
 - Keeping master data and meta data in same data base
 - Centralization of data updates (and creation) through a workflow process by dedicated staff
 - Creation of an interface to allow other applications online access to the master data
 - Full data historization
 - Not only keeping track of changes, but being able to analyze which information was valid at each point-in-time.
 - Existing data must not be deleted (also not in case of reporter liquidation) or overwritten (also not in case of reporter mergers & acquisitions), but new rows can be created in the data base for changes of existing data.

Starting point: Centralized Master and Meta data base

Example: Master Data view

Kontakt |

DEUTSCHE
BUNDESBANK

AWMuS Anwendung - AWDV Meta- und Stammdaten 02.00.0076 ::: PRODUKTIONSUMGEBUNG :::

AWMuS

Metadaten

Daten

Kombinationen

Wissensstand Check

Stammdaten

Suche Inland

Suche Ausland

Gesamtsuche

Neuanlage

Workflow

Aufträge

Archiv

Infocenter

Metadaten

Stammdaten

Betriebsstatistik

Benutzerdaten

Benutzerdaten anzeigen

System

Stammdatenkonfigurati

TransferCheck AWW-Web

Transfer Salza

Stammdaten - Inländer (ohne privatw. Hh)

Meldenummer: 00777771 -> i

Name *: TESTKUNDE HV MAINZ

Sitz (juristischer Sitz) *: Mainz

Branche NACE Rev. 2 *: 8200 - Erbringung v. ¹ Verweisfeld

Auftragsmodus Gesamtgültigkeit ändern Stammdaten PDF zurück

Allgemein Z4 Z5/5a/5b Z8 Z10 Z11 Z12/13 Z14/15 K3/4 AUSNA Fremdschlüssel Dritteinreicher M&A Meldestellen Kontakte

Postleitzahl *: 55122

Straße: Hegelstr.

Hausnummer: 65

Postfach:

HReg / Ort: Mainz - 55116/55001

HReg / Art:

HReg / Nr.:

Rechtsform *: 3 - Sonstige rechtlich

Branche NACE Rev. 1 *: 7480 - Erbr. sonst.

Bundesland *: 31 - Rheinland-Pfalz

Notizfeld (allgemein): SV von Frankfurt 12/03

Klassifizierung:

Klassifizierung K3:

Klassifizierung K4:

Internet:

Tel. (allgemein): 06131 377-0

Fax (allgemein): 06131 377-0

E-Mail: (allgemein):

AMS: 1 - Ja

AMS-Extranet: 1 - Ja

Land (AMI):

Wirtschaftszweig (AMI):

ZBB-Extranet: - Nein

ZBU-Extranet: - Nein

ehem. Meldenummer:

UCI-Nummer:

Insolvenz/Liquidation: - Nein

Z4 Abgabe an R 14: - Nein

Branchenbeschr. AMS:

AW-Prüfungen:

Aliasname:

Sektor ESA2010 *: S.14 - Private

UCI - Land:

Zweckgesellschaften:

Bilanzierung nach:

SPE:

Jens Walter, Joachim Hösch
6/21/2018
Slide 5

Approach for Analysis

Previous system ZABDB	New system SALZA
Mainframe based	SAP BI-Server based
No micro data	Aggregated micro data per reporting unit
No GUI (Graphical User Interface)	MS Excel GUI (BEx-Analyzer) and Web Browser GUI (SAP Front End)
Performance limit reached with the changeover to BPM6	Broad OLAP/ BI functionality
No real OLAP/ BI functionality	Real-time data (updates on a daily basis)
	Versioning of data (stand-alone snapshots)
	Broad and flexible methods of analysis
	Drill down capability to the reporter
	Primary and secondary cell suppression (protection of confidentiality)

Old ZABDB

vs.

New SALZA

ZA03 Zeit: 10:11:32 Datum: 12/09/17 Anwender: S2504JM
 Anzeigen von Bausteinen und Aggregaten Blättern: ...
 TERMIN S 201201 - 201212 SAPO A IAX0551 LAND . LLL - ... BRANCHE
 (oder BEREICH ERG.ART) BRA2

Zeile	TERMIN	SAPO	LAND	BRA	BRA2	BETRAG in Tsd
1	2012 J	1301900	LLL			805.622 EUR
2	2012 J	1302900	LLL			2.430.782 EUR
3	2012 J	3102270	LLL			-1.084.612 EUR
4	2012 J	3108030	LLL			808.871 EUR
5	2012 J	3108070	LLL			532.032 EUR
6	2012 J	3108090	LLL			-2.432 EUR
7	2012 J	3302270	LLL			3.449.409 EUR
8	2012 J	8101070	LLL			1.743.377 EUR
9	2012 J	8101080	LLL			131.802 EUR
10	2012 J	8101081	LLL			3.600.475 EUR

ZA02 0: TERMIN: 201212 MASKE: 901 LAN: LLL BRA: BRA2: S2504JM1
 Wichtige Posten der Zahlungsbilanz (fob/fob; Ursprungslandkonzept)

Land: Alle Länder Stand: 12.09.2017
 Branche: Zeit: Dezember 2012

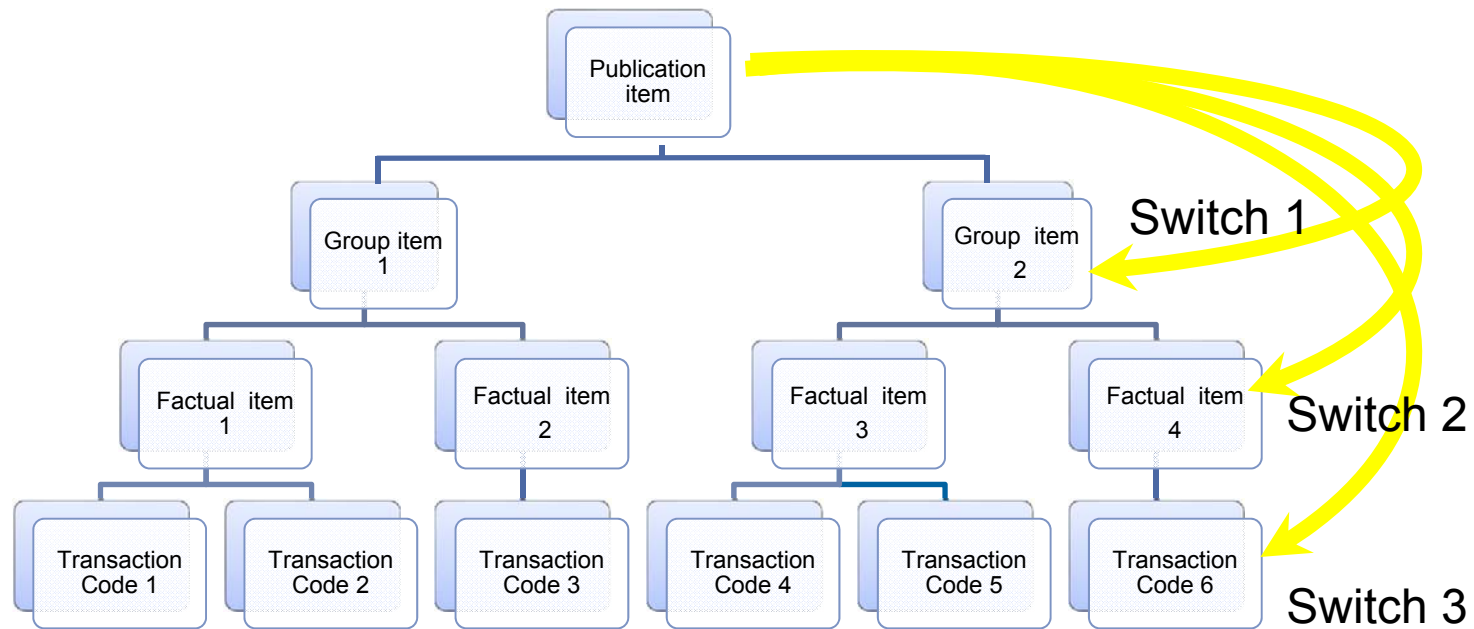
in Mio Euro	Einnahmen	Ausgaben	Saldo
Leistungsbilanz	123.611	103.203	20.408
Warenhandel (fob/fob)	76.618	64.778	11.840
Außenhandel (fob/cif)	78.217	65.992	12.225
Ergänzungen, Transit, und NWG	- 1.599	- 1.214	- 386
Ergänzungen (ohne Transit, und NWG)	- 3.229	- 1.730	- 1.499
Unsichtbare Leistungstransaktionen	46.993	38.425	8.568
Dienstleistungen	20.944	18.738	2.206
dar. Transportleistungen	3.348	4.181	- 832
dar. Reiseverkehr	2.371	2.694	- 323
dar. Geistiges Eigentum (ab 2013)	1.140	497	643
dar. EDV- und Informationsdienstl.	2.873	1.651	1.223
dar. Sonst. unternehmensb. Dienstl.	1.423	1.112	311
dar. Forschung & Entwicklung	7.491	7.712	- 222
Primäreinkommen	22.116	10.468	11.648
Sekundäreinkommen	3.933	9.219	- 5.286

ZUGRIFF PER AGGREGATS-TABELLE

Table		Berichtsjahr	2017			
		Versionsstatus	Veröffentlicht			
		Datenversion	DKAP	DM	ZUP	Ergebnis
			Transaktion DMEUR	Transaktion DMEUR	Transaktion DMEUR	Transaktion DMEUR
Bestandsart	SALZA-KEY		* 1.000.000 EUR	* 1.000.000 EUR	* 1.000.000 EUR	* 1.000.000 EUR
Einnahmen	DL, Ein	ZSGDXUE51	215.035	3.250	54.574	272.860
	DL, Fertigungs-DL, an Werkstoffen anderer Eigentümer	ZSGDHUE11	6.224			6.224
	DL, Instandhaltung u Reparatur, Ein	ZSGDXUE11	8.336			8.336
	DL, TrL, Ein	ZSGDXUE41	51.571	3.250		54.821
	DL, Reiseverk, Ein	ZSGDXUE21			35.251	35.251
	DL, Bauleist, Ein	ZSGDXUE11	1.829			1.829
	DL, Vers. u Altersvorsorge, Ein	ZSGDVUE21	1.736		8.288	10.024
	DL, FinanzDL, Ein	ZSGDFUE21	13.314		7.804	21.118
	DL, Gebü f Nutz geist. Eigent.	ZSGDXUE41	17.795			17.795
	DL, Telekom, EDV u Inform, Ein	ZSGDXUE31	33.035			33.035
	DL, sonst unt bez DL, Ein	ZSGDXUE31	77.855			77.855
	DL, DL f pers. Zwecke, Kultur u Freizeit, Ein	ZSGDPXUE21	2.917			2.917
	DL, Reg. waren u -leist, Ein	ZSGDGXUE21	423		3.231	3.654
Ausgaben	DL, Aus	ZSGDXUA51	181.275	26.956	80.744	288.975
	DL, FertigungsDL, an Werkstoffen anderer Eigentümer	ZSGDHUA11	5.320			5.320
	DL, Instandhaltung u Reparatur, Aus	ZSGDXUA11	9.074			9.074
	DL, TrL, Au					
	DL, Reise					
	DL, Bauleis					
	DL, Vers. u					
	DL, Finanz					
	DL, Geb. fr					
	DL, Telekom					
	DL, sonst u					
	DL, DL f pe					
	DL, Reg. we					
Saldo	DL, Saldo					
	DL, Instand					
	DL, TrL, Sa					
	DL, Reisev					
	DL, Bauleis					
	DL, Vers. u					
	DL, Finanz					
	DL, Geb. fr					
	DL, Telekom, EDV u Inform, Saldo	ZSGDXUS31	3.449			3.449
	DL, sonst unt bez DL, Saldo	ZSGDXUS31	-1.681			-1.681
	DL, DL f pers. Zwecke, Kultur u Freizeit, Saldo	ZSGDPXUS21	1.213			1.213
	DL, Reg. waren u -leist, Saldo	ZSGDGXUS21	-1.139		3.231	2.092

Table			Einnahmen	Ausgaben	Saldo
		Versionsstatus	Veröffentlicht	Veröffentlicht	Veröffentlicht
		Datenversion	* 1.000 EUR	* 1.000	* 1.000
	SALZA-KEY				
	ZSA1105720	DL, Telekom.-, EDV- u Inform.-DL, Nachrichten- u Inform	93.856		
	ZSA1105730	DL, Telekom.-, EDV- u Inform.-DL, sonst. EDV-DL, Ein	16.213.154		
	ZSA1105740	DL, Telekom.-, EDV- u Inform.-DL, Speicherung v Inform.	1.294.500		
	ZSA1105760	DL, Telekom.-, EDV- u Inform.-DL, KommunikationsDL, Ein	3.643.188		
	ZSA1106130	DL, Telekom.-, EDV- u Inform.-DL, Nutz. v Computer-SW, Ein	11.576.845		
	ZSA1106330	DL, Telekom.-, EDV- u Inform.-DL, Kauf/Verkauf v	213.836		
	Gesamtergebnis		33.035.379		

Drill down capability of SALZA



- Switch (1) to previous position
- Switch (2) to the factual item level
- Switch (3) to the reporter level (with transaction codes)

Drill down example in SALZA

41	4.533.796,7	3.856.114,3	3.057.280,5	3.267.510,0	3.269.886,0	3.490.998,0	3.3
90	1.009,0		632,0				
XXX	2.725.969,0	1.374.602,0	1.168.574,0	232.850,0	239.533,0	366.782,0	
11	1.70						
31	1.02			232.850,0	239.533,0	366.782,0	
41	10.77			5.304.097,0	5.417.364,0	5.147.486,0	4.7
90							
XXX	1.03						
11	1.03						
50							
70							
41	-5.29			-1.988.746,0	-2.064.076,0	-1.588.913,0	-1.3
XXX	1.56						
41	4.30			232.850,0	239.533,0	366.782,0	
90				3.057.312,0	3.019.823,0	3.246.740,0	3.1
XXX	2.48						
11	1.472.079,0	617.227,0	619.87				
31	1.016.681,0	469.361,0	387.84				
41	9.556.556,3	15.714.005,1	13.005.15				4.4
90	8.348,0	6.801,0	9.38				
XXX	920.744,0	653.178,0	551.21				
11	920.744,0	653.178,0	551.21				
70	0,0		1.10				
41	-279.328,6	-202.317,6	-204.35				
XXX	121.827,0	193.353,0	48.58				
41	233.220,9	233.649,5	261.79				
90	55,0	29,0	3				
XXX	237.209,0	288.014,0	160.857,0				

- Drill down from an highly aggregated data level to related reporters and reporting items

- Other reporting options are likewise available (e.g. branches of the reporters)

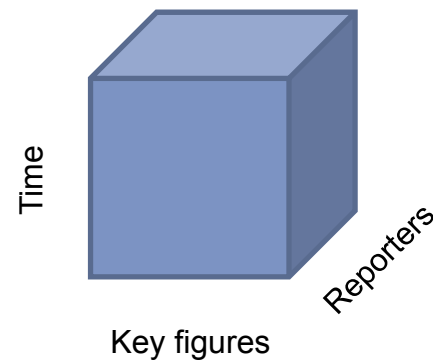
Berichtsmonat	SALZA-KEY	Meldepflichtiger /S	Saldo * 1.000	Ausgaben * 1.000	Einnahmen * 1.000 EUR
Gesamtergebnis					2.500.835
JAN 2014	ZKA34670	ausländische Emissionszertifikate			170
					40
					1.462
					26.116
					43.360
					37.311
	ZKA35070	inländische Emissionszertifikate			1.625
					24
					63
					20
					727.958
					258.055
					22
					1.090
					31
					67.292
					55.041
					257
	ZKA16170	Nutzung von snst.n Rechten			0
					50
					853
					26

SALZA's achievements

- SALZA creates SDMX time series for national and international publication commitments
- SALZA merges the publication process within a single application
- SALZA makes swift replies to external and internal inquiries possible
- Flexible data analyses
- Standardized reports with MS Excel GUI (first quality check)
- Integrated trend and estimation procedures
- Source and decomposition information for aggregated data
- Slicing and dicing from aggregated data to reporter

Excursus: Slicing and dicing (the OLAP cube and Business Intelligence)

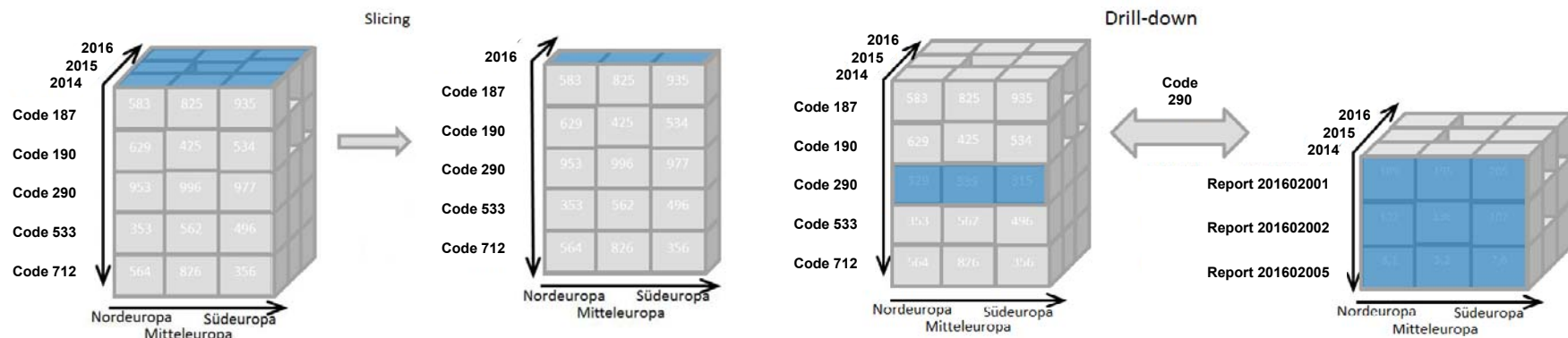
- Online analytical processing (OLAP) enables users to analyze multidimensional data interactively from multiple perspectives
- An OLAP cube refers to an multi-dimensional dataset, not limited to three dimensions technically but often visualized three-dimensional.



- Business intelligence (BI) encompasses a multitude of strategies and technologies for data analysis. OLAP is the technique used for our BI-system

Excursus: The OLAP cube offers three analytical operations

1. Slicing – Creation of a sub cube with one dimension less than before
2. Dicing – Creation of a sub cube with limited values but same dimensions
3. Drill Down and Drill Up – Navigation along the data levels, i.e. from most aggregated (up) to most detailed (down)



New approach for processing survey reports - SIMBA

Current Report Processing	Future Report Processing using the new system SIMBA
In general, manual processing of each reporting line	Focusing on invalid and implausible reports using a dashboard approach
Data validation by staff	Data validation by system (automated plausibility checks)
Various processing programs and data bases per section	Integrated platform and frontend for report processing for all external statistics micro data
Division of labour per reporting form	Focus on all external economic activities of a reporter instead of single reporting forms
	Dynamic crosstab analyses for transactions & stocks
	Plausibility editor to allow power users adding or modifying plausibility checks independent from support of the IT staff
	One face to the reporter – only one Bundesbank employee responsible for one reporting unit

Planned SIMBA dashboard for report processing

Anzeigevariante

Klassifizierung

Zeitraum:

09 / 2016

/

Meldenummer:

Branche:

ISIN:

Z5a 1 // Pos: 62, 65

Zeitraum: 12/2013 - 12/2014

×

Z5a 2 // Pos: 84

Zeitraum: 12/2013 - 12/2014

×

Z4 KV // KZA: 262, 289, 789 // BA: 4

Zeitraum: 12/2013 - 12/2014

×

K4 // Pos: 37, 38

Zeitraum: 12/2013

×

Hinzufügen

Speichern

Anzeigen

Meldenummer	Meldepflichtiger	Branche	Transaktionen			Z10			Bestände Z5			Bestände K3/K4		
00002382	Süddeutsche Versicherung AG	6510	203 (12)	18 (3)	5	56	6	2	12	3		25	3	
00005468	SIMBA IT-Solutions GmbH	1300	901 (17)	13 (1)	4				3 (1)	1 (1)		3	1	
00007654	Reiser KGaA	1200	112	26	4									
00009811	Mettigel GmbH & Co. KG	1000	516	14	3	2			9	2				
00015463	Cyberdyne Productions SE	2800	1119 / 23	11 / 2		7 / 1		1	32 / 4	1	1	16 / 2	2 / 1	1
00018467	Kinvara Sportsinnovation AG	1400	836 / 14	2 / 1	2				42 / 6	3 / 3				
00022239	Bankhaus Sonneborn - Hot Assets KG	6419	967	8		21	2		27	4	2	21	4	
00024687	Seitenscheitel Kosmetik KG	2000	407	7					12		1			
00031871	Bölkstoff Brauerei GmbH	1100	122	3					13					
00052384	Fiedel Instrumentenbau GmbH	1600	28	1					6					
00063125	Weingut Schluckspecht KG	0100	79											
00084665	Kaventsmann Schifffahrts GmbH	5000	132	3		8			54	6				
00099123	Scharf Optik GmbH & Co. KG	2675	101			13	3	1						
00146233	Hartenberger Verkehrs GmbH	8480	56	4										
00198883	Einrad & Sturz KGaA	3090	12		4									
00245682	Kaiserwetter Technologie AG	2700	241	11		17			16	2				
00315489	Charlie-Bravo International SE	3030	1184	15					51			36		
00373323	Salto Mortale e.V.	9310	16			16								
00442468	Gemeinnützige Wohnungsbau GmbH	6801	5											

Jens Walter, Joachim Hösch

6/21/2018

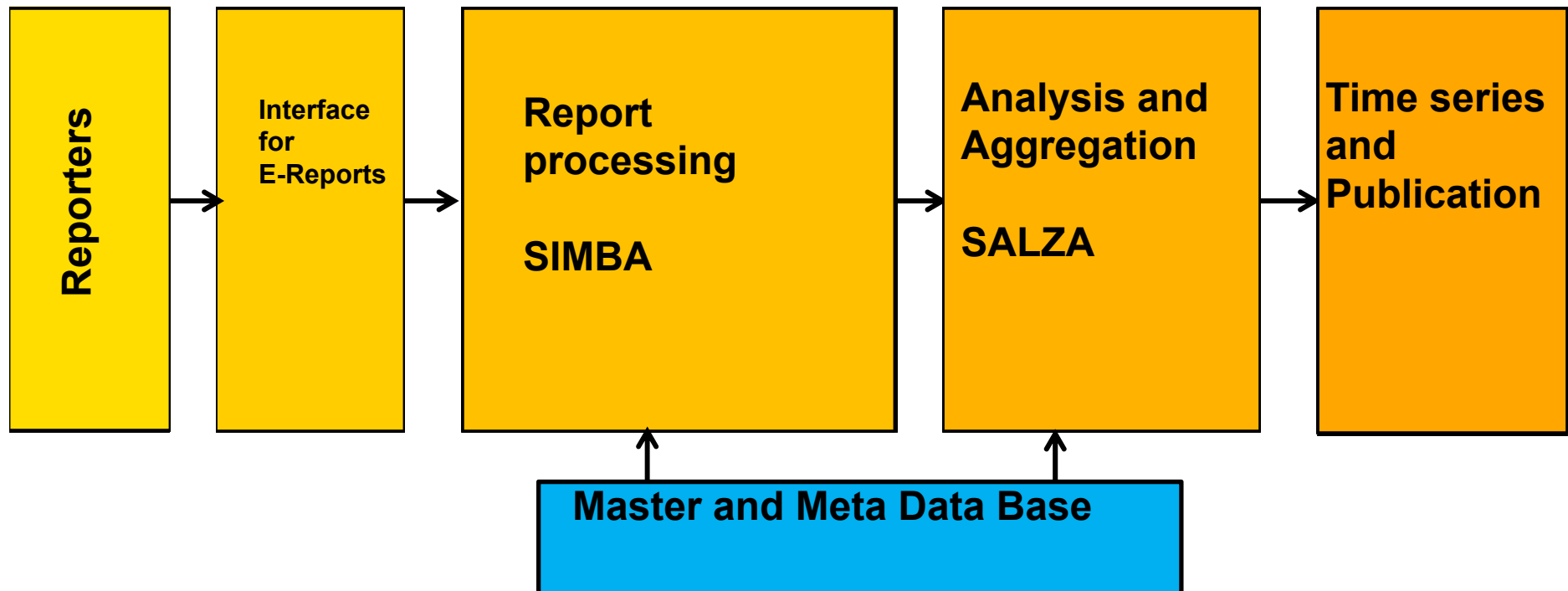
Slide 14

SIMBA approach and objectives

- Integrated platform and frontend for all BOP micro data
- Improve data consistency and therefore quality by a holistic view of a reporting unit
- Crosstab checks and analyses for transactions & stocks
- Process automation
 - System-supported plausibility checks
 - At a future stage, auto-correction functionality ideally with machine learned data
- Not only a new IT system, but process improvement by implementing traffic lights:
 - Intuitive status visualisation of a report
 - Automated work-in-process (WIP) overviews
 - Automatic processing of flawless and plausible reports
- Future extension of the base system to allow secure communication with reporters and a reminder mechanism for missing reports



Summary: ... and where we want to be.



.. a fully digitized process for the automated processing, integration and analysis of quality-assured primary and secondary statistical data. Online publication of the data supply with the users' option for customized data requests.



Thank you for your attention!

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6/21/2018

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IFC - Central Bank of Armenia Workshop on *"External Sector Statistics"*

Dilijan, Armenia, 11-12 June 2018

Estimation of financial intermediation services indirectly measured in Armenia's external accounts¹

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¹ This paper 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.

Estimation of Financial intermediation services indirectly measured in Armenia's external accounts

Anush Davtyan

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The accurate calculation of Financial intermediation services indirectly measured (FISIM) became a challenging issue during the last decade both for National accounts and the Balance of payments statistics. The estimation of FISIM export by the resident financial institutions of Armenia is regarded as an essential issue, which will both improve the external sector statistics coverage and contribute to the GDP calculation enhancement. The SNA 2008 revision as well as the BPM6 Manual clarified the measurements standards, as well as reviewed the sources and methods of relevant data collection. Despite details provided for both the reference rate selection, and the calculation methods applicable, there still remain a lot of issues with availability of the data required (mainly during FISIM import calculation), the treatment of credit organizations and international financial organizations, the use of appropriate reference rate based on analysis of financial environment in Armenia. Being a small highly dollarized economy makes Armenian interest rate formation subject not only to open market relations but also to other factors difficult to quantify. To address the issues different approaches were used and compared to derive the proper reference rate, with the discussion of strength and weaknesses of each method. As a result, the Central bank of Armenia calculated the export of FISIM to incorporate it into the Balance of payments data. At the same time, further steps are initiated, through introducing a new reporting form, to collect data necessary for calculations of FISIM import by non-financial organizations and ensure consistency with National accounts.

Keywords: Financial intermediation services indirectly measured, FISIM, reference rate, loans and deposits, FISIM export, FISIM import

JEL classification: C81, C82, G21, F39, F65

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Introduction

Nowadays it is very difficult to imagine a market economy without financial intermediation. Moreover, it can be argued that the effectiveness and level of development of any modern economy depends largely on the development level of financial intermediation. Recently, many economists have concluded that “finances have an impact”. This expression means that the level of financial intermediation and level of financial services development are very important for the country's welfare and economic growth. For this reason, researchers are increasingly paying more attention to financial intermediation issues, involving the estimation of financial services, both explicitly and implicitly charged.

The accurate estimation of financial intermediation services indirectly measured (FISIM) became a challenging issue during the last decade both for National accounts and the Balance of payments statistics. The estimation of FISIM export and import by the resident sectors of Armenia is regarded as an important issue, which will both improve the external sector statistics coverage and contribute to the GDP calculation enhancement. The SNA 2008 revision as well as the BPM6 Manual clarified the measurements standards, as well as reviewed the sources and methods of relevant data collection.

Despite details provided in different manuals and research papers about the reference rate selection and the calculation methods applicable, there still remain a lot of questionable issues with data limitations (mainly during FISIM import calculation), the treatment of credit organizations and international financial organizations. The fact that Armenia is a small highly dollarized economy makes interest rate formation subject not only to market relations but also to other factors difficult to quantify. Thus the selection of appropriate reference rate, among other things, should be based on analysis of financial environment in Armenia.

The main objective of this working paper is to develop the internationally accepted approaches and localization of the methodology, taking into account the main features of the Armenian economy, the development of the FISIM estimation methodology for Armenia, as well as discovering the weak points of the calculations and proposing solutions for future development.

The Central bank of Armenia is responsible for external accounts statistics compilation, so this paper is focused solely on FISIM export and import estimation and provides methodological approach for measuring FISIM export and import in Armenia. For that, I used and compared different approaches to derive the proper reference rate, with the discussion of strength and weaknesses of each method. As a result, I calculated the export of FISIM to incorporate it into the Balance of payments data. A special importance was given to the analysis of available data sources, data limitations and existing problems with data series.

The final part of the paper discusses the steps initiated for FISIM import calculation. The data is still not complete and further development and improvement of the methodology is in progress.

Financial Intermediation Services and the Concept of Reference Rate

Financial Intermediation Services

The well-known theory of financial intermediation proposed by Garry and Shaw (1955) is one of the best examples of the role of the financial system. According to this theory, banks are mediators between economic units that have a surplus of financial resources and those needing them.

Banks collect the savings in the form of deposits and provide them to different borrowers whose own funds are insufficient to meet their needs. In the course of this process, banks are transforming the characteristics of financial assets primarily with regard to the amounts, timing and appropriate risks of these instruments. Thus, unlike the case of direct funding, banks exist as financial mediators and producers of financial services. While implementing the role of producers banks increase the value of financial capital, as they create the opportunity to use the funds more efficiently. This becomes possible by solving the issue of asymmetric information about available investment projects between lenders and borrowers. Possession of this information creates the need for financial services provision.

Considering financial intermediation services as a production activity implies that someone should consume these services. As with all other services, financial services can be used for intermediate consumption, final consumption or export. Financial organizations, in addition to intermediation services, also provide a variety of so-called support services for which they charge a separate fee. This part is called explicit charge. Production and consumption of such secondary services can be valued as in case of other services through paid commissions and fees. However, financial services cannot be fully evaluated in this way as the financial intermediaries also charge indirectly the lenders and receivers with the difference between interest received and interest rates paid on them. They pay lower interest rates to those entities who lend their money and charge higher interest rates from those who borrow from them. The major challenge facing statisticians in this area is the partitioning of the relevant interest flows to derive a service component. The purpose of this partitioning of interest is to make the service item explicit and attributable to the economic agent using the service, so categorizing the interest flows in order to reflect the service (FISIM) and property income (so called SNA rate) components separately.

According to existing methodology export of FISIM is the amount of indirectly measured financial services provided on the loan assets and deposit liabilities by resident financial institutions for which the counterparty is non-resident non-financial unit. At the same time, import of FISIM is the sum of indirectly measured financial services purchased by resident non-financial units on their loan liabilities and deposit assets from non-resident financial corporations. Indirect service charge is imputed in respect of all loans and deposits offered by a financial institution irrespective of the source of the funds and does not imputed in respect of securities by convention within the international measurement standards.

In line with SNA 2008 and BPM6 Manual only by certain financial intermediaries produce FISIM, that is deposit-taking corporations except the central bank and other financial intermediaries, except insurance corporations and pension funds. I should also stress that FISIM is estimated in respect of non-bank user institutional sectors only, and no interbank FISIM has to be calculated, as well as it is not generated by central banks.

Reference Rate

The evaluation of financial intermediation services indirectly measured cannot be done directly, so an indirect method should be applied. The methodology proposes to use a so called "basic rate" or "reference rate" which is a risk free rate. A reference rate of interest is the rate at which both the lender and borrower would be happy to strike a deal. So, the services of financial intermediation are indirectly bought from financial institutions by lenders through receiving lower interest payments for deposited funds and by borrowers through paying higher interest for loans than in case the service was charged for directly. The difference between interest calculated at the reference rate and interest actually paid to depositors and charged from borrowers is a financial intermediation service charge indirectly measured (FISIM). Total FISIM is the sum of the implicit fees paid by the borrower and the lender.

From the discussion above, it is obvious that for FISIM calculations the selection of appropriate reference rate is essential. It should fully reflect the conditions of the financial market, the risk premium has to be eliminated and it should contain no intermediation service element. In the past decade a lot of academics and statistical institutions referred to the choice of reference rate, particularly focusing attention at the term premium eliminations, credit default risk and currency structure of balances.

For instance, a FISIM Task Force was set up in the European Union (EU) to consider and test a number of methods of reference rate calculation. As a result the methodology was approved, which specified the selection of two reference rates, to be used by countries to allocate FISIM on domestic loans and deposits (the internal reference rate) and on imports and exports (the external reference rate), without distinction by type and maturity of the instrument. Both rates would represent the average (interbank) interest rate, reflecting the domestic lending activity among financial intermediaries and the lending activities between resident and non-resident financial intermediaries respectively.

UK Office for National Statistics adopted the same approach and changed the methodology of internal reference rate calculation to using interbank loans average rates in 2014. As for external reference rate estimation, the interbank rate approach was denied by the UK statisticians for the reason of being unrealistically low, thus getting negative results for deposit FISIM of non-resident non-bank sectors. The reason was that being major financial centre led to using interbank lending and borrowing just for liquidity issues regulations, and did not truly reflect the pure cost of funding for banks.

There are countries which further developed this methodology, for example, estimating separate reference rates for each type of instrument (loans and deposits), or distinguishing between short and long-term operations. There are also options tested for estimating the reference rate as a weighted average of relevant EURIBOR and swap rates. The use of government bond yield as a risk free reference rate approximation was also proposed in international methodology.

Further in this paper, I will show three options for external reference rate estimation and the final combined version. The diversification by currency of stock denomination was performed. The research of data for Armenia showed that it is not rational to separate data by maturity of stocks, as this almost did not influence the value of reference rate. At the same time, in one of the options tested, I attempted to account for country risk premium.

The main features of Armenian economy influencing reference rate

The level of financial market development in Armenia, and factors influencing country risk indicators and the mechanism of interest rate formation in the financial system all influence the formation of the reference rate. In its turn, the choice of appropriate reference rate will lead to accurate estimation of FISIM export and import data.

One of the important features of Armenia's economy is the high rate of dollarization. Since early 90s until the mid-2000s, the main currency for savings, for real estate market transactions and the payment currency for durable goods was US dollar. Since the adoption of law on "Foreign exchange regulation and control" in 2004 the comparative ratio of foreign exchange started to decrease, but still, on average from 2010 to 2017 the share of foreign currency denominated liabilities of financial system was 68%. It means that in the process of FISIM export and import calculations the role of foreign currency is quite significant and it justifies the estimation of reference rates by different currencies in this research.

The next characteristic of financial relationships between commercial banks and their clients is the potential influence by direct investors to the formation of the banking rate. I should mention that there is

historically big share of direct investment in banking system of Armenia with average rate of commercial banks with direct investment for 2017 of 60%, which potentially may influence the borrowing/lending rate formation mechanism between affiliated institutions because of strong economic links. Thus, the deposit or loan from a related party can contain non-market elements, which will change the overall picture of the interest rates in economy.

Analyses of available data sources

The main constraint in performing calculations is always the accessibility of trustful and comprehensive data. The data should be both quite detailed and should cover the specific needs of calculation methodology. The other problem is the length of data series, which is obvious issue for developing economies whose statistical system is still developing and new reporting sources are still being introduced and used.

Using different data sources can give on the one hand a more comprehensive picture of the economic reality making available the analyses from different points of view, but on the other hand, the attempts to compare data available from different sources can make your life more difficult.

The main data sources, which were combined in FISIM export and import estimations for Armenia, were the following:

1. Balance sheets of financial institutions

The balance sheets contain detailed information by Chart of accounts confirmed by the Central bank of Armenia for the use of financial institutions. The balance sheets also contain the breakdown by national currency and convertible foreign currencies used in the economy, which are US dollar, EURO and Russian ruble. All the accounts are broken down by residency. The balance sheets are collected from all the financial institutions and long data series are available.

2. Raw data from commercial banks

Starting from 2016 new kind of database was created in the Central bank of Armenia. It is also an administrative data source and is structured on the same principle as the balance sheets of the commercial banks based on the same Chart of accounts. The aim was to collect the most granulate data from the commercial banks to be able to generate the consolidated set of information which is needed by different users. As a result, the reporting financial institutions provided a comprehensive database, which gives the opportunity to group the data based on different attributes. The database contains detailed information on the counterparty sector, maturity, the terms of financial instruments, the future repayments schedule, stocks at the end of the reporting period, etc. The shortcoming of these data series are the unavailability of historical data before 2016.

3. Reporting form of financial institutions on the average lending/borrowing interest rates.

The data from this reporting form is broken down by currencies, maturity of loans/deposits and by type of counterparty sector. This reporting form collects information only about the new contracts arranged during the reporting period. The weighted average interest rates are compiled and published as lending/borrowing rates by the Central bank of Armenia. In published data, the breakdown available is of Armenian dram and foreign currencies. The further analyses of interest rates data by each foreign currency is not valid, because frequently new contracts and transactions denominated in a particular currency are missing in the observed period.

4. Reporting form of financial institutions on their external assets and liabilities

The statistics department has been using this administrative resource starting from 1999 as the main data source for Balance of payments and International investment position compilation for financial sector. Since then it has been modified to meet the current developments in the external statistics methodology and adapted to the needs of external accounts compilers. The reporting form contains consolidated data broken down by the financial instruments, currencies of denomination and maturity. It also contains information about the interest rates accrued for each group of financial instruments.

5. Revenue/expenditure statements of financial institutions

This administrative data source contains breakdown of revenue and expenditure accrued for the reporting period by the counterparty sector and the financial instrument. Unfortunately, the currency breakdown is not available in this reporting form.

6. Report on loan liabilities of financial institutions

Alongside with the external assets and liabilities report from the financial institutions the reporting form contains detailed data on the loans liabilities from non-resident parties. This information is provided on the loan-by-loan basis and besides the stocks and flows values, gives the details of interest rate, maturity, the country and sector of the creditor, as well as the relationship with the creditor. This gives the opportunity to compare the data on external loans and the average interest rate charged from the resident banks from different sources and make necessary adjustments.

7. Reporting form for private non-bank sector liabilities

The new reporting form was introduced by the Statistical Committee in cooperation with the Central bank of Armenia at the beginning of 2018. The aim was to collect extensive data on the liabilities of private enterprises on loan-by-loan basis. The reporting form contains information on the future payments schedule of the liabilities, the interest rates, loan terms and conditions. This data set will allow in future estimating the import of financial intermediation services by the private enterprises. I refer to this issue in more details in the chapter dedicated to Estimation of Import of FISIM.

8. BIS locational banking statistics

Bank of International settlements publishes locational statistical data on the deposit and loan liabilities of reporting countries. This data also can be used in the process of Import estimation of FISIM.

The First option for reference rate selection

I have already mentioned above that fundamental and most questionable variable in FISIM calculation is the reference rate. The selection of appropriate reference rate will influence the results of the calculations so it has to be chosen in connection with the overall economic and financial conditions in the country. The next important point in respect of reference rate selection is the availability and limitations of relevant datasets, which can definitely become a problem in small economies with short "statistical history". That is the reason that many comparable data sources were tested and the most trustful and comprehensive information was derived from the available data.

The first option, which I tested in this paper, refers to the methodology, which is extensively used by the European Union member countries. In the European Union (EU), a FISIM Task Force was set up to discuss and test a number of methods, and agreed on a methodology, which resulted into Council Regulation (EC)

No. 448/98 (the FISIM Regulation). It is based on the assumption that interbank transactions have low-risk attached and thus reflect the basis rate at which the financial agents would be happy to strike a deal.

For calculations in this case I used so called raw database of commercial banks, which include detailed information broken down by balance sheet accounts. The data was filtered by counterparty sector, which made possible the segregation of interbank transactions. Only the assets and liabilities, which reported stocks at the respective end of period, took part in calculations. After that, I calculated the weighted average interest rate for interbank positions broken down by main currencies. The rates for all outstanding amounts were used to provide the relevance of the estimated reference rates for the entire portfolio, as opposed to using only “new business” rates.

The dataset gave the opportunity to have a clear allocation of liabilities by instruments, so only deposits and loans were filtered, as well as leasing transactions. By the convention within the international measurement standards FISIM is not imputed in respect of securities, so securities data was also taken out from the interbank stocks.

The results of reference rate calculations for four major currencies are presented in the table below:

Table 1: Reference rate by Option 1

	2016				2017			
	USD	EUR	RUB	AMD	USD	EUR	RUB	AMD
Q1	6.2%	0.8%	4.5%	4.4%	6.4%	1.5%	1.7%	9.5%
Q2	6.5%	1.2%	1.4%	0.5%	6.0%	1.1%	1.9%	5.9%
Q3	5.8%	1.5%	5.8%	0.0%	5.7%	1.2%	0.9%	4.9%
Q4	6.5%	1.8%	1.1%	9.3%	5.4%	1.5%	1.3%	6.3%

The results show that reference rates for Armenian dram are quite volatile. It is due to limited transactions and stocks of interbank positions with non-resident banks denominated in Armenian dram. Thus, reference rates on Armenian drams are not representative as are based on from just few contracts. At the same time the value of FISIM generating transactions in Armenian dram are quite big in their value and represent approximately 42% on assets side and 16% on liabilities side of Armenian commercial banks. In further estimations a different method for Armenian dram reference rate was chosen.

We can notice the same high volatility in respect of Russian ruble rate, but this is not significant in respect of its impact on FISIM final export calculations, as the stocks, which take part in FISIM generation denominated in rubles, represent less than 1% of total assets and liabilities of domestic commercial banks in respect of non-resident non-financial corporations.

there are concerns in professional literature that interbank borrowing/lending rate can give a distorted picture of interest rates as it may not exactly reflect the risk and maturity structure of the deposits and loans, since the rate reflects just short-term lending and borrowing used to overcome short time liquidity issues. This statement can be true with regard to countries, which have big financial centres, but it is not the case for a small country like Armenia. For instance, in Armenia interbank borrowing with non-resident financial institutions is mainly long-term comprising in average 80% of non-resident interbank liabilities.

There are stocks of corresponding accounts of International organizations in Armenian commercial banks. It is still not quite clear whether to classify them as financial institutions and refer to their relationships with commercial banks as interbank transactions. In this case, these stocks will influence the formation of reference rates. The other option is to categorize them as non-bank to banks transactions; in that case, the

stocks should be included in FISIM generating transactions. In the framework of this working paper, I decided to classify them as non-FIs and thus I excluded these stocks were while estimating the reference rate.

The most significant shortcoming of using the raw database in Option 1, is the absence of the same dataset for previous years, because it is a new reporting format, which is collected starting from 2016. For historical data it was not possible to filter the transactions based on the counterparty sector and the rate of each transaction simultaneously.

The Second option for reference rate selection

The second option, which I checked in the process of external reference rates selection exercise were the weighted average interest rates from new deposits and loans provided of Armenian commercial banks in course of business. In this case, the interest rates from newly signed contracts are used to calculate the reference rates broken down by currencies. These are the official lending and borrowing rates, which are published by the statistics of the Central bank of Armenia on monthly basis and are used by external users as valuation of banking rates fluctuations. The breakdown by the counterparty sector and currency of contract denomination is available.

In the same way as in the previous method, these calculations are based on the nominal interest rates fixed in the contracts and not on the accrued interest to stocks ratio. The main disadvantage of this method is the possible limited number or even absence of transactions during the reporting period. This makes impossible the reference rate estimations for particular currencies, for example there might be periods when there is no new loan provided or amount deposited from non-resident client denominated in Russian ruble. For that reason, the foreign currency rates were grouped and a weighted average rate was taken in respect of all foreign currencies. For clarity, it should be mentioned that the vast majority of these transactions are denominated in US dollar.

As a result, the following reference rates were estimated for Armenian dram and foreign currency.

Table 2: Reference rate by Option 2

	2016		2017	
	Foreign currency	AMD	Foreign currency	AMD
Q1	7.2%	15.4%	6.2%	14.2%
Q2	6.8%	15.0%	5.8%	13.2%
Q3	6.7%	15.0%	5.5%	11.8%
Q4	6.4%	14.1%	5.2%	10.9%

In contrast to the first Option results, the reference rate calculated in respect of Armenian dram is quite high in this table. Spreading these results to relationships with non-residents will not explain the true business rates established in the economy. This is also proved by looking through some biggest transactions, which are bargained between Armenian commercial banks and non-resident clients, which have lower rates fixed. Further in the paper we will see that the Government bond yields better reflect the true situation with AMD rate in financial market. Relative to foreign currency estimates it we can acknowledge that they go in line with USD rates calculated in Option 1.

The Third option for reference rate selection

One of the options suggested by the international methodology and manuals for external reference rate selection is the use of official rates established in international financial markets, such as LIBOR and EURIBOR. In my case, I used LIBOR for USD, EURIBOR for EURO and Weighted Average Actual Rates in rubles for RUB. At the same time, in course of using international rates for a developing country like Armenia country risk factors should also be accounted for, as by definition the reference rate should contain no risk element. As an approximation of country risk assessment, I took the difference between Government bond (GB) yields of respective countries and Armenian Government bond. The assumption made was that the higher the difference between Armenian GB yield and, for example, the Fed Reserve's bond yield the higher is country risk for Armenia, so the higher should be the USD reference rate. To calculate the reference rate for each currency I used USA Fed Reserve's bond yields for US dollar, Germany GB's for Euro and Russian Federation GB for Russian ruble.

Based on this approach the 3rd option of external reference rate valuation was implemented and I got the following results for reference rates:

Table 3: Reference rate by Option 3

	2016				2017			
	USD	EUR	RUB	AMD	USD	EUR	RUB	AMD
Q1	6.1%	6.7%	6.4%	11.9%	4.1%	4.2%	4.0%	7.7%
Q2	5.8%	6.3%	5.9%	10.9%	4.0%	4.1%	4.5%	6.9%
Q3	5.2%	5.5%	8.8%	9.0%	4.1%	4.5%	4.5%	6.6%
Q4	4.9%	5.4%	7.5%	7.9%	4.3%	4.8%	5.5%	6.3%

As the main problem with using this method can be mentioned that the reference rate formation in small highly dollarized country like Armenia with strong links with direct investors is influenced by a lot of factors which are difficult to incorporate only to country risk concept measured by GB yields. For example, historically big share of Direct investment in banking system of Armenia (average rate of commercial banks with Direct investments for 2017 was 60%) which influences the borrowing/lending rate formation mechanism between affiliated institutions because of strong economic links and in this case it cannot be accounted for by using the estimation of country risk. Anyway, as we can see from the table, except for lower rates calculated for 2016 the remaining results for USD reference rates do not significantly differ and are somewhere around 5%- 6%. We should take into account that more than half of foreign assets and more than 70% of foreign liabilities of Armenian commercial banks are denominated in USD. Thus this is the main variable that will influence the final FISIM calculations.

Final decision- Combined Method

After putting together all the available data sources and evaluating the results, taking into account the abovementioned pros and cons of using different options, the final decision on the methodology of reference rate calculations was made. The choice is also based on data limitations and the economic logic and reasonability of the different results derived. The reference rates for foreign currencies were taken from First method that is the rates derived from interbank weighted average factual rates. At the same time, taking

into account the limited data for AMD denominated transactions in interbank market, it was decided to use the rate of government bonds in respect of Armenian dram.

Table 4: Reference rate by combined Final method

	2016				2017			
	USD	EUR	RUB	AMD	USD	EUR	RUB	AMD
Q1	6.2%	0.8%	4.5%	11.9%	6.4%	1.5%	1.7%	7.7%
Q2	6.5%	1.2%	1.4%	10.9%	6.0%	1.1%	1.9%	6.9%
Q3	5.8%	1.5%	5.8%	9.0%	5.7%	1.2%	0.9%	6.6%
Q4	6.5%	1.8%	1.1%	7.9%	5.4%	1.5%	1.3%	6.3%

In the following table you can see the results of FISIM export calculations separately for loans provided by resident commercial banks to non-resident non-bank sector and for deposits taken from non-resident non-bank sector by the Armenian commercial banks for 2016 and 2017.

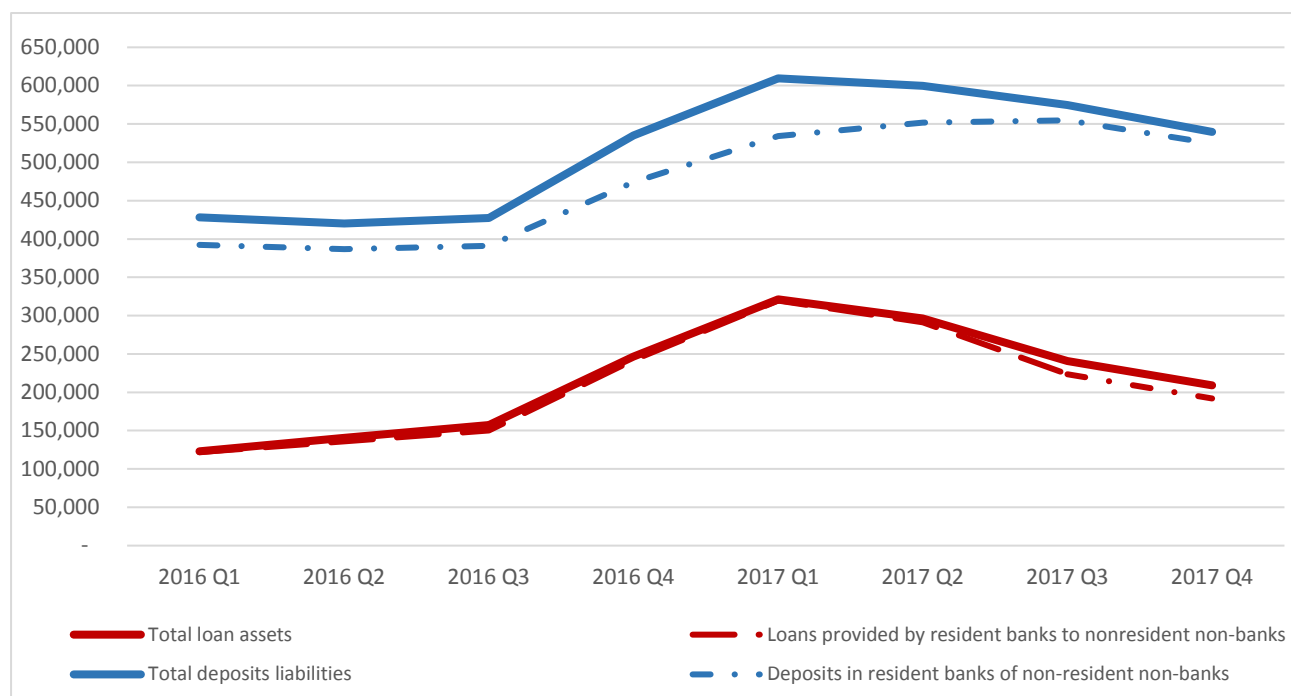
Table 5. Results of FISIM export for each Option, mln USD

	Option 1			Option 2			Option 3			Option 4 Final		
	On Loans	On deposits	Total	On Loans	On deposits	Total	On Loans	On deposits	Total	On Loans	On deposits	Total
2016 Q1	2.1	(0.0)	2.1	(0.9)	6.7	5.7	0.3	4.0	4.3	0.3	2.2	2.5
2016 Q2	3.3	(0.7)	2.6	(1.1)	6.3	5.2	0.5	3.4	3.9	0.3	2.6	3.0
2016 Q3	4.6	(1.8)	2.8	(0.9)	6.0	5.1	1.8	1.6	3.3	1.6	1.2	2.8
2016 Q4	6.0	2.5	8.4	3.0	6.1	9.1	7.6	0.4	8.0	6.8	1.9	8.6
2016	15.9	(0.0)	15.9	0.1	25.1	25.2	10.2	9.3	19.5	8.9	7.9	16.9
2017 Q1	5.8	2.5	8.3	1.9	6.3	8.2	8.9	(1.9)	7.1	7.3	1.5	8.8
2017 Q2	10.5	(0.7)	9.8	5.0	5.7	10.7	11.0	(2.2)	8.8	9.8	(0.1)	9.7
2017 Q3	8.7	(2.1)	6.7	5.2	3.9	9.0	8.7	(2.3)	6.4	7.9	(1.0)	6.9
2017 Q4	2.9	1.9	4.8	1.1	5.6	6.7	3.3	1.3	4.6	2.9	1.9	4.8
2017	28.0	1.5	29.6	13.1	21.5	34.6	31.8	(5.0)	26.8	27.9	2.3	30.2

The table shows that while in Option1 and Option3 there were some negative FISIM results on deposits part, in the final version they are offset due to combining RRs by currencies from different options. The other point, which comes to attention, is the increase of FISIM export in 2017 as compared to 2016. The reason is the dynamic increase of loan assets starting from the end of 2016, denominated both in US dollars and in Armenian drams. I should mention that the vast majority of these loans were provided to non-resident non-bank sector, which led to increase in FISIM export. This can be observed by the difference of the lines in the

graph. The solid lines show the total external loan/deposit assets of the commercial banks and the dotted lines show the part where the counterparty is non-resident nonbank private sector.

Graph 1. Commercial banks external assets/ liabilities stocks for 2016-2017, mln USD



Accounting for FISIM in Balance of payments

After the incorporation of the results to the Balance of payments, the interest received in the primary account decreases, at the same time the export of financial services will increase by the same amount. In the terms of the overall balance on the current account, it will have no effect, but if the users will need to analyse the Goods and services account then the difference will be visible. Hereafter in the next table the results are shown from the viewpoint of the balance of payments accounts.

Table 6. Results of FISIM export evaluation for 2015¹-2017, mln USD

	2015					2016					2017				
	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total
credit	4.0	4.9	5.1	3.9	17.9	2.5	3.0	2.8	8.6	16.9	8.8	9.7	6.9	4.8	17.9

¹ Calculations for 2015 were made using Option 2 for reference rates, because of data shortage. I will refer to this issue in detail under the Future steps and conclusions title.

Table 7. Balance of payments interests and financial services data before FISIM for 2015-2017, mln USD

	2015					2016					2017				
	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total
Interests accrued by FIs	(27.5)	(25.4)	(26.4)	(26.3)	(105.6)	(26.4)	(23.9)	(23.2)	(10.4)	(84.0)	(13.1)	6.1	4.4	9.6	7.0
credit	5.6	5.8	6.1	7.6	25.1	7.5	9.1	9.9	26.5	53.0	36.2	49.7	47.5	47.1	180.5
debit	33.1	31.2	32.4	34.0	130.7	33.9	33.1	33.2	36.8	137.0	49.2	43.6	43.1	37.5	173.5
Financial services by FIs	(2.2)	(1.5)	(1.3)	(2.1)	(7.1)	(2.6)	(3.6)	(1.6)	(3.6)	(11.5)	(1.1)	(2.1)	(1.5)	(4.3)	(9.0)
credit	1.5	1.4	1.3	1.9	6.1	1.3	1.5	1.5	1.8	6.1	1.4	1.8	2.3	0.6	6.1
debit	3.7	2.9	2.6	4.0	13.2	4.0	5.1	3.2	5.5	17.6	2.5	3.9	3.8	4.9	15.1

Table 8. Balance of payments revised data after the incorporation of FISIM export estimations for 2015-2017, mln USD

	2015					2016					2017				
	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total
Interests accrued by FIs	(31.5)	(30.3)	(31.5)	(30.2)	(123.5)	(28.9)	(26.9)	(26.0)	(19.0)	(100.8)	(21.8)	(3.7)	(2.5)	4.8	(23.2)
credit	1.6	0.9	0.9	3.8	7.2	5.0	6.2	7.1	17.8	36.1	27.4	39.9	40.6	42.3	150.3
debit	33.1	31.2	32.4	34.0	130.7	33.9	33.1	33.2	36.8	137.0	49.2	43.6	43.1	37.5	173.5
Financial services by FIs	1.8	3.5	3.8	1.8	10.8	(0.2)	(0.6)	1.2	5.0	5.4	7.7	7.7	5.4	0.5	21.2
credit	5.5	6.3	6.5	5.8	24.0	3.8	4.4	4.4	10.5	23.0	10.2	11.6	9.2	5.4	36.3
debit	3.7	2.8	2.6	4.0	13.2	4.0	5.1	3.2	5.5	17.6	2.5	3.9	3.8	4.9	15.1

As the table shows the export of the financial services increased as a result of FISIM export for approximately 4 times in 2015-2016 and for 6 times in 2017. At the same time, the credit of interest account for commercial banks decreases for nearly 17% for 2017, 30% for 2016 and more than 3 times for 2015.

Estimation of FISIM import

The import of financial intermediation services indirectly measured represents the import of services by nonbanking sector of Armenia from the non-resident financial institutions. Thus, it is generated in process of depositing amounts abroad and receiving loans by resident nonbank sector from non-resident financial institutions.

As for calculating FISIM import data for Armenia there are still more problems than reference rate estimation. The issue is that until the beginning of 2018 there was no information for distinction of international liabilities of nonbank sector by counterparty sectors. As we know, FISIM is generated only in the cases when the loan is received from financial institution. Thus, the breakdown by the counterparty sectors of the private sector loans are required to perform the calculations.

Starting from the 1st quarter of 2018 a new reporting form was introduced in close collaboration with the Statistical committee. In the new form the private companies report on the details of the loans acquired on a loan-by-loan basis. The information on the non-resident partner's sector is filled in. The reporting company also gives information on the interest rate of the contract, which will give the opportunity to calculate the factual accrued interest and estimate the difference with the reference rate on a loan by loan basis. Moreover, the currencies of denomination of the loans are also available. As regarding the deposits side, the aggregated information on the deposited funds and interests accrued by nonbanks is also available from the corresponding reporting form.

In international methodology there are recommendations to use the counterparty country's reference rate in estimation of import for financial intermediation services. At the same time, it is not always practically possible to get the necessary information from other countries.

The other option is to use the same rates as for export calculations. In this case there is no need to make extra calculations, but using the export reference rates might not fully reflect the economic relationships between resident nonbank sector and non-resident financial institutions.

The other option, which I will test when I start to calculate import of FISIM, is based on using the reference rate of Option 2 described above, which is the combination of international financial markets rates (LIBOR/EURIBOR) and the estimation of country risk factor based on GB rates difference among countries. In my opinion, this method better reflects the grounds for choosing the rate for signing a contract by non-resident financial institutions with Armenian private sector.

Unfortunately, there is still some misreporting by private companies due to the new format and structure of information collected. After the mistakes will be corrected, the import calculation of FISIM will be initiated and incorporated to the balance of payments statistics.

The calculation of import of FISIM should also include the transactions by the Government and the Central bank based on loans received and deposited funds in non-resident financial sector. This information is readily available in details from the Ministry of finance and the Central bank. The only issue which still needs to be clarified is the treatment of International organizations, which are one of the main creditors in public sector. Considering these organizations as non-financial institutions will generate corresponding import of FISIM by Government and Central bank. This issue still needs further clarification and study.

Future steps and conclusions

As the outline of future steps in calculation and incorporation of FISIM export/import to balance of payments, I should first mention the need to calculate the historical data. The current chosen reference rate method cannot be applied to years before 2016 because the detailed raw data is not available for years before 2016, as mentioned in data sources list. Thus, the estimates for 2015 in the table above were actually made based on weighted average interest rate of loans and deposits, that is, based on Option 2. As for stocks denominated in AMD, there is no problem with the data used in the Final option, so the reference rate was chosen based on Government bond yields. The same approach will be used for previous years' data.

As a future improvement, the FISIM calculation should also include information on credit organizations. They mostly perform the same financial functions as commercial banks, but the overall circulation of financial funds is much lower than in banks (the stocks of deposits from non-bank nonresidents is approximately 4% of banks' stocks). At present raw database is not yet collected from them.

As future development of the methodology more emphasis should be made to country risk valuation of small economy like Armenia. The best result would be the maximum elimination of risk factor from risk free reference rate estimations. It concerns both the default risk, as well as foreign currency risk.

After the data and estimations for import will be available, a further discussion will be performed with the Statistical committee whether the rates for domestic FISIM should differ from rates of export and import of intermediation services. All after all the main idea of FISIM export and import calculation is not only including the results to the balance of payments statistics, but also deriving a consistent estimation of financial services indirectly measured for the whole economy and incorporating the data to GDP. This should be done by close cooperation with the Statistical committee. Thus, the next step would be to harmonize the methods of calculations and in future use one single estimation for FISIM export and import by the both agencies, by clarifying whether it should be under the responsibility of statistical agency or the Central bank.

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IFC - Central Bank of Armenia Workshop on *"External Sector Statistics"*

Dilijan, Armenia, 11-12 June 2018

Estimation of financial intermediation services indirectly measured in Armenia's external accounts¹

Anush Davtyan,
Central Bank of Armenia

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.

Estimation of Financial Intermediation Services Indirectly Measured in Armenia's external accounts

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**IFC-CBA Workshop on External Sector Statistics,
Armenia, Dilijan, 11-12 June 2018**



Contents

- What is FISIM, how and when it occurs
- FISIM export and import valuation in External accounts
- Current state of financial intermediation services in Armenia
- Selection and evaluation of different data sources available
- Reference rate- pros and cons of each method
- Comparison of results using each option for RR
- Method picked up for Armenia- main results, incorporation of results in BOP
- Future steps, FISIM import calculations



Financial intermediation and FISIM generation mechanism

- Financial institutions are providing financial intermediation services for which the consumers are charged, either explicitly (fees and charges) or implicitly.
- The implicit part of charge is hidden in the spread between rates receivable and payable, as financial institutions pay lower interest rates to deposited funds and charge higher interest rates from funds lent out.
- Export- indirectly measured financial services provided on the loan assets and deposit liabilities from resident financial institutions for which counterparty is non- resident non-financial unit.
- Import- indirectly measured financial services purchased by resident non-financial units on their loan liabilities and deposit assets with nonresident financial corporations
- The part covered in interest paid and received should be reclassified in BOP from Primary income account to Financial services



Main changes in new manuals

Indirect service charge is imputed in respect of **all loans and deposits** offered by a financial institution irrespective of the source of the funds

According to SNA 2008 and BPM6 Manual Financial intermediation services indirectly measured are produced only by certain financial intermediaries:

- *Deposit-taking corporations except the central bank (S.122)*
- *Other financial intermediaries, except insurance corporations and pension funds (S.125)*

FISIM is calculated in respect of non-bank user institutional sectors only, so **no interbank** FISIM has to be calculated.

No FISIM is generated by **central banks**.



Formulas:

$$\text{FISIM}_L = (r_L - rr) * S_L$$

$$\text{FISIM}_D = (rr - r_D) * S_D$$

$$\text{FISIM}_{L+D} = (r_L - rr) * S_L + (rr - r_D) * S_D$$

Where:

S_L – stock of loan

S_D – stock of deposit

r_L – rate on loan

r_D – rate on deposit

rr - reference rate

Reference rate - the key variable:

- ✓ *the risk premium has to be eliminated*
- ✓ *should contain no intermediation service element*
- ✓ *should reflect the risk and maturity structure of deposits and loans*
- ✓ *should reflect the currency structure when estimating FISIM external trade*



Armenia's case:

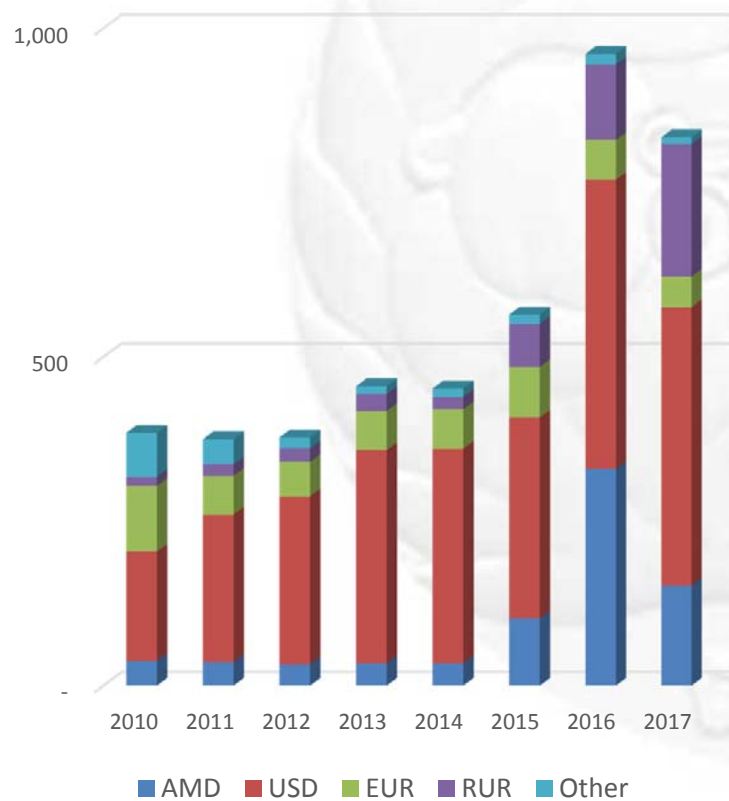
main features of financial system

- Highly **dollarized** economy (average share of foreign currency liabilities of financial system from 2010-2017 was 68%)
- Historically big share of **Direct investment** in banking system of Armenia (average rate of commercial banks with DI for 2017 was 60%), which influences the borrowing/lending rate formation mechanism between affiliated institutions because of strong economic links
- Still actively developing financial market with **limited range** of financial instruments available
- **Short data** series for demanded breakdown of financial data, which sometimes makes it difficult to select appropriate data source for calculations

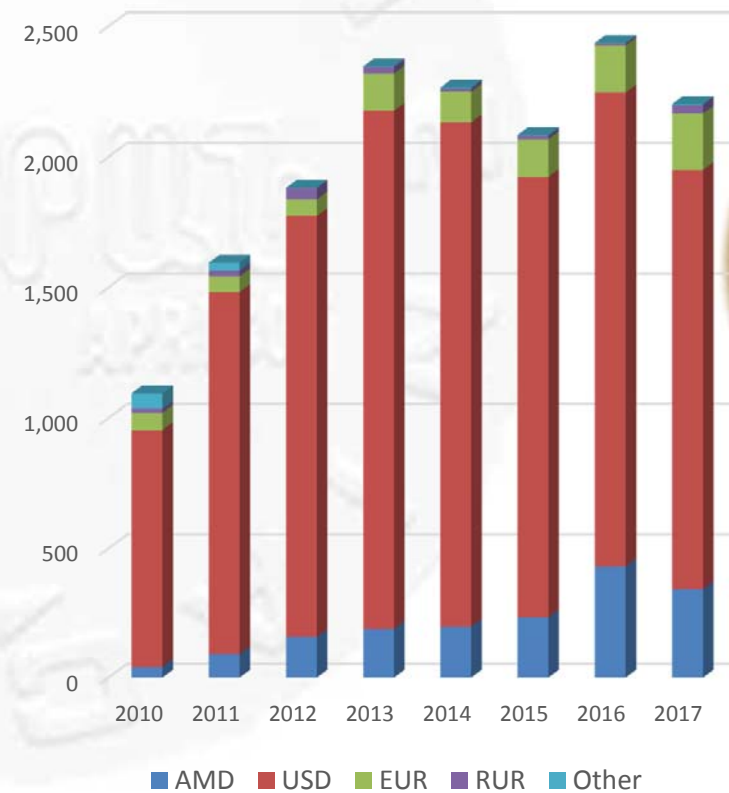


Dollarization of economy

Currency composition of FI's foreign **assets**- loans and deposits, mln USD



Currency composition of FI's foreign **liabilities**- loans and deposits, mln USD



Available data sources

- Balances of financial institutions
- Raw data from financial institutions with detailed breakdown (Soushi)
- Reporting form N18 for commercial banks and credit organizations on their external assets and liabilities
- Revenue/expenditure statements of financial institutions
- Report on loan liabilities of financial institutions on a loan by loan basis, containing information on the interest rate, maturity, currency of loan and information about counterparty sector
- New reporting form for Private sector liabilities for services import estimations
- BIS statistics for services import estimations



Different options for external reference rate selection:

Option 1

Using the weighted average factual interest rates of loans and deposits between resident and nonresident financial institutions which report stocks at the end of period.

Pros:

- ❖ clear-cut allocation of instruments between residents and nonresidents
- ❖ information on the nonresident counterparty sector
- ❖ availability of currency breakdown of stocks

Cons:

- ❖ the detailed breakdown of data is available for only 2 years
- ❖ sometimes the counterparty sector is not clearly identified, which makes it difficult to derive the FI vs FI positions
- ❖ not clear whether the loans received from International organizations should be classified as interbank stocks thus included in reference rate calculations

Despite the opinion that interbank borrowing/lending may not exactly reflect the risk and maturity structure of the deposits and loans, since the rate only reflects short-term lending and borrowing, in Armenia interbank borrowing is mainly long-term (80% of nonresident interbank liabilities).



Different options for external reference rate selection:

Option 2

Using weighted average interest rates from new deposits and loans provided in commercial banks

Pros:

- ❖ Unlike in previous Option 1, the data is available for longer years
- ❖ Data can be broken down both by maturity and by sectors

Cons:

- ❖ The use of midpoint of the interest rates on loans and deposits assumes that the service element is equally shared between the borrower and depositor.
- ❖ The separation of international organizations accounts from other financial organizations is not available
- ❖ Only new transactions can be seen, so “today’s” interest rate is applied to historical stocks
- ❖ Number of new transactions may be too small to calculate a valid interest rate, especially in by currency allocation. Thus, the deposit/lending rates are published in just AMD/Foreign currency breakdown.



Different options for external reference rate selection:

Option 3

The selection of the reference rate for foreign currency denominated stocks is based on using LIBOR/EURIBOR rates combined with country risk valuation. As a country risk indicator the difference between Government Bond yields of countries is calculated.

Pros:

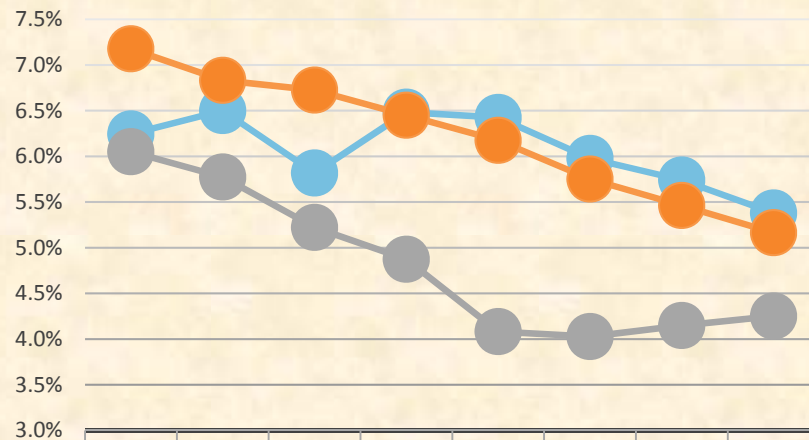
- ❖ Takes into consideration the risk component of the particular country
- ❖ A currency breakdown is available
- ❖ Long data series are available

Cons:

- ❖ The reference rate formation in small country with high dollarization levels and strong links with direct investors is influenced by a lot of factors which are difficult to incorporate only to country risk concept measured by GB yields.

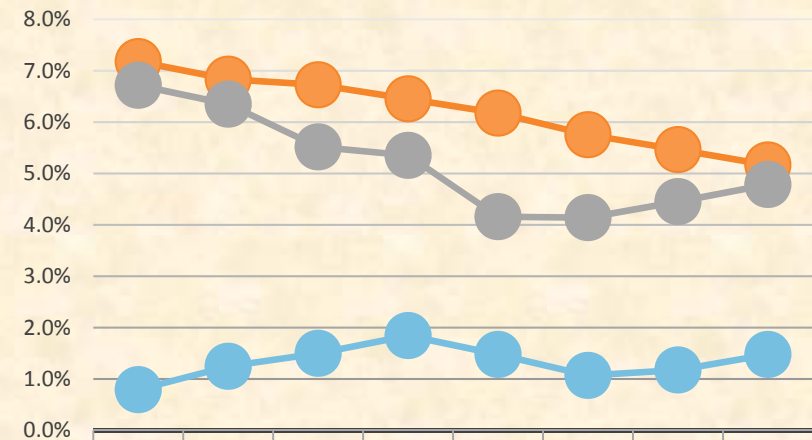


USD Reference rate



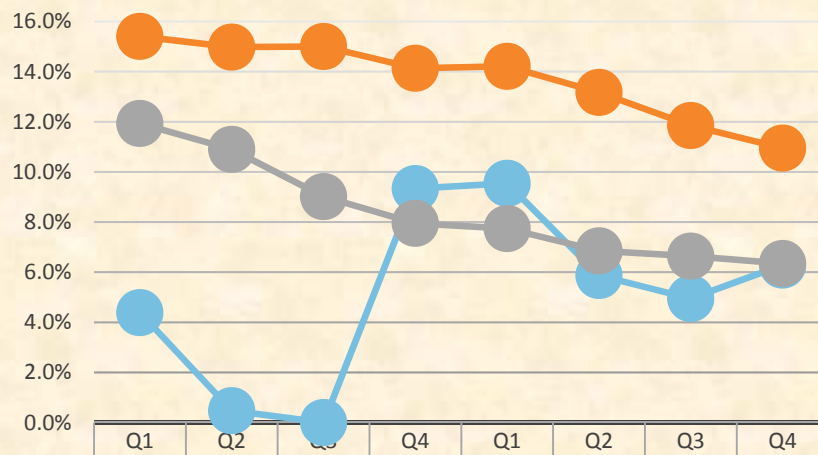
Option 1	6.2%	6.5%	5.8%	6.5%	6.4%	6.0%	5.7%	5.4%
Option 2	7.2%	6.8%	6.7%	6.4%	6.2%	5.8%	5.5%	5.2%
Option 3	6.1%	5.8%	5.2%	4.9%	4.1%	4.0%	4.1%	4.3%

EUR Reference rate



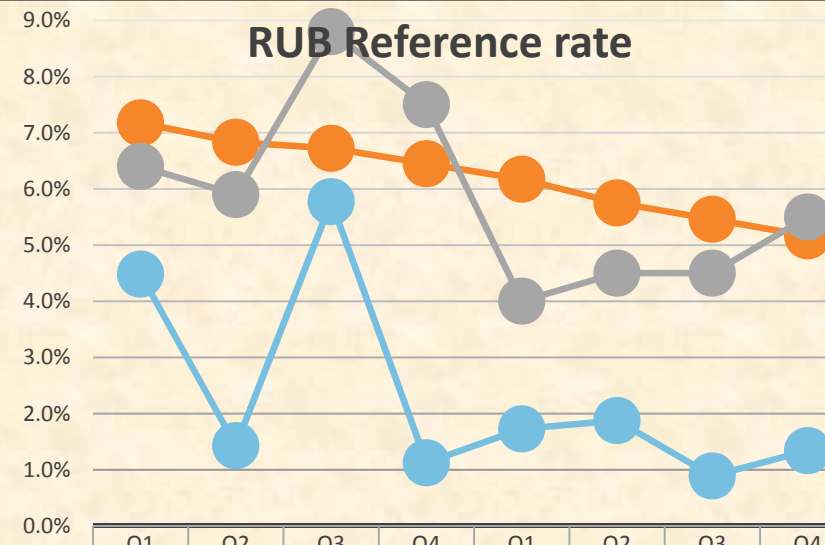
Option 1	0.8%	1.2%	1.5%	1.8%	1.5%	1.1%	1.2%	1.5%
Option 2	7.2%	6.8%	6.7%	6.4%	6.2%	5.8%	5.5%	5.2%
Option 3	6.7%	6.3%	5.5%	5.4%	4.2%	4.1%	4.5%	4.8%

AMD Reference rate



Option 1	4.4%	0.5%	0.0%	9.3%	9.5%	5.9%	4.9%	6.3%
Option 2	15.4%	15.0%	15.0%	14.1%	14.2%	13.2%	11.8%	10.9%
Option 3	11.9%	10.9%	9.0%	7.9%	7.7%	6.9%	6.6%	6.3%

RUB Reference rate

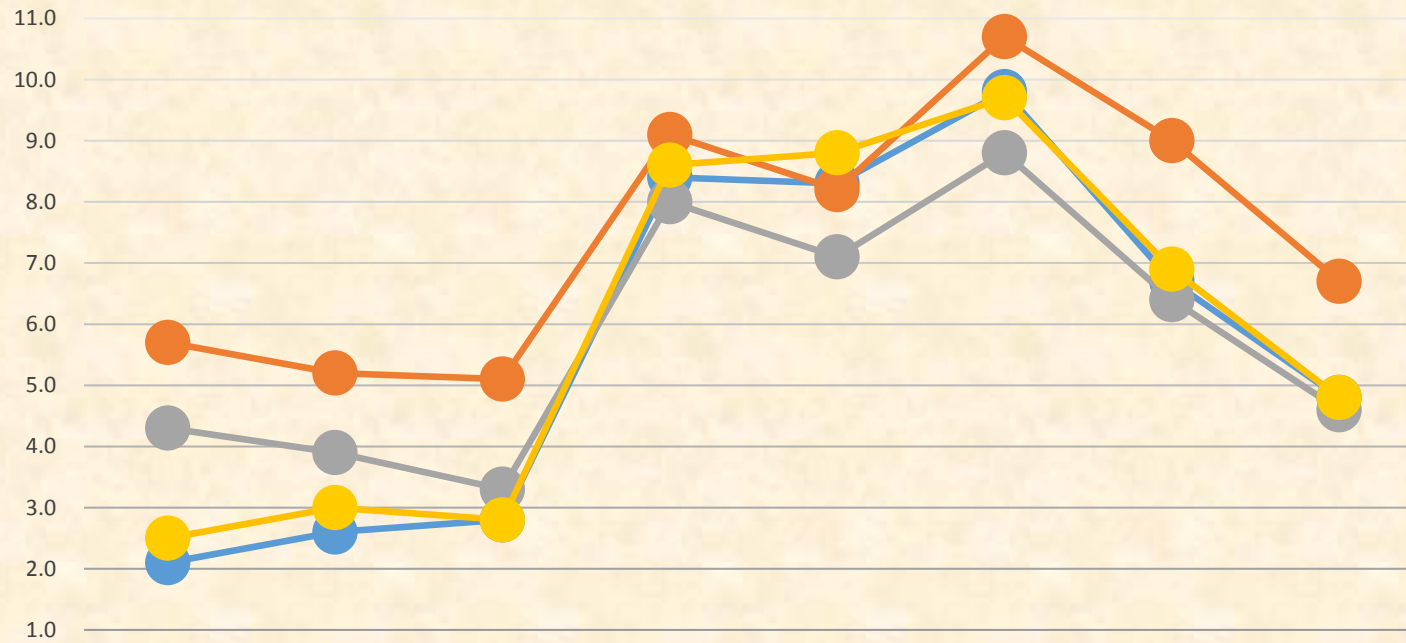


Option 1	4.5%	1.4%	5.8%	1.1%	1.7%	1.9%	0.9%	1.3%
Option 2	7.2%	6.8%	6.7%	6.4%	6.2%	5.8%	5.5%	5.2%
Option 3	6.4%	5.9%	8.8%	7.5%	4.0%	4.5%	4.5%	5.5%

The final decision, combination of different methods used, mln USD

	<i>Option 1</i>			Option 2			Option 3			Option 4 combined		
mln USD	On Loans provided	On deposits	Total	On Loans provided	On deposits	Total	On Loans provided	On deposits	Total	On Loans provided	On deposits	Total
<i>2016 Q1</i>	2.1	(0.0)	2.1	(0.9)	6.7	5.7	0.3	4.0	4.3	0.3	2.2	2.5
<i>2016 Q2</i>	3.3	(0.7)	2.6	(1.1)	6.3	5.2	0.5	3.4	3.9	0.3	2.6	3.0
<i>2016 Q3</i>	4.6	(1.8)	2.8	(0.9)	6.0	5.1	1.8	1.6	3.3	1.6	1.2	2.8
<i>2016 Q4</i>	6.0	2.5	8.4	3.0	6.1	9.1	7.6	0.4	8.0	6.8	1.9	8.6
2016	15.9	(0.0)	15.9	0.1	25.1	25.2	10.2	9.3	19.5	8.9	7.9	16.9
<i>2017 Q1</i>	5.8	2.5	8.3	1.9	6.3	8.2	8.9	(1.9)	7.1	7.3	1.5	8.8
<i>2017 Q2</i>	10.5	(0.7)	9.8	5.0	5.7	10.7	11.0	(2.2)	8.8	9.8	(0.1)	9.7
<i>2017 Q3</i>	8.7	(2.1)	6.7	5.2	3.9	9.0	8.7	(2.3)	6.4	7.9	(1.0)	6.9
<i>2017 Q4</i>	2.9	1.9	4.8	1.1	5.6	6.7	3.3	1.3	4.6	2.9	1.9	4.8
2017	28.0	1.5	29.6	13.1	21.5	34.6	31.8	(5.0)	26.8	27.9	2.3	30.2

Total FISIM by different options, mln USD



	2016 Q1	2016 Q2	2016 Q3	2016 Q4	2017 Q1	2017 Q2	2017 Q3	2017 Q4
Option 1	2.1	2.6	2.8	8.4	8.3	9.8	6.7	4.8
Option 2	5.7	5.2	5.1	9.1	8.2	10.7	9.0	6.7
Option 3	4.3	3.9	3.3	8.0	7.1	8.8	6.4	4.6
Option 4	2.5	3.0	2.8	8.6	8.8	9.7	6.9	4.8

FISIM Results

	2015					2016					2017				
mIn USD	Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4	
credit	4.0	4.9	5.1	3.9	17.9	2.5	3.0	2.8	8.6	16.9	8.8	9.7	6.9	4.8	17.9

Data from BOP

	2015					2016					2017				
mIn USD	Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4	
Interests	(27.5)	(25.4)	(26.4)	(26.3)	(105.6)	(26.4)	(23.9)	(23.2)	(10.4)	(84.0)	(13.1)	6.1	4.4	9.6	7.0
credit	5.6	5.8	6.1	7.6	25.1	7.5	9.1	9.9	26.5	53.0	36.2	49.7	47.5	47.1	180.5
Financial services by Fis	(2.2)	(1.5)	(1.3)	(2.1)	(7.1)	(2.6)	(3.6)	(1.6)	(3.6)	(11.5)	(1.1)	(2.1)	(1.5)	(4.3)	(9.0)
credit	1.5	1.4	1.3	1.9	6.1	1.3	1.5	1.5	1.8	6.1	1.4	1.8	2.3	0.6	6.1

Modified Data from BOP after FISIM incorporation

	2015					2016					2017				
mIn USD	Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4	
Interests	(31.5)	(30.3)	(31.5)	(30.2)	(123.5)	(28.9)	(26.9)	(26.0)	(19.0)	(100.8)	(21.8)	(3.7)	(2.5)	4.8	(23.2)
credit	1.6	0.9	0.9	3.8	7.2	5.0	6.2	7.1	17.8	36.1	27.4	39.9	40.6	42.3	150.3
Financial services by Fis	1.8	3.5	3.8	1.8	10.8	(0.2)	(0.6)	1.2	5.0	5.4	7.7	7.7	5.4	0.5	21.2
credit	5.5	6.3	6.5	5.8	24.0	3.8	4.4	4.4	10.5	23.0	10.2	11.6	9.2	5.4	36.3

Efforts to estimate import of FISIM

Loans attracted/ funds deposited abroad

➤ Private sector

Available data- stocks, interest accrued during the period, maturity breakdown, BIS data on funds deposited in member countries' FIs

Not available data- breakdown by counterparty sector, currency breakdown

Future steps

Collecting data from a new reporting form on Private sector external liabilities containing detailed information on the creditor sector, interest rate, future payments schedule, etc.

Estimation of possible reference rates by currencies

➤ Central bank and Government



Future steps Issues to clarify

- Estimation of **FISIM import**
- Cooperation with National statistical service for incorporation of FISIM export/import data in **GDP**
- Loans and deposits of **International organizations**
- Calculation and incorporation of FISIM export/import **historical data**
- Inclusion of **credit organizations** data in FISIM calculations



THANK YOU





IFC - Central Bank of Armenia Workshop on *"External Sector Statistics"*

Dilijan, Armenia, 11-12 June 2018

Imputation techniques for the nationality of foreign shareholders in Italian firms¹

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¹ This paper 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.

Imputation Techniques for the Nationality of Foreign Shareholders in Italian Firms

Andrea Carboni¹, Alessandro Moro²

Abstract

In order to estimate the Foreign Direct Investments (FDI) item of the Italian Balance of Payments and International Investment Position, the Bank of Italy realises a direct sample survey for the non-financial and insurance companies; the survey's methodology and definitions follow the international standards defined in the IMF BPM6 and OECD BD4 and best practices. In the sampling strategy a stratified sample is used, considering among the other stratification variables the presence or absence for the firm of FDI relationships (inward and outward). In general information on FDI inward is available in administrative data: in fact, the Italian enterprises annually report to the Chambers of Commerce the list of their shareholders (the so-called "*Elenco Soci*" in the *Infocamere* database). While this information is used by the Bank of Italy to identify the list of enterprises with FDI inward, it is in many cases incomplete as the nationality of the shareholders is missing. In order to solve this problem, the present paper proposes an algorithm of imputation when the nationality of foreign firms is unknown and the only relevant information is represented by the name of the corporations. The procedure works as follows: firstly, the name of the different firms is decomposed in its elementary words and the most frequent ones are selected; then, for each selected word, a dummy variable is constructed taking value one when that word is included in the name of the firms and zero otherwise; finally, a statistical model is estimated linking the nationality of the firms to those dummy variables. The out-of-sample analysis reveals that this procedure is able to obtain a high percentage of correct classification, with an almost perfect discrimination between Italian and foreign firms.

Keywords: Foreign Direct Investments; Balance of Payments; Machine learning; Statistical learning; Imputation techniques; Classification problems; Logistic regressions; Multinomial models.

JEL classification: C10, C80.

The views expressed in the paper are those of the authors and do not involve the responsibility of the Bank of Italy.

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1. Introduction

In order to estimate the Foreign Direct Investments (FDI) item of the Italian Balance of Payments and International Investment Position, the Bank of Italy realises a direct sample survey for the non-financial and insurance companies; the survey's methodology and definitions follow the international standards (IMF, 2009; OECD, 2008). In the sampling strategy a stratified sample is used, considering as stratification variables the dimension, the geographical location and the presence or absence for the firm of FDI relationships (inward and outward).

In particular, for the outward side, strata are given by three dimensional classes (according to the total asset of the enterprises), four geographic areas, and the presence/absence of FDI abroad. For the inward side, instead, the strata are defined considering the three dimensional classes, the four geographic areas and then the two binary variables related to FDI: presence/absence of FDI abroad and presence/absence of at least a foreign shareholder. The two designs are reconciled by means of overlapping techniques, that ensure the possibility to realise simultaneously an efficient allocation for both samples (FDI inward and FDI outward).

In general, information on FDI is available in administrative data. For the FDI outward, the information is reported annually in the supplementary note of the financial statement; the Bank of Italy acquires this information in a structured database provided by the Cerved Group. On the other hand, regarding the FDI inward, the Italian enterprises annually report to the Chambers of Commerce the list of their shareholders (this is the so-called "*Elenco Soci*" in the *Infocamere* database). While this information is used by the Bank of Italy to identify the list of enterprises with FDI inward, it is in many cases incomplete as the nationality of the shareholders is missing. The nationality of the foreign shareholders would be an important variable in order to improve the stratification, and consequently the efficiency, of the sampling scheme of the survey. Moreover, this piece of information can be used in the grossing up procedure for calibrating the statistical estimates of FDI since the foreign investments data are disseminated with the geographical detail of the shareholder.³

Actually, the current procedure employed by the Bank of Italy only discriminates between Italian and foreign enterprises. In fact, a "dictionary" has been constructed considering all the words contained at least 20 times in the names of a sample of 15,000 foreign firms (extracted from an external source: the Cerved database). If the denomination of the shareholder in our database contains at least one of the words in the dictionary, it is classified as a foreign investor; otherwise, it is considered as Italian. The percentage of correct classification is around 80% but the outcome of the procedure is simply binary (Italian vs foreign enterprise).

In order to solve these problems, the present paper proposes a machine learning algorithm⁴ for the imputation of the nationality of foreign shareholders when the only relevant information is represented by the name of the corporations. The procedure works as follows: firstly, the name of the different firms is

³ For details about the estimation of FDI and sampling techniques adopted in the compilation of the Balance of Payment of Italy, see http://www.bancaditalia.it/statistiche/manuale_bop_19mag16.pdf.

⁴ There is a growing interest on the practical applications of machine learning algorithms in central banks. For a recent review, see Chakraborty and Joseph (2017).

decomposed in its elementary words and the most frequent words are selected; secondly, for each selected word, a dummy variable is constructed taking value one when that word is included in the name of the firms; finally, a model is estimated linking the nationality of the firms to those dummy variables.

In order to train the algorithm, it is necessary to use a database in which the nationality of the single enterprise is known. To this scope, the database Orbis, provided by Bureau van Dijk, appears appropriate. In fact, Orbis contains financial statement information about almost all the equity capital enterprises of the world: in total about 300 million of firms from all over the world, merging information from about 80 qualified data providers.

Given the prevalence of Italian shareholders in the *Infocamere* database (around 90%), which is the dataset to whom the algorithm should be applied, an unbalanced set is drawn from the Orbis database using the prior information, evaluated from our past direct surveys, about the proportion of the different nationalities of the shareholders of the Italian enterprises. Since in the obtained sample the Italian firms represent the vast majority of cases, a two-step algorithm has been adopted. In the first step, a logit model (Cox, 1958) is estimated with the aim of identifying the Italian firms. Then, in the second step, on the observations identified as foreign enterprises in the first step, a multinomial model (McFadden, 1974) is fitted.

In sum, the out-of-sample analysis reveals that this algorithm is able to obtain a high percentage of correct classification (about 98%), with an almost perfect discrimination between Italian and foreign firms. The results of the model can be further improved by combining the two-step approach with a popular dimension reduction technique used in text mining, i.e. the Singular Value Decomposition (Deerwester et al., 1990). The paper also shows that the performance of the proposed model is better than that of alternative machine learning algorithms, like the decision trees and random forests (for a review of these techniques, see Friedman et al., 2001).

The procedure described in this paper can enhance the quality of the Bank of Italy's statistics of FDI in two ways: (a) ex-ante, since the imputed nationality of firms in the *Infocamere* database, evaluated with the model, is a relevant stratification variable for the sampling scheme of the direct surveys, much richer than the binary classification obtained with the current procedure; (b) ex-post, since the model can be used in the FDI grossing-up procedure to improve the allocation of the FDI estimates to the different counterpart countries. In fact, this allocation can be performed on the model-based imputed nationality evaluated on the entire *Infocamere* database and not only on the sampled firms, as in the procedure currently adopted. Moreover, the allocation can also be realised in a fuzzy prospective: given the model probabilities that an enterprise is resident in different countries, the equity capital can be split among those countries with weights equal to these probabilities.

The rest of the paper is organised as follows: Section 2 presents the proposed procedure from a methodological point of view; Section 3 describes the data; Section 4 summarises the main results; Section 5 proposes an improved version of the two-step algorithm that combines it with more sophisticated text mining techniques; some robustness checks are described in Section 6, in which the results of the model are compared to those obtained with different sample compositions

and alternative machine learning approaches; finally, Section 7 summarises the main conclusions.

2. The Algorithm

The procedure currently used at the Bank of Italy in order to discriminate between Italian and foreign enterprises is such that if the name of the investor contains a word included in a predefined list of foreign words, it is considered as a non-resident enterprise, otherwise it is considered as an Italian (resident) one. This model has shown an overall accuracy of about 80 percent of correct classification of the shareholders. However, this approach does not provide any information about the nationality of the shareholders and yields only a binary response (resident/ non-resident). Moreover, the response is not based on a rigorous inferential statistical model. Against this background, this work aims at improving the current set up by overcoming the above limits.

The aim of the proposed new algorithm is the identification of the nationality of a given firm when the only observed feature is represented by the name of the corporation. The problem can be formalised by considering a set of N firms, each of them characterised by the couple $(Name, Country)$. The final objective is the identification of a predictive model $f(\cdot)$ relating the probability of belonging to a given country $\pi_{Country}$ to the name of the firm:

$$\pi_{Country} = f(Name) \quad (1)$$

After a preliminary data cleaning step, in which the punctuation and the special characters are removed, the procedure begins with the decomposition of the name of each firm in its elementary words. Then, the frequencies of the different words with at least two characters are evaluated and only the most frequent K ones are selected.⁵ For each selected word, a dummy variable is constructed taking value 1 in correspondence of a given firm when the considered word is included in the name of the firm, and 0 otherwise: therefore, $d_{i,j} = 1$ if the name of the i -th firm includes the j -th word; $d_{i,j} = 0$, elsewhere (Table 1 presents some examples of dummy construction). These dummy variables constitute the regressors of all the subsequent statistical models.

Table 1: Examples of dummy variables

Name	SRL	Societa	SPA	SA	Ltd	GMBH	PTY
Trelpa SA	0	0	0	1	0	0	0
Sud Chemie Australia PTY Ltd	0	0	0	0	1	0	1
Tarigia SRL	1	0	0	0	0	0	0
NGM Verwaltungs GMBH	0	0	0	0	0	1	0

⁵ After a sensitivity analysis exercise, K is set to a value of 50 words in the next application of the algorithm. In fact, different choices of K have also been proved but do not alter the main results. In particular, the inclusion of a higher number of words, and consequently of dummies, does not increase the performance of the procedure.

Since in our database the Italian firms represent the vast majority of cases, the procedure is articulated in two-steps. In the first one, a logit model is estimated with the scope of identifying the Italian firms. In particular, the probability that the nationality of the i -th firm is Italian, $\pi_{i,IT}$, is given by:

$$\pi_{i,IT} = \frac{\exp(\beta'_{IT} d_i^{(1)})}{1 + \exp(\beta'_{IT} d_i^{(1)})} \quad (2)$$

where $d_i^{(1)}$ is the K -dimensional vector of dummy variables observed on the i -th firm, while β_{IT} represents the vector of coefficients specific to the probability of being Italian. If $\pi_{i,IT} > 0.5$, then, the i -th firm is classified as Italian.

On the observations that have been considered as foreign in the first step, the selection of the most frequent K words is repeated and the corresponding dummy variables are created: these new words should be more representative of the foreign countries given the selection of Italian corporations in the first step. Then, a multinomial logit model⁶ is estimated, in which the probability that the i -th firm belongs to the h -th nationality is given by:

$$\pi_{i,h} = \frac{\exp(\beta'_h d_i^{(2)})}{\sum_{h=1}^H \exp(\beta'_h d_i^{(2)})} \quad (3)$$

in which $d_i^{(2)}$ is the new K -dimensional vector of dummy variables observed on the i -th firm, while β_h represents the country-specific vector of coefficients. The predicted nationality for the i -th corporation is the one to whom is associated the maximum probability.

3. The Sample Selection

As already mentioned, the algorithm is trained using the Bureau Van Dijk's Orbis database, which contains, beyond many balance information, the name and nationality of more than 300 million world enterprises.

From this source a large set of about 1.7 million enterprises is selected from the most developed countries (G-20) and from the main partners of Italy in terms of direct investments abroad. Since every year the Bank of Italy collects from a sample of about 6,000 enterprises individual detailed data about the FDI (both outward and inward), this piece of information has been taken into account in order to update, ex-post, the fitted probabilities when applied to the *Infocamere* database, or, ex-ante, to define directly the sample for the training of the model. Both approaches are tested.

Firstly, balanced samples are used in which each country has the same proportion, namely the same number of units. In this case the model results should be adjusted (ex-post) to take into account the priors probability applying the Bayes Theorem. The alternative approach consists of using the a priori information about the FDI breakdown for building the sample; in this case the units for each country

⁶ The model is estimated with the *multinom* function of the *nnet* package in R (Ripley and Venables, 2016), which is based on neural network techniques.

are proportional to the weights of the nations in the distribution of the equity capital of the Italian enterprises among the different shareholders. Overall, this second option improves the results.⁷

Therefore, in the best training sample, 180,000 enterprises are extracted from the Orbis database with a country-specific probability of inclusion equal to these known priors. In particular, since about 90% of the shareholders in the *Infocamere* database are Italians, the sample is constructed in order to reproduce this proportion. The remaining 10% of the sample has been selected according to the frequencies of firms by country evaluated on our past samples (see Table 2): the most frequent countries are Luxembourg (21% of the foreign shareholders are from that country), Netherlands (18%), France (12%), Germany (10%), Great Britain (10%), while China is the last relevant country considered (1%). Firms from countries members of the OECD and G20, different from those listed in Table 2, are randomly selected in order to cover the residual component, called "Others" (OT).

Table 2: FDI in Italian enterprises by country

Country	FDI in Italian enterprises (Euros)	Percentage (%)
LU	19.701.471.920	21,4
NL	38.562.125.473	17,7
FR	23.375.783.193	11,9
DE	5.921.531.842	10,4
GB	24.979.578.528	9,8
CH	4.838.944.447	6,1
ES	3.362.143.938	3,5
US	3.171.216.814	3,1
BE	5.592.011.842	2,6
AT	915.696.442	2,4
JP	929.862.399	1,6
DK	682.030.864	1,5
SE	774.057.108	1,2
CN	48.917.610	0,7
OT	4.248.537.125	0,1

The information extracted from the Orbis database are simply the name and the country of each company. The reason for this choice is that the main objective of the present work is the application of the algorithm to the list of shareholders from the administrative data of the Chambers of Commerce (*Infocamere* database), in which the only available information is represented by the name of corporations. The model is trained using 80% of the sample (training set) constructed from Orbis and it is validated with the remaining 20% (validation set).

A standard cross-validation technique has also been performed, by splitting the sample in five groups of the same cardinality and rotating the test set (the other

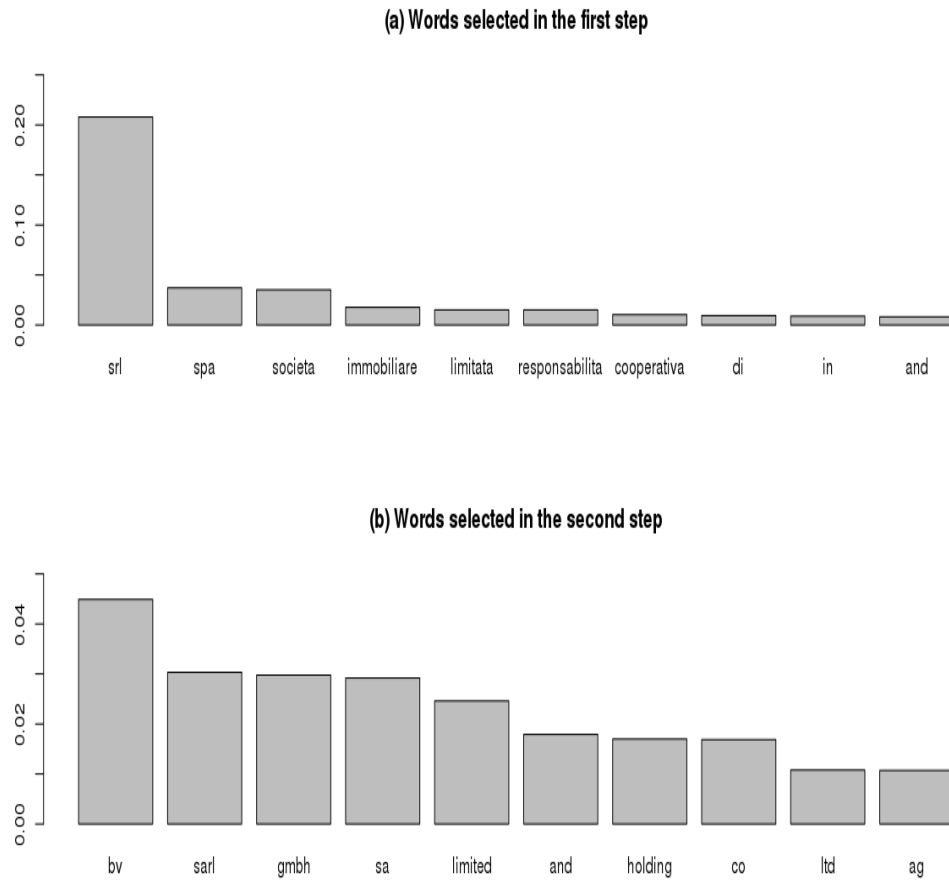
⁷ In Subsection 6.1 a robustness check has been carried out with a balanced set.

four groups are used as training set). Results are robust and very similar to the one presented in this document.

4. Results

Given the high proportion of Italian firms in the sample (around 90%), a two-step algorithm that is able to firstly select the Italian units and then to discriminate between different foreign nationalities seems to be an appropriate choice.

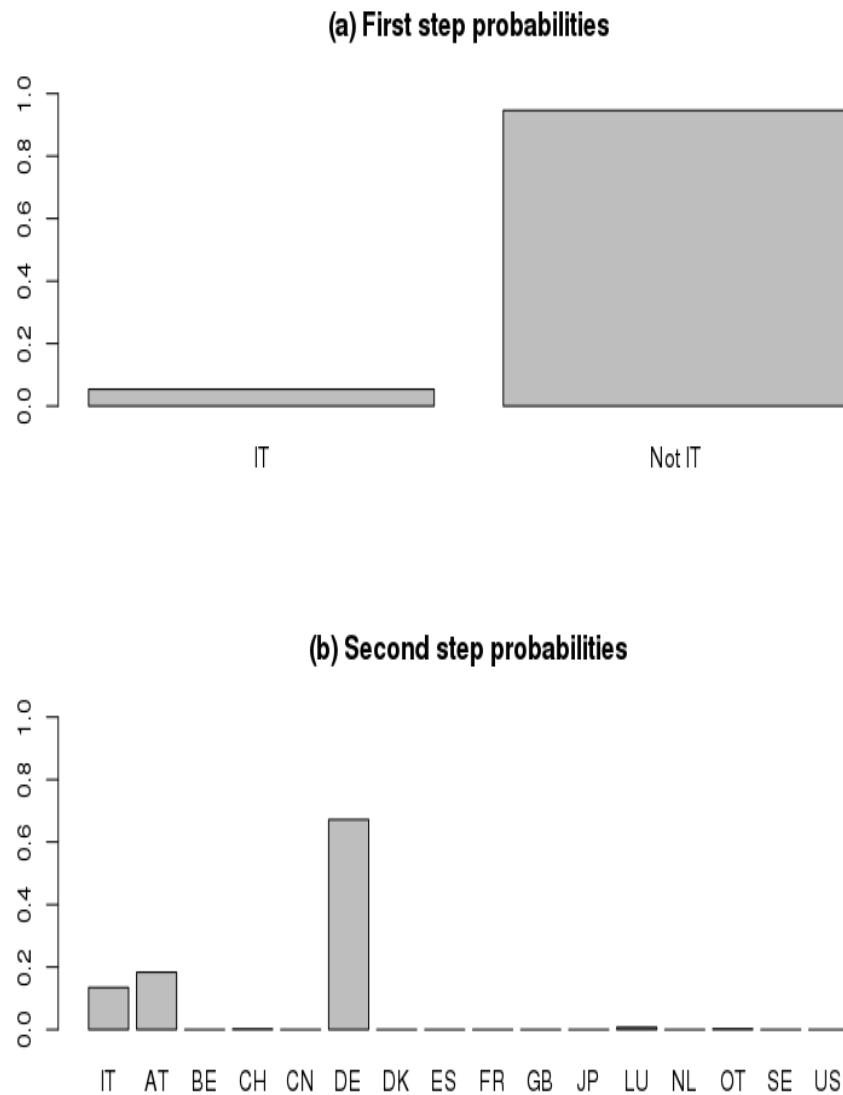
Figure 1: Example of word selection: the first ten most frequent words selected in the first and second step



For a better understanding of how the procedure works, the process of word selection in the two steps is briefly described. The first panel in Figure 1 shows the most frequent ten words selected in the first step of the procedure. As expected, most of them are Italian: they include two abbreviations of legal entities of Italian corporations (SRL and SPA) and other frequent expressions in Italian names of corporations (like "*Società a Responsabilità Limitata*"). Given the specificity of these words, they should be able to identify very well the Italian corporations. Then a logit model is estimated using the dummies associated to these words as regressors.

Once the firms considered as Italian in the first step are filtered out, the process of word selection is repeated: the new most frequent words are displayed in the second panel of Figure 1. In the second step the most frequent words are the abbreviations of legal entities of the firms located in different European countries, such as BV for Netherlands, SARL for Luxembourg, GMBH for Germany and Austria, and frequent English words in international companies, like limited, ltd, holding, and so on. These new words are the inputs in the multinomial model.

Figure 2: Example of a model prediction: first and second step fitted probabilities in the case of a German firm



Once the models in the first and the second step are estimated on the training set, then they are used in order to make out-of-sample predictions on the nationality of any given firm. Figure 2 illustrates the case of the German firm NGM

Verwaltungs GMBH. The first panel of the figure shows the probabilities estimated at the first step from the logit model: it is easy to observe that the model correctly classifies the firm as foreign. In the second step the highest probability predicted by the multinomial model is the one associated to Germany: therefore, the final prediction is correct. It is interesting to notice that the second highest predicted probability is the one of Austria since GMBH is a common legal entity name in that country too.

In order to illustrate the results of the model performance in the validation set, Table 3 shows the confusion matrix: the columns report the true countries, the rows the predicted nationalities. Each column exhibits how often, in percentage terms, a given country is classified correctly and, conversely, when it is confused with another nationality: for example, German firms are classified correctly 90% of cases, 3% of cases they are classified as Swiss, 2% as Austrian, 2% as French and 2% as Italian. It is worth remarking that the highest percentages usually lie on the main diagonal, which means that the model correctly discriminates the different nationalities, especially those with the most relevant FDI in Italian firms (Luxembourg, Netherlands, Germany, Great Britain), that are also more represented in the sample. Moreover, the model presents a perfect discrimination between Italian and foreign firms which explains, given the prevalence of Italian units in the sample, the high performance in terms of overall model accuracy (around 98%).

Table 3: Confusion matrix of the two-step procedure

FITTED	TRUE															
	AT	BE	CH	CN	DE	DK	ES	FR	GB	IT	JP	LU	NL	OT	SE	US
AT	10%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
BE	0%	7%	2%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	2%
CH	0%	0%	41%	0%	3%	0%	1%	6%	2%	0%	0%	2%	0%	2%	27%	0%
CN	0%	2%	0%	14%	0%	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%
DE	81%	0%	1%	0%	90%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
DK	0%	0%	2%	0%	0%	82%	0%	1%	1%	0%	0%	1%	0%	1%	0%	0%
ES	0%	0%	0%	0%	0%	0%	59%	1%	0%	0%	0%	1%	0%	3%	0%	0%
FR	0%	76%	24%	7%	2%	9%	4%	66%	5%	0%	3%	1%	2%	21%	0%	45%
GB	0%	0%	1%	7%	0%	0%	0%	80%	0%	6%	0%	0%	18%	0%	0%	0%
IT	10%	9%	16%	7%	2%	9%	10%	11%	5%	100%	13%	6%	1%	10%	8%	6%
JP	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	45%	0%	0%	0%	0%	0%
LU	0%	2%	10%	0%	0%	0%	25%	9%	0%	0%	0%	88%	0%	5%	0%	0%
NL	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	96%	0%	4%	2%
OT	0%	0%	2%	64%	0%	0%	0%	0%	7%	0%	29%	0%	0%	34%	0%	6%
SE	0%	2%	2%	0%	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	62%	0%
US	0%	2%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	5%	0%	39%

It is interesting to notice that the low percentages of correct classification are due to cases in which there is a common language and in which the legal entity abbreviations are the same: this explains the reason why the model classifies most of the Austrian corporations as German and most of the Belgian companies as French.

Furthermore, a cross-validation exercise is done rotating the 20% of the sample used for the testing of the model and estimating the coefficients with the remaining 80%. Coefficient estimates and classification results are very stable over these different trials.

5. Further Improvements

Our two-step procedure can be easily improved by considering, instead of the $K=50$ most frequent words, all the terms in the denominations of firms and by applying a popular dimension reduction procedure used in text mining, i.e. the Singular Value Decomposition (SVD).

The SVD can be interpreted as a sort of Principal Component Analysis applied to the matrix of the dummies associated to the different words. The extracted principal components are then the new regressors of the two-step procedure. Using this method, it is possible to extract information in a more efficient way from the denominations of firms. However, this enrichment of the information set comes with a cost, i.e. the interpretation of the input variables is less clear.

More precisely, the SVD method can be described as follows. Let D be the $N \times M$ matrix of dummies, where N is the number of firms and M the number of terms, and assume r the rank of the matrix. The singular value decomposition of the transpose of D is:

$$D' = U \Sigma V' \quad (4)$$

where U and V are orthogonal matrices with dimensions $M \times r$ and $N \times r$, respectively, and Σ is a $r \times r$ diagonal matrix, whose diagonal elements are ordered, by convention, from the largest to the smallest ones.

The power of this representation comes from the property of the SVD regarding approximating matrices. In fact, we can note that expression (4) can be viewed as a sum of rank one matrices:

$$D' = \sum_{i=1}^r \sigma_i u_i v_i' \quad (5)$$

in which u_i and v_i are the columns of U and V , respectively. The best rank- k approximation of D , with $k \leq r$, is given by:⁸

$$D_k' = \sum_{i=1}^k \sigma_i u_i v_i' = U_k \Sigma_k V_k' \quad (6)$$

Therefore, it is possible to map the M -dimensional vector d_i of dummy variables for enterprise i to a lower dimensional subspace using matrix U_k :

$$\hat{d}_i = U_k' d_i \quad (7)$$

In fact, \hat{d}_i is a k -dimensional vector obtained through a linear combination of the original elements of d_i using as weights the elements of U_k . In this way the new input variables for the subsequent statistical models are obtained.

The revised version of the proposed two-step algorithm becomes:

- application of the SVD decomposition to the matrix of the dummies associated to the words contained in the denomination of all the firms in the sample and use of the extracted components as inputs in the logit model (first step);
- estimation of the logit model and classification of the Italian companies;
- application of the SVD decomposition to the matrix of the dummies associated to the words contained in the denomination of the firms classified as foreign in the first

⁸ After a sensitivity analysis exercise, k is set to a value of 50 in the next application of the algorithm.

step and use of the extracted components as inputs in the multinomial model (second step);

- estimation of the multinomial model and classification of the foreign companies.

The confusion matrix evaluated on the validation set of this improved version of the two-step procedure is reported in Table 4. It is possible to observe that the percentages of correctly classified enterprises, i.e. those on the main diagonal of the confusion matrix, generally increase and the countries with the highest levels of FDI (Luxembourg, Netherlands, France, Germany, Great Britain) have percentages of correct classification higher than 89%.

Table 4: Confusion matrix of the two-step procedure with SVD

FITTED	TRUE															
	AT	BE	CH	CN	DE	DK	ES	FR	GB	IT	JP	LU	NL	OT	SE	US
AT	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
BE	0%	4%	2%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	2%
CH	0%	0%	49%	0%	2%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
CN	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
DE	97%	0%	1%	0%	91%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
DK	0%	0%	0%	0%	0%	95%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%
ES	0%	0%	0%	0%	0%	0%	67%	0%	0%	0%	0%	0%	0%	2%	0%	0%
FR	3%	89%	33%	7%	6%	5%	4%	92%	9%	0%	13%	3%	1%	31%	27%	45%
GB	0%	0%	2%	7%	0%	0%	0%	0%	89%	0%	3%	0%	0%	18%	0%	0%
IT	0%	4%	1%	0%	0%	0%	1%	3%	2%	100%	0%	1%	0%	0%	0%	4%
JP	0%	0%	0%	0%	0%	0%	0%	0%	0%	42%	0%	0%	0%	1%	0%	0%
LU	0%	0%	11%	0%	0%	0%	28%	4%	0%	0%	0%	94%	1%	2%	0%	0%
NL	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	98%	0%	0%	0%
OT	0%	0%	1%	86%	0%	0%	0%	0%	0%	0%	42%	0%	0%	41%	0%	10%
SE	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	73%	0%
US	0%	0%	1%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	2%	0%	39%

6. Robustness Checks

In this section, the robustness of the results is tested with respect to both the sample composition and the choice of the classification algorithm. In particular, a completely balanced set is employed in which the different countries have the same number of units. Moreover, the outcome of the model is compared to an alternative, totally non-parametric, machine learning algorithm, i.e. random forests.

6.1 Balanced Set

Keeping fixed the total number of firms (around 180,000 units), a new sample is constructed in which all the sixteen countries represented (including the residual "Others - OT" category) have the same number of companies. Then, the algorithm is trained using the 80% of this new sample and is tested on the remaining 20%.

The new confusion matrix evaluated on the test set is reported in Table 5. It is possible to notice that the percentages of correct classification increase with respect to the previous unbalanced sample for the countries with low levels of FDI in the Italian companies, like Sweden, China, Spain, United States, which were previously underrepresented. However, the model performance is lower for countries with high levels of FDI. In particular, in some important cases, the choice between a balanced or unbalanced sample implies a clear trade-off: the increase in the accuracy of classification, obtained with a balanced sample, for Austria and Belgium (countries with low levels of FDI) is translated into a decrease of precision for Germany and France (countries with high levels of FDI), respectively.

Table 5: Confusion matrix when all countries have the same frequencies

FITTED	TRUE															
	AT	BE	CH	CN	DE	DK	ES	FR	GB	IT	JP	LU	NL	OT	SE	US
AT	50%	0%	2%	0%	22%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
BE	1%	75%	19%	3%	2%	6%	1%	62%	7%	1%	5%	2%	6%	20%	0%	25%
CH	2%	5%	39%	1%	3%	2%	2%	6%	1%	0%	1%	3%	0%	4%	0%	4%
CN	0%	0%	1%	86%	0%	0%	0%	0%	1%	0%	24%	0%	0%	20%	0%	1%
DE	45%	0%	5%	0%	72%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
DK	1%	5%	2%	0%	0%	83%	0%	3%	1%	0%	0%	1%	0%	6%	0%	4%
ES	0%	2%	4%	0%	0%	1%	77%	4%	0%	0%	0%	5%	0%	6%	1%	1%
FR	0%	5%	2%	0%	0%	1%	0%	11%	0%	0%	1%	1%	0%	2%	0%	2%
GB	0%	0%	3%	1%	0%	0%	0%	0%	81%	0%	1%	0%	0%	10%	0%	0%
IT	0%	0%	1%	0%	0%	0%	2%	0%	0%	97%	0%	0%	0%	0%	0%	0%
JP	0%	0%	1%	2%	0%	1%	0%	0%	0%	0%	57%	0%	0%	2%	0%	1%
LU	0%	2%	15%	0%	0%	0%	15%	7%	0%	0%	1%	87%	0%	4%	0%	2%
NL	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	93%	0%	0%	0%
OT	0%	0%	3%	4%	0%	0%	0%	0%	7%	0%	5%	0%	0%	23%	0%	1%
SE	0%	3%	2%	0%	0%	5%	2%	4%	0%	0%	1%	0%	0%	1%	98%	0%
US	0%	4%	3%	2%	0%	0%	1%	2%	1%	0%	5%	0%	0%	3%	0%	59%

Since the loss of accuracy involves countries with high levels of direct investments in the Italian enterprises, an unbalanced set should be preferred for the training of the algorithm.

6.2 Random Forests

In order to check whether the analytical assumptions underlying our approach are too restrictive to fit the data adequately, the binary and multinomial logit models are replaced by a totally non-parametric classification algorithm, i.e. the random forests, using as input variables the extracted components of the SVD procedure. The exercise is carried out using the unbalanced sample.

The confusion matrix evaluated on the validation set (20% of the sample) is reported in Table 6. It is possible to observe that the results obtained with this approach are similar to those in the two-step algorithm for most of the countries with high levels of FDI in the Italian enterprises, such as Great Britain, Luxembourg, Netherlands; moreover, random forests are also able to discriminate accurately between Italian and foreign firms and show better results for countries with low levels of FDI, such as Switzerland, Spain, Japan, and Sweden. However, the percentages of correct classification are much lower than our proposed two-step approach for two important countries with high levels of direct investments, namely France and Germany.

All in all, we can conclude that the classification performances of the proposed two-step algorithm are at least competitive with respect to other machine learning methods.

Table 6: Confusion matrix of the random forests approach with SVD

FITTED	TRUE															
	AT	BE	CH	CN	DE	DK	ES	FR	GB	IT	JP	LU	NL	OT	SE	US
AT	38%	0%	1%	0%	16%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%
BE	0%	13%	0%	0%	0%	0%	0%	10%	1%	0%	0%	0%	0%	0%	0%	8%
CH	0%	25%	85%	0%	1%	0%	2%	2%	1%	0%	0%	2%	0%	0%	0%	0%
CN	0%	0%	0%	33%	0%	0%	0%	0%	1%	0%	0%	0%	0%	11%	0%	2%
DE	63%	0%	4%	0%	76%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	2%
DK	0%	0%	0%	0%	0%	70%	0%	1%	1%	0%	0%	0%	0%	0%	0%	2%
ES	0%	0%	0%	0%	0%	0%	95%	0%	0%	0%	0%	4%	0%	0%	0%	0%
FR	0%	50%	1%	0%	0%	3%	0%	59%	1%	0%	0%	2%	0%	0%	0%	8%
GB	0%	0%	0%	0%	0%	0%	0%	2%	86%	0%	0%	0%	0%	4%	0%	5%
IT	0%	0%	2%	0%	7%	0%	0%	11%	0%	100%	0%	1%	0%	0%	0%	3%
JP	0%	0%	0%	11%	0%	0%	0%	0%	1%	0%	95%	0%	0%	9%	0%	0%
LU	0%	0%	6%	0%	0%	3%	0%	2%	0%	0%	0%	90%	1%	0%	0%	0%
NL	0%	6%	0%	0%	0%	3%	0%	1%	0%	0%	0%	0%	99%	0%	0%	3%
OT	0%	0%	1%	44%	0%	20%	2%	5%	8%	0%	5%	1%	0%	77%	0%	13%
SE	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	2%
US	0%	6%	0%	11%	0%	0%	0%	3%	2%	0%	0%	0%	0%	0%	0%	51%

7. Conclusions

This paper describes a procedure to impute the nationality of foreign shareholders in Italian firms when the only relevant information is represented by the name of the corporations. The interpretation of the model and its predictions is very intuitive.

Despite this simplicity, the analysis has shown that the overall accuracy of the algorithm is very high (around 98%), with an almost perfect discrimination between Italian and foreign firms. Moreover, the proposed approach seems to be able to classify correctly most of the countries with high levels of direct investments in Italy.

The outcome of the classification can be further improved by combining this two-step approach with a popular method for dimension reduction used in text mining applications, i.e. the Singular Value Decomposition, that allows to extract in a more efficient way the information contained in the denominations of firms with a cost related to less interpretable input variables.

Furthermore, it has been proved that it is better to train the algorithm on an unbalanced sample based on the known priors on the distribution of the nationalities in the population than a balanced one, in order to classify with a higher accuracy the countries with the highest levels of FDI in the Italian enterprises.

The analysis has also shown that the results of the proposed procedure are competitive with respect to other, non-parametric, machine learning algorithms, like the random forests.

The adoption of the two-step algorithm presented in this work would improve significantly the procedure currently used by the Bank of Italy, that only discriminates between Italian and foreign firms, with a percentage of correct classification of about 80%. Indeed, the new model presents an overall accuracy equal to 98% and allows to impute the country of residency of the shareholders.

More in detail, the procedure described in this paper can enhance the quality of the Bank of Italy's FDI statistics in two directions: (a) ex-ante, since the imputed nationality of firms in the *Infocamere* database is a relevant stratification variable for the sampling scheme of the direct surveys; (b) ex-post, since the model can be used in the FDI grossing-up procedure to improve the allocation of the direct investments to the different counterpart countries, even in a probabilistic or "fuzzy" way.

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IFC - Central Bank of Armenia Workshop on *"External Sector Statistics"*

Dilijan, Armenia, 11-12 June 2018

Imputation techniques for the nationality of foreign shareholders in Italian firms¹

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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.



BANCA D'ITALIA
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Imputation Techniques for the Nationality of Foreign Shareholders in Italian Firms

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Processing Directorate, External Statistics Division

IFC – Central Bank of Armenia workshop on “External sector statistics”
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Outline

- ✓ Motivations
 - ✓ Current Procedure
 - ✓ A New Algorithm:
 1. Methodology
 2. Sample Selection
 3. Results
 4. Robustness Checks
 - ✓ Conclusions



Motivations (1)

- In order to estimate the **Foreign Direct Investments (FDI)** item of the Italian Balance of Payments and International Investment Position, the Bank of Italy realises a direct sample survey for the non-financial and insurance companies.
- A stratified sample is used, considering among the other stratification variables the presence or absence for the firm of FDI relationships (inward and outward).
- Information on FDI inward is available in administrative data: annually, Italian enterprises report to the Chambers of Commerce the list of their shareholders (the so-called “*Elenco Soci*” in the *Infocamere* database).



Motivations (2)

- While this information is used by the Bank of Italy to identify the list of enterprises with FDI inward, quite often **the nationality of the shareholders is missing**.
- This piece of information would:
 1. help us in improving the stratification (and the efficiency) of the sampling scheme of our survey.
 2. allow to correctly attribute the FDI investments to the different countries.
- Hence, the present paper proposes a **Machine Learning Algorithm** of imputation when the nationality of foreign firms is unknown and the only relevant information is represented by the name of the corporations.



Current Procedure

- The current procedure discriminate between Italian and foreign firms as follows:
 - A «**dictionary**» has been constructed considering all the words contained at least 20 times in the names of a sample of 15,000 foreign firms (extracted from an external source: Cerved database).
 - If the denomination of the shareholder in our database contains at least one of the words in the dictionary, it is classified as a foreign investor; otherwise, it is considered as Italian.
- The percentage of correct classification is around 80%.
- The outcome of the actual procedure is binary (Italian vs foreign firms).



A New Algorithm (1)

- We propose a Machine Learning Algorithm for the identification of the nationality of shareholders based only on the **name of enterprises**.
- Our problem can be formalised by considering a set of N firms, each of them characterised by the couple $(Name, Country)$.
- The **final objective** is the identification of a predictive model relating the country to the name of the firm:

$$Country = f(Name)$$

- The outline of the procedure is:
 - a) Preliminary data cleaning step: punctuation and special characters are removed.
 - b) Decomposition of the name of each firm in its elementary words.
 - c) The frequencies of the different words are evaluated and only the most frequent $K=50$ words are selected.

A New Algorithm (2)

d) For each firm i and selected word j , a dummy variable is constructed:

$D_{i,j} = 1$ if the name of the i -th firm includes the j -th word;

$D_{i,j} = 0$, elsewhere

Table 1: Examples of dummy variables

Name	SRL	Societa	SPA	SA	Ltd	GMBH	PTY
Trelpa SA	0	0	0	1	0	0	0
Sud Chemie Australia PTY Ltd	0	0	0	0	1	0	1
Tarigia SRL	1	0	0	0	0	0	0
NGM Verwaltungs GMBH	0	0	0	0	0	1	0

These dummy variables constitute the regressors of all the subsequent statistical models



A New Algorithm (3)

- Since in our database the Italian firms are more than 90%, the procedure is articulated in **two steps**.
- **First step.** A logit model is estimated with the aim of identifying the Italian firms. The probability $\pi_{i,IT}$ that the nationality of the i -th firm is Italian is given by:

$$\pi_{i,IT} = \frac{\exp(\beta'_{IT} D_i)}{1 + \exp(\beta'_{IT} D_i)}$$

- If $\pi_{i,IT} > 0.5$, the i -th firm is classified as Italian. The selection of the most frequent K words is repeated on the observations classified as foreign in the first step.
- **Second step.** A multinomial logit model is estimated, in which the probability that the i -th firm belongs to the h -th nationality is given by:

$$\pi_{i,h} = \frac{\exp(\beta'_h D_i)}{\sum_{h=1}^H \exp(\beta'_h D_i)}$$

- The predicted nationality for the i -th corporation is the one to whom is associated the maximum probability.



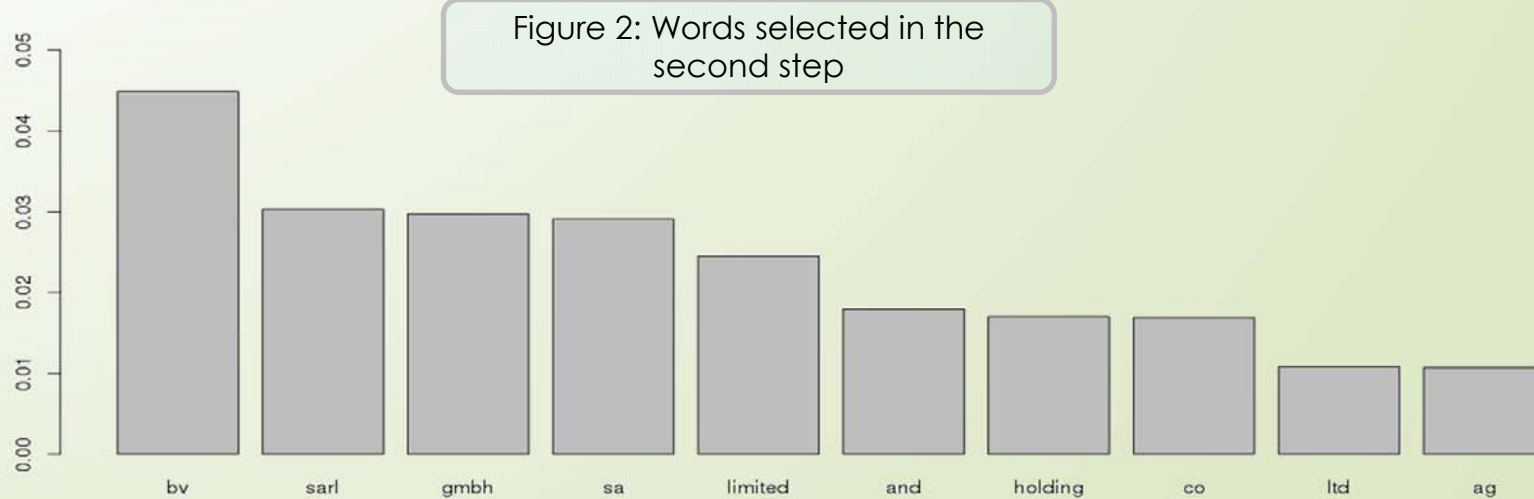
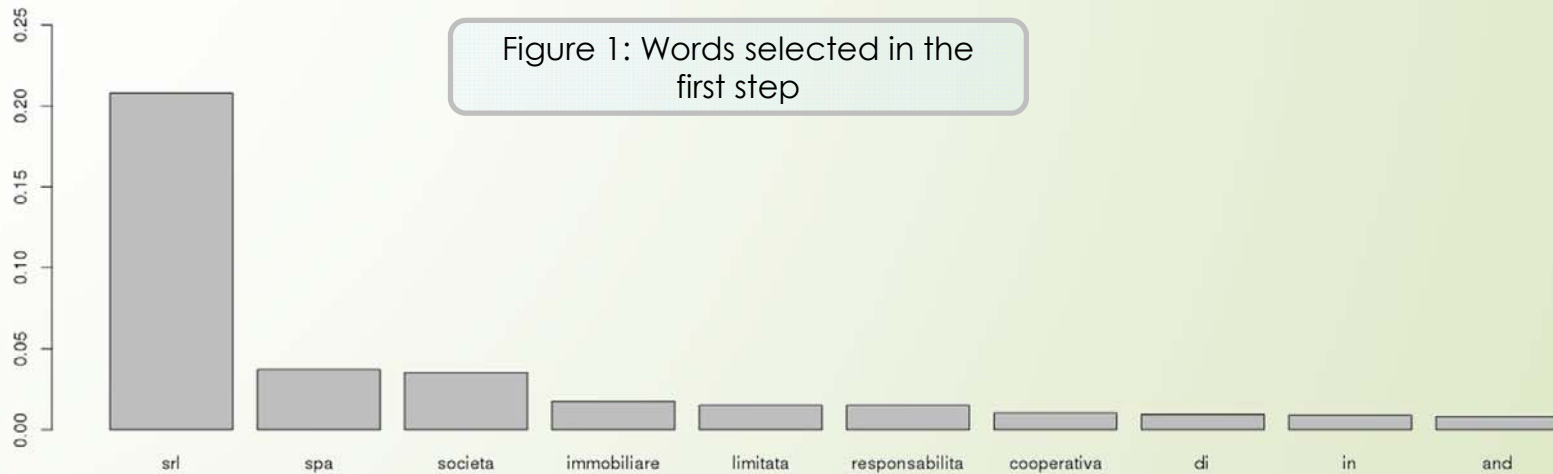
Sample Selection

- The algorithm is trained using the **Bureau Van Dijk's Orbis database**, which contains, beyond many balance information, the name and nationality of more than 300 millions world enterprises.
- We have extracted from the Orbis database around 180,000 enterprises with a country-specific probability of inclusion equal to **our known priors**:
 - In particular, we know that more than 90% of the shareholders in the *Infocamere* database are Italians.
 - The remaining 10% of the sample has been selected according to the frequencies derived from our past samples (Table 2).

Table 2: FDI Investments in Italy by Country

Country	FDI Investments (Euros)	Percentage (%)
LU	19.701.471.920	21,4
NL	38.562.125.473	17,7
FR	23.375.783.193	11,9
DE	5.921.531.842	10,4
GB	24.979.578.528	9,8
CH	4.838.944.447	6,1
ES	3.362.143.938	3,5
US	3.171.216.814	3,1
BE	5.592.011.842	2,6
AT	915.696.442	2,4
JP	929.862.399	1,6
DK	682.030.864	1,5
SE	774.057.108	1,2
CN	48.917.610	0,7
Others	4.248.537.125	0,1

Example of Word Selection



Example of Model Prediction

- First and second step fitted probabilities in a real case: the German firm NGM Verwaltungs GMBH.

Figure 3: First Step Probabilities

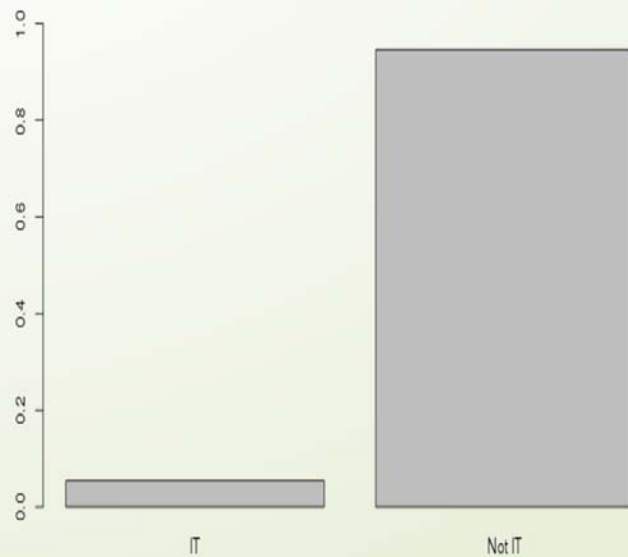
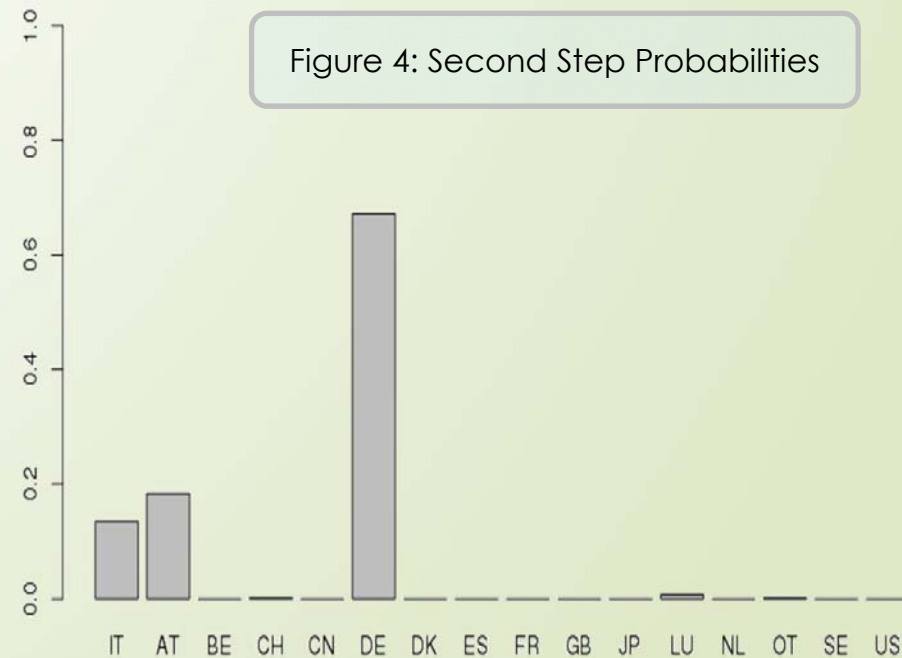


Figure 4: Second Step Probabilities



Results

- The model is estimated on the 80% of the sample and it is validated with the remaining 20%.
- The overall accuracy on the validation set is 98.29%.
- The confusion matrix in the validation set is:

FITTED	TRUE															
	AT	BE	CH	CN	DE	DK	ES	FR	GB	IT	JP	LU	NL	OT	SE	US
AT	10%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
BE	0%	7%	2%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	2%
CH	0%	0%	41%	0%	3%	0%	1%	6%	2%	0%	0%	2%	0%	2%	27%	0%
CN	0%	2%	0%	14%	0%	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%
DE	81%	0%	1%	0%	90%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
DK	0%	0%	2%	0%	0%	82%	0%	1%	1%	0%	0%	1%	0%	1%	0%	0%
ES	0%	0%	0%	0%	0%	0%	59%	1%	0%	0%	0%	1%	0%	3%	0%	0%
FR	0%	76%	24%	7%	2%	9%	4%	66%	5%	0%	3%	1%	2%	21%	0%	45%
GB	0%	0%	1%	7%	0%	0%	0%	0%	80%	0%	6%	0%	0%	18%	0%	0%
IT	10%	9%	16%	7%	2%	9%	10%	11%	5%	100%	13%	6%	1%	10%	8%	6%
JP	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	45%	0%	0%	0%	0%	0%
LU	0%	2%	10%	0%	0%	0%	25%	9%	0%	0%	0%	88%	0%	5%	0%	0%
NL	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	96%	0%	4%	2%
OT	0%	0%	2%	64%	0%	0%	0%	0%	7%	0%	29%	0%	0%	34%	0%	6%
SE	0%	2%	2%	0%	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	62%	0%
US	0%	2%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	5%	0%	39%

Table 3: Confusion matrix of the proposed algorithm

Robustness Checks (1)

- A cross-validation exercise has been performed (80% training, 20% validation): both the parameter estimates and the percentages of correct classification are constant over the different samples.
- The procedure has been applied to a new sample in which all countries have the same frequencies. The new confusion matrix is:

	TRUE															
FITTED	AT	BE	CH	CN	DE	DK	ES	FR	GB	IT	JP	LU	NL	OT	SE	US
AT	50%	0%	2%	0%	22%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
BE	1%	75%	19%	3%	2%	6%	1%	62%	7%	1%	5%	2%	6%	20%	0%	25%
CH	2%	5%	39%	1%	3%	2%	2%	6%	1%	0%	1%	3%	0%	4%	0%	4%
CN	0%	0%	1%	86%	0%	0%	0%	0%	1%	0%	24%	0%	0%	20%	0%	1%
DE	45%	0%	5%	0%	72%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
DK	1%	5%	2%	0%	0%	83%	0%	3%	1%	0%	0%	1%	0%	6%	0%	4%
ES	0%	2%	4%	0%	0%	1%	77%	4%	0%	0%	0%	5%	0%	6%	1%	1%
FR	0%	5%	2%	0%	0%	1%	0%	11%	0%	0%	1%	1%	0%	2%	0%	2%
GB	0%	0%	3%	1%	0%	0%	0%	0%	81%	0%	1%	0%	0%	10%	0%	0%
IT	0%	0%	1%	0%	0%	0%	2%	0%	0%	97%	0%	0%	0%	0%	0%	0%
JP	0%	0%	1%	2%	0%	1%	0%	0%	0%	0%	57%	0%	0%	2%	0%	1%
LU	0%	2%	15%	0%	0%	0%	15%	7%	0%	0%	1%	87%	0%	4%	0%	2%
NL	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	93%	0%	0%	0%
OT	0%	0%	3%	4%	0%	0%	0%	0%	7%	0%	5%	0%	0%	23%	0%	1%
SE	0%	3%	2%	0%	0%	5%	2%	4%	0%	0%	1%	0%	0%	1%	98%	0%
US	0%	4%	3%	2%	0%	0%	1%	2%	1%	0%	5%	0%	0%	3%	0%	59%

Table 4: Confusion matrix when all countries have the same frequencies

Robustness Checks (2)

- Our procedure has been compared to other text mining approaches (Singular Value Decomposition - SVD) and machine learning methods (random forests).
- The SVD is a sort of PCA applied to the matrix of dummies (considering all the words in the names of firms). The extracted components are then the inputs of a random forest algorithm.
- The confusion matrix of this approach (SVD + random forest) is:

	TRUE															
FITTED	AT	BE	CH	CN	DE	DK	ES	FR	GB	IT	JP	LU	NL	OT	SE	US
AT	2%	0%	1%	8%	2%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
BE	0%	4%	1%	0%	0%	0%	0%	1%	1%	0%	0%	1%	1%	0%	0%	0%
CH	2%	0%	33%	0%	0%	4%	2%	1%	1%	0%	0%	0%	0%	0%	5%	4%
CN	0%	0%	1%	17%	0%	0%	0%	0%	1%	0%	0%	0%	0%	2%	0%	0%
DE	76%	0%	1%	0%	86%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
DK	0%	0%	0%	0%	0%	58%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
ES	0%	0%	0%	0%	0%	0%	31%	0%	0%	0%	0%	0%	1%	1%	0%	0%
FR	0%	6%	7%	0%	1%	8%	8%	36%	1%	0%	0%	4%	4%	3%	0%	7%
GB	0%	0%	0%	17%	0%	0%	0%	0%	85%	0%	0%	0%	1%	20%	0%	0%
IT	12%	13%	4%	0%	4%	4%	8%	6%	1%	100%	4%	3%	4%	4%	0%	5%
JP	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	11%	0%	0%	1%	0%	2%
LU	0%	11%	7%	17%	1%	0%	5%	9%	2%	0%	7%	67%	8%	3%	0%	2%
NL	7%	64%	44%	0%	5%	27%	45%	47%	3%	0%	71%	23%	77%	29%	68%	25%
OT	0%	0%	0%	42%	0%	0%	0%	0%	4%	0%	4%	0%	1%	36%	5%	5%
SE	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	23%	0%
US	0%	2%	1%	0%	0%	0%	2%	0%	1%	0%	4%	0%	2%	2%	0%	49%

Table 5: Confusion matrix in the SVD + random forest procedure

Conclusions

- The overall accuracy of the model is very high with an almost perfect discrimination between Italian and foreign firms.
- The proposed approach seems to be able to classify correctly most of the countries with high levels of FDI investments in Italy.
- Estimates and predictions seem robust in different samples, with the same country composition (CV) and with a different one (same number of units per country).
- The results are competitive with respect to other approaches (SVD + random forest).
- The model can help us in two ways:
 - **Ex-ante:** the imputed nationality of firms is a relevant stratification variable for our sampling scheme;
 - **Ex-post:** the model can be used in the FDI grossing-up procedure to attribute the values of FDI investments to the different countries in a probabilistic or “fuzzy” way.

IFC - Central Bank of Armenia Workshop on "*External Sector Statistics*"

Dilijan, Armenia, 11-12 June 2018

A method for estimating 'pass-through activities' in official FDI statistics¹

Topias Leino,
Bank of Finland

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.

Topias Leino

Bank of Finland

A method for estimating ‘pass-through activities’ in official FDI statistics

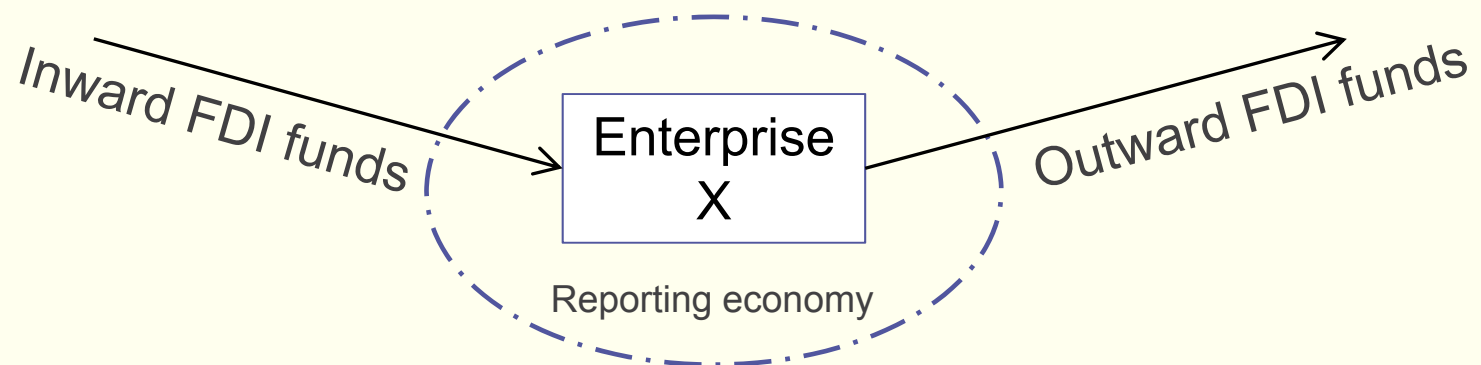
IFC-CBA Workshop on ‘External Sector Statistics’, Dilijan (Armenia) 11-12 June 2018





What do we mean by 'pass-through activities'?

Activities where foreign finance in form of foreign direct investment (recorded as *FDI liabilities* or *inward FDI*) are passed through as direct investment abroad (recorded as *FDI assets* or *outward FDI*)



NB: This is not the only meaningful definition in external sector statistics.

NB2: Other terms like 'capital-in-transit' and 'pass-through funding' are also used to broadly refer to the phenomenon.



Why identifying such activities is important?

- FDI statistics are widely used to analyze cross-border investment phenomena in 'real economic sense'
 - *How attractive is the economy to foreign investment?*
 - *How significant are foreign companies in the domestic economy?*
 - *How much have domestic companies expanded their operations abroad?*
 - ...
- → Inclusion of pass-through activities in data hampers such analyses
 - Per-unit impacts of inward FDI are arguably smaller with 'pass-through' than without
 - Outward FDI does not reflect investments originating from the reporting economy
 - Comparability issues between countries
- 'Pass-through' can be an interesting phenomenon in itself and needs to be communicated to the users



Globally, inward and outward FDI are highly correlated

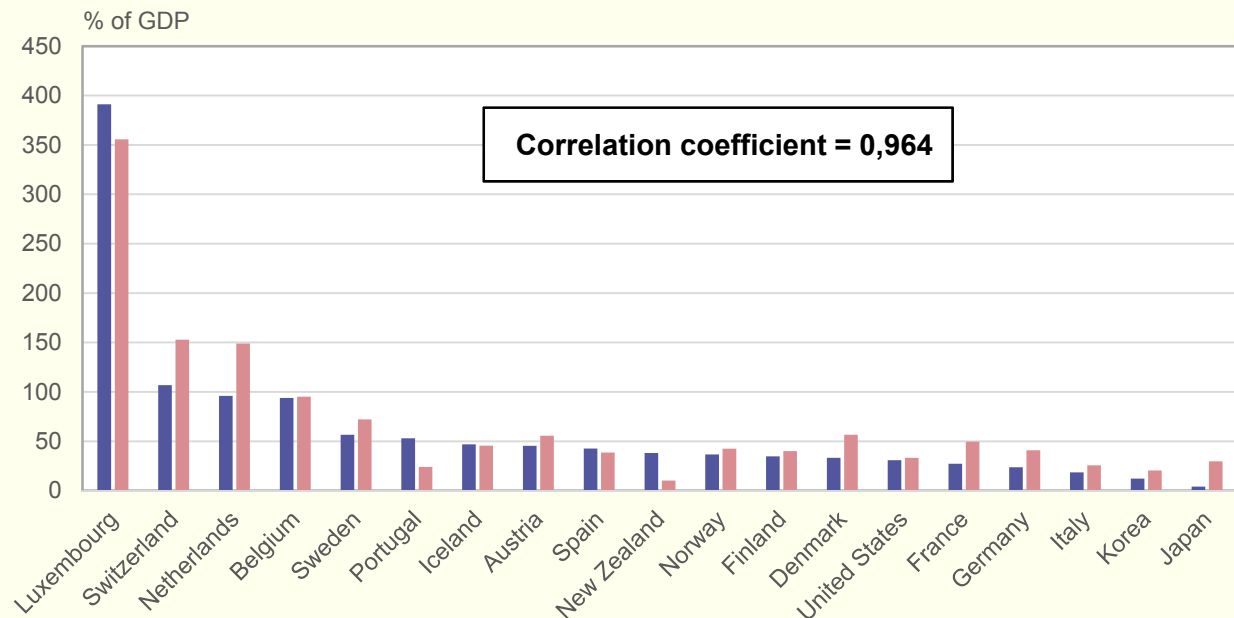
Inward and outward FDI positions in selected countries relative to GDP at end-2015, excluding resident SPEs*

■ Inward FDI stock, excl. resident-SPEs ■ Outward FDI stock, excl. resident-SPEs

...particularly among countries with high GDP per capita

To what extent do the inward and outward FDI figures reflect FDI merely passing through the economies?

Are FDI figures comparable between countries?



*) Special Purpose Entities; only for countries that have reported the data to OECD

Data source: OECD.



Current statistical standards* provide two methods for segregating pass-through in FDI

NB: These methods also have other analytical uses and may not have been designed primarily for segregating 'pass-through'.

1) Calculation of FDI according to the 'directional principle'

- **Essential idea:** *Net out investments that flow in reverse direction vis-à-vis the determined direction of influence/control*

Problems:

- Does not allow for "parent-to-subsidary pass-through" → **underestimation**
- Does not allow for pass-through 'in chains' → **underestimation**
- Does not allow for non-FDI finance → **overestimation**

2) Segregation of Special Purpose Entities (SPEs)

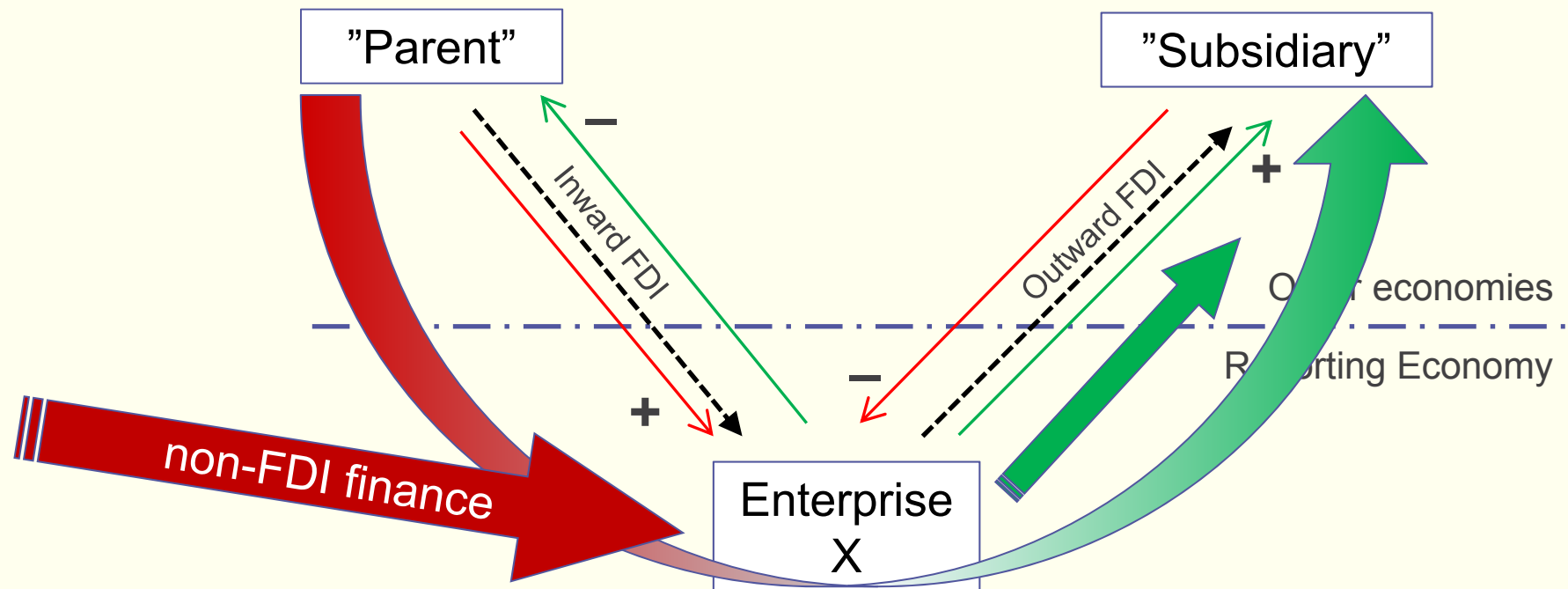
- **Essential idea:** *Label all FDI to/from SPEs as 'pass-through'*

Problems:

- Does not allow for pass-through activities in non-SPEs → **underestimation**
- Numerous specification problems → **underestimation** or **overestimation**

*) OECD Benchmark Definition of Foreign Direct Investment, 4th ed. (BD4) and IMF Balance of Payments Manual, 6th ed. (BPM6)

Directional principle: what it does?



- > Direction of influence/control
- Assets of Enterprise X (stock or flow)
- Liabilities of Enterprise X (stock or flow)

→ But it does not allow for

- "parent-to-subsidary pass-through"
- non-FDI finance



Blanchard & Acalin (2016):

- *"FDI inflows and outflows are highly correlated, even at high frequency and using different methodologies"*
- *"A lot of measured FDI reflects flows through rather than to the country and..."*
- *"...the suggested corrections – from separate treatment of SPEs, to measures of capital in transit, to the use of directional flows measures – **reduce but do not eliminate the problem**"*

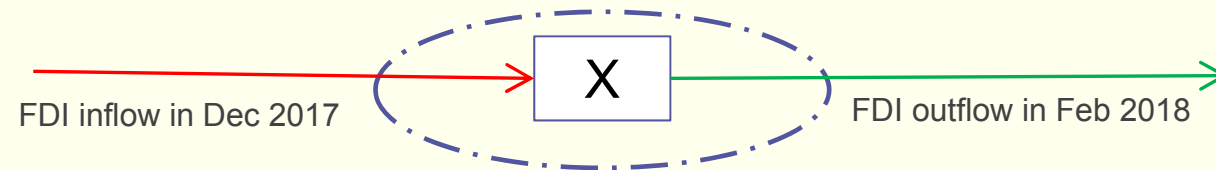
Blanchard, Olivier & Acalin, Julien (2016). ***What Does Measured FDI Actually Measure?***
Peterson Institute for International Economics Policy Brief 16-17, October 2016.



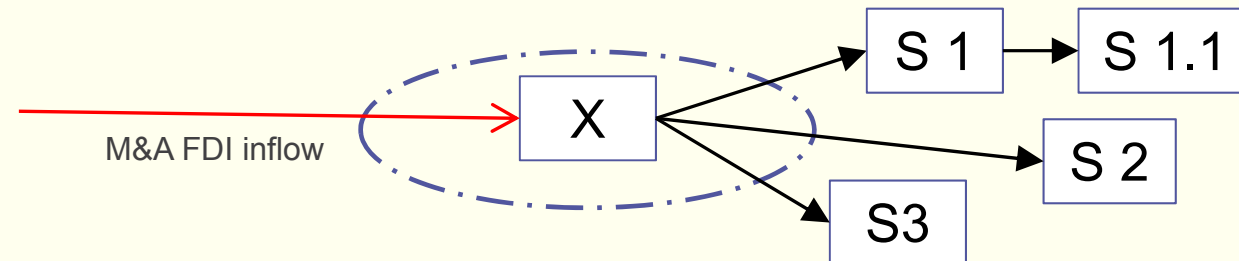
Conceptual issues in determining 'pass-through'

- Funding is often interchangeable → Linkages between the source and the use of funding are often obscure
- Estimating 'pass-through' by using FDI flow data is highly interpretative:

How we should allow for the possible timing differences between inflow and outflow?



How we should interpret M&A-related flows?



→ We estimate 'pass-through' by using data on FDI positions



Our method for estimating pass-through of FDI

1. We choose the FDI figure which is closer to zero (this is the theoretical maximum of 'pass-through')

2. We weight this with the % of FDI liabilities in total liabilities

NB: If FDI liabilities and FDI assets have different signs (common with flow data), we determine pass-through FDI as zero. Note that negative pass-through are still allowed.

Enterprise X	
Liabilities	Assets
FDI liabilities 500	FDI assets 400
Other foreign liabilities 200	Other foreign assets 100
Domestic liabilities 100	Domestic assets 300
<hr/>	
Total liabilities 800	Total assets 800

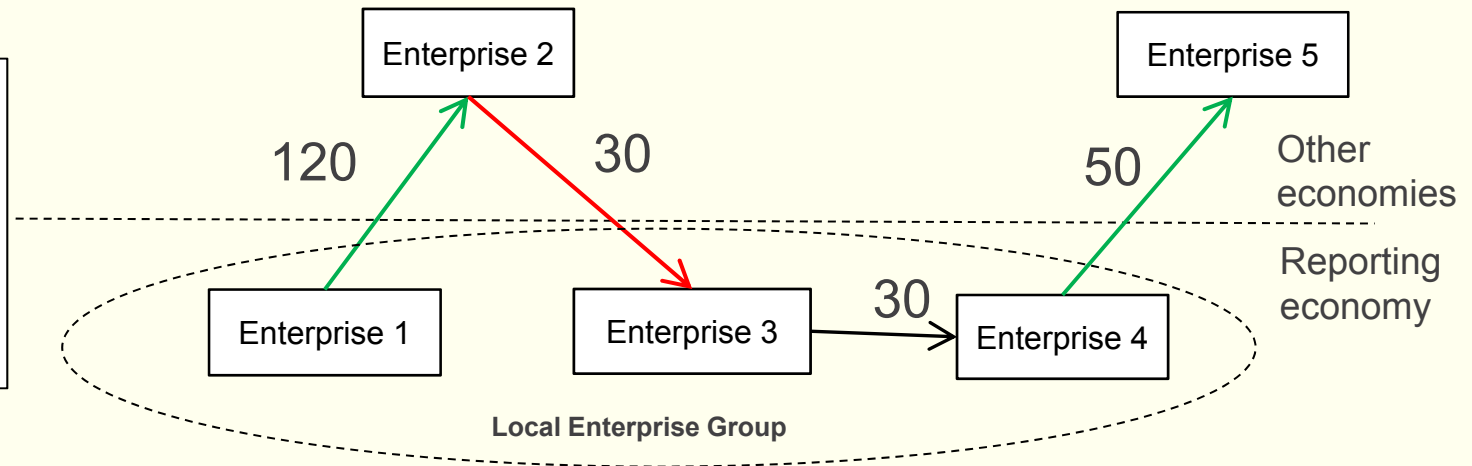
Pass-through of FDI:

$$400 \times \frac{500}{800} = 250$$



Pass-through activities may also take place in chains of local enterprise group units

3. We take this into account by using data aggregated at local enterprise group level.



Local Enterprise Group

Pass-through of FDI:

$$30 \times \frac{30}{180} = 5$$

FDI liabilities 30
Other liabilities 150
<hr/>
Total liabilities 180

FDI assets 170
Other assets 10
<hr/>
Total assets 180



Formal presentation of our method

$$X_t = \sum_i f(I_{i,t}, O_{i,t}, \lambda_{i,t})$$
$$f(I_{i,t}, O_{i,t}, \lambda_{i,t}) = \begin{cases} \min(I_{i,t}, O_{i,t}) \times \lambda_{i,t} & , I_{i,t} > 0 \text{ and } O_{i,t} > 0 \\ \max(I_{i,t}, O_{i,t}) \times \lambda_{i,t} & , I_{i,t} < 0 \text{ and } O_{i,t} < 0 \\ 0 & , \text{otherwise} \end{cases}$$

where:

X_t = Total of pass-through FDI in the economy

$I_{i,t}$ = FDI liabilities (or inward FDI) of enterprise (group) i at time point t

$O_{i,t}$ = FDI assets (or outward FDI) of enterprise (group) i at time point t

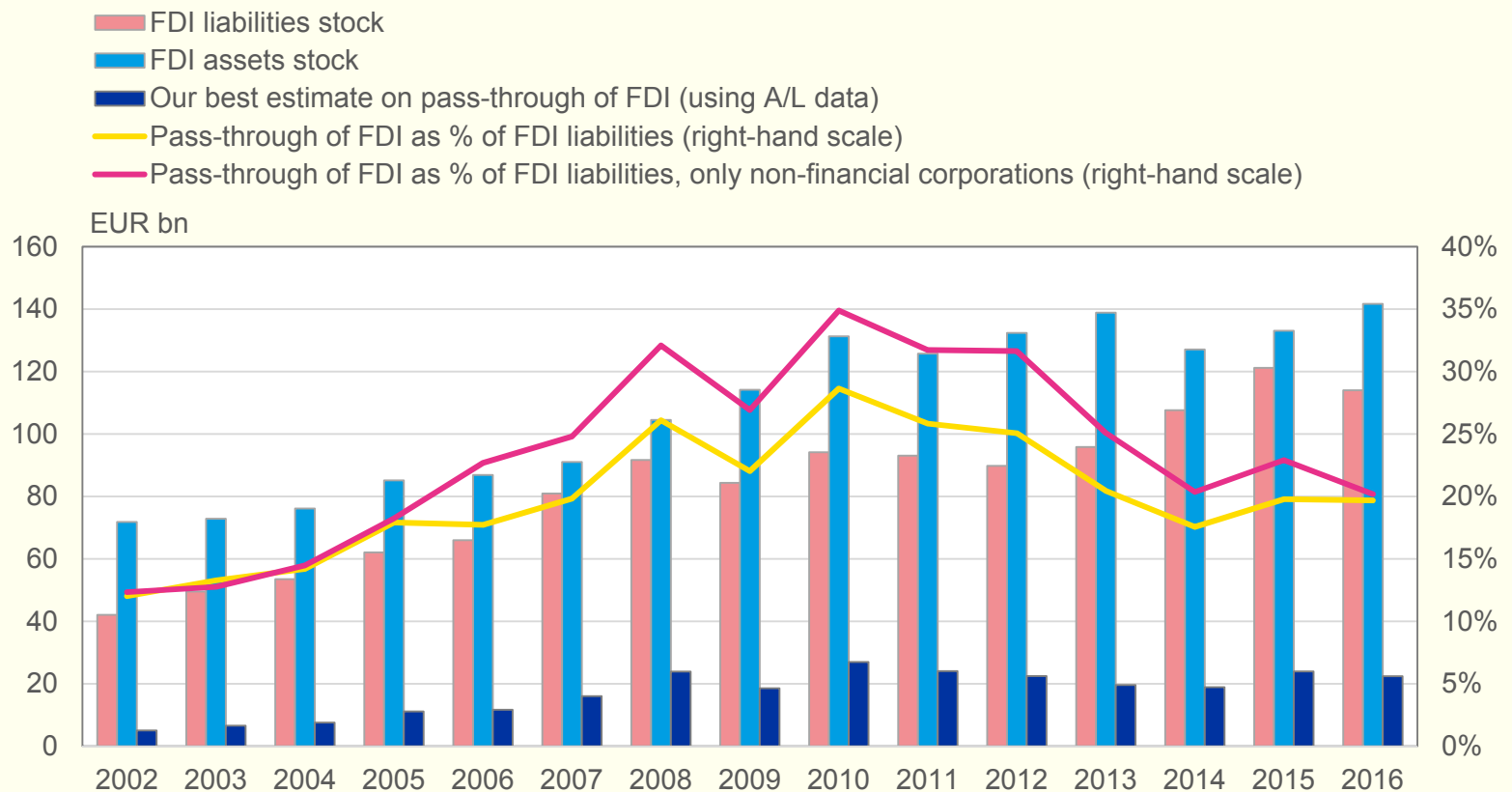
$\lambda_{i,t}$ = % of FDI liabilities in total liabilities of enterprise (group) i at time point t

NB: In addition to FDI positions, the method can be applied to measure pass-through FDI flows (though the above-mentioned conceptual issues need to be considered). Also, an application to cover also other BoP/IIP items in estimation is possible.



Results for Finland (preliminary)

Estimated pass-through positions of FDI in Finland



Sources: author's calculations, Bank of Finland, Statistics Finland



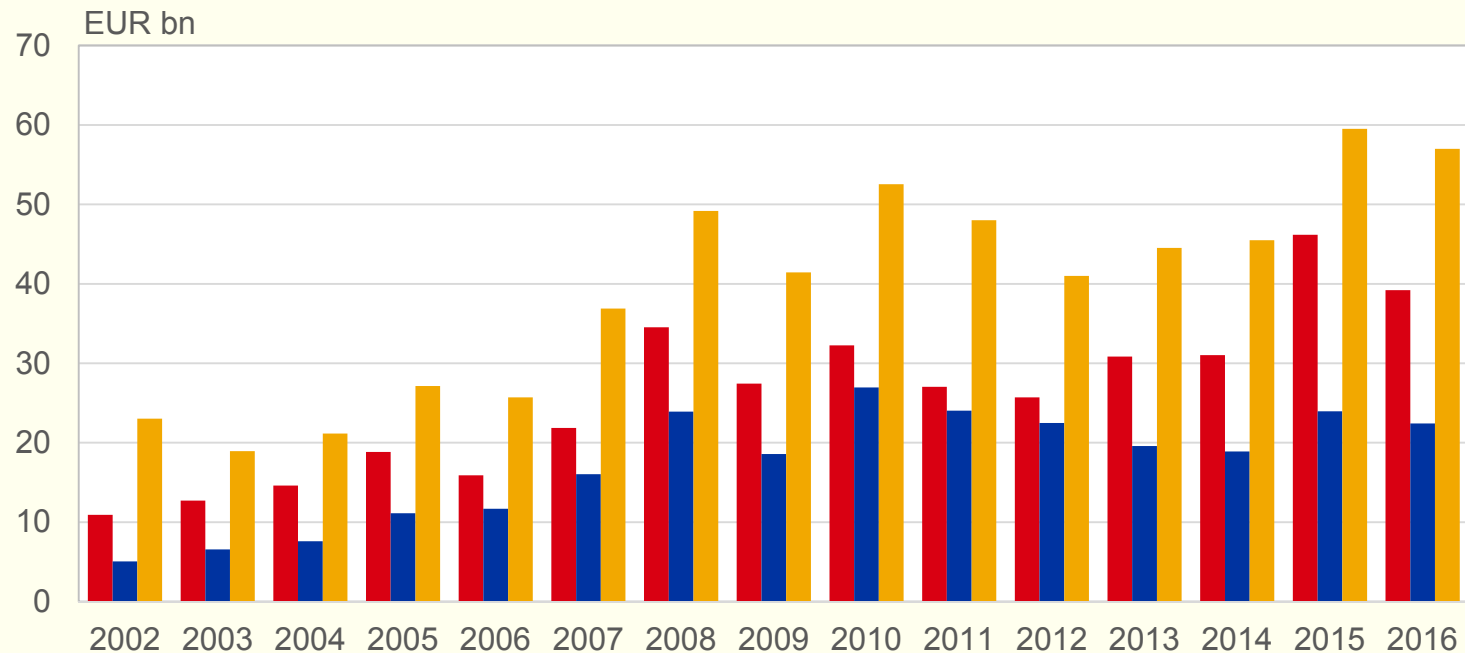
Results for Finland: comparison to the directional principle calculation

Our estimations on pass-through of FDI vs. directional principle

- Funds netted out by the directional principle calculation
- Our best estimate on pass-through of FDI
- Our estimate on pass-through of FDI without allowing for non-FDI finance

→ Overall, directional principle seems to overestimate 'pass-through' for Finland

→ Non-FDI finance is a highly significant factor!



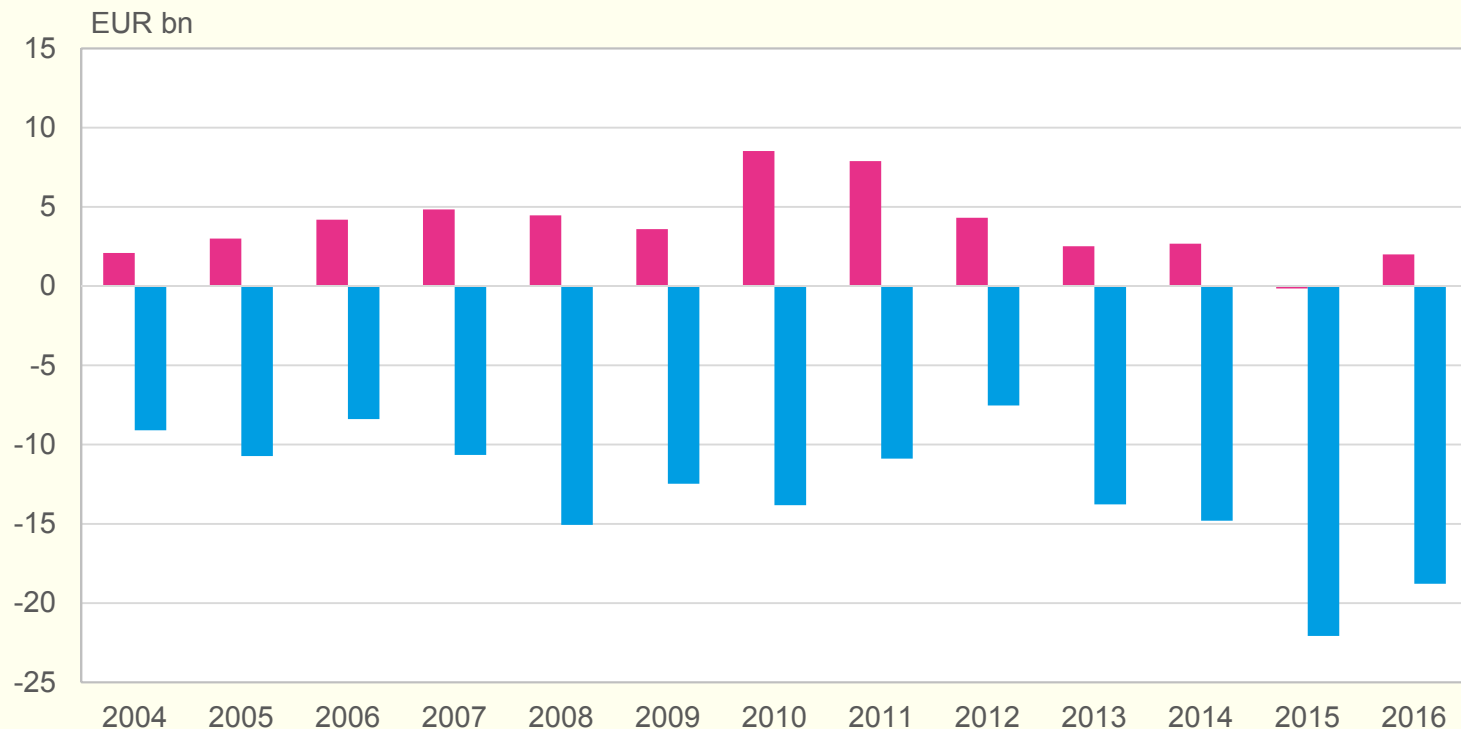
Source: author's calculations.



Results for Finland: comparison to the directional principle calculation (2)

Difference between our best estimate of 'pass-through' and the funds netted out by the directional principle calculation*

■ Foreign enterprise groups ■ Domestic enterprise groups



→ However, 'overestimation' is mainly due to Finnish enterprise groups in the data

→ 'Pass-through' by foreign groups in Finland seem rather to be underestimated by the directional principle

*) Here, a negative figure can be interpreted as an overestimation and a positive figure as an underestimation of 'pass-through' by the directional principle calculation. Enterprise group's nationality is determined based on the residency of the ultimate controlling parent enterprise.

Source: author's calculations.



Evaluation of our method

- Simple
- Works theoretically best with positional FDI asset/liability data
 - Can be applied to other FDI and BoP/IIP data, but some conceptual ambiguities need to be addressed
- Captures 'pass-through activities' in SPEs and non-SPEs
- May not require any extra data collection from statistics compiler
 - But requires access to firm-level data



Thank you!

- Questions?
 - Topias.Leino@bof.fi



IFC - Central Bank of Armenia Workshop on "*External Sector Statistics*"

Dilijan, Armenia, 11-12 June 2018

Estimation of round tripping transactions: the Ukrainian experience¹

Olena Syvak,
National Bank of Ukraine

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.

Estimation of round tripping transactions: the Ukrainian experience

National Bank of Ukraine
Statistics and Reporting Department

OLENA SYVAK,
Head of the IIP compilation Unit

Dilijan, June 2018



Core points

Purpose

The estimation of volumes of *round tripping transactions* (involves funds from an entity in one economy being invested in an entity resident in a second economy, that are then invested in another entity in the first economy) on the basis of available statistical data by:

- identifying whether the UCP is a resident *;
- redistribution of FDI flows by the countries of the UCP.

Time period: Y2010 – Y2017.

Results

- During Y2010 – Y2017 volumes of transactions if the USP is resident (*round tripping*) were estimated at \$7.5 billion, representing 21.3% of direct investment inflow (\$35.5 billion). During Y2010 – Y2013 there were the biggest round tripping transactions volumes - on average 32% of the total, while in 2016-2017 they were only 6%; in 2014 - 2015 there was an outflow of funds from Ukraine for such operations.
- In Y2017 round tripping transactions formed 12.3% of FDI to Ukraine.

Future plan

- To add additional information about complex indirect capital reinvestment schemes based on, for example, detailed balance sheet data of corporations.



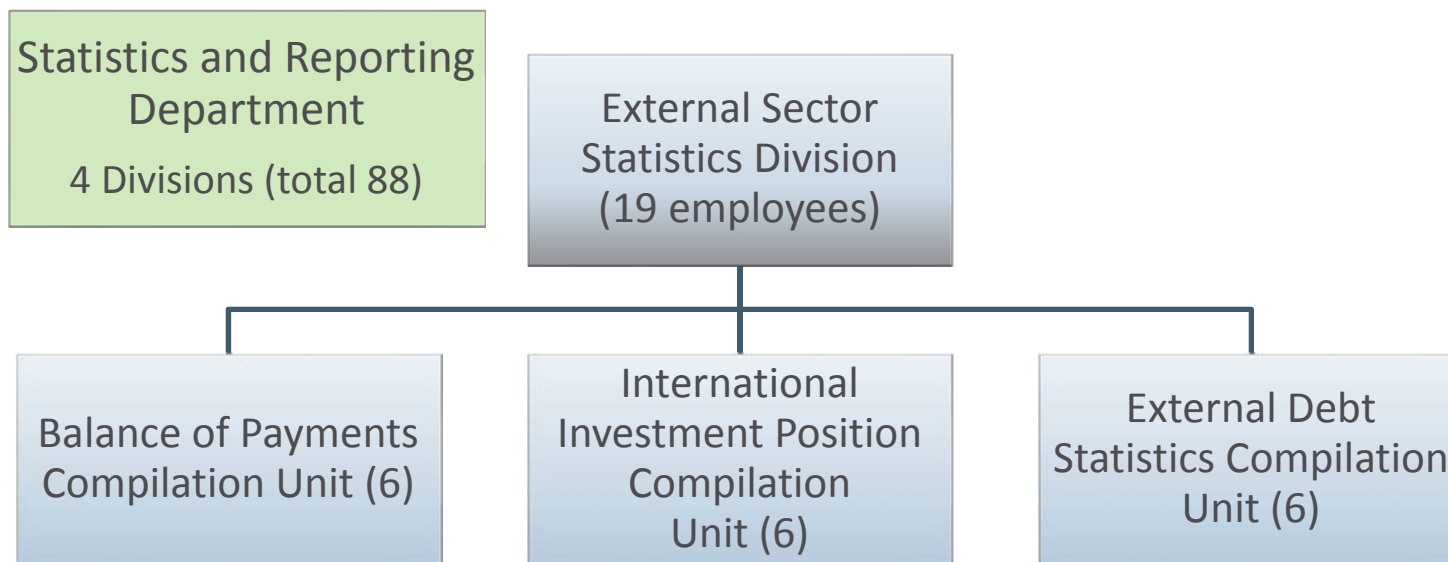
* An investor (company or individual) is considered to be the ultimate control investor (UCP) if it is at the head of a chain of companies and directly or indirectly controls all the enterprises in the chain without itself being controlled by another investor.



Outline

I	Organizational Structure	4
II	Data Collection System for FDI	5
III	Incentives for Round Tripping	6
IV	Data Sources for Round Tripping	7
V	Algorithm of Calculation	8
VI	Difficulties	9
	Graphs, Tables, Examples	10-16

Organizational Structure



- *BOP Compilation Unit* is responsible for the compilation of the current account and the dissemination of the overall BOP.
- *IIP Compilation Unit* is responsible for the compilation of the financial account in the BOP, and the compilation and dissemination of the IIP; in addition it compiles the Coordinated Portfolio Investment Survey (CPIS).
- *External Debt Statistics Unit* compiles data on external debt and debt service, and is responsible for their dissemination.

Data Collection System for FDI

National Bank of Ukraine

- **International Transactions Reporting System (ITRS)**
 - Two categories of respondents:**
 - Banks that undertake international transactions both for their own accounts and on behalf of their customers (79)
 - Resident enterprises that have opened foreign accounts outside the domestic banking system (76)
 - Closed system**
 - Simplification Thresholds**
 - (transactions above USD 50,000 or equivalent value are reported as individual with the identification of the resident customer)
 - Transactions are reported in the original currency**
- **Surveys of banks and enterprises on external loans**
 - Monthly loan-by-loan data on stocks, transactions, schedules of repayments
- **Banks' balance sheets**
- **Bank Supervision data**
 - Ownership structure of Ukrainian banks,
 - Data on personal licenses for investing abroad,
 - Information on the approval of acquiring substantial participation in banks

State Statistics Service of Ukraine (SSSU)

- **Quarterly Surveys of enterprises on:**
 - FDI (Forms 10,13-ZEZ: assets/liabilities, stocks/flows; breakdowns by: countries, economic activities, regions)
 - Accounts receivables/payables

State Property Fund

- **Information about receipts from privatization.**

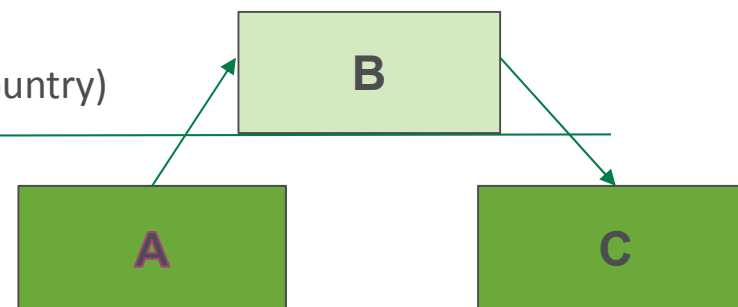
Incentives for *round tripping*

Definition

- **Round tripping** is a specific case of pass-through funds that involves funds from an entity in one economy, i.e. host economy, being invested in an entity resident in a second economy, i.e. routing economy, then having them reinvested in an entity in the first economy. (6.46, BPM6; 467, OECD benchmark definition of FDI 4-th edition)

Routing Economy ("Transit" country)

Host economy (Ukraine)



Enterprise A in Ukraine provides direct investment funds to a non-resident related Enterprise B in the "Transit" country for investing back in another Enterprise C in Ukraine.

Main incentives

- Property right protection, in some cases, concealing equity ownership;
- Tax and fiscal advantages, lowering tax burden; use of preferential policies to attract FDI;
- Expectations on exchange control and exchange rate: round-tripping for greater flexibility in foreign exchange management;
- Accessing better financial services;
- Reducing production costs;
- Optimizing liquidity management (netting, pooling, zero balances, financing through securitization).

Data Sources for Round Tripping

Sources

- 1, 2 PB Forms (files #1P, #2P) «Bank`s/enterprise`s report about financial transactions with nonresident» for determining of FDI inflows in form of cash (appropriate *transactions codes*: 4221- *inflows in FDI` enterprise, share capital, liabilities*; 4271– *other capital in form of DI, liabilities*; 4261– *intercompany lending etc.*);
- Data on FDI loans obtained from nonresidents (Form №503, file #6A);
- Official web-sites of relevant enterprises on ownership structure;
- www.youcontrol.com.ua та <https://edr.dominus.kiev.ua/catalog>: Information on relevant enterprises' ultimate controlling parent (UCP) which received FDI;
- usr.minjust.gov.ua/ua/freesearch: the Ministry of Justice of Ukraine web-site: unified state register of legal entities, individual entrepreneurs and community groups;
- Enterprise`s yearly reports;
- https://bank.gov.ua/control/uk/publish/article?art_id=6738234&cat_id=51342 on the ownership structure of Ukrainian banks.

Methodology

- Balance of payments and international investment position manual. – Washington, D.C.: International Monetary Fund, 2009;
- OECD benchmark definition of foreign direct investment: fourth edition – OECD 2008;
- Balance of payments and international investment position compilation guide. – Washington, D.C. : International Monetary Fund, 2014;
- The coordinated direct investment survey guide. – Washington, D.C. : International Monetary Fund, 2015

Algorithm of calculation

1. Definition of sample of enterprises/banks.
The list of FDI enterprises/banks (1022) are derived from the №1,2-PB and №503 forms based on FDI inflows in cash for each of sample year.
2. Analysis of the sample of enterprises/banks for the purpose of determining the UCP and marking the resident/non-resident.

Enterprises (year)	\$ mln	Country of FDI inflow	Immediate investor (country)	UCP (country)	Round tripping	Comments
ITRS	ITRS	ITRS	ITRS	https://youcontrol.com.ua/en/catalog/company_details ; https://smida.gov.ua ; Other		
PUBLIC JOINT STOCK COMPANY "DTEK" DNIPROOBLENERGO	65	CYP	DTEK HOLDINGS LIMITED (CYP)	mr. X (UKR) (100%)	yes	Mr. X : ownership of 100% of the voting power of DTEK Holdings ltd
Limited Liability Company "LIFECCELL"	74	NLD	Euroasia Telecommunications Holding BV (NLD)	Turkcell (RUS)	no	Turkcell owns of 100% of Eurasia Telecommunications
....	30	CYP	Uglass Holding Limited (CYP)	mr. Y (UKR)	no	Less 50%

3. Aggregation of results of round tripping flows broken down by years, sectors, instruments.
4. Sampling and analysis of new enterprises/banks is carried out on quarterly basis.



Difficulties

Residency

- Some companies are well known worldwide with managing offices in different locations.
- Ultimate investors-individuals are usually known to have a specified nationality, but not always their residency (in BoP terms) is known.

Complicated structure

- Some companies have difficulties obtaining the information about the whole group structure. Only immediate links are available.

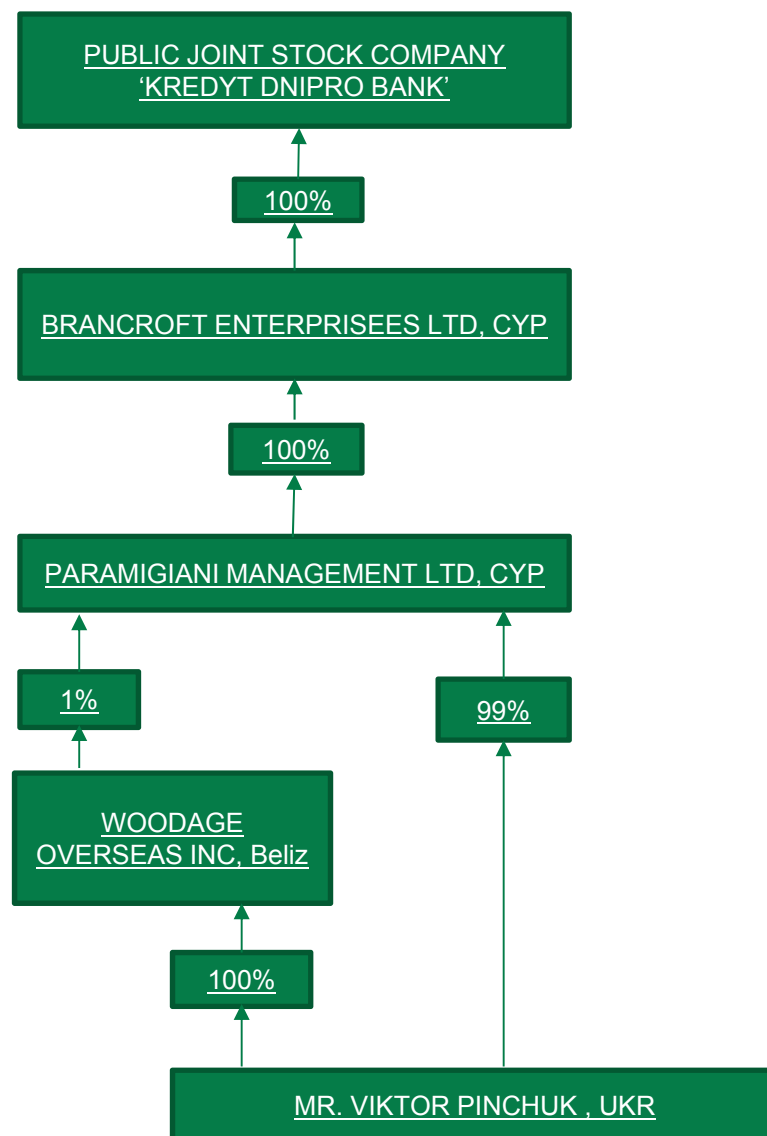
Researching period

- Long period of research (2010-2017). Significant changes in ownership structure could be happened in each certain year.

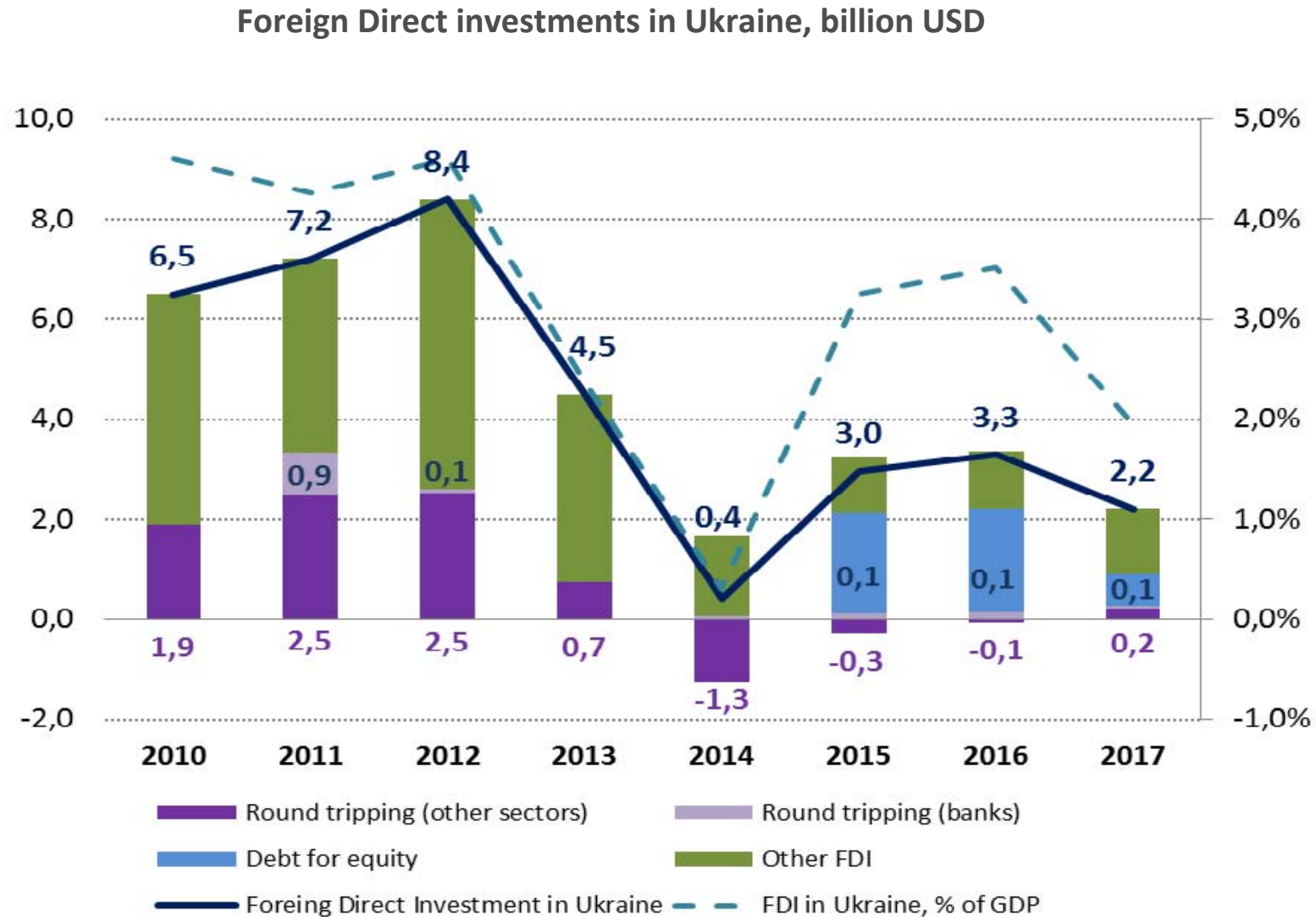


Graphs, Tables, Examples

An Example of KREDYT DNIPRO Bank` ownership structure

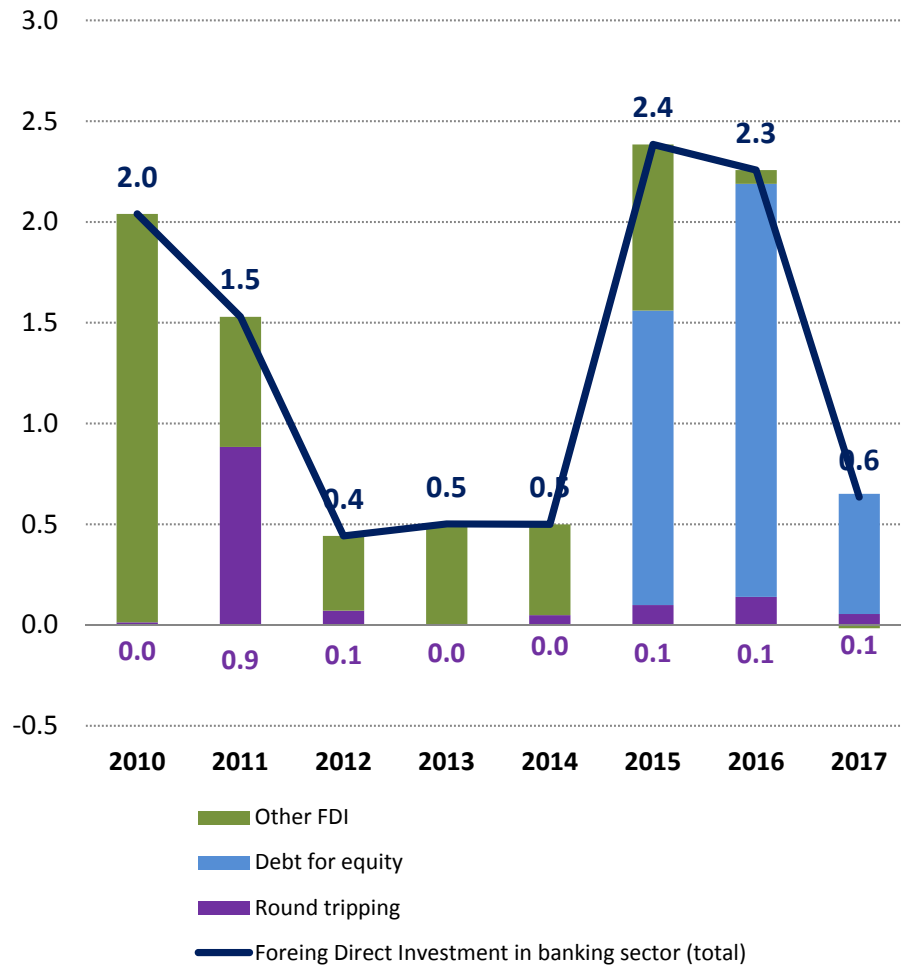


Round tripping transactions in FDI net inflow for 2010-2017

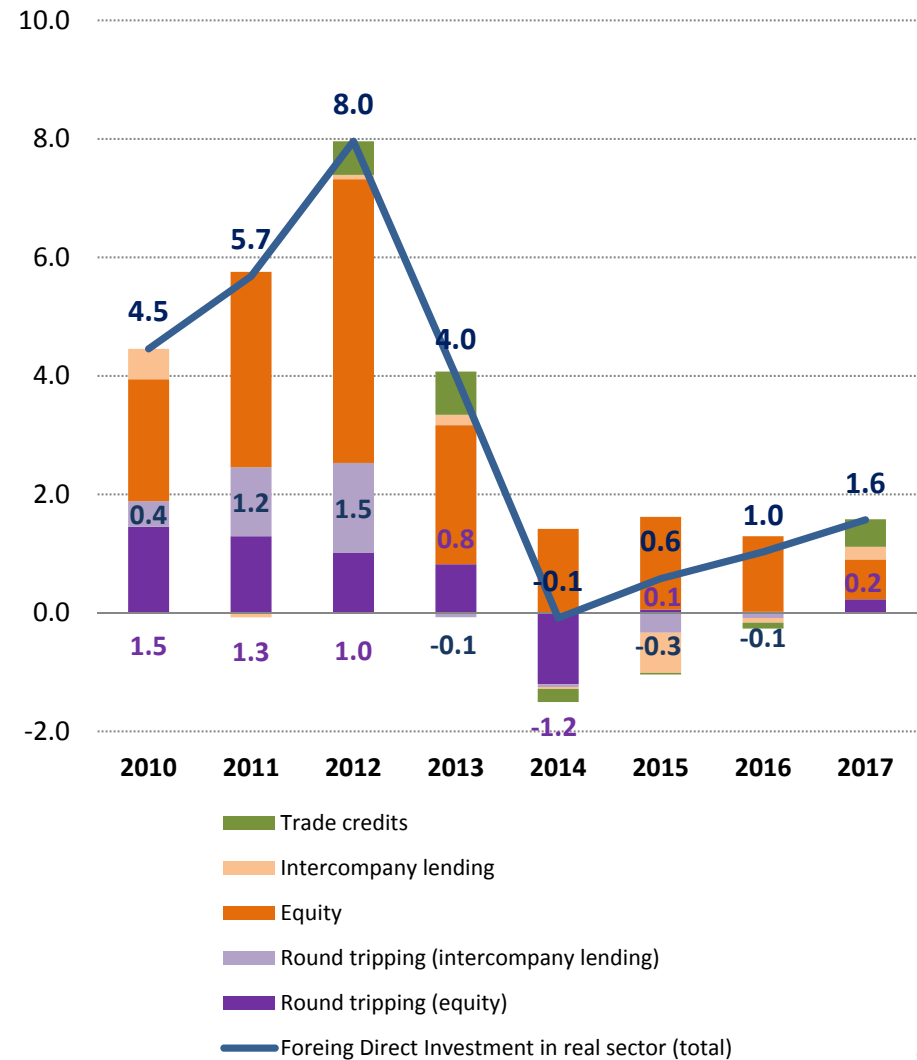


The largest volume of *Round tripping* transactions were observed in 2010-2013 in real sector (in average 38% of total FDI inflow)

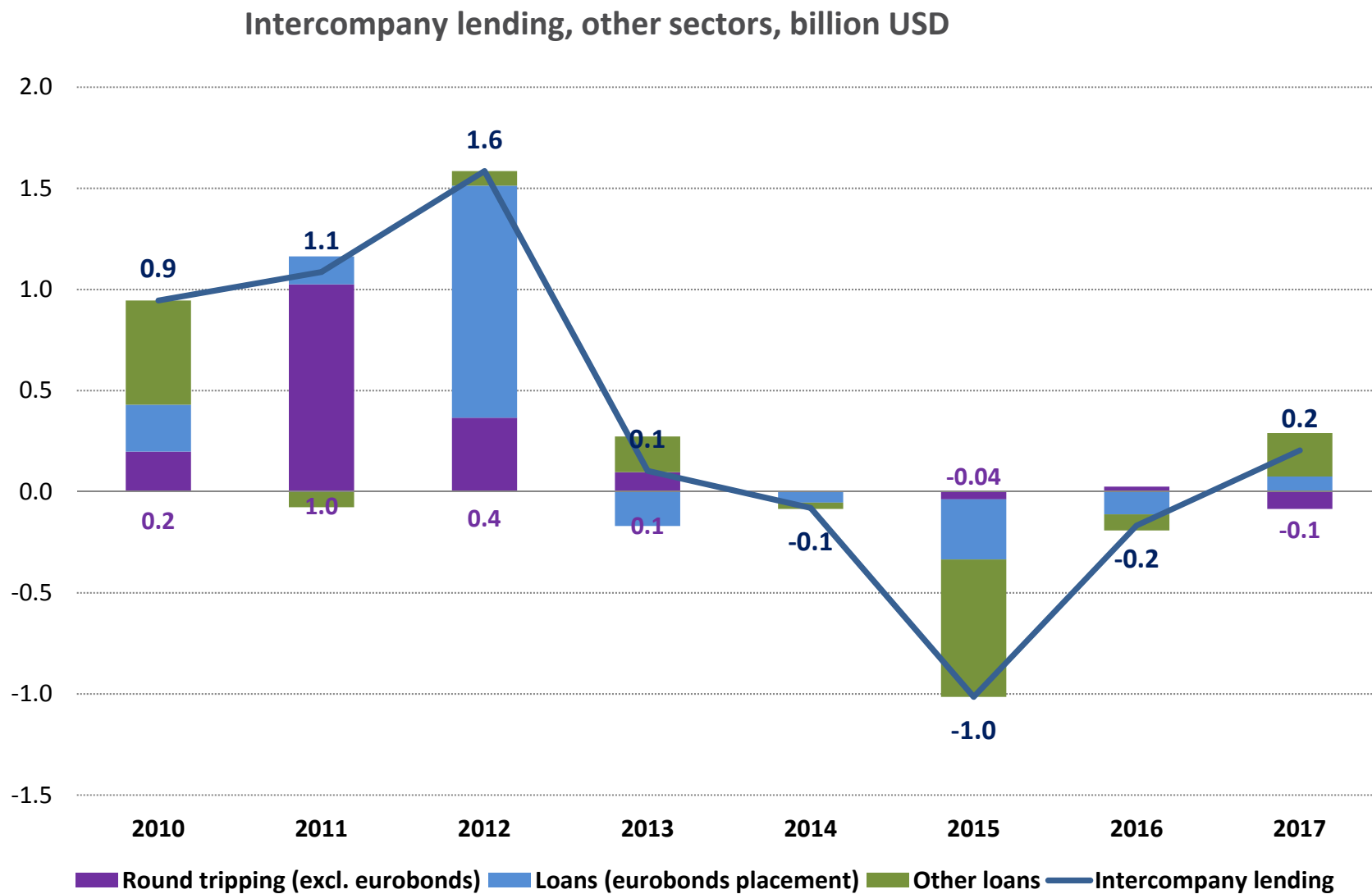
FDI in banking sector, billion USD



FDI in real sector, billion USD

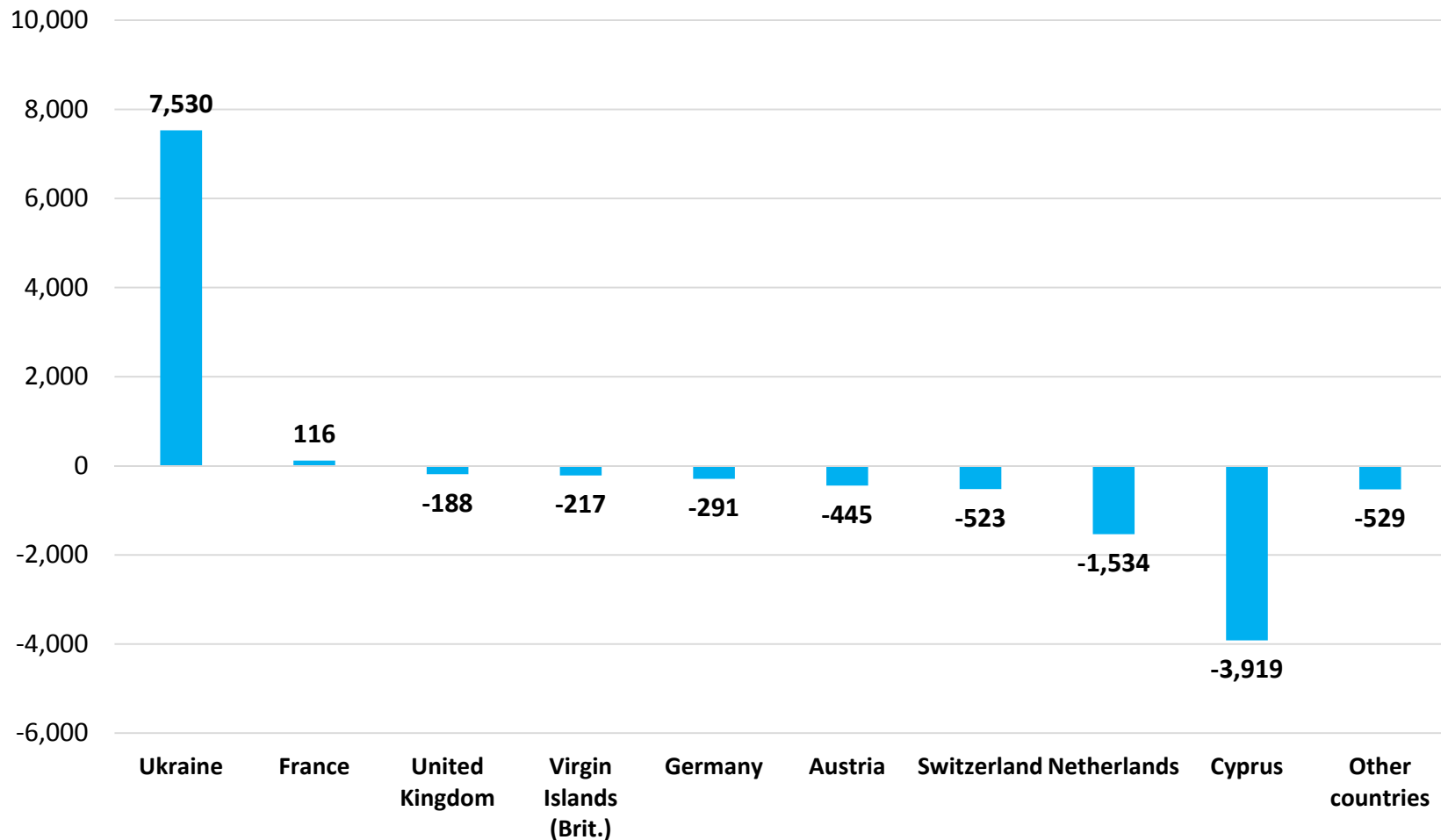


In 2010-2012 net inflow on loans from direct investors was mainly due to *round tripping* transactions



Round tripping transactions were routed mainly through Cyprus, Netherlands, Switzerland and Austria

Redistribution of FDI inflow for 2010-2017 by ultimate investing countries
(vs immediate investment countries), million USD



Estimates of *round tripping* transactions for 2010-2017

	2010	2011	2012	2013	2014	2015	2016	2017
FOREING DIRECT INVESTMENT in UKRAINE (1.+2.) \$ mln	6 495	7 207	8 401	4 499	410	2 961	3 284	2 202
banking sector	2 039	1 529	442	501	499	2 384	2 257	635
other sectors	4 456	5 678	7 959	3 998	-89	577	1 027	1 567
Round tripping, \$ mln	1 896	3 339	2 600	746	-1 203	-181	69	270
banking sector	13	883	71	0	49	99	139	54
other sectors	1 883	2 456	2 529	746	-1 252	-280	-70	216
<i>Round tripping, % of total value</i>	29,2	46,3	30,9	16,6	–	–	2,1	12,3
<i>banking sector</i>	<i>0,6</i>	<i>57,8</i>	<i>16,1</i>	<i>0,0</i>	<i>9,8</i>	<i>4,2</i>	<i>6,2</i>	<i>8,5</i>
<i>other sectors</i>	<i>42,3</i>	<i>43,3</i>	<i>31,8</i>	<i>18,7</i>	<i>–</i>	<i>–</i>	<i>–</i>	<i>13,8</i>

Estimates of *round tripping* transactions for 2010-2017 by instruments

	2010	2011	2012	2013	2014	2015	2016	2017
1. Equity and investment fund shares	5 550	6 121	6 248	3 668	712	4 003	3 550	1 535
banking sector	2 039	1 529	442	501	499	2 384	2 257	635
other sectors	3 511	4 592	5 806	3 167	213	1 619	1 293	900
Round tripping, \$ mln	1 466	2 176	1 087	819	-1 154	154	156	281
banking sector	13	883	71	0	49	99	139	54
other sectors	1 453	1 293	1 016	819	-1 203	55	17	227
<i>Round tripping, % of total value</i>	26,4	35,5	17,4	22,3	–	3,8	4,4	18,3
<i>banking sector</i>	<i>0,6</i>	<i>57,8</i>	<i>16,1</i>	<i>0,0</i>	<i>9,8</i>	<i>4,1</i>	<i>6,2</i>	<i>8,5</i>
<i>other sectors</i>	<i>41,4</i>	<i>28,2</i>	<i>17,5</i>	<i>25,9</i>	<i>–</i>	<i>3,4</i>	<i>1,3</i>	<i>25,2</i>
2. Debt instruments	945	1 086	2 153	831	-302	-1 042	-266	667
<i>of which</i> Intercompany lending	945	1 086	1 585	103	-80	-1 015	-167	204
Round tripping, \$ mln	430	1 163	1 513	-73	-49	-335	-87	-11
<i>Round tripping, % of total value</i>	45,5	107,1	95,5	–	61,3	33,0	52,1	–



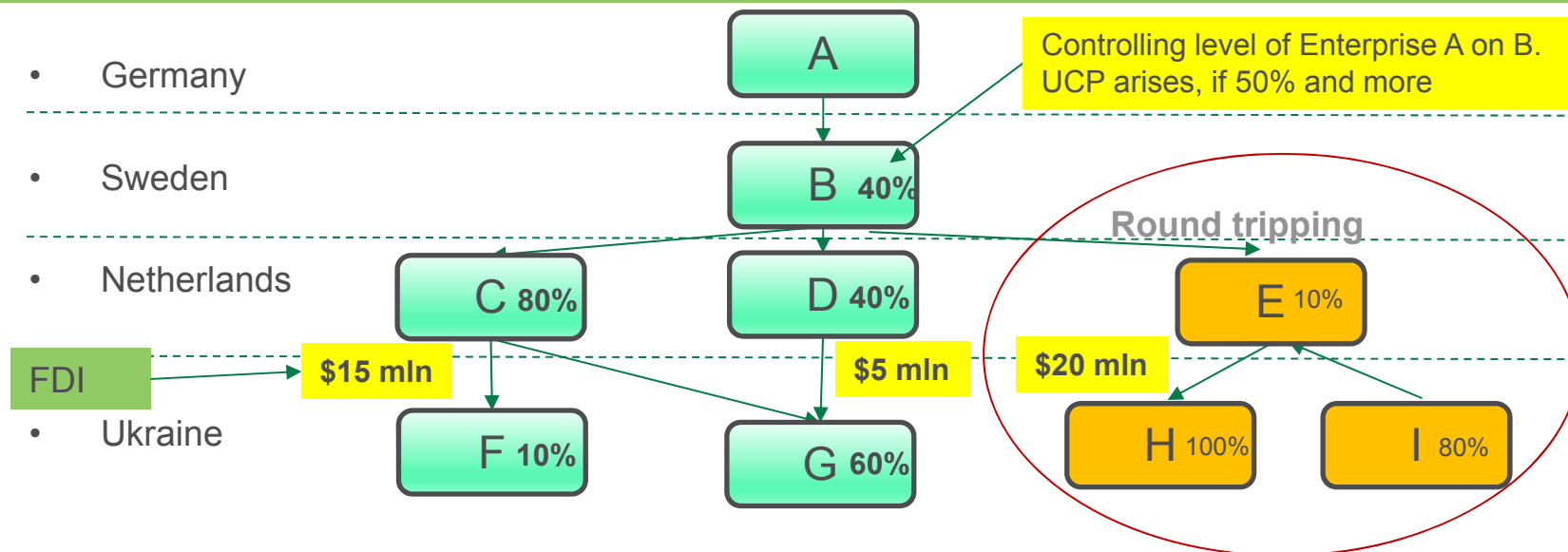
Thank you for your attention

Everybody welcome to invest into Ukrainian Economy!



Additional information

An illustration of the reallocation process to the ultimate investing country *



According to the standard presentation by country (on an immediate investor basis Ukraine would show \$40 mln (15+5+20) of inward FDI positions from Netherlands. According to the supplemental presentation of inward positions by UIC (Ultimate investing country) :

\$15 mln investment from C into F would be relocated to Sweden, as enterprise B is the ultimate investor in enterprise F (as the UCP of enterprise C);

\$5 mln investment from D into G would remain allocated to Netherlands as enterprise D is the ultimate investor in enterprise G (no enterprise exerts control over enterprise D, so enterprise D is its own UCP);

\$20 mln investment from E into H would be reallocated to Ukraine as enterprise I is the ultimate investor in enterprise H (as the UCP of enterprise E). It is **Round tripping**.

! Redistribution of investments by country UCP does not lead to a change in the total amount of FDI.



* OECD benchmark definition of foreign direct investment: fourth edition – OECD 2008, Annex 10

Periodicity and Timeliness of External Sector Statistics

ESS are compiled in accordance with BPM6 (“Balance of Payments and International Investment position Manual”, sixth edition, 2009)

	Periodicity	Timeliness	Type of data
Balance of Payments	Quarterly, Monthly (preliminary estimation)	75 – 80th day 30th day	<ul style="list-style-type: none"> Standard presentation Analytical presentation By sectors
International Investment Position	Quarterly	90th day	
Foreign Direct Investment	Quarterly	90th day	<ul style="list-style-type: none"> Directional principle presentation (stocks/flows) Assets/Liabilities principle presentation (stocks/flows)
External Debt	Quarterly	75 – 80th day	<ul style="list-style-type: none"> Gross External Debt Currency breakdown Short-term debt on remaining maturity

IFC - Central Bank of Armenia Workshop on *"External Sector Statistics"*

Dilijan, Armenia, 11-12 June 2018

Euro area balance of payments and international investment position statistics: present and future¹

Nuno Silva,
European Central Bank

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.

Nuno Silva
Head of Section
External Statistics

Euro area balance of payments and international investment position statistics:

Present and future

Session 5

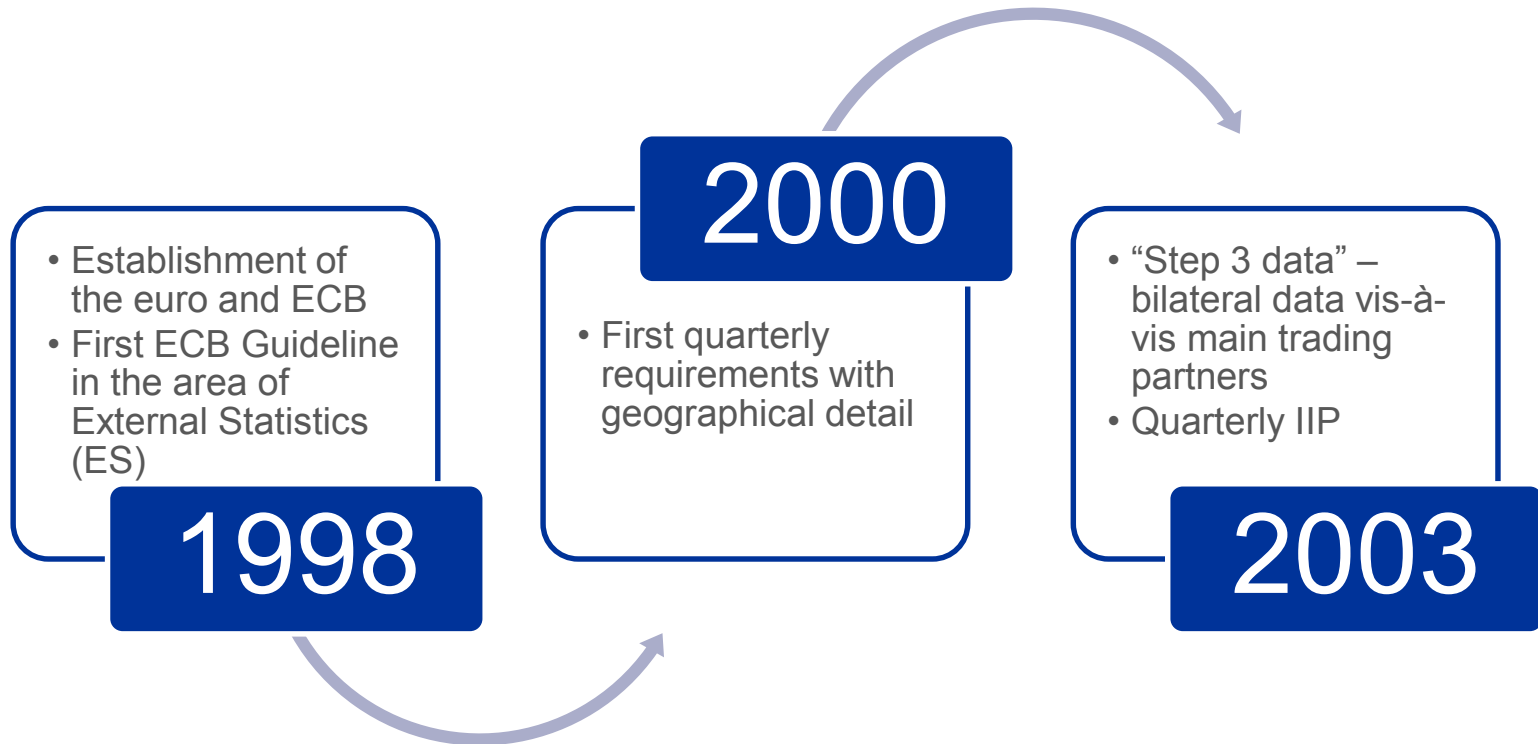
**IFC – Central Bank of Armenia workshop on
“External sector statistics”**

11–12 June 2018, Dilijan, Republic of Armenia

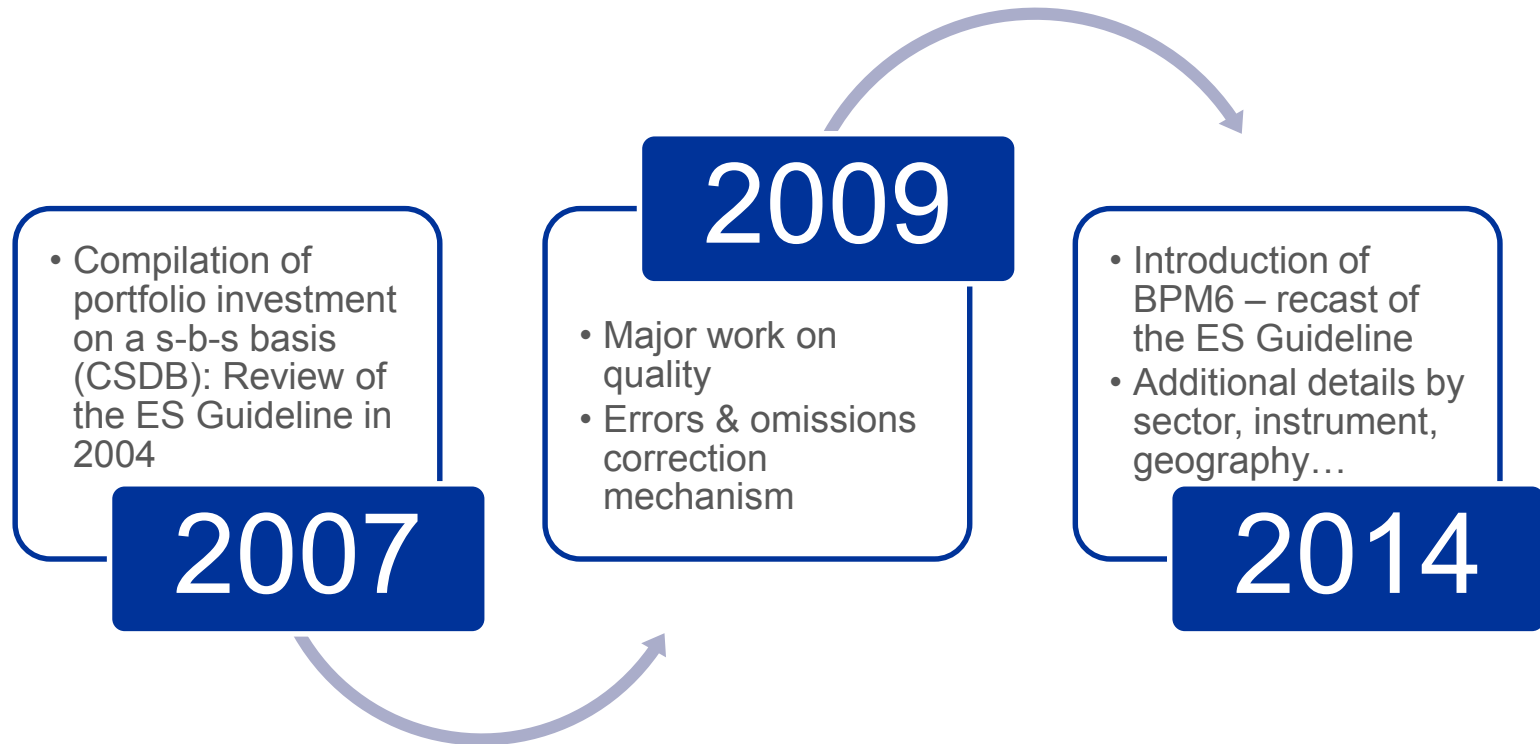
Overview

- 1** State of play
- 2** The environment
- 3** The road ahead: medium-term strategy
 - 3.1** Development of fit for purpose data
 - 3.2** Production of high quality data
 - 3.3** Dissemination of comprehensive data
 - 3.4** International cooperation and methodological coherence

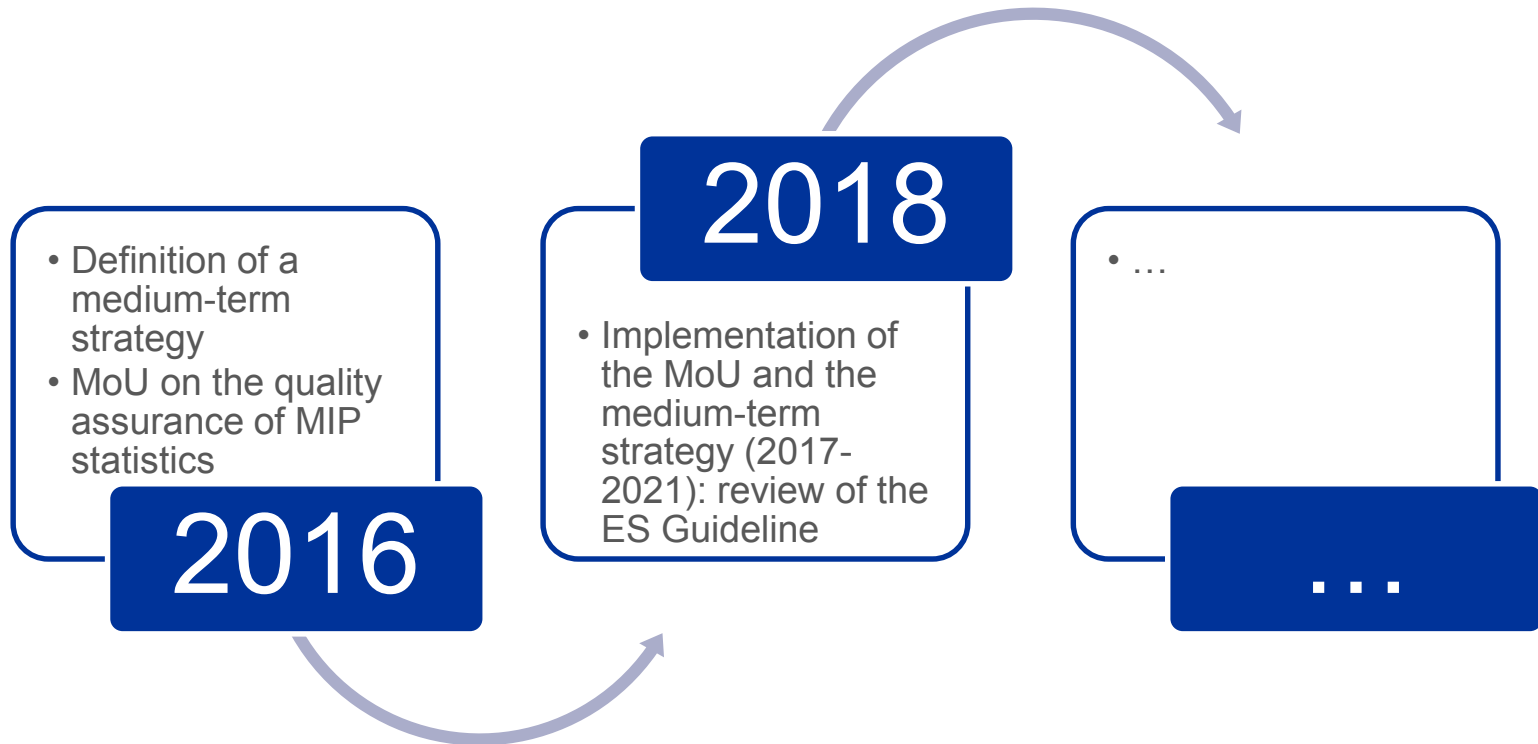
1. State of play *(from 1998...)*



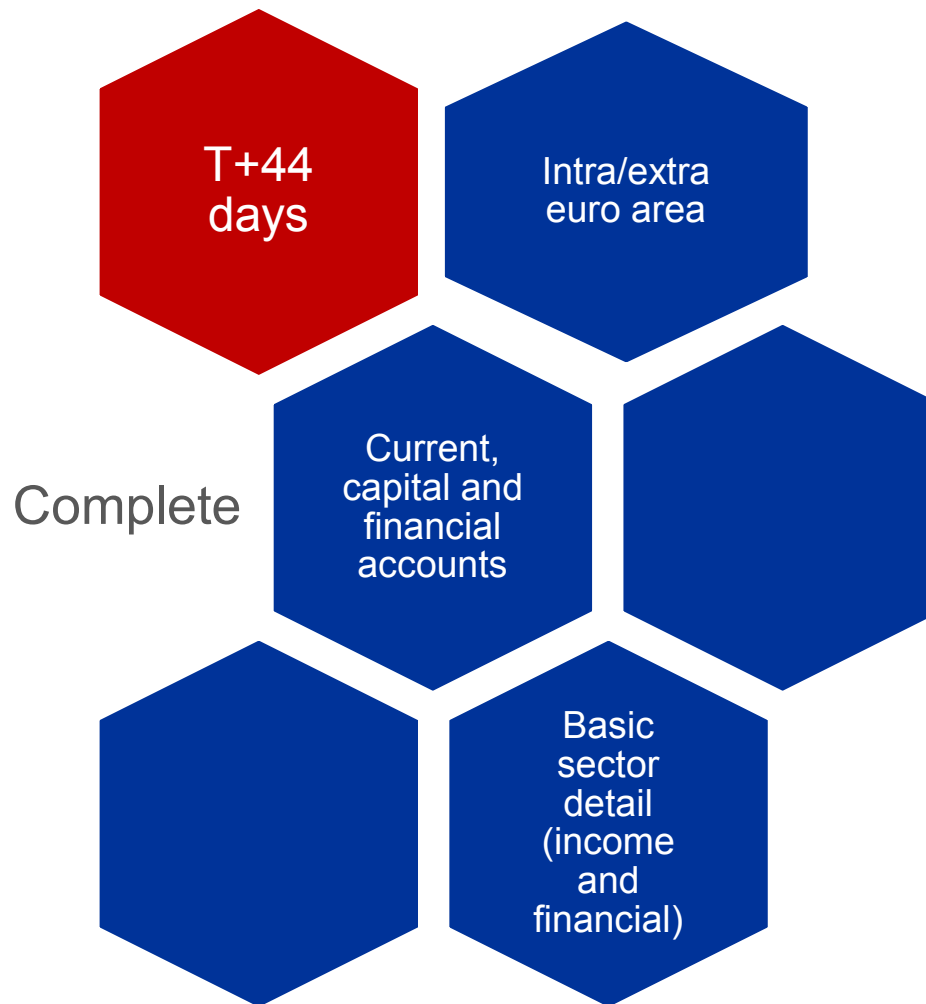
1. State of play (*... through the introduction of BPM6...*)



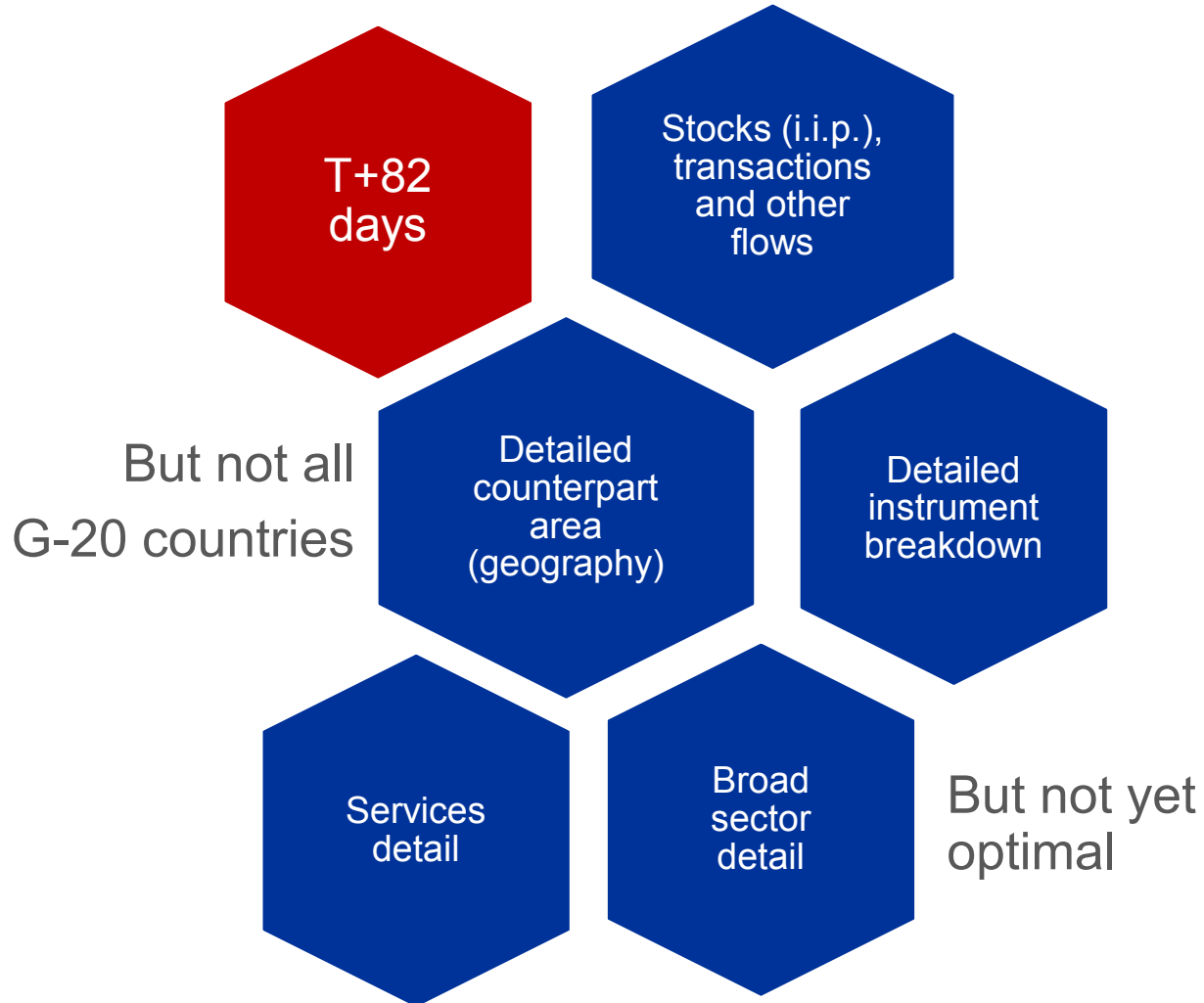
1. State of play (*... until now*)



1. State of play (*monthly b.o.p.*)



1. State of play (*quarterly b.o.p./i.i.p.*)



2. The environment

Financial crisis

- Need for more detailed cross-border statistics
- Need to link macro and micro (granular) data
- Need to measure the impact of non-standard (monetary policy) measures

Globalization and digitalisation

- Better assess inter-linkages, risk exposures, contagion and imbalances
- Measure financial innovation and account for complex and inventive strategies by MNEs – new measurement challenges

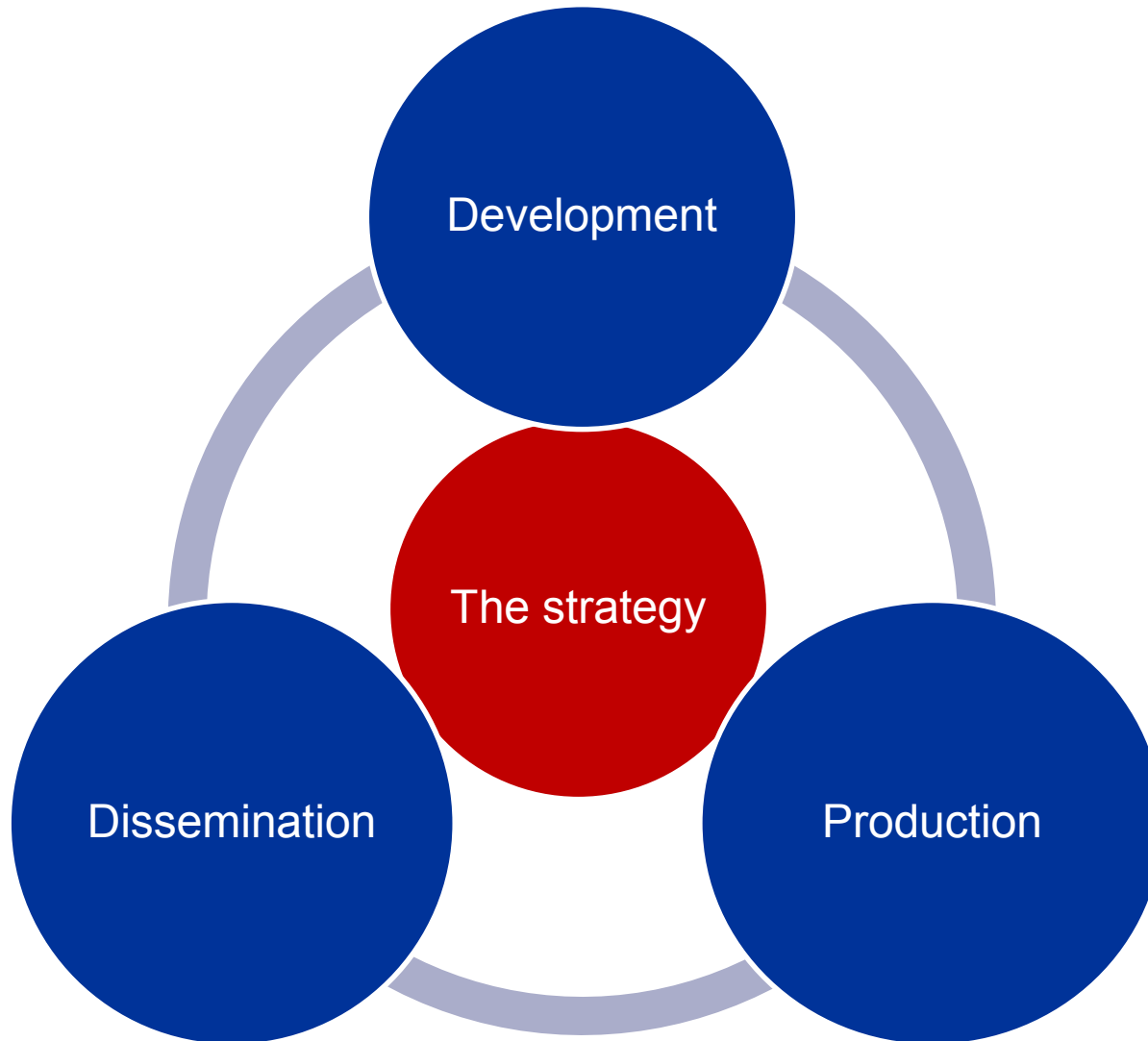
Technology and innovation

- More complex statistical methodology (BPM6/SNA08) – “ownership”
- Opportunity: technical innovation facilitates the management of large scale (micro) data sets bringing flexibility, speed and data quality

Budgetary constraints

- Countries face budgetary/financing constraints (no money for statistics!)
- Wish to reduce reporting burden and develop cheaper data sources
- Close collaboration between the parties is crucial to address the challenges (international data cooperation)

3. The road ahead: the medium-term strategy



3.1 Development of fit for purpose data

- Review quarterly b.o.p./i.i.p. requirements (address users' needs):
 - Coverage of non-financial corporations and financial sub-sectors
 - Collect data for SPEs and/or measure the impact of SPEs (“pass-through”)
 - Currency risk analysis: start with extended currency breakdown
 - Coverage of all G-20 countries (as counterparts)
- Linking macro data with detailed euro area micro datasets to:
 - Improve the analytical value, particularly of monthly b.o.p (monetary policy)
 - Estimate debt securities at nominal value
 - Estimate write-offs/downs – non-performing loans

3.1 Development of fit for purpose data

- Longer national and euro area time series
 - Can we all go back to 1995?
- Additional trade data
 - Trade by invoicing currency:
 - *International role of currencies*
 - *Estimate exchange rate pass-through to prices*
 - *Competitive (dis)advantage for firms (un)able to invoice in domestic currency*
 - Intra-group trade: linked to globalization and the role of MNEs
- Breakdown of financial derivatives
 - Design a set of meaningful requirements (measure hedging and speculation)

3.2 Production of high quality data

- Implementation of MoU related initiatives
 - Revamped quality reports: first time in mid-2018
 - Country visits to sponsor harmonisation and quality developments
- Errors & omissions and asymmetries
 - Euro area correction mechanism in place since 2016... BOP/EAA integration will bring it to another level
 - Several initiatives on asymmetries ongoing, including data sharing
 - Need to re-discuss the existing legal framework on confidentiality
- Bop/row consistency project
 - Ongoing... deadline for accomplishment defined (September 2019 or next benchmark revision)

3.3 Dissemination of comprehensive data

- Make an inventory of your users and segment to target... we are all different
- Provide “all” information, particularly important for policy makers and other experienced users ([SDW](#))
- Publish an “External sector Dashboard” and/or other digital publications for markets and analysts
- Support users in their analytical efforts and get their views – make it a two way relationship
- Support global transparency and a level playing field (G-20 DGI / SDDS+)

3.4. International cooperation and methodological coherence

- Support the international research agenda on methodology
 - Towards a robust definition of SPEs
 - A meaningful implementation of the “ownership” concept
- Support the initiatives to share and exchange data... help yourself by helping the others
 - CPIS, CDIS, IBS, etc...
- Increase efficiency and effectiveness on data exchange (SDMX and IDC)
 - From a push to a pull framework

**Thank you for your
attention!**



IFC - Central Bank of Armenia Workshop on *"External Sector Statistics"*

Dilijan, Armenia, 11-12 June 2018

From balance of payments and international investment position to the rest of the world account: roadmap to Bank of Portugal's experience¹

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Bank of Portugal

¹ This paper 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.

From Balance of Payments and International Investment Position to the Rest of the World account: Roadmap to Banco de Portugal's experience ¹

"The road to success is always under construction"²

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In Portugal, external statistics (Balance of Payments/International Investment Position – BoP/IIP) and financial accounts are a responsibility of *Banco de Portugal*. The non-financial accounts are compiled by *INE-Portugal*.

The methodological manuals suggest a high degree of consistency and harmonization between the BoP/IIP statistics and the Rest of the World (RoW) account. *Banco de Portugal's* compilation process of BoP/IIP and RoW account statistics was improved in 2014 to reinforce its consistency, achieving higher statistical quality standards, increasing the comparability between the two domains and obtaining a more efficient compilation process. One example is the internalization of quarterly analysis of the RoW financial account into a monthly BoP/IIP process, implying changes in procedures and IT developments.

There is also a strong link between the BoP and the national sector accounts given that net lending/ borrowing of the economy is obtained through the balancing item of the current and capital accounts.

Keywords: Balance of payments, International investment position, Financial Accounts, Rest of the world sectoral account

JEL classification: C80

¹ Acknowledgements: We would like to thank Filipa Lima for the valuable insights and suggestions.
Disclaimer: The views expressed in this paper are those of the authors and do not reflect those of Banco de Portugal.

² Citation from Arnold Palmer, American athlete.

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1. Balance of Payments and International Investment Position compilation

1.1 Basic concepts and methodological framework

The methodological standards that guide the compilation of BoP/IIP are set out in the sixth edition of the Balance of Payments and International Investment Position Manual (BPM6).

BoP/IIP statistics aim to grasp the economic relationships between residents and non-residents of a given economy. The full set of external accounts comprise both the operations related to financial assets and liabilities, known as the financial account and also those operations involving the non-financial assets, portraying the so-called real economy, recorded in the current and capital account.

BoP/IIP high quality statistics are a crucial set of information for determining the net lending/borrowing of a given national economy. The principles and methodology underlying the BoP/IIP are consistent with those of national accounts, compiled accordingly to SNA2008³ or ESA2010⁴. The variety and dimensions that are reflected in BoP/IIP are enormous aggregating flows/stocks that are reflected in the different institutional sectors of a given economy. Moreover, BoP/IIP are based on several data sources and similarly to national accounts, the non-financial and financial part should be balanced. This task is, in practice, rather demanding taking into account that BoP/IIP statistics, in the case of Portugal, are compiled on a monthly basis.

1.1.1 The current and capital account

The structure of the current and capital account shows links with the sequence of accounts of national accounts. The current account has flows of goods, services, primary income, and secondary income between residents and nonresidents (BPM6, §2.14). The capital account shows credit and debit entries for nonproduced nonfinancial assets and capital transfers between residents and nonresidents (BPM6, §2.16). BoP is compiled from the perspective of the resident sectors. As an example, if the sector of non-financial corporations is exporting goods and services, the corresponding amount will be recorded as a credit in BoP (an example is shown below).

Goods and services are recorded when there is a change of economic ownership from a unit in one economy to a unit in another country (ESA2010, §18.26). In BoP the current and capital account reflect the export and imports of goods and services, regardless of its final use, whereas in national accounts this information is recorded either as intermediate consumption or gross fixed capital formation. Therefore, the entries in the capital account only cover acquisitions and disposals of non-produced non-financial assets and capital transfers. Land acquisitions and disposals are not included (ESA2010, §18.55). On the other hand, in relation to current and capital transfers the links are more straightforward.

³ System of National Accounts 2008

⁴ European System of National and Regional Accounts 2010

BoP statistics provide a useful insight to some items regarding households. As an example, remittances, which are recorded in the current account as current transfers can have, in countries like Portugal, a significant weight. Current transfers encompass also the lottery prizes which are received by households whenever those are organized at the European level. BoP is also a useful instrument for analysing the impact in the economy of a given phenomenon. This is the case of the European Union Funds, which are recorded via BoP. The related amounts are recorded in the current account if they are received as subsidies by the national producers, which are mostly on the non-financial corporations sector. The most common example are the agricultural subsidies. The European Funds can also be recorded in the capital account whenever those funds are devoted to finance gross fixed capital formation. The balance of the current and capital account will imply an increase/decrease in net foreign assets, e.g. the financial account balance. As an example, a deficit on the current and capital accounts implies that it is financed by either the disposal of foreign assets or the increase of liabilities to nonresidents.

1.1.2 The financial account

The financial account has two key pieces: BoP and IIP. According to its definition in BPM6 (§ 2.8), the IIP is a *"a statistical statement that shows at a point in time the value of: financial assets of residents of an economy that are claims on nonresidents or are gold bullion held as reserve assets; and the liabilities of residents of an economy to nonresidents"*. Its net position, obtained from the difference between assets and liabilities, can either represent a net claim (if positive) or a net liability (if negative) from an economy to the rest of the world. This net position is a balancing item known as net worth.

In figure 1, there is an illustration of the schema for the compilation of the international financial accounts between two consecutive periods, t and $t+1$.

BoP_{t+1} represents the flows that reflect only economic transactions, while OC_{t+1} comprises other changes in financial assets and liabilities not related to transactions, such as holding gains and losses, arising from changes in their prices and/or the exchange rates and other changes in the volume of assets and liabilities (BPM6, §3.20). Together BoP_{t+1} and OC_{t+1} summarize the flows between residents and non-residents that explain the changes in the IIP from t to $t+1$. These flows are recorded in net terms, separately for financial assets and liabilities.

The balancing item which results from netting BoP's net acquisition of financial assets and net incurrence of liabilities is called net lending (if positive) or net borrowing (if negative), representing either a surplus or a deficit of the economy regarding the rest of the world.

Conceptually, in BoP the balancing item of the non-financial account's side, the sum of the current and capital accounts, and of the financial account should be equal, but

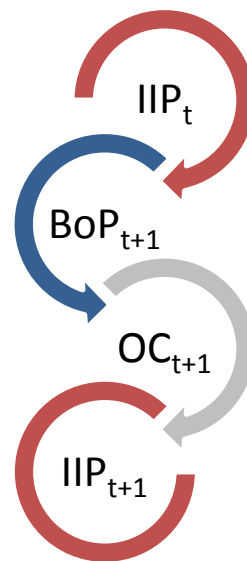


Figure 1 – Compilation schema of BOP/IIP

imbalances between these two items do exist, usually due to discrepancies in source data. This imbalance is known as 'errors and omissions'. The following equality can be expressed:

$$\text{Sum of the current and capital account} = \text{Net financial external accounts} + \text{Errors \& Omissions}$$

In the financial account, BOP/IIP items are primarily grouped by functional categories, which aim to reflect the economic motivation of cross border transactions and positions. These functional categories are: direct investment, portfolio investment, reserve assets, other investment and financial derivatives and employee stock options. At a second level of classification, BPM6 uses three broad categories for financial assets and liabilities: Equity and investment fund shares; debt instruments other financial assets and liabilities.

2. From BOP/IIP to the Rest of the World account

2.1 Methodological framework of National Accounts

In the latest publication of these manuals and also of BPM6, there was a clear effort of convergence, enabling more consistency between both statistical domains.

Although convergent, complementary approaches still remain. For example in the financial account, while BOP/IIP operations are primarily recorded by functional categories as already mentioned, in NA the record is done by type of instrument, giving priority to the classification based upon the legal characteristics of the relationship between the parties involved in a certain operation rather than its economic motivation. Through the bridging between BPM6's financial assets and liabilities broad categories and SNA2008/ESA2010 financial instrument type, a correspondence between the two statistical outputs can be achieved, as can be observed in figure 2.

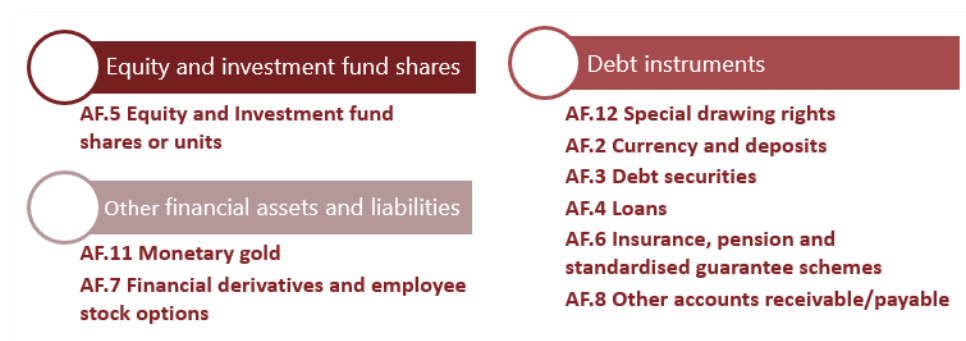


Figure 2 – Bridging financial instrument classification between BPM6 and SNA2008/ESA2010

In addition, these two statistical domains allow for a complementary analysis. While BoP/IIP is compiled from the standpoint of the resident sectors, in the RoW account in NA the external operations are recorded from the perspective of non-residents and portrayed like an institutional sector: Rest of the World (RoW). According to the

definition in ESA2010 (§2.131) the RoW sector “is a grouping of units without any characteristic functions and resources; it consists of non-resident units insofar as they are engaged in transactions with resident institutional units, or have other economic links with resident units”.

The recording perspective in NA results in the following dynamics: a resource or a claim for RoW is a use or a liability for total economy and vice versa. Consequently, balancing items are symmetric. The recording of monetary gold (gold held monetary authorities as reserve asset) is an exception since it is registered as a financial asset for the holding sector but has no counterpart liability, which conveys into a methodological difference between BoP and RoW account.

In Portugal, the compilation of National Accounts is a responsibility shared between Banco de Portugal and INE - Portugal. The first is responsible for the compilation of the financial account and the latter for the non-financial account.

From this point on, the focus will be on the compilation of the financial account of BoP/IIP and NA, showing some of the procedures currently in practice.

2.2 Compilation procedures of the National Financial Accounts in Portugal

National Financial Accounts (NFA) have a dedicated unit within the statistics department, but for the compilation Banco de Portugal developed a multidisciplinary team with experts from financial accounts and from the different underlying primary statistics. All team members are co-responsible for producing NFA, for example, the input for the RoW account is a responsibility of the BoP/IIP experts.

In terms of the compilation procedures, the several units give the inputs for their sector account. Then, through a pre-established hierarchy of sources, inputs from some sectors have a prevalence over the others. RoW has hierarchy of source upon most of its counterparts, with the following exceptions: the sectors investment funds other than monetary market funds; pension funds and for the insurance corporations data on the instruments within AF.6 category (SNA2008/ESA2010) related with insurance and standardised guarantee schemes, since the information from these specific sectors/instruments was regarded as having better quality/coverage. For example, much of the information provided to BoP/IIP for pension funds is made by the entities managing the funds, which sometimes makes it difficult to distinguish between operations of the manager itself or of the funds.

The balancing item net lending/borrowing used by NFA for the total economy is given by the current and capital accounts' balancing item. As already mentioned, the different perspective in the compilation of BOP and NFA leads to this symmetry. Therefore the following equalities can be expressed:

$$\begin{aligned}\text{Net lending/net borrowing of RoW} &= - (\text{Net lending/net borrowing of total economy}) \\ &= - (\text{Sum of the current and capital account}) \\ &= - (\text{Net financial external accounts} + \text{Errors \& Omissions})\end{aligned}$$

Another balancing item also used in NFA is net worth, for which the following expression is used:

$$\text{Net worth of RoW} = - (\text{International Investment Position} - \text{Monetary gold position})$$

The monetary gold position is subtracted from IIP, given that it is not a liability for RoW in the NFA compilation.

Another methodological difference regards the instrument 'Financial derivatives' (AF.7 in SNA2008/ESA2010) which is recorded on gross basis in the IIP and on net basis in the NFA. When considering the net output, this does not originate any discrepancy between both statistics.

2.2.1 From BoP/IIP to RoW – an example

To illustrate some of the correspondences mentioned along the paper, let's consider an NFC resident in Portugal and the recording of its external operations.

Figure 3 shows the NFC current and capital account for t+1. This NFC imports its goods to manufacture the final product and exports part of its production. A property income is paid related to securities issued and held by foreign investors. The sum of the current and capital account flows result in a net borrowing balance of -3 monetary units (m.u.).

Flows t+1	
Credit	2.7
Exports of goods	2.7
Debit	5.7
Imports of goods	5.4
Property income	0.3
Net (C-D)	-3

Figure 3 – Current and capital account flows for t+1

This NFC is controlled by a non-resident entity and the operations between them are recorded in the direct investment functional category. During t+1, the NFC issued securities that were also of the interest of portfolio investors, reflected on the liabilities side. On the assets side, the investment in securities issued outside the monetary union is recorded on the assets side on the portfolio investment category. Also on the assets side the NFC's deposits on banks outside Portugal are recorded under the other investment category. Figure 4 displays the NFC's IIP for t and t+1 and also the summarized flows that occurred during period t+1. The IIP is represented by the stock columns in t and t+1. The financial transactions, other price changes, exchange rates changes and other volume changes are respectively recorded in the columns 'Trans t+1', 'OPC t+1', 'ERC t+1' and 'OC t+1'.

	Stock t	Trans t+1	OPC t+1	ERC t+1	OC t+1	Stock t+1
Assets	195	10	5	-2	0	208
Direct investment	35	-10	0	0	0	25
Debt instruments	35	-10	0	0	0	25
Portfolio investment	150	20	5	-2	0	173
Debt instruments	150	20	5	-2	0	173
Other investment	10	0	0	0	0	10
Debt instruments	10	0	0	0	0	10
Liabilities	77	13	2	0	0	92
Direct investment	77	3	2	0	0	82
Equity	70	0	2	0	0	72
Debt instruments	7	3	0	0	0	10
Portfolio investment	0	10	0	0	0	10
Debt instruments	0	10	0	0	0	10
Net (A-L)	118	-3	3	-2	0	116

Figure 4 – IIP and financial flows between t and t+1

During the period t+1, the balance of payments' financial net transactions is of -3 m.u., presenting the same net borrowing result as of the current and capital account as desired.

Figure 5 shows the same information as figure 4, but with SNA 2008/ESA2010's instrument classification. Functional categories are dismissed and items grouped by financial instrument type.

	Stock t	Trans t+1	OPC t+1	ERC t+1	OC t+1	Stock t+1
Assets	195	10	5	-2	0	208
F22	10	0	0	0	0	10
F32	185	10	5	-2	0	198
Liabilities	77	13	2	0	0	92
F32	0	10	0	0	0	10
F41	7	3	0	0	0	10
F512	70	0	2	0	0	72
Net (A-L)	118	-3	3	-2	0	116

Figure 5 - IIP and financial flows: bridging from BPM6 to SNA2008/ESA2010 instrument classification

Figure 6 shows the transition from BoP/IIP's perspective to RoW's perspective.

	Stock t	Trans t+1	PC t+1	OC t+1	Stock t+1
Assets	77	13	2	0	92
F32	0	10	0	0	10
F41	7	3	0	0	10
F512	70	0	2	0	72
Liabilities	195	10	3	0	208
F22	10	0	0	0	10
F32	185	10	3	0	198
Net worth/Net lending	-118	3	-1	0	-116

Figure 6 – From BoP/IIP do RoW

Assets and liabilities change their places and balancing items have now symmetrical values. The columns of OPCt+1 and ERCT+1 in figure 5 are now merged in the PCt+1 column in figure 6, summarizing the prices changes.

3. Mitigating differences between BOP/IIP and RoW

Given the described compilation procedure, differences between BOP/IIP and RoW, other than methodological, can emerge for one of two reasons: either by discrepant counterpart information with hierarchy of source or by different vintages of information.

As mentioned earlier, BoP/IIP data through RoW's sectoral account has hierarchy of source over most of its counterparts in the compilation of the NFA, which only adds increased responsibility to the quality of information. The compilation timeliness of BoP/IIP stressed the need of enhancement of the quality procedures to avoid corrections introduced to RoW's account data, which ultimately lead to vintage differences.

To better understand the quality procedures implemented, we shall look at the compilation process of BoP/IIP in *Banco de Portugal*.

3.1. BOP/IIP's compilation system



Figure 7 - Compilation system schema

The process begins with data acquisition and its validation. For the compilation of BOP/IIP several sources of information are used, but they can be condensed in five types:

- direct report of external operations - entities which conduct cross border operations, from a defined threshold, must classify and report such operations to *Banco de Portugal*;
- settlements data from banks – a very valuable piece of information to help validate the direct report and to detect new entities involved in operations with non-resident entities. This information is reported on an entity by entity basis and by type of flow (inward or outward) or position by the end of the period
- external data from other entities and organizations - emphasis to information from *INE-Portugal* and on a supra-national level Centralised Securities Database⁵ and Coordinated Portfolio Investment Survey⁶;
- internal data from Banco de Portugal- statistical outputs such as SSIS, the securities statistics integrated system with information on residents' holdings investor by investor, security by security (s-b-s) and residents' issuances s-b-

⁵ Information from the European Central Bank

⁶ Information from International Monetary Fund

s, and monetary financial statistics and investment funds. As a curiosity, this latter source of information was integrated after realizing through NA hierarchy of sources that for RoW's holdings of investment fund shares/units, this was a more accurate source than SSIS. Internal but non-statistical, such as accounting data for the central bank sector and Target settlements;

- specific surveys of BoP/IIP division – to fill as in the case of financial derivatives.

All these different data sources are analyzed and then incorporated, initiating the compilation process. The statistical information is processed using SAS, which insofar has proven to efficiently deliver to the compilers autonomy and flexibility to adapt to new sources/procedures when needed. Later, when the compilation process is finished, we start the data analysis, which is generally done through excel files, with pivot tables connected to SAS tables in the database. If needed, corrections are made and in part the compilation is reprocessed. Afterwards, outputs are disseminated to several users: internal, within Banco de Portugal, external national and supra-national entities and also to the public in general.

3.2 Improvements in the BoP/IIP compilation system envisaging to mitigate differences

The update of the methodological manual to BPM6 presented itself as an opportunity to redesign BOP/IIP's compilation system from its core. One of the changes that had a direct impact on RoW's compilation was the data warehouse framework.

Figure 8 shows both the old and the current structure of the data warehouse. In the old structure, the BOP/IIP data base was only in its own terminology, as so to give the inputs for the RoW account the information had to be 'translated' outside the data base. Additional inputs with information not directly available on the database had to be prepared separately. In the current structure the database supports both terminologies, enabling a direct extraction of data for RoW's account.

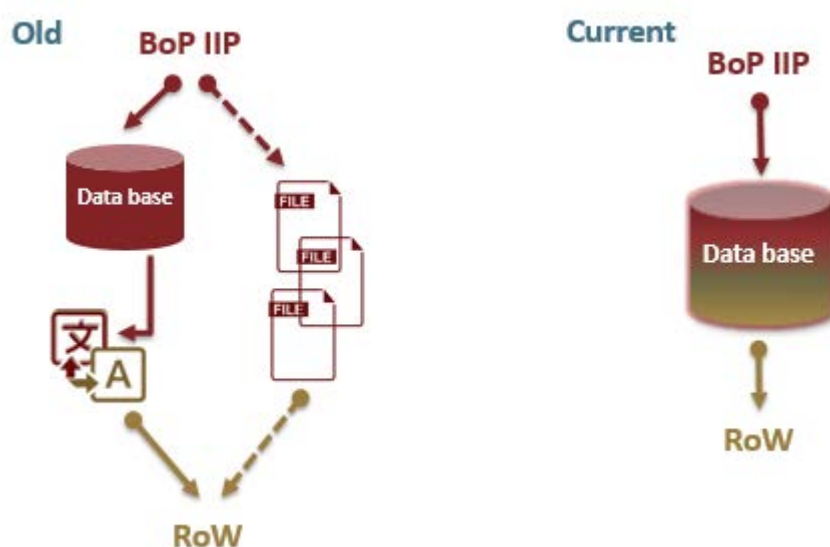


Figure 8 – Data warehouse structure

The combination of an enriched database with a flexible compilation system, allowed for several additional analysis. One of those analysis, which was even included within

the compilation procedure, was the monthly comparison of the securities' whom-to-whom transactions. This comparison is made between BOP and SSIS's statistical outputs: RoW's holdings by resident issuer sector and RoW's issuances by resident investor sector (respectively, blue highlighted row and column in figure 9). In terms of instrument, it is broken down by short and long-term debt securities, listed shares (only for RoW's holdings) and investment fund shares/units. This procedure is also made monthly for transactions.

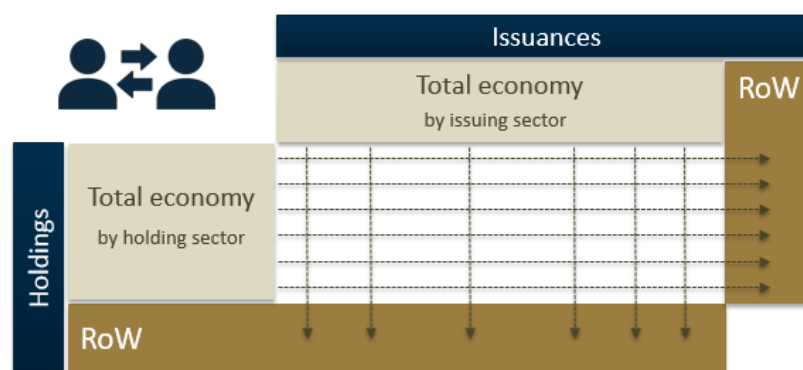


Figure 9 - Securities' whom-to-whom

This allows to detect divergences between both statistical outputs, which trigger an investigation of its origin. If needed, corrections are still included in the course of BoP/IIP's production. As a result of this process, there was a clear quality improvement in both statistical domains.

Another procedure only made possible by the current data base structure is the monthly analysis of the IIP and all the financial flows through the perspective of RoW account. It allows an early identification of possible outliers, for example examining if a price change vis-à-vis resident sector in a certain instrument is plausible given its stock. As mentioned by Mink, R. et al (2012), a "set of accounts that show by sector and type of financial instrument the transactions, other economic flows, and the positions of financial assets and liabilities vis-à-vis the counterpart sector, whether resident or cross-border, reflect more accurately the reality of the interconnected global economy".

All these procedures are tools to mitigate vintage differences between BoP/IIP and RoW. Operations are recorded in BoP/IIP with the best information available, but often additional time and information from other statistical domains brings clairvoyance to its full extent. A check of media news and press releases from official entities is regularly made. When a complex operation is identified, meetings are promoted with colleagues from other statistical domains concerning such operations, aiming to achieve higher consistency and accuracy upon its recording.

4. Final considerations

Banco de Portugal improved its BoP/IIP compilation system for the implementation of BPM6. Since then it became possible to analyze data through both BoP/IIP and RoW's account perspective and in doing so compilers became more aware of how their data affect other statistics. When the focus goes beyond the production that

each compiler is carrying, there is shift in the mindset that supports a more integrated and cooperative approach to the statistical compilation as a whole.

Even if the navigation is not as straight forward as one may initially predict, the roadmap is definitely clear about the destination, which all in all is the consistency and quality improvement of statistical outputs.

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Dilijan, Armenia, 11-12 June 2018

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IFC workshop on External Sector Statistics - IFC/CBA
Dilijan, 11-12 June 2018





Outline

- I. Introduction**
- II. Balance of Payments and International Investment Position (BoP/IIP) compilation**
- III. From BoP to the Rest of the World (RoW) account**
- IV. Mitigating differences between BoP/IIP and RoW**
- V. Final remarks**



International Investment Position (IIP)

Position or stock value of financial assets and liabilities of residents to non-residents at a certain moment in time

Balance of Payments (BoP)

Economic transactions between residents and non-residents during a certain period

Financial account (FA)

Transactions that involve financial assets and liabilities

Current and capital account (CCA)

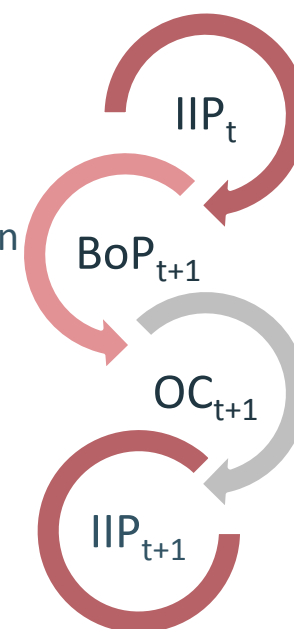
Flows of goods, services, primary and secondary income, nonproduced nonfinancial assets and capital transfers

Other changes in the financial account (OC)

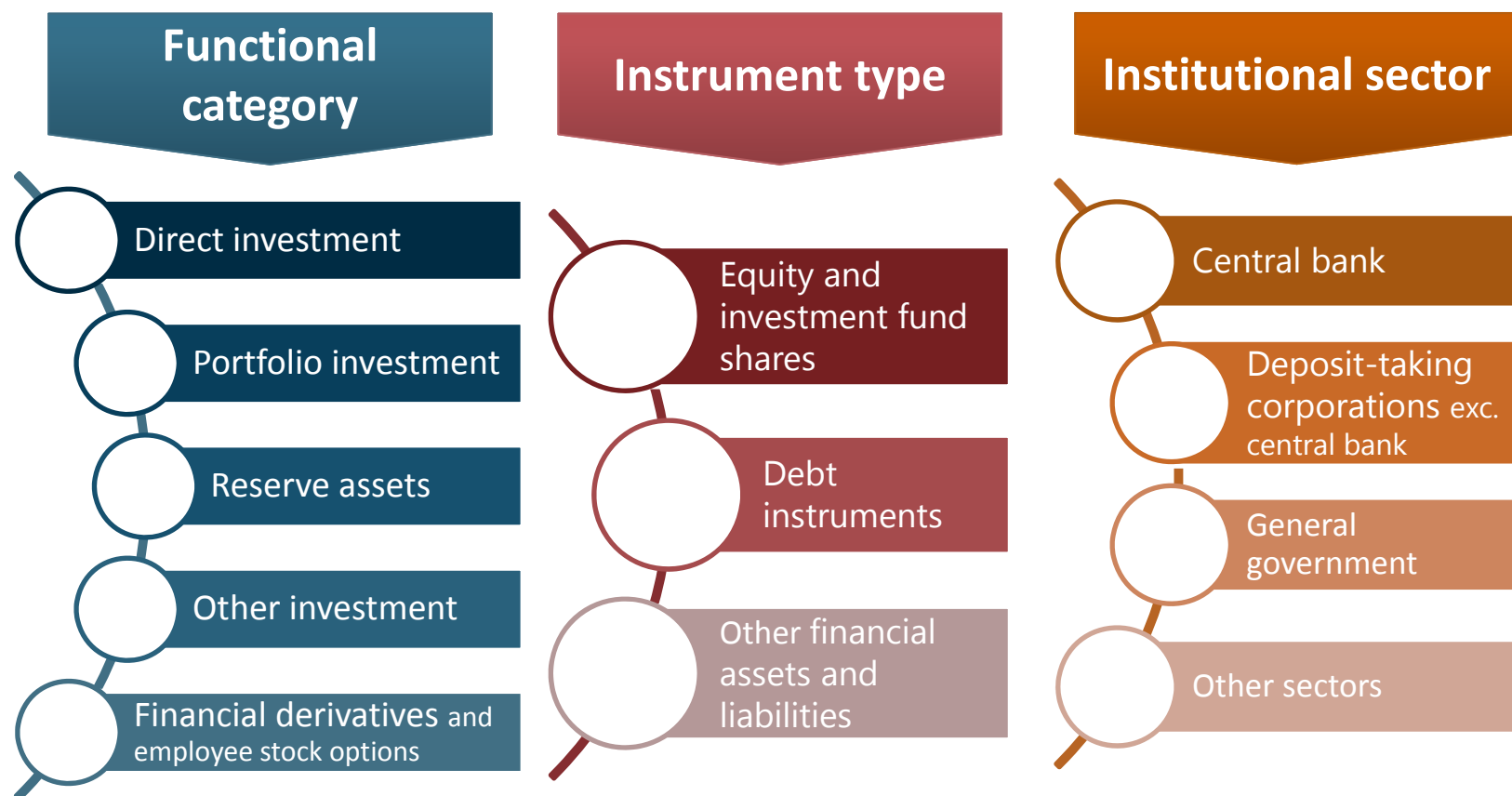
Flows other than transactions (ex.: valuation changes, reclassifications)

Methodological manual

BPM6 – Balance of Payments and International Investment Position Manual, sixth edition, IMF

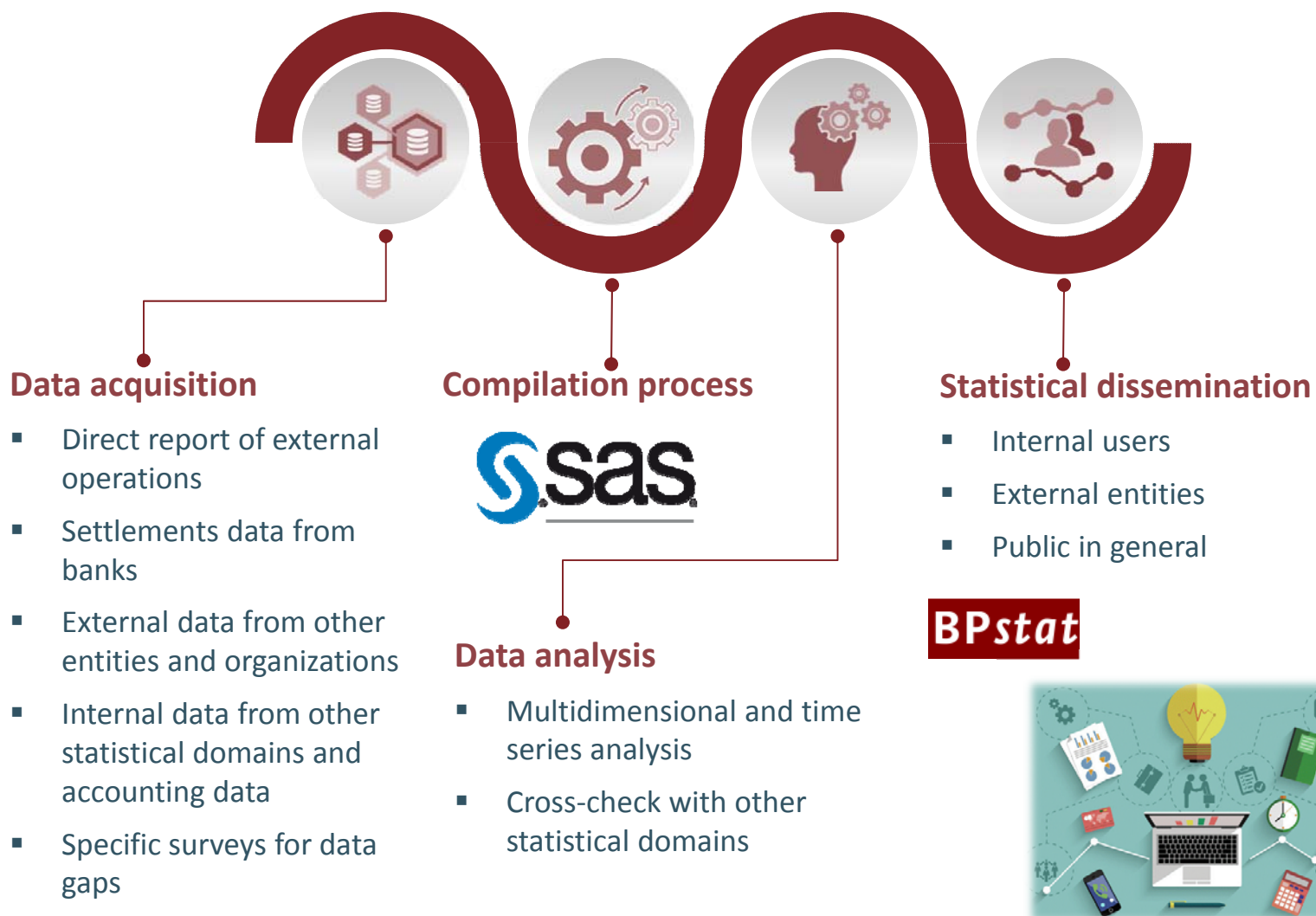


BoP FA/IIP main categories and classifications in BPM6





II. Balance of Payments and International Investment Position compilation





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III. From BoP to the Rest of the World account

National accounts methodological manuals

SNA2008 (System of National Accounts)/**ESA2010** (European system of accounts)

National accounts compilation in Portugal



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Non-financial account



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Financial account

National financial accounts

Mission structure composed by compilers of several statistical units, centrally coordinated by the unit of financial accounts





Methodological differences

IIP	RoW
Monetary gold Recorded as an asset of central bank	Monetary gold <u>Not recorded</u> as a liability vis-à-vis central bank
Financial derivatives Recorded on <u>gross</u> basis	Financial derivatives Recorded on a <u>net</u> basis

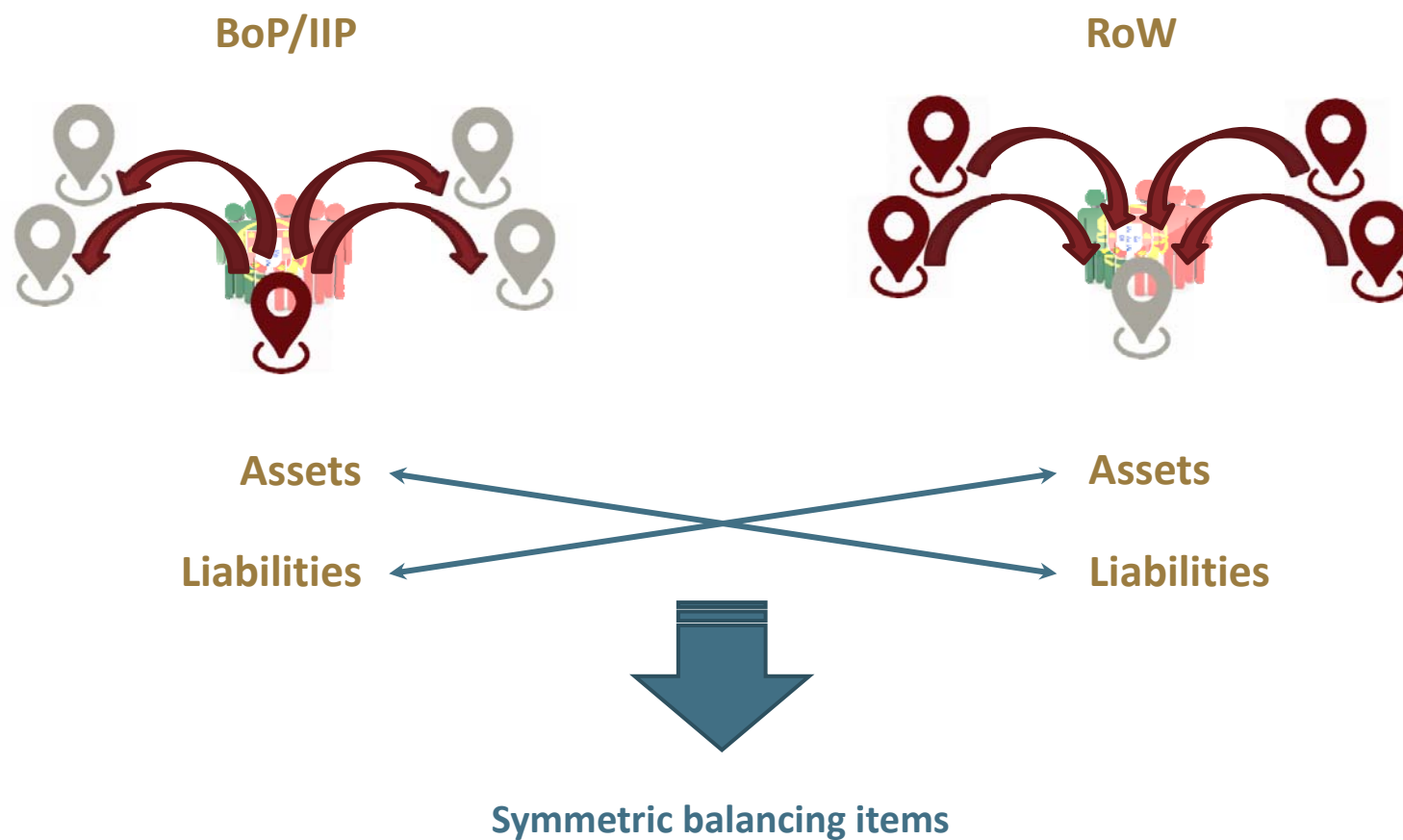
Compilation procedures

BoP/IIP has hierarchy of sources over most contributions for national financial accounts, with the following exceptions:

- The subsectors '**Investment funds except money market funds**' (S124) and '**Pension funds**' (S129)
- Financial instruments within **F.6** category (**Insurance, pension and standardised guarantee schemes**)

III. From BoP to the Rest of the World account

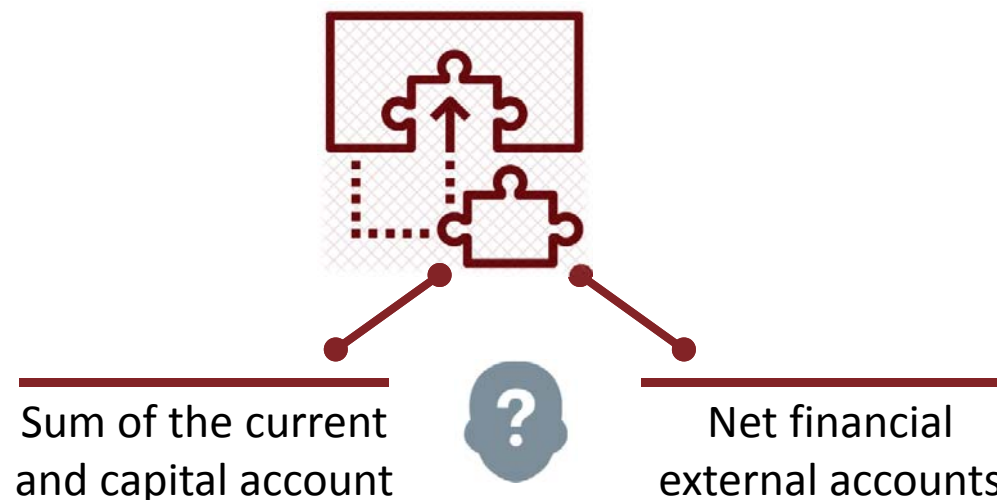
Different perspectives





III. From BoP to the Rest of the World account

Balancing items



$$\begin{aligned}\text{Net lending/net borrowing of RoW} &= - (\text{Net lending/net borrowing of total economy}) \\ &= - (\text{Sum of the current and capital account}) \\ &= - (\text{Net financial external accounts} + \text{Errors \& Omissions})\end{aligned}$$

$$\text{Net worth of RoW} = - (\text{International Investment Position} - \text{Monetary gold position})$$



BOP FA/IIP - Bridging the main items and classifications

Instrument type



Financial instrument

Equity and investment fund shares

**AF.5 Equity and Investment fund
shares or units**

Debt instruments

AF.12 Special drawing rights
AF.2 Currency and deposits
AF.3 Debt securities
AF.4 Loans
**AF.6 Insurance, pension and
standardised guarantee schemes**
AF.8 Other accounts receivable/payable

Other financial assets and liabilities

AF.11 Monetary gold
**AF.7 Financial derivatives and employee
stock options**



III. From BoP to the Rest of the World account

Example (part 2)

BOP FA/IIP account for an NFC – Financial instrument perspective

	Stock t	Trans t+1	OPC t+1	ERC t+1	OC t+1	Stock t+1
Assets	195	10	5	-2	0	208
F22	10	0	0	0	0	10
F32	185	10	5	-2	0	198
Liabilities	77	13	2	0	0	92
F32	0	10	0	0	0	10
F41	7	3	0	0	0	10
F512	70	0	2	0	0	72
Net (A-L)	118	-3	3	-2	0	116

RoW account perspective

	Stock t	Trans t+1	PC t+1	OC t+1	Stock t+1
Assets	77	13	2	0	92
F32	0	10	0	0	10
F41	7	3	0	0	10
F512	70	0	2	0	72
Liabilities	195	10	3	0	208
F22	10	0	0	0	10
F32	185	10	3	0	198
Net worth/Net lending	-118	3	-1	0	-116

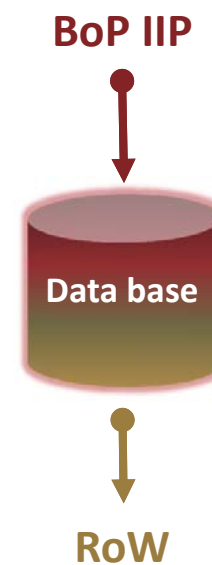
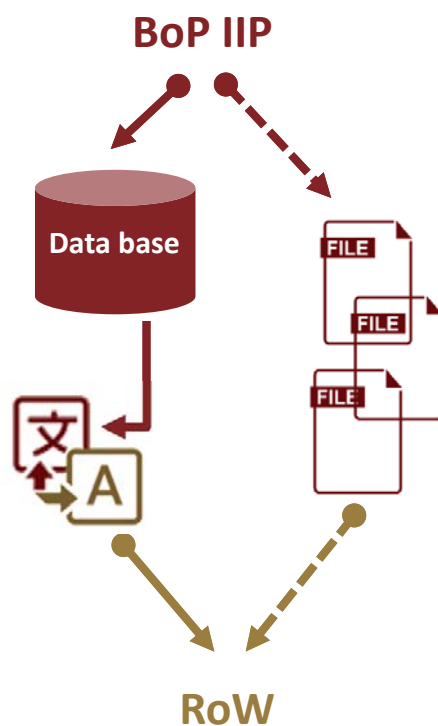
**Symmetric
balancing
items!**



Changes in the compilation of BoP/IIP



New data warehouse framework

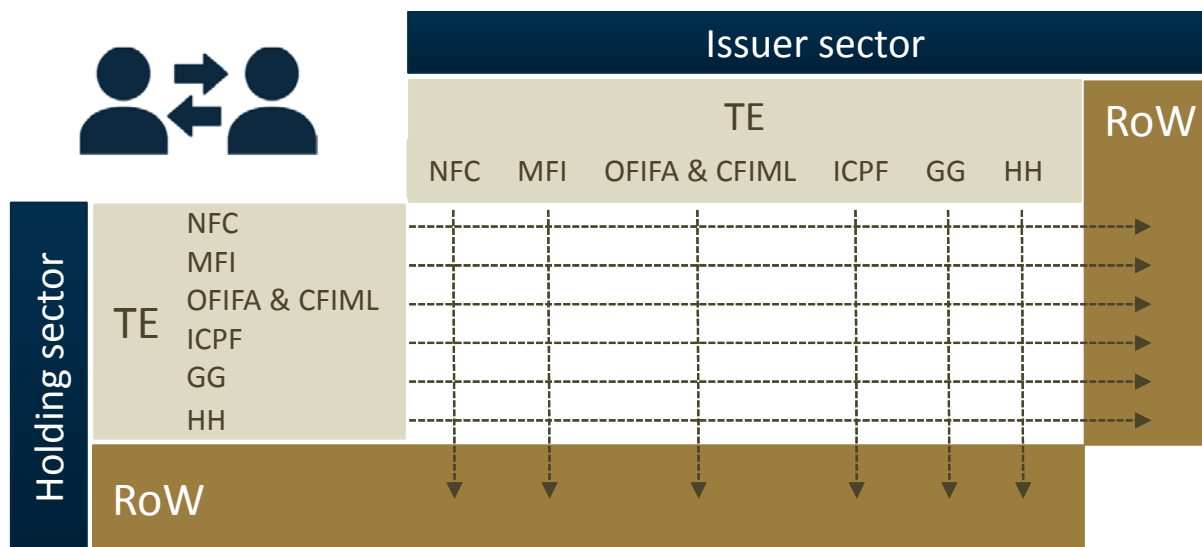


Changes in the compilation of BoP/IIP



Comparison of BoP/IIP with other statistical outputs

Ex.: Securities' whom-to-whom analysis and comparison



- ✓ Debt securities
short-term
long-term
- ✓ Listed shares
RoW holdings
- ✓ Investment funds units

Changes in BoP/IIP procedures



Monthly analysis of BoP FA/IIP data through Row's perspective

- ✓ Early identification of possible outliers



New data sources aligned with financial accounts compilation, respecting its hierarchy of sources

- ✓ Consistency between BoP/IIP and RoW



Joint analysis of complex operations

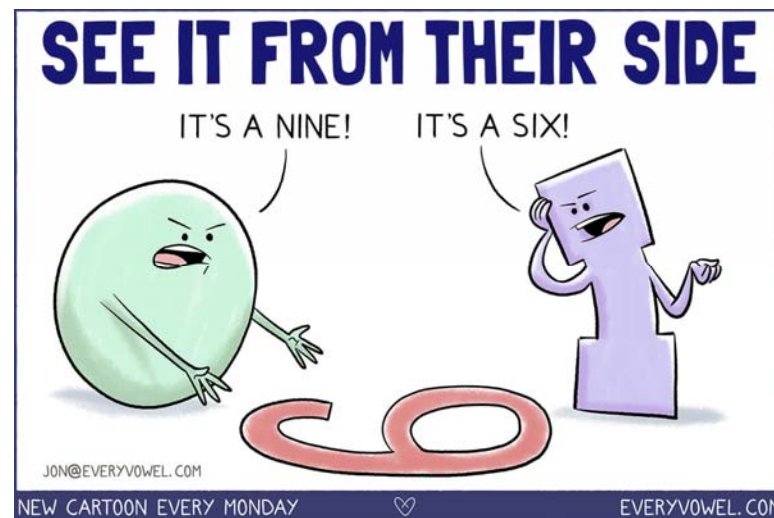
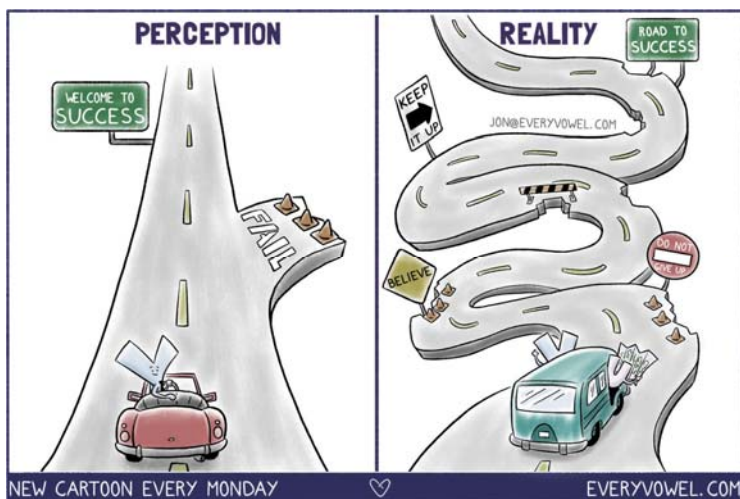
- ✓ Consistency on the recording of the operations
- ✓ Avoidance of differences due to vintages



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V. Final remarks

Dual perspective over BoP/IIP data



*“The road to success is
always under construction”*

Arnold Palmer



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Thank you for your attention!



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IFC - Central Bank of Armenia Workshop on *"External Sector Statistics"*

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Sharing of data reported by complex multinational enterprises: a cooperative approach between Deutsche Bundesbank and Banque de France¹

Tatiana Mosquera Yon, Bank of France,
and Jens Walter, Deutsche Bundesbank

¹ This paper 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.

Sharing of data reported by complex multinational enterprises: a cooperative approach between Deutsche Bundesbank and Banque de France

Tatiana Mosquera Yon (Banque de France) and Jens Walter (Deutsche Bundesbank)

Abstract

The financial crisis raised concerns about the worldwide interconnectedness of financial institutions and their ability to finance the economy. In the real economy, multinational enterprises generate more and more economic and financial flows due to their international organisation. In order to better understand and explain the contribution of multinational enterprises in their Balance of Payments (BoP), France and Germany undertook a common work on large and complex multinational enterprises operating in the two countries. Based on two work streams: an inter-institutional and an external one (in collaboration with the multinational enterprises), implying exchange of confidential information between institutions, this analysis improved the knowledge on the multinational enterprises involved. It underlined the increasing importance of intra-group real and financial flows that, thanks to this work, will be more coherently recorded in the BoP of the two countries and can be better explained in the future.

Keywords: Multinational enterprises, balance of payments, complex global production arrangements, international fragmentation of production process

JEL classification: F23, F60, M00

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1. Motivation for a bilateral analysis by Deutsche Bundesbank and Banque de France

Links between multinational enterprises and globalisation

Multinational enterprises (MNEs) are the key drivers to the globalisation process in the last decades. International flows are increasing in amount and frequency as MNEs grow. They enhance the interconnectedness of the countries where they operate but also the competition among countries willing to attract them as investors to stimulate economic growth and employment.

The removal of restrictions on the movement of capital, the lowering of trade barriers by the World Trade Organisation GATT and GATS¹ agreements, sinking transport costs and the improvement of information technologies have allowed companies to relocate their production activities to even more remote places around the globe. This all has led to a steady growth in the number of MNEs which in turn intensify the globalisation process. New markets are created, new production chains being established leading to the birth of new leaders. A well-known example is the global production of the I-phone or the development of the digital market which led to the emergence of new actors such as Apple, Amazon, or Google. Their economic development relies on the possibilities offered by globalisation allowing them to grow faster by reaching more customers and to offer more products.

The understanding of the global thinking of MNEs - which are mainly driven by tax minimisation and profit maximisation at a global level - is of utmost importance for politicians today. An adequate statistical measurement of MNEs induced international flows of capital, goods, services and intellectual property is a prerequisite to assess the consequences of national economic and financial policies for employment, income and wealth. Thus, the comprehensiveness of all statistics affected by MNE decisions like the Balance of Payments (BoP), National Accounts (NA) and Business Statistics (BS) are necessary to establish efficient economic, trade or fiscal policies.

Relevant statistics are also important to produce more sophisticated indicators on globalisation, global value chain and international fragmentation of the production process. To give the best information, these indicators need to be produced with high quality data that can only be compiled if the contribution of MNEs is clearly identified.

Location of economic ownership in MNE-Groups

In the International Monetary Fund (IMF)'s sixth edition of balance of payment manual (BPM6), the time of recording of transactions is based on the change of ownership. *"The change of economic ownership is central in determining the time of recording on an accrual basis for transactions in goods, non-produced non-financial assets, and financial assets"*².

¹ GATT: General Agreement on Tariffs and Trade. GATS: General Agreement on Trade in Services.

² Paragraph 3.41 of BPM6, p.55.

In the case of MNEs, the BPM6 specifies that *"goods may move between a parent and its branch abroad. In that case, possibilities exist that either the goods have changed economic ownership or they may have been sent for processing. The correct statistical treatment is to identify which location assumes the risks and rewards of ownership most strongly (e.g., from factors such as whether the goods are included in the accounts, and which location is responsible for subsequent sale of the goods)"*³. For BoP compilers, it is a real challenge to identify which entity assumes risks and rewards in an MNE-Group. It requires having a precise and complete knowledge of how the MNE is organized and operates.

Although the BPM6 gives in several paragraphs (e.g. paragraph 5.3) some guidance for compilers to identify the economic owner inside a group, the explanation of the concept of economic ownership versus legal ownership to their MNEs' correspondents is however not a simple and often time consuming task.

Once this definition is explained, it becomes important to analyse the organisation of MNEs to identify which entity assumes the risk and rewards. There may be several entities or just one, depending on how the MNEs is organised. In the MNEs involved in the analysis, the identification of the economic owner of the produced goods and services was a challenge. Their very complex organisation and the multiple flows between the entities of the group did not allow an unambiguous identification of the economic owner, despite the characteristics given by the BPM6.

When the economic owner is identified inside the group, it can have impact on BoP compilation since goods may be delivered from Germany, which is recorded in Foreign Trade Statistics (FTS), but sold by the economic owner located in France. Under such circumstances, the export must be reported in France outside the FTS source and to FTS in Germany, using a code which indicates that the goods are not owned by the exporter.

Once these flows are clearly explained by the MNEs, it becomes relevant to share the information with colleagues from the counterpart countries to make sure that the flows are treated in the same way and reported symmetrically in FTS and BoP.

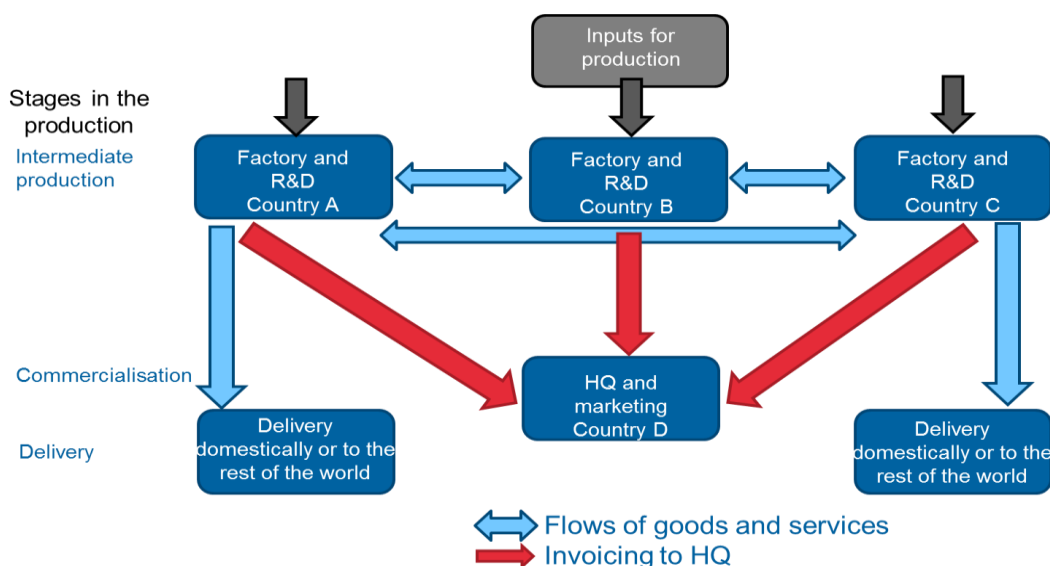
³ Paragraph 3.46 of BPM6, p 56.

Overview of the MNEs involved in the work stream

The structure of the MNEs involved in the analysis can be schematized as shown below (see illustration 1).

Illustration 1

Organisation of the analysed MNEs



The affiliates are operating in different countries inside or outside the European Union. At least, one affiliate is established in France and in Germany. The affiliates exchange goods (semi-finished products) and services (use of intellectual property) and invoice each other at transfer prices (that can be agreed in an Advanced Price Agreement with the tax authorities of the countries). Thus, flows can occur between different countries or domestically.

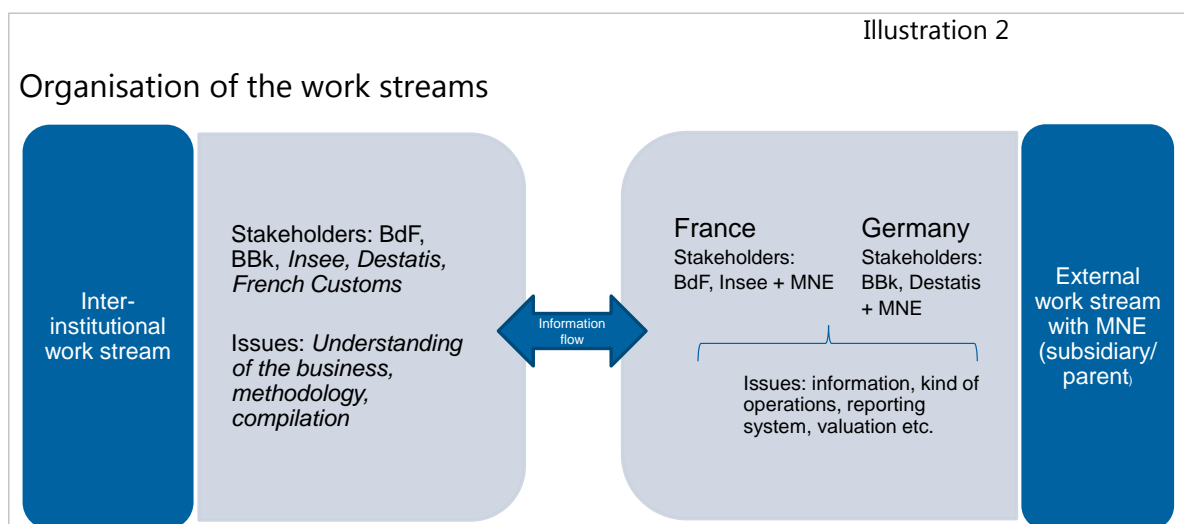
It was recognized by the compilers that the (factoryless) headquarters don't usually manage the whole supply chain. Instead, the affiliates are responsible for certain stages of the chain, usually the production of a semi-finished good or the assembling of the final good. The affiliates invoice their headquarters to cover their operating costs at transfer prices. At the end of the production process, the final goods are owned by the headquarters which is in charge of marketing and customer services.

For the MNE-Group members the correct reporting of these complex arrangements for customs, FTS and BoP is challenging, depending on economic ownership and the movement of the goods. For example, if the headquarters buys semi-finished products from a foreign affiliate and send them for final assembly to another affiliate abroad (without selling them to its affiliate), the headquarter has no obligation to report this to customs/FTS (no movement of goods in its country) but to BoP (as an import, due to the change of ownership) and a subsequent import of manufacturing services (final assembling abroad). If the assembling takes place in the country where the headquarters reside, only a report for customs/FTS is necessary because the movement of the goods coincides with the change of economic ownership.

2. Cooperation between Banque de France and Deutsche Bundesbank

The Banque de France and Deutsche Bundesbank have been cooperating for decades on various fields of balance of payments. From conceptual or methodological issues to resorption of asymmetries, both institutions have been working together to improve their common knowledge by sharing their understanding and experiences. This cooperation is managed at various levels: senior managers or technical experts meet regularly to enhance their collaboration.

The organisation of the cooperation on MNEs mainly relies on two parallel work streams dealing with common topics but analysed under different perspectives. The outcomes of the two work streams are merged at the end of the process in order to have a comprehensive view of MNEs activities and their recording in the relevant statistics, notwithstanding the fact that interactions between the two work streams can happen.



The inter-institutional work stream

The first work stream called "the inter-institutional work stream" deals with conceptual, methodological and compilation topics. It is constituted of experts from different statistical institutions such as the National Statistical Institutes (NSI), National Central Banks (NCB) and the Ministerial Statistical Department of the French customs and indirect taxation authority. Experts from the NSI come from three statistical areas: NA, FTS and Enterprise Statistics.

This inter-institutional work stream meets at two levels: a national level and at an international one. The national level meetings are designed to exchange views on the organisation of the MNEs, to share information on the current reporting, to identify problems and specific reporting practices as well as to clarify the statistical treatment acknowledging the conceptual background. At the beginning of the process, it appeared that each institution had its own comprehension of the MNEs, based on the data it collected. The data reported are usually analysed focusing on the needs of the specific institution/respective statistic and not aimed to design a coherent picture of the MNEs. However, this stovepipe approach sometimes leads to a partial comprehension of the MNEs organisation.

For example, one of the MNEs used the VAT number of one of its subsidiary to report exports of goods from France to Germany to the custom authorities. In the following year, this MNE decided to report its exports under its headquarters' VAT number, with a lower value of the exported goods (as required by the conclusions of an internal audit). For NA, this change was analysed as a major drop of exports of this subsidiary that was not completely balanced inside the group. For BoP compilers, total exports of the group had lowered. Thanks to the cross-checking of data with the custom authorities in one of the "inter-institutional work stream", the information of the change of value and reporting agent was shared, giving sense to the reported data.

The international level of the inter-institutional work stream is aimed at detecting differences in the treatment of cross border flows, to understand the reasons of current asymmetries, clarifying conceptual and methodological issues to get a common view and selecting questions to be addressed to the other work stream. In this work stream, experts can share their understanding of the MNEs organisation developed within the national inter-institutional work stream.

The common understanding of the organisation is a key element of the international inter-institutional work stream to solve asymmetries. Every difference in the assessment of the production process can lead to different customs/FTS codes (e.g. nature of transaction, partner country) reported by the affiliates of an MNE in the countries involved.

Therefore, in order to get a correct reporting, statisticians and reporters must be aware not only of the conceptual differences i.e. physical flows (customs oriented) and the concept of change of economic ownership (BoP oriented) but also have to take into account the whole production chain even if it takes place beyond the borders of their own statistical territory. Throughout the meetings, it was challenging for all the participants to put together the pieces of the puzzle from the external work streams into a picture on which a final decision could be taken, about how these transactions must be recorded in the statistics to provide a consistent dataset.

The external work stream with MNEs

The external work stream with MNEs can only be successful if the MNEs fully agree to cooperate. To reach this level of cooperation, it is really important to communicate and explain what the problems are, how the MNEs will be involved to help solving the problems and what is to be done when solutions are found.

As an in-depth analysis of the MNEs implies to talk about individual data, the principle of confidentiality must be guaranteed in order to allow the MNEs accounting, excise and custom teams to cooperate fully. Regarding confidentiality, it is also important to receive an allowance of the MNEs to share confidential data with the experts of the other statistical institutions of both countries. To reach these two goals it is of utmost importance to create an atmosphere of trust between all stakeholders. Therefore, all steps followed by the other work stream must be clearly presented to the MNEs team, which implies frequent and regular meetings explaining the achieved steps and the coming ones. These meetings took place on a face to face basis, mainly at the beginning and the end of the process. In between, due to practical considerations, these meetings were mostly conference calls.

Once the confidentiality is guaranteed, the conceptual and methodological issues can be debated. The first step is a stocktaking where the MNE team precisely explain how the group operates inside the countries and at the international level. This information is the key element to identify all relevant cross border flows and to characterise them. After the international flows are filtered out, the data reported by the MNEs are scrutinized to evaluate if they reflect the MNEs activities properly.

In some cases, it appeared that the reporting was not relevant, especially when it covers intra-group flows. When the organisation of the MNE is highly centralised, a significant part of the production process is guided by the headquarters, which sometimes also centralise purchases of key components of the final product. In such a case, the headquarters have the economic ownership of the purchased and final goods. Several options of reporting are open to the MNE. The most frequent is the following: Taking the example above i.e. a component is purchased by headquarters located in a country A and is delivered to a factory in a country C from a country B. The factory in country C reports an import from country B, to materialize the inflow of goods to the customs authority of country C. The headquarters in the country A report a financial flow to the country B to the BoP compilers of the country A to materialize the payment of the invoice from country B.

Regarding that reporting, the BoP compilers must be aware that the economic owner of the component is the MNE's headquarters but there is no reporting in the goods item of the country A's BOP. In country C, a final import of goods is reported that the BoP compiler (due to a wrong coding in its FTS) may take into account in the goods item even though there is no change of ownership between the countries C and B. As MNEs generate important flows of this type, this case was analysed by the two work streams to define a homogeneous reporting scheme for headquarters and the factories.

After taking all information about such transactions into account, it was decided that the import of the component in country C should be reported as an import for processing which enables compilers to identify these goods movements and to withdraw them from the BoP of country C because there is no change of ownership. In country A, the headquarters has to report an import for BoP to take into account the change of ownership from country B. If -at the end of the production process - the final product is exported to a third country directly from C, this has to be reported in C as an export after processing (and not as a final sale as it is often done) so that it could be again withdrawn from the BoP of country C. Further, this export has to be reported as a final sale of goods in country A to take into account the change of ownership (again, outside the customs/FTS reporting scheme). To complete the reporting, the factory in country C would also report processing fees charged to headquarters in country A as an export of manufacturing services on physical inputs owned by others; the headquarters in A has to report the corresponding service import.

These in-depth analyses lead finally to coordinated reporting instructions. They must be explained comprehensively to the members of the MNEs to better understand the needs and the interplay of the relevant statistics. The MNEs' accounting, customs and excise teams usually support this work because it is an efficient way for them to get a clearer view of what has to be reported by each subsidiary in the countries where they operate.

The fact that the external work-stream is fed by the inter-institutional work stream gave the experts in the local team much more legitimacy in the discussion

with the local MNEs members regarding reporting advices because they can rely on the fact that the explanations given by the local experts are communicated in an identical way to their sister or mother company in the other country.

Once the conclusions were settled by the "inter-institutional" work stream, a final meeting was organised to explain what the new reporting should be, to decide when it could be implemented and to discuss technical aspects (IT development, backward revisions). One MNE, willing to report efficiently, ask French BoP to second experts to work on the changes and help them to identify the accounting elements to include in their reporting. Support all along the process is another key element to make the external work stream successful.

Conclusions

The increasing relevance of MNE-Groups in a globalised world and the influences of their economic decisions on national economies must be reflected in macroeconomic statistics like the BoP and national accounts in an adequate way. The current concepts of these statistics, focusing on the national territory, are questioned in various ways by users today. The basic question is: do these concepts are still able to reflect economic activities inside the economy and its international relations adequately?

The experience made with the cooperative approach between the Deutsche Bundesbank and the Banque de France turned out that a cross statistical approach combined with a cross-country approach could foster the understanding of MNE activities and enable compilers to measure their activities adequately and consistently without leaving the grounds of the existing concepts.

The insights into a group's operations, in its international production arrangements and internal pricing help to improve the statistical reporting of the MNE-Group members in a common and coherent way in all statistics. Even more, the work in the external work stream improved the understanding about statistical needs and interdependencies between various statistics of the responsible units in the group and it has fostered the internal communication between the group members in different countries.

The work in "two work streams" has eased the communication between the experts (rapid conclusions on conceptual issues and methods) on the one hand and talks with national group members (simple communication without language barriers, openness to admit mistakes) on the other hand.

In addition, what should not be underestimated for the future work between all stakeholders is the confidence in each other combined with the will to improve the meaningfulness and therewith the overall quality of the statistics. However, even with an optimal cooperation between all stakeholders the process is very time consuming. From our experience at least two years are needed from the initial start to a fully "harmonized" reporting in all countries.

But it is all worth to produce statistics which reflect faithfully the volume of trade of MNEs' complex global production arrangements.

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Complex multinational enterprises in statistics: the cooperative approach between Deutsche Bundesbank and Bank of France¹

Tatiana Mosquera Yon, Bank of France,
and Jens Walter, Deutsche Bundesbank

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.



Complex multinational enterprises in statistics

The cooperative approach between Deutsche Bundesbank and Banque de France

**Tatiana Mosquera Yon – Banque de France
Jens Walter – Deutsche Bundesbank**

Introduction

- Not at least since the „Irish Case“ it has become clear that economic decisions of MNE in a globalized world could have sizeable effects on Business Statistics (BS), National Accounts (NA), Foreign Trade Statistics (FTS) and the Balance of Payments (BOP)
- The main characteristic of an MNE is the internationality of its operations, organized across borders to maximize the efficiency of production and to minimize their tax burden
- To measure their operations adequately and symmetrically in statistics like the BOP, a close cooperation of statisticians in all countries affected by MNE transactions are of utmost importance
- To better capture and understand intra-group flows between France and Germany the Banque de France (BdF) and the Deutsche Bundesbank (BBk) strengthened their cooperation in the last years by focusing on MNEs, which are of high relevance to their respective BOP

The approach

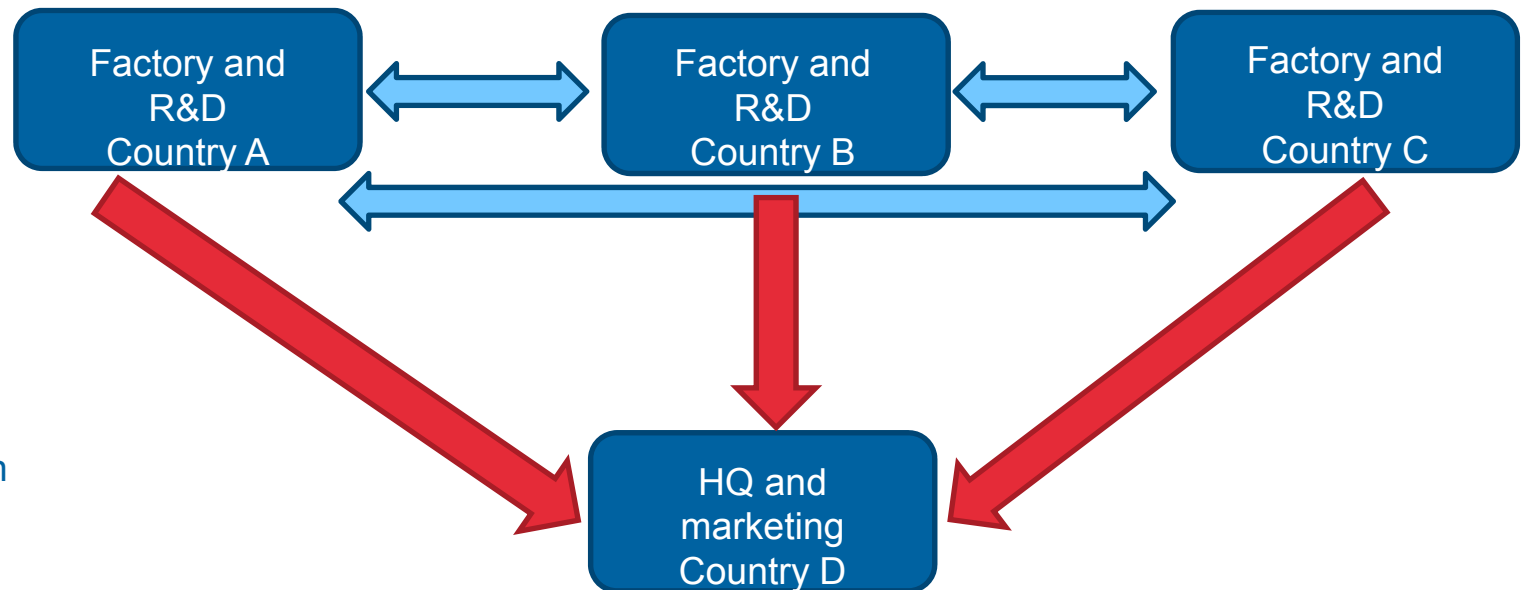
- Since decades, the BdF and the BBk have worked closely together in various fields of the BOP (conceptual/methodological issues, bilateral asymmetries and organizational questions)
- Regular meetings of the senior management and on the expert level reflect this constructive collaboration between both institutions
- Intra group flows (and stocks) of MNEs play always an important role in these meetings due to the close interconnection of both economies
- The cooperation established in the field of MNEs mainly rely on two parallel workstreams

Overview of the MNEs involved

Stages in the
production

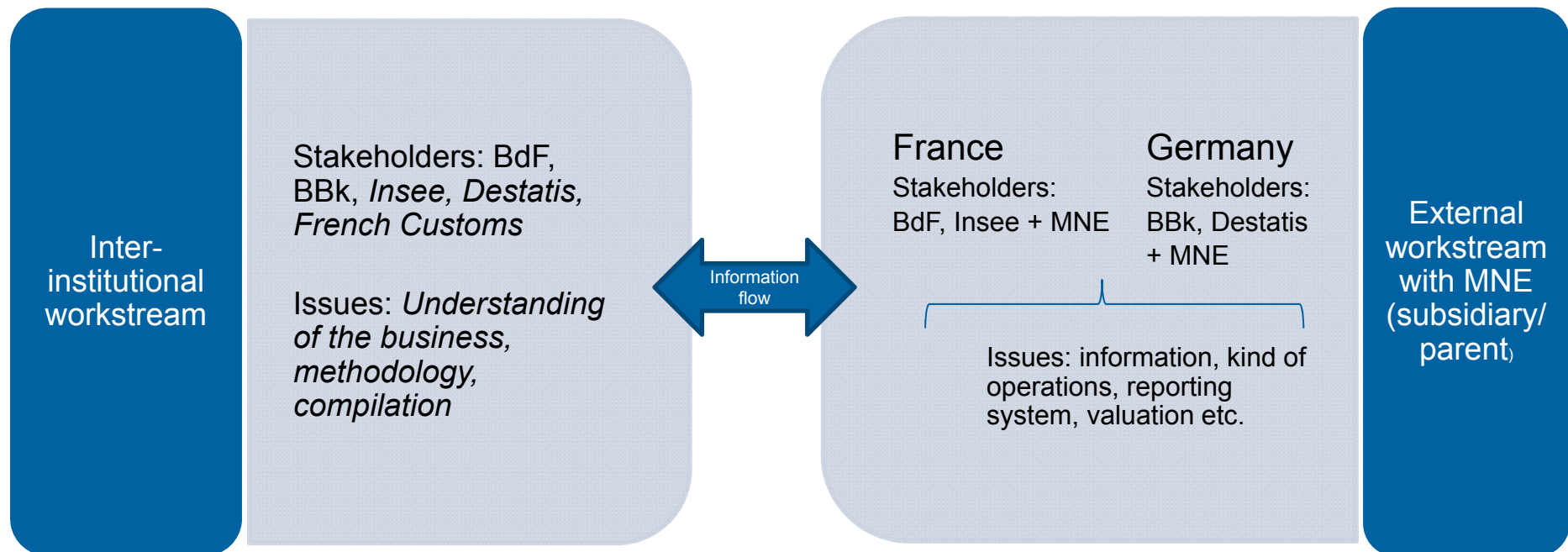
Intermediate
production

Commercialization
and delivery



↔ Flows of goods and services
→ Invoicing to HQ

The workstreams



Workstream I in detail

Inter- Institutional Workstream

- Exchange views on the respective comprehension of the MNE, what are the operational tasks in the countries?
- Exchange information about the current reporting practice and problems
- Conceptual treatment of operations in the respective country
- Detecting differences in the treatment of cross border flows → reason for asymmetries
- Clarifying the issues to get a common view
- Open questions to be addressed in workstream II
- Discussion of outcomes of workstream II
- Final agreement on the future statistical treatment and data collection in the relevant statistics (BOP, FTS, NA)

Workstream II in detail

France (1/2)

External
workstream with
MNE
(subsidiary/parent)

- Doubts about the consistency between the reporting of the MNE and its activity
- Meeting with the MNE to understand its global production arrangement
- Meetings with experts of related statistics (national accounts, foreign trade statistics and profiling division)
- Regular meeting with the MNE to understand its reporting and the data reported to other statistical institutions (also allowing us to exchange confidential information between institutions)
- In-depth analysis between statistical institutions of our understanding (in dedicated workshops)

Workstream II in detail

France (2/2)

External
workstream with
MNE
(subsidiary/parent)

- Meeting with workstream I to check our respective understanding and clarify doubts leading to a common vision but also new questions
- Explanation of our new questions to the MNE and definition of answers
- Final meeting with workstream I to reach a common definition of the MNE's activities and how they should be reported
- Meeting with the MNE to explain our understanding of their global production arrangement and the new reporting requirements and definition of the main stages of the implementation of the new reporting
- Secondment of Banque de France's experts to the MNE to adapt the reporting

Workstream II in detail Germany (1/2)

External
workstream with
MNE
(subsidiary/parent)

- Detection of anomalies in reported data of the MNE
- First discussion with experts of related statistics (FTS, NA)
- Contact with the national MNE (explaining the issue)
- Meeting with the MNE and all institutional stakeholders
- Agreement with MNE to exchange confidential information between institutions (very important!)
- Clarification of the production chain inside the group
- Organization of the MNE reporting system

Workstream II in detail Germany (2/2)

External
workstream with
MNE
(subsidiary/parent)

- Explanation of statistical treatment of the intra group flows (processing, final export/import, merchanting, valuation, institutional units)
- Documentation of new insights for workstream I
- Addressing questions from workstream I
- Final meeting with MNE and institutional stakeholders to agree on future reporting and corrections for backward revisions (BOP, FTS)
- Discussion of technical aspects i.a. time to change computer systems to fulfill the „new“ requirements by the MNE
- Agreement on the date to start with revised reporting

Conclusions (1/2)

- Exchange of views between all statistical stakeholders and MNE (parent, subsidiary) on national and international level fosters the understanding of MNE activities
- Insights into the group's operations, its international production arrangements and internal pricing help to improve the statistical reporting in a common and coherent way in all statistics
- A coordinated approach of statistical institutions across countries regarding reporting requirements of an MNE is of utmost importance also for the group entities
- It improves the understanding about statistical needs and interdependencies between various statistics of the responsible units in the group. Furthermore, it fosters the internal communication between the group members in different countries.

Conclusions (2/2)

- The work in „two workstreams“ has eased the communication between the experts (rapid conclusions on conceptual issues and methods) on the one hand and talks with national group members (simple communication without language barriers, openness to admit mistakes) on the other hand.
- However, even with an optimal cooperation between all stakeholders the process is very time consuming. From our experience at least two years are needed from the initial start to a full „harmonized“ reporting in all countries.
- But it is all worth to produce statistics which reflect faithfully the volume of trade of MNEs' complex global production arrangements.



IFC - Central Bank of Armenia Workshop on *"External Sector Statistics"*

Dilijan, Armenia, 11-12 June 2018

Sectoral risk assessment: Evidence from Poland¹

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¹ This paper 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.

Sectoral risk assessment: Evidence from Poland¹

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Abstract

The article presents a methodological framework for the analysis of sectoral risk and an evaluation of the financial condition on sectors level. In addition, the hypothesis was verified that the financial constraints of enterprises affect decisions making by prospective exporters and sales in foreign markets. The empirical analysis was based on the individual data from different sources (from the years 2005 to 2016), which are: balance sheet and profit and loss account (F-02 statement), financial and behavioural data (BISNODE POLAND).

The evaluation consists of two parts. The first part presents the financial strength depending on the net value of enterprises. The financial strength defines the financial strength of enterprise. The second part presents PD model. The statistical model is built on logistic regression model, and produces an estimate of the annual Probability of Default of the assessed company. Based on the results of the evaluation of the risk associated with the financial condition of enterprises, it was found that SMEs faced a higher risk. The lowest risk of bankruptcy was observed in the *pharmaceutical industry* (where the probability of bankruptcy did not exceed 0.1%) and the highest risk of bankruptcy - in the *mining sector* (where the PD was equal to or higher than 1%). Exporters were characterised by better financial equipment.

Keywords: Sectoral Risk, Bankruptcy Risk, Scoring Methods, export

JEL classification: C190, G210, L11, L25, G33, M13

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¹ I thank Francois Coppens (*National Bank of Belgium*) for useful comments and suggestions.

Introduction

Macroeconomic conditions in which companies operate are an important aspect in the analysis of the factors affecting the financial condition of enterprises, the risk of bankruptcy, and transition of enterprises from the high-risk group to the group of enterprises whose financial condition is good, and vice versa.

The IRB credit risk evaluation concept is based on the assumption that the risk to the credit portfolio may result from two sources:

- *systemic risk*, which is caused by unexpected macroeconomic and market changes. The risk is faced by all borrowers; however, the level of susceptibility of individual borrowers to this risk may be different;
- *idiosyncratic risk*, which is the outcome of various unique threats faced by individual borrowers.

In case of non-financial firms their default display positive correlations within and across industries. Their dependence structure might be driven by sectoral (*systematic*) risk factors. (Das et al. 2007; Saldías 2013).

Sectoral risk is taken into account in credit risk modelling. It includes latent sectoral risk factors influencing the correlation of defaults among firms. Sectoral risk reflects important risk component in credit portfolios, that arises when there is a concentration of borrowers in a sector. Sectoral risk represents the instability of the banking system when capital requirements for exposures to a given sector are inappropriate comparing to those that take into account sectoral risk.

ESRB (2015) shows that a build-up of sectoral vulnerabilities can become a source of systemic risk. For example, if the aim is to slow down credit growth in the real estate sector a reasonable solution would be to consider first instruments that specifically target mortgage lending and not broad credit instruments such as the counter-cyclical capital buffer.

The article presents a methodological framework for the analysis of sectoral risk and an evaluation of the financial condition on sectors level. In addition, the hypothesis was verified that the financial constraints of enterprises affect decisions making by prospective exporters (Chaney, 2013) and sales in foreign markets (Manova, 2013). Individual data from yearly financial reports for the years 2005-2016 is used in the analysis. This research has an original concept and high added value as it was performed using representative micro data for over 50,000 non-financial companies per year. The risk sector results from the current or forecast situation in the sector in which the enterprises operate (Gregoriou et al. 2010). In the present article, sector risk is defined as uncertainty concerning changes in the economic-financial situation of sectors. The sectoral analysis is a risk barometer and determines the indicators of insolvency for all enterprises conducting operations in specific sectors. Measurement of sector risk indirectly affects the significant problem of mutual influence of the economic situation for the country's economic development. These influences are reflected, for example, through profitability, investment opportunities, shaping public sentiment.

Based on the present literature on this subject manner, it can be concluded that the approach used in the present article concerning sectoral risk, which is based on individual data, has not been applied so far. The analysis was performed using logistical regression on categorised variables transformed using the WoE (weight of

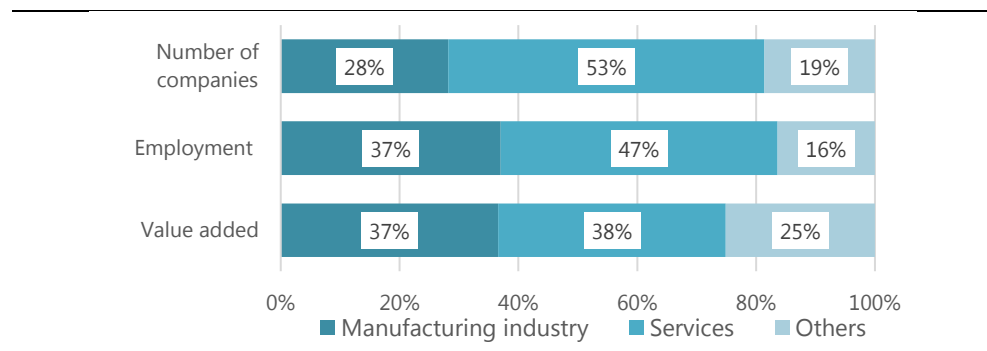
evidence) method. Scoring methods which enable division of enterprises according to their level of risk bankruptcy were used. When other conditions imposed by regulatory authorities are met, the models that were designed could be used among others in the process of calculation of capital requirements. Jankowitsch et al. (2007) demonstrated that such application of the model can bring real benefits for banks.

In 2015, the manufacturing industry enterprises generated 36% of the overall added value in the non-financial sector. They accounted for 28% of companies and employed 37% of employees. Among both large companies and SME, the highest number of employees worked in metal manufactures (24% in total in 2015). In 2015 service providers generated PLN 251 billion of added value (38% of the sector of non-financial enterprises). They accounted for 53% of companies and employed over 2.4 million people (46%). As regards services, the highest employment figures were recorded in the trade sector (43%). In SME, in addition to trade, most people worked in professional, scientific, technical, administration and support service activities (29%). For large companies, the highest employment figures were recorded in transport (25%).

Share of the firms by brand activity (in 2015)

Source: author's own calculation

Graph 1



Large enterprises (4% of the total number of enterprises) generated 52% of the overall added value and employed 38% of staff. The percentage of large enterprises in the manufacturing industry was higher (6% in 2015) than in services (3%).

The structure of the article is the following: the first chapter presents a review of empirical literature on sectoral risk analysis. Next part describes the economic environment. The third chapter presents description of the data, sectoral risk methodology and the last one describes the study performed.

Literature review

Based on an analysis of the review of the literature concerning sectoral risk, Nguyen (2007) remarked that quite frequently sectoral risk is defined as the average risk of enterprises conducting operations in the sector.

The basic problems with measurement of the risk are identification and definition of an appropriate risk variable. In the case of sectoral risk, various concepts of measurements and various methods of its assessment are used. Falk and Heintz (1975) and Batóg et al. (2017) studied sectoral risk based on sectoral characteristics

that are reflected in the financial indicators. A critique of this approach was presented by Blocher and Chen (1978) who also presented proposals concerning the solution of the problem with the selection of financial indicators. Another group of studies covers profitability and sectoral risk depending on the market structure (Demsetz 1973; Esposito 1985). Nguyen (2007), following Merton's (1974) model of insolvency, performed an assessment of sectoral risk using a measure based on a distribution of cash flow to all companies in a sector level.

A different approach to sectoral analyses is presented in analyses focusing on sectoral concentration. Studies on sectoral concentration have been analysed by Düllmann and Masschelein (2006). The authors studied the extent to which sectoral concentration contributed to an increase in the economic capital and checked the effectiveness of various - other than Monte Carlo simulations - methods of measurement of the risk of sectoral concentration. It was confirmed that economic capital increased with an increase in sectoral concentration. Holub et al. (2015) studied the risk resulting from the sectoral concentration of credit portfolios and found that, due to its level and its impact on the credit risk, banks should establish additional capital requirements. The level of sectoral concentration and its trends were determined using the *HHI indicator*. In the opinion of Accornero et al. (2015), a high concentration of a bank's involvement in sectors of the economy that are more sensitive to the business cycle can significantly contribute to an increase in the credit risk of the bank. This is particularly important in periods of slower economic growth or recession because excessive credit concentration in sectors that are sensitive to the changes in the business cycle in such periods can result in financial losses that pose a threat to the bank's solvency. It was determined that credits granted concentrated in three sectors: the industrial sector (20% of the total credit exposure), the commerce sector (14% of the total credit exposure), and the construction sector (13% of the total credit exposure). Those sectors are the riskiest and are characterised by the highest ratio of unexpected losses in relation to the value of the exposure. The average probability of bankruptcy in each of the sectors is higher.

Heifitfield et al. (2005) presented a study on the impact of systematic and idiosyncratic risk on the distribution of portfolio loss. Saldias (2013) uses panel data to analyse systematic and idiosyncratic determinants of the risk of insolvency in the corporate sector of the Eurozone. The author studies the way that the risk of bankruptcy of entities is transferred between/within the financial sector and the corporate sector. This approach takes into account observable and non-observable factors and presents a different level of sectoral dependence between entities. Iosifidi and Kokas (2015) showed that banks characterised by a higher credit risk grant loans to companies that are riskier and whose financial condition is worse (selection mechanisms). The results of the study point at the need to monitor banks with elevated credit risk.

Economic environment

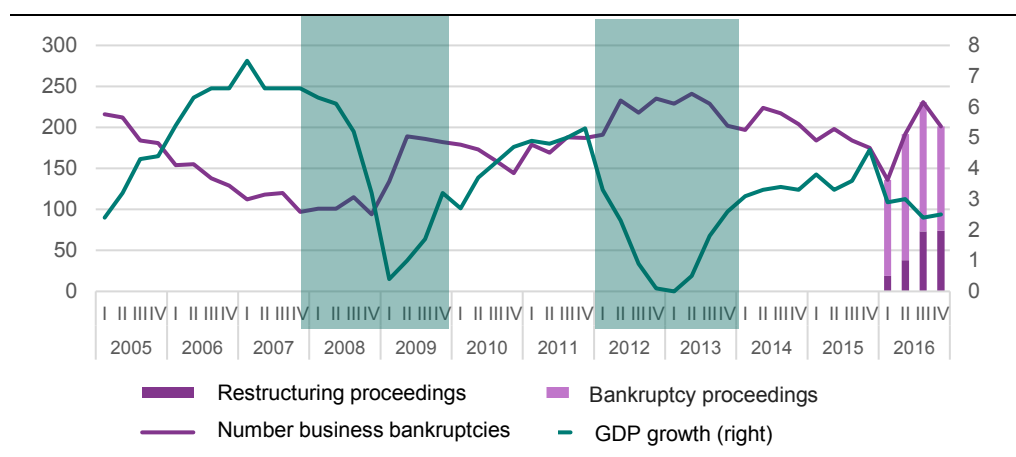
To analyse the links between GDP and the number of business bankruptcies in Poland in the period of 2005-2016, an overview of the dynamics of their changes during this period was made. The author has concluded that there is a negative relation between the GDP growth rate and the number of bankruptcies declared by

courts. It should be noted that the number of actual bankruptcies is frequently much higher as some of the petitions are returned due to formal deficiencies or dismissed as a result of a shortage of assets. In particular, small companies end their business activity without undergoing the bankruptcy procedures.

Number business bankruptcies vs. GDP

Source: author's own calculation based on Coface, GUS data

Graph 2

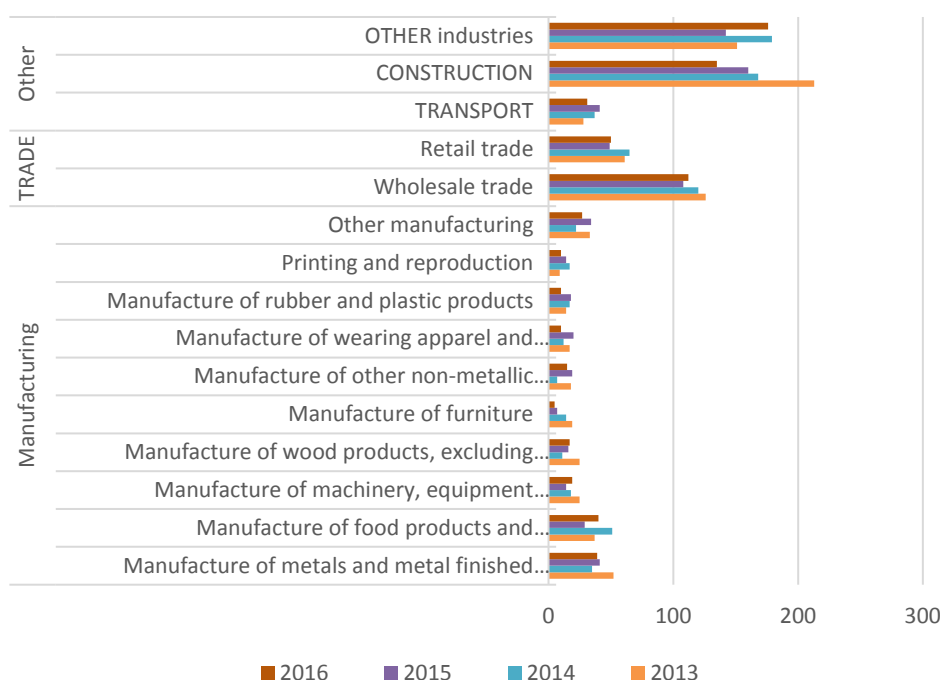


During the global financial market crisis of 2007-2009, GDP growth rate was observed to fall from 6.6% to 3.2% and the number of declared bankruptcies went up by 55% (in 2009 the highest increase was observed in the number of pending bankruptcy proceedings - by 68% compared to the previous year). In 2012, the courts declared 877 enterprises bankrupt, which was the highest number over the last 8 years. This situation can be partially explained by deteriorated economic conditions in 2012 (the GDP growth rate did not exceed 3.3% reaching the level of 0.1% in Q4). By the end of 2015, the GDP growth rate was on the increase, and the improving economic situation was conducive to further decrease in the number of bankruptcies. Despite the improved situation of the construction sector, which has been recorded since 2013, the payment backlogs of those enterprises and their low financial liquidity impacted the production companies cooperating with this industry. Slow stabilisation of the construction sector contributed to increased number of bankruptcies among manufacturers of construction materials and other non-metallic mineral products by 171% (12 enterprises) compared to the previous year. A decrease in the number of bankruptcies among food and drink producers is also noteworthy. This could result from continued improvement on the job market, which supports increased consumption of households, or from the search for new markets after the difficulties in trade with the East experienced in 2014. The improved situation of the construction sector was supported by the good condition of commercial construction, infrastructural construction and the government programme – "*Mieszkanie dla Młodych*" ["*Apartments for the Young*"]. As in 2014, despite low interest rates, decreased oil prices, economic revival in the EURO zone, the situation of transport companies deteriorated. The 11% increase of bankruptcies in this sector was primarily caused by the conflict between Russia and the Ukraine, recession in the Russian economy, the Russian embargo imposed in 2014, and the German minimum pay regulations for carriers, as well as increased competition.

Number of bankruptcies by branch of activity

Source: author's own calculation based on Coface

Graph 3



Preliminary analysis of the financial condition of enterprises

The preliminary analysis of the data focuses on the presentation of the financial condition of enterprises in accordance with the categories of return and financial structure, and on analysing the effect of financial leverage and ability to pay interest. It is followed by the presentation of the payment conditions agreed between the customers and the suppliers.

Return on sales is presented using the net margin on sales, which is the quotient of the net operating result and the sales revenue. In nearly the entire period of the analysis, with the exception of the years 2005-2006 and 2010-2011, SMEs had a higher return on sales compared to large enterprises. In 2014, the difference between the net marking on sales of entities in the SME sector and that of large enterprises was equal exactly to 1 p.p., and in the following year it reached the value of 2 p.p. It should be mentioned that in large enterprises the pace of growth of full operating costs has been higher than the pace of growth of their added value in the recent years. In 2015, the return on sales in large enterprises reached the lowest level in history. Entities in this sector are forced to reduce their margins due to international competition.

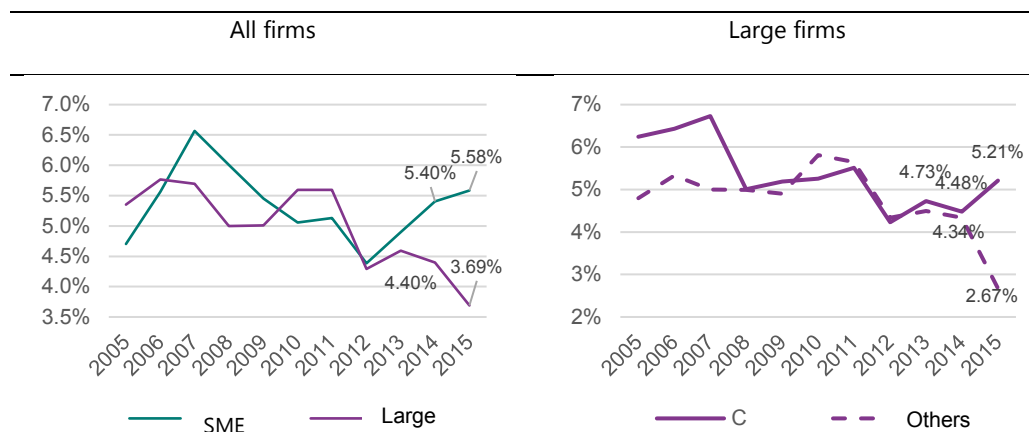
In the years 2005-2009 and 2013-2015, large enterprises in the manufacturing sector had higher net operating margins than entities in other sectors. They achieved their highest margin in 2007 (7%). In 2008, due to the financial crisis, there was a sharp drop in the margin achieved by those entities. On the other hand, the net margin achieved by other entities reached the highest value (6%) in the year after the crisis, i.e. 2010. In the period of slow economic growth (2012), similar to enterprises in the

manufacturing sector, the profitability of the entities in question was sharply reduced. What contributed to this was the increase in the number of declared bankruptcies compared to the previous year.

Net margin on sales

Source: author's own calculation

Graph 4

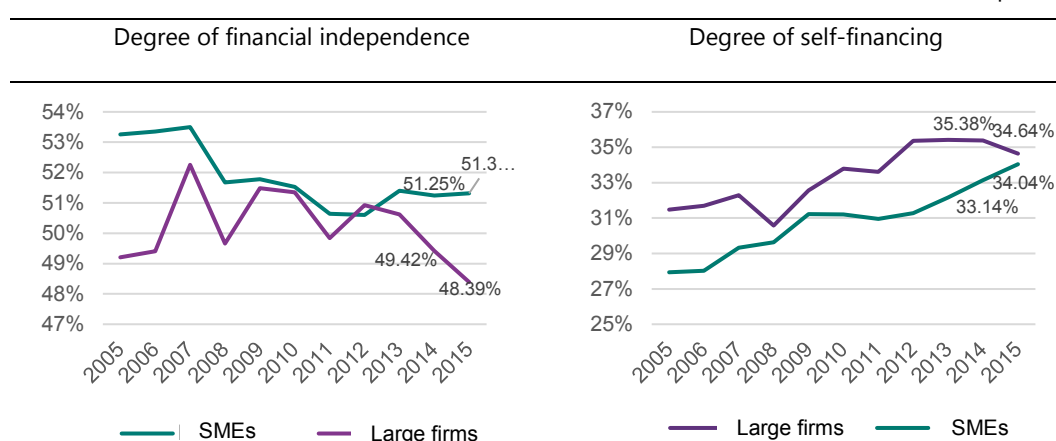


The analysis of solvency was performed using the degree of financial independence measure, which is calculated as the ratio of equity to total assets, and the self-financing level indicator, which is a quotient of the total reserve capital and the profits withheld and the total assets. In the analysed period (with the exception of 2012), SMEs were characterised by higher financial independence. In 2014, the degree of financial independence of those entities was 2 p.p. higher than that of large enterprises and in 2015 the difference increased to nearly 3 p.p. This means that such entities are better able to pay off their debts in the event of bankruptcy and that they financed their operation with equity to a larger extent.

Degree of financial independence and self-financing

Source: author's own calculation

Graph 5



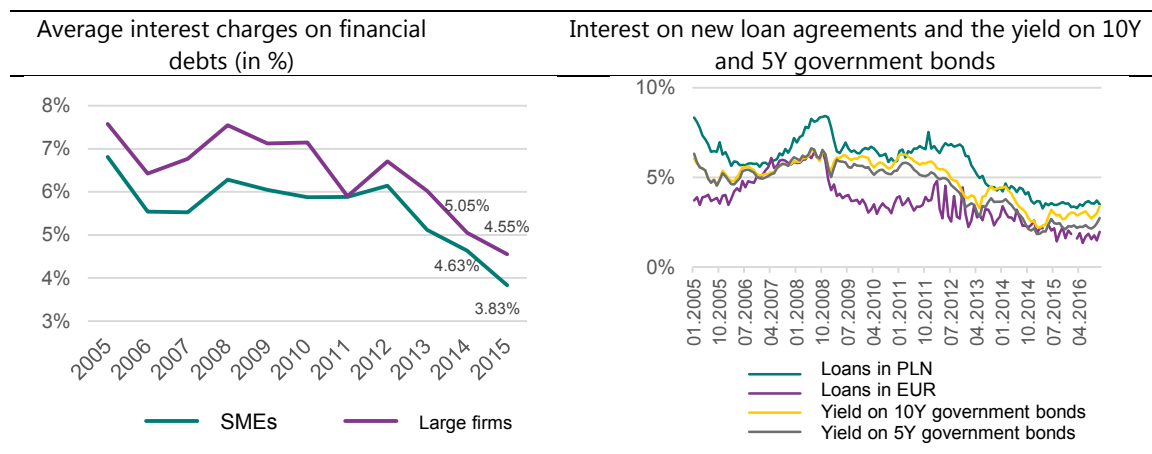
In the years 2005-2015, the degree of financial independence of large enterprises changed more than that of enterprises in the SME sector. The largest changes took place in the years 2007-2008. After an increase by 2.8 p.p. in 2007, when large enterprises reached the highest degree of financial independence, the crisis year of

2008 brought about a drop in the share of equity in the balance sheet total by 2.6 p.p. Since 2012, which was the last year of its increase, this indicator has decreased. As a result of the credit boom, the degree of financing of assets with equity decreased and this trend continued until 2012.

Average interest charges on financial debts

Source: author's own calculation

Graph 6



Another important indicator showing possible causes of the decreased interest in external financing is the average cost of debt. The trend of the average interest indicator follows the trend of the weighted average cost applied by Polish banks to new loans and the trend of cost of emission of government bonds. One must also remark that the interest rates of government bonds, due to minimum risk of default, is definitely lower than that of corporate bonds.

In the years 2005-2015, the average interest on debt for large corporations was higher than that for enterprises in the SME sector. The interest for large corporations was in the range of 5%-8%, while the average interest for SMEs in the analysed period was 6% (lower than 1 p.p. than that for large enterprises). The average interest on debt paid by large enterprises until 2012 was subject to significant changes. The changes were bigger in the case of large enterprises that use external sources of financing to a larger extent. Their highest value was observed in 2008 (with the exception of 2005), which was naturally related to the outburst of the financial crisis (the cost of loans in Polish zlotys reached 8% in that year and the cost of loans in euros was 6%; the interest paid on corporate bonds reached the highest level since 2005). Since 2012, both in the large enterprise sector and in the SME sector, the average interest paid on debt has decreased. It reached the lowest value in 2015. In the case of large enterprises, it was 32% lower than in 2012 and in the case of SMEs, it decreased by 38%. This was due to the good liquidity of companies and the good credit situation that has been in place since the end of 2013.

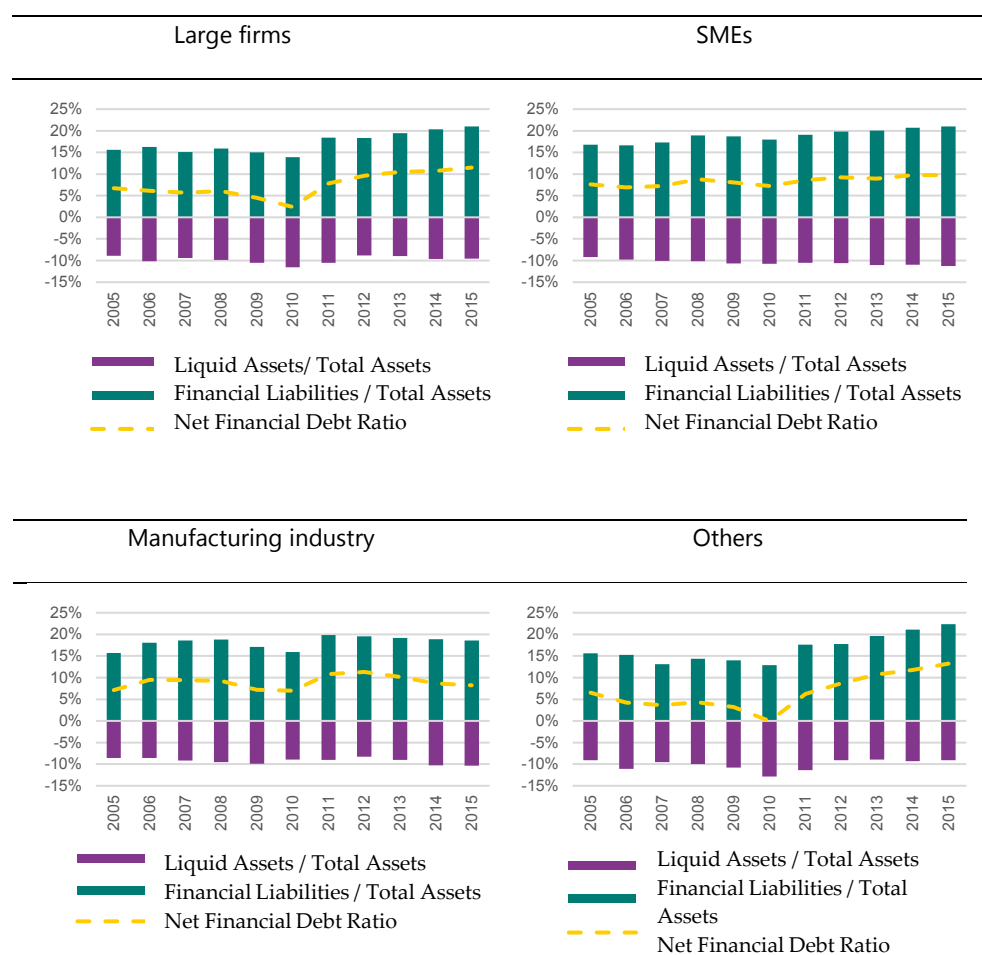
The net financial debt indicator, which is the quotient of the financial liabilities minus short-term financial assets and the total assets, is an indicator used by enterprises in their credit policies. The lower the value of net financial debt, the higher the ability to obtain external funds in the future. A constant increase of this measure means that enterprises constantly finance their operations with new credits and loans and avoid financing using their own funds.

In the years 2005-2011, large enterprises had lower values of the net financial debt indicator than SMEs. This was particularly pronounced in 2010 when the value of the indicator was nearly 5 p.p. smaller than in the SME sector (in that year, the short-term financial assets of large enterprises grew much faster than their financial obligations). In the last years of the analysis, the decrease of financial independence among large enterprises was accompanied by an increase in the net financial debt indicator, while the value of this indicator for enterprises in the SME sector was on average 1 p.p. lower. Until 2012, corporations in sectors other than the manufacturing sector achieved much lower values among large enterprises than manufacturing companies (in 2010, the value of cash and cash equivalents was even larger than the value of financial liabilities of those entities - there was a 33% increase in liquid assets of the enterprises in question compared to a 3% increase in the value of financial liabilities). In the years 2013-2015, this trend was reversed: corporations in the manufacturing sectors that were characterised by greater financial independence and had higher values of the self-financing indicator became safer for creditors.

Net financial debt

Source: author's own calculation

Graph 7

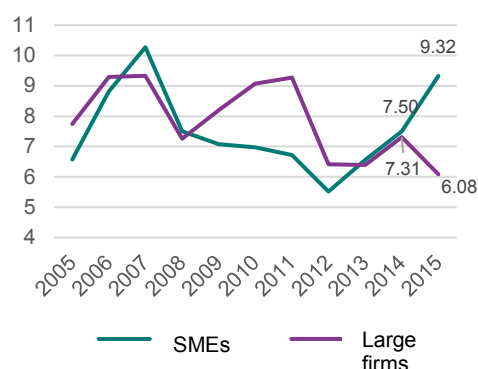


An important indicator demonstrating the degree to which an enterprise is able to pay the interest on loans is the debt coverage ratio. It is calculated as the ratio of the net operating result and the financial revenue to the cost of interest. If the value of the ratio is larger than 1, the enterprise is able to pay the interest from its profit.

The times interest earned ratio

Source: author's own calculation

Graph 8



In the years 2007-2008 and 2013-2015, SMEs had higher values of the interest coverage ratio. In 2008, both large enterprises and SMEs had a low value of the interest coverage ratio, which was due to the increasing costs of loans and bonds. In the case of large enterprises, after 2009, the value of the ratio started to increase thanks to the decreased cost of credit. An increase in the income of enterprises in 2010 resulted again in increasing values of this ratio.

In 2012, the value of the ratio decreased and reached the lowest level in the entire studied period due to an economic downturn. In the years 2008-2012, SME's experienced decreased values of the interest coverage ratio. In the pre-crisis year of 2007, the highest values of the ratio were observed. In the case of large enterprises, they were 3 p.p. higher than in the last year of the analysis and in the case of SMEs, the difference was a little below 1 p.p. In 2015, a significant difference was observed between the values of the interest coverage ratio in large enterprises and SMEs: the coverage of interest by financial profit and net operating profit in large enterprises was 53% smaller than the coverage in SMEs.

The payment terms agreed between customers and suppliers were determined using two indicators. The first indicator was the days sales outstanding (DSO) ratio, which is the ratio of the difference between the receivables for deliveries and services and the short-term advance payments received for deliveries to the sales revenues, multiplied by 360 days. The lower the value of this ratio, the sooner the company receives its money. The second indicator was the days payable outstanding (DPO), which is the quotient of the liabilities for deliveries and services minus advance payments for deliveries, and the costs of the purchased goods, multiplied by 360 days. The lower the value of this ratio, the sooner the company pays its liabilities to its suppliers.

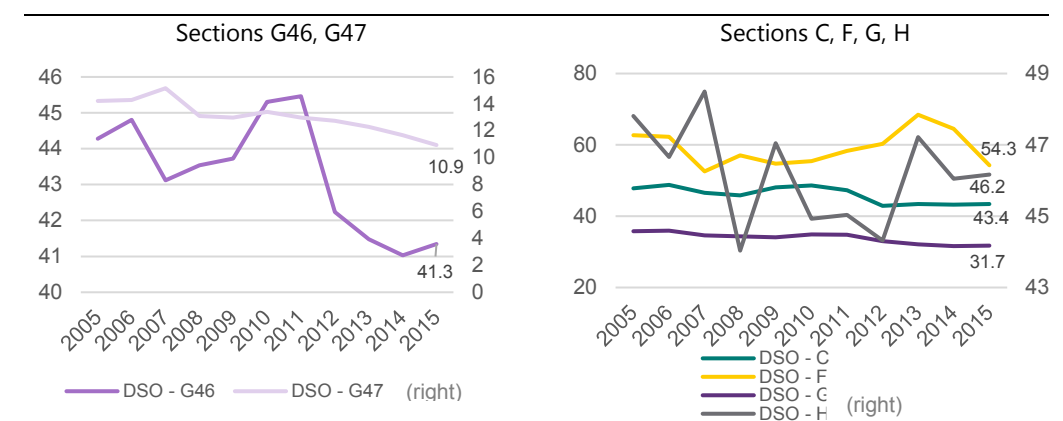
In the years 2005-2015, the value of the days sales outstanding ratio in most non-financial sectors did not change significantly, which means that the proportion of enterprises that received payments within time limits that exceeded the desirable values of the DSO did not change and, moreover, did not noticeably depend on the changing economic conditions. The largest differences between the values of the ratio that were observed in the construction sector (a difference of nearly 16 days; in 2007, the DSO was equal to 53 days and in 2013 it reached the highest level and was equal to 69 days).

More dynamic changes were observed in the case of the DPO ratios. The differences in the time of payment of liabilities to suppliers in the specific sector of enterprises did not, however, exceed 29 days. The largest differences in the observed value of the days payable outstanding ratio in the analysed period were experienced by enterprises in the real estate activities sector (28 days), the construction sector (22 days) and the transportation and storage sector (nearly 21 days).

DSO ratio

Source: author's own calculation

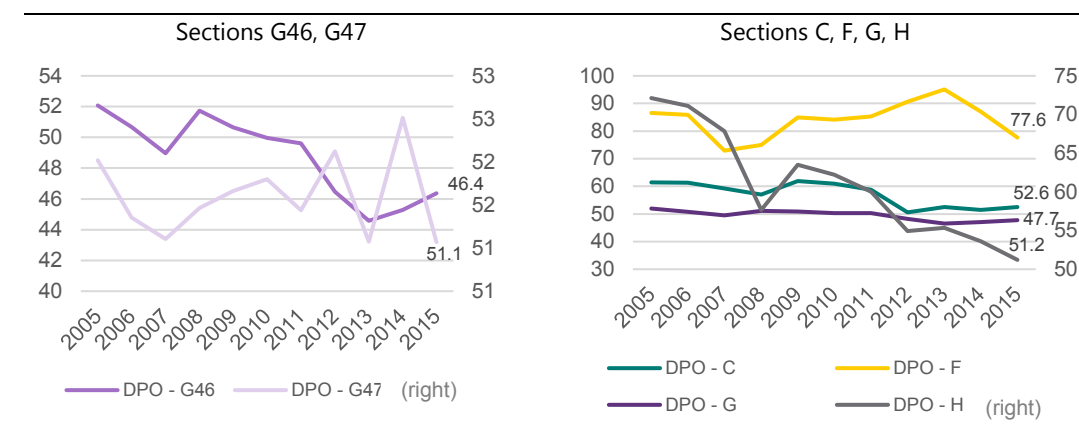
Graph 9



DPO ratio

Source: author's own calculation

Graph 10



Description of the data, sectoral risk assessment methodology and results

To evaluate non-financial enterprises, the author relied on figures from annual financial reports (*F-02*). The analysis was made for active entities (according to the definition of the Statistical Office). The evaluation consists of two parts: the financial strength and the risk of bankruptcy.

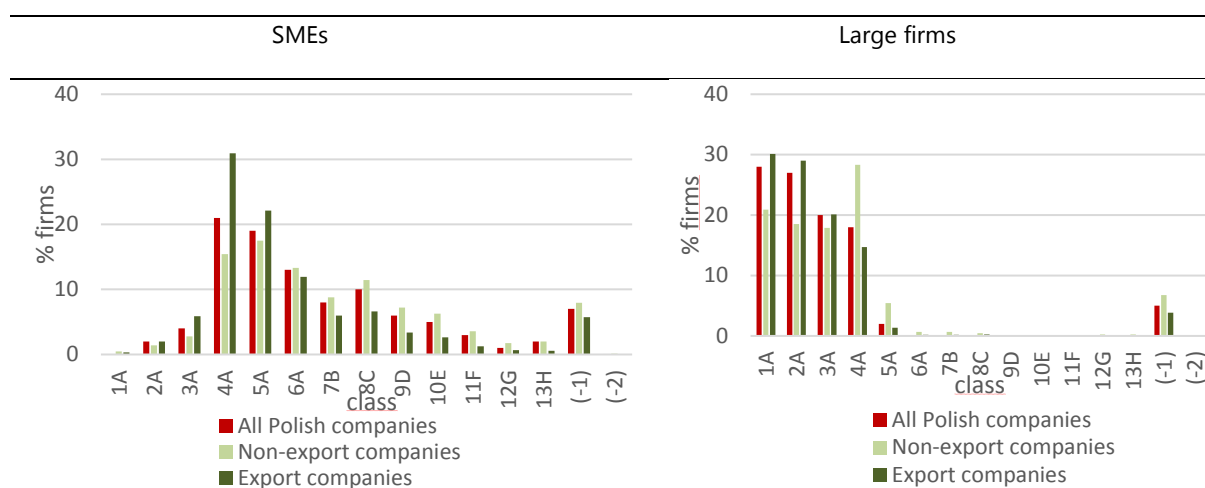
Financial strength

The first part presents the financial strength depending on the net value of enterprises. The financial strength defines the financial capacity of an enterprise. The defined *classes* 1 – 4 are considered to be low-risk groups, with the first group being the group with the lowest risk. The safety of class 5 is average. Classes 6-13 are considered to have an above-average risk, whereby the 13th group is associated with the highest risk. *Class* (–1) groups enterprises with negative equity. The danger resulting from excessive use of external capital in the form of debt is negative equity, i.e. a situation where the liabilities and provisions exceed the value of the enterprise's assets. If the value of equity is larger than the value of assets, the balance sheet value of the assets decreases, i.e. funds from the liquidation of assets are insufficient to cover liabilities to debtors and provisions for such those liabilities have not occurred but whose value can be credibly estimated. Pursuant to the Code of Commercial Companies, a drop in the value equity, even one that does not lead to negative value of equity, constitutes grounds for declaration of bankruptcy of limited companies, both limited liability companies and joint stock companies (in the case of limited liability companies - a loss that exceed the value of the supplementary capital and a half of the share capital, and in the case of joint stock companies - a loss that exceeds the value of the supplementary capital and one third of the share capital). In the case of businesses established under other legal forms, whose capital requirements are not governed by law, negative equity means that if the business is liquidated its assets will not suffice to pay off the liabilities to all the creditors and owners forced to close business will not recover their contributions and will have to pay off the liabilities to the creditors from their private assets.

Financial strength in 2015 (% firms)

Source: author's own calculation

Graph 11



The analysis of the aforesaid data led to a conclusion that in 2005-2015, in terms of financial strength, all non-financial enterprises fell under the risk classes 4 to 8 (in 2015, the median of the financial strength was in class 5 (financial capacity from EUR 750,000 to EUR 1,750,000), while the first quartile of financial strength was in class 8 (financial capacity from EUR 165,000 to EUR 300,000)). In 2015, 16% of enterprises were below class 8. The trend was set by the SME sector, dominant in terms of the number of enterprises. The situation of large entities was different. They usually (in

more than 90%) fell under the first four (safer) risk classes. The SME sector featured a higher percentage of enterprises with negative goodwill. Among large enterprises, the percentage of companies with negative goodwill was 2-3 percentage points lower on average than among SME, and it has remained at the level of 5% since 2008. Exporters were characterised by better financial equipment.

Small and medium-sized enterprises

In 2015, the sector of small and medium-sized non-financial enterprises was dominated by entities classified in groups with above-average risk (classes 6-13). The highest percentage of such enterprises (above 50%) was present in the retail sector, companies providing business services, the construction sector, and the transportation and storage sector. The lowest percentage of such enterprises was present in the pharmaceutical sector (17%), and the real estate activities sector.

The enterprises that constituted the highest percentage in the group of enterprises with the highest financial capacity (classes 1-4) was small and medium-sized enterprises in the real estate activities sector (above 66%), the energy, water and waste sector (54%), and the pharmaceutical sector (52.2%). The enterprises that constituted the lowest percentage in the lowest-risk group (below 10%) was enterprises in the retail sector.

In 2015, the largest group of enterprises with negative net goodwill was service companies. Those were enterprises active in the accommodation and food service activities sector (15%), the information and communication sector (13%), the retail sector (11%), and the business services sector (11%). The enterprises in the manufacturing industry included those in the pharmaceutical sector (9), the textiles, clothing and footwear sector (8%), and the metallurgy sector (7%). The smallest percentage of enterprises with negative net goodwill was present in the energy, water and waste sector (2%) and the real estate activities sector (3%).

Large enterprises

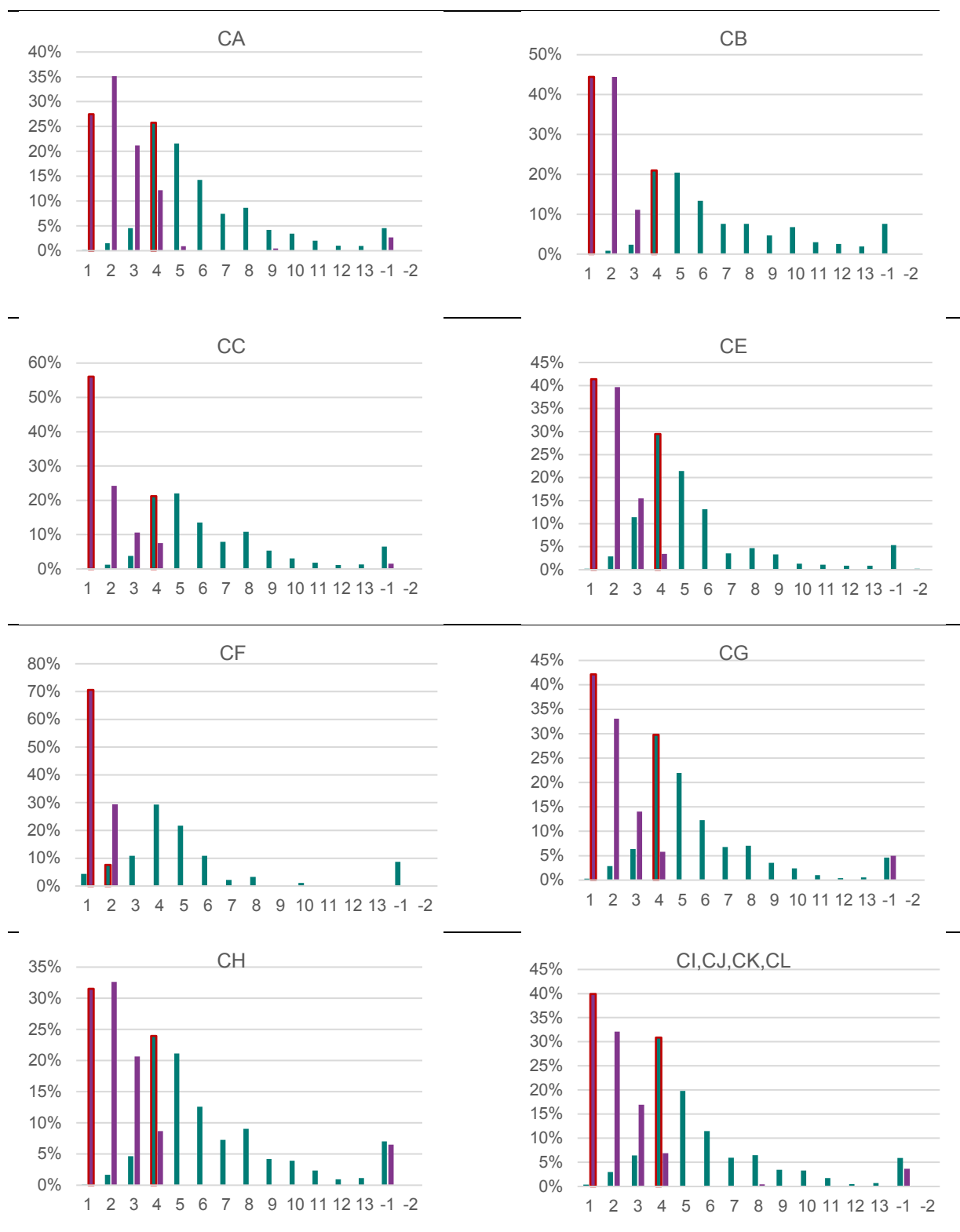
The situation in the last year of the analysis was different in the large enterprise sector. More than 80% of large non-financial enterprises were classified in the low-risk group that is characterised by the highest financial strength. Among the enterprises in the manufacturing industry, this share did not drop below 93%. All enterprises in the first four risk classes were present in the case of the textiles, clothing and footwear sector, the chemical industry, the pharmaceutical sector, as well as the accommodation and food service activities sector and the real estate activities sector. The smallest percentage of enterprises in the lowest-risk groups was present among service enterprises providing business services (less than 84%).

An analysis of the above-average risk group indicated that the largest percentage in the risk classes 6-13 in 2015 was present among enterprises in the business services sector (8%). The largest percentage of entities with negative goodwill was observed among service enterprises in the information and communication sector (12%) and in the mining and quarrying sector (11%). A share of entities with negative net goodwill that was higher than 5% was also observed in the transportation and storage sector, the retail sector, the metallurgy and metalworking sector, and in the construction sector.

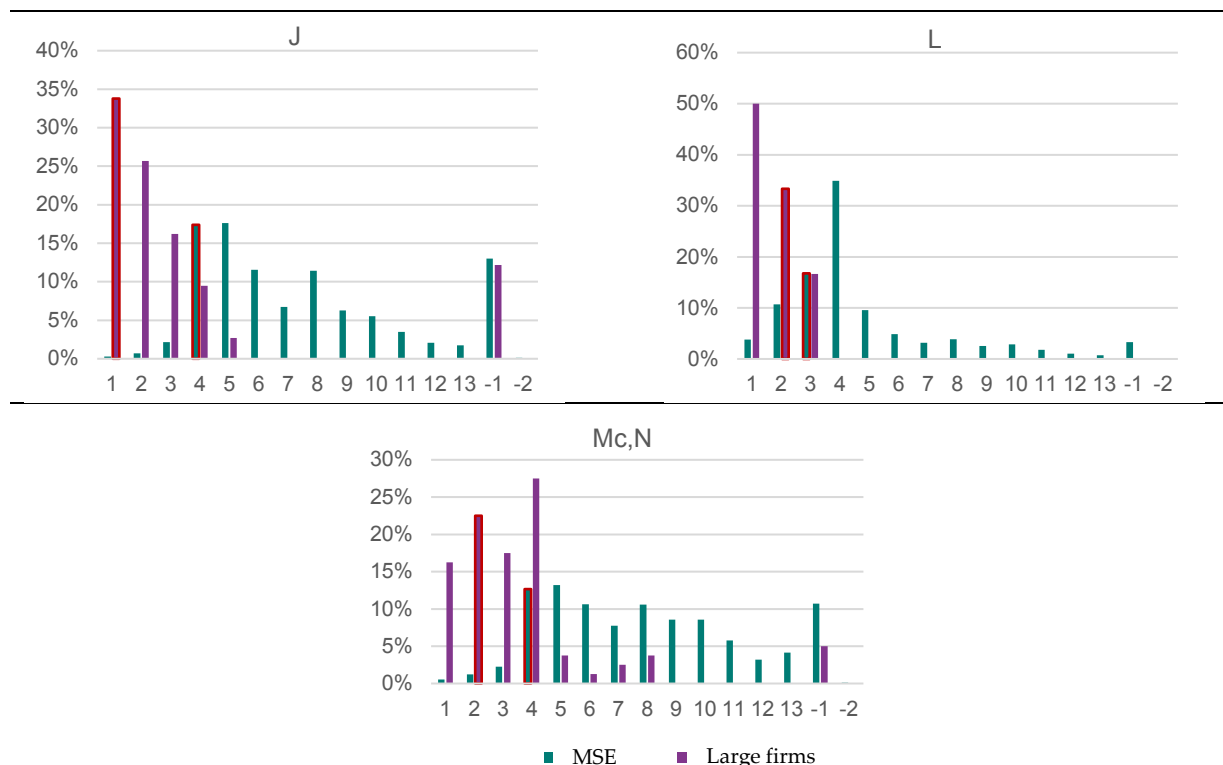
Financial strength in 2015 according to the section in which business is conducted

Source: author's own calculation

Graph 12







Risk of bankruptcy

The second part of the evaluation concerns the risk of bankruptcy. At a given time, each of the studied companies could have one of the following four statuses of legal and economic activity: active entity conducting activities, an active entity in construction, an active entity in liquidation, and active entity in bankruptcy. Consequently, failure forecasting applies to entities that, as of 31 December, are in bankruptcy but continue their activities and had revenue from the activities in the period covered by the report.

Probability of default **PD** model consists of the next part:

- **Quantitative** – financial factors,
- **Qualitative** – behavioral factors,
- **Sector riskiness.**

The models were estimated on databases which included all companies that went bankrupt and randomly chosen healthy companies. Companies that declared bankruptcies made up for 20% of the created samples. This approach is common for scoring methods where 'bad' subject constitute only a small share of the whole population and it has the purpose of improving the statistical characteristics of the applied tools. Before estimating the model it was tested whether the constructed sample is representative following the results of the non-parametric *Wilcoxon-Mann-Whitney test*, *Kolmogorov-Smirnov test* and the parametric *t-Student* test for equality of averages for the continuous variables and the χ^2 *Pearson* test and the *Population Stability Index* (PSI) for the discrete variables. The PSI coefficient is applied in order to investigate the differences in distribution of two categorized variables.

The higher the value of the coefficient, the greater the statistical distance between the distributions.

In order to construct an indicator (*probability of default - PD*) which would enable assessing the probability of a company to go bankrupt, a logistic regression was used. Due to a high number of financial indicators of a company's condition (explanatory variables) in the initial analysis the predicting force of each was determined (*Gini coefficient, Information Value Indicator*) followed by clustering in order to limit the size of the analysis. Thanks to this variable selection procedure it was possible to avoid the collinearity problem, which was assured by calculating the appropriate *Variance Inflation Factor* statistics. The model was estimated on categorized variables transformed using the Weight of Evidence (*WoE*) approach. The *WoE* transformation is often used for the creation of scoring models using logistic regression, because such a transformation allows maintaining linear dependence in regard to the logistic function. In addition, *WoE* conveys information on the relative risk associated with each category of the particular variable, with a large negative value indicating a higher risk of bankruptcy.

$$WoE_i = \ln \left(\frac{p_i^{non\ bankrupts}}{p_i^{bankrupts}} \right)$$

where:

- i - category
- $p_i^{non\ bankrupts}$ - the percentage of not bankrupt companies that belong to category i
- $p_i^{bankrupts}$ - the percentage of bankrupt companies that belong to category i .

The categorisation was based on the division with the highest Information Value (*IV*), which measures the statistical *Kullback – Leibler* distance (H) between the bankrupts and non-bankrupts. The *IV statistic*, based on the *WOE*, allows measuring the predicting force of a particular characteristic. The *IV* value depends on the number of categories and division points. The variables for which the *IV* does not exceed 0.1 are assumed to be weak in their relative predicting force, while values exceeding 0.3 bear evidence of a strong discriminating force (Anderson, 2007).

$$IV = H(q^{non\ bankrupts} || q^{bankrupts}) + H(q^{bankrupts} || q^{non\ bankrupts}) \\ = \sum_i (p_i^{non\ bankrupts} - p_i^{bankrupts}) WoE_i$$

where:

- q - density function.

The final model was created following the top-down approach. Based on the estimated parameters, weights for particular explanatory variables were determined. As a result, a set of financial indicators allowing to grade companies was obtained and bankruptcy probabilities were assigned to companies.

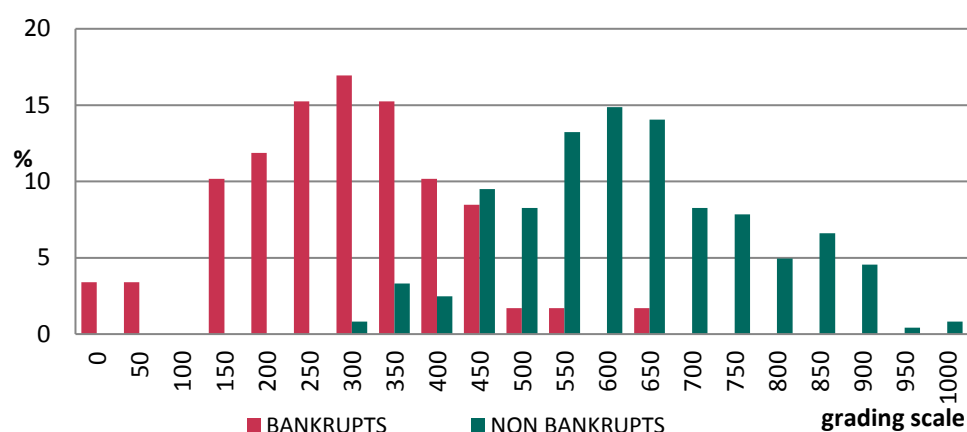
The first included companies observed in 2014. In this model the probability of default (*PD*) was predicted for a one year horizon. The greatest weight was assigned to the indicator of industry sector (21%). The great weight also was assigned to the indicator of ability to cover financial costs (17%). This indicator was also mentioned

by Mączyńska and Zawadzki (2006) as significant for forecasting firm bankruptcy, because it reflects the degree in which operating profits can decrease without preventing the company from covering its financial costs. A higher value of this indicator translates to higher financial security of a company (Görgi and Spaliara, 2009). The indicator for net-assets structure (weight of 19%) is the second most important characteristic that can signal a potential bankruptcy. The share of current liabilities in total assets, direction of sales, size of companies and *ROA* are also good bankruptcy predictors. In line with the results of Chaney (2013) specialized exporters are considered to be performing best.

Distribution of company grades based on the model for "Bankrupts" and "Non bankrupts"

Source: author's own calculation

Graph 13



The distribution of grades across companies which have or have not gone bankrupt shows that the selected indicators (explanatory variables) allow identifying a potential bankruptcy to a significant degree (Figure 13). The information collected in the database indicated that no company that obtained more than 650 points went bankrupt within a year. However, for companies with less than 200 points bankruptcy was almost certain. Bankruptcy was predominant among companies from the 200-300 points interval.

In accordance with the guidelines of Basel III, the decision to implement the scoring model should be determined by the results of the validation process: the discriminatory power and calibration quality. The *GINI* and *K – S value* of the model were equal to, respectively, 94 and 84, which means satisfactory discrimination. The hypothesis on the combined insignificance of explanatory variables in the model was rejected ($p - value = 0.000$). While using the Wald method, tests were carried out on the significance of individual variables separately and the p -value for each of them was below the established 5% significance level. There are also no grounds to reject the zero hypothesis on the good adjustment of the model to the data ($p - value = 0.19$). The *VIF (Variance Inflation Factor)* value does not indicate any issues of excessive collinearity. While using the bootstrap method, the stability of the calculated *GINI value* was verified. To achieve this, a sample was drawn and returned a thousand times, which contained 2/3 observations from the original set. The

operation of the model was verified with the use of a validation set. The hypothesis on the combined insignificance of the parameters was rejected. There are also no grounds to reject the zero hypothesis on the insignificance of individual explanatory variables in the model.

Bankruptcy rate (% of the total number of enterprises) during one year (2015)

Source: author's own calculation

Table 1

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Total
Total	0	0	0,01	0,01	0,02	0,18	0,76	1	1,5	6,19	0,06

The defined classes 1-4 are considered to be low-risk groups, with the first group being the group with the lowest risk. The safety of class 5 is average. Classes 6-10 are considered to have an above-average risk, whereby the 10th group is associated with the highest risk.

Evaluation of the risk of bankruptcy (% of the total number of enterprises) in 2015

Source: author's own calculation

Table 2

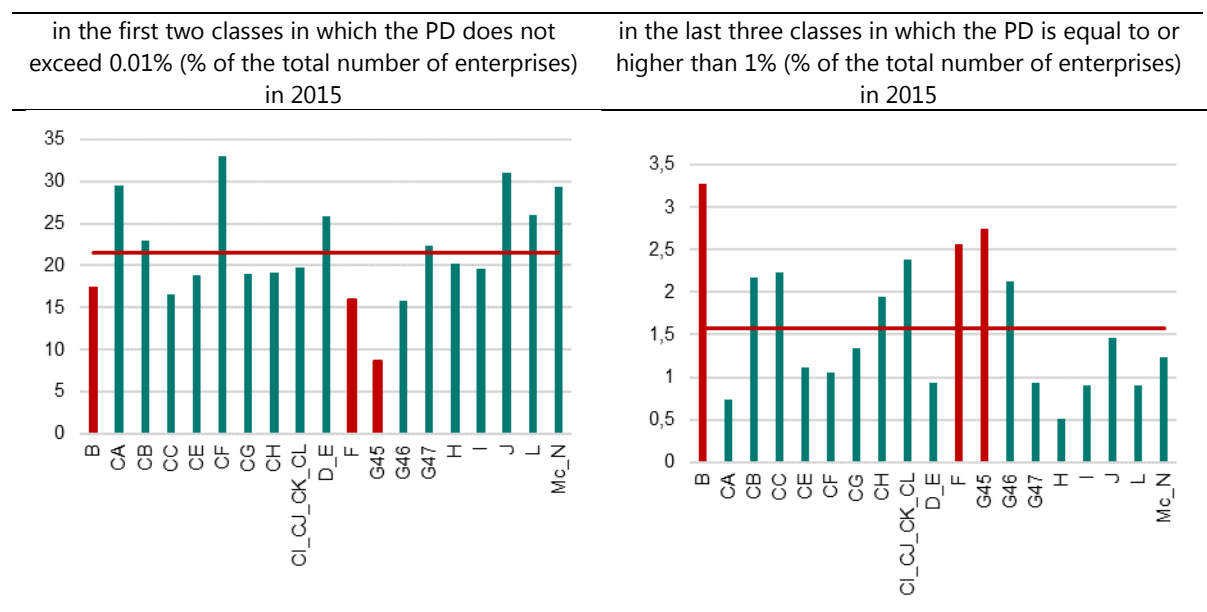
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	TOTAL
Total	7,26	14,29	28,87	25,32	14,22	7,57	0,89	0,88	0,26	0,44	100
B	6,91	10,55	24,73	24,73	17,82	11,27	0,73	1,82	0	1,45	100
CA	12,52	16,94	26,39	25,78	12,87	4,64	0,13	0,39	0	0,35	100
CB	6,23	16,77	28,21	20,33	14,1	10,93	1,27	1,02	0,64	0,51	100
CC	7,44	9,15	28,5	26,71	16,37	8,93	0,67	1,41	0,37	0,45	100
CE	8,99	9,89	30,79	24,04	18,2	5,84	1,12	0,9	0	0,22	100
CF	14,89	18,09	18,09	25,53	17,02	4,26	1,06	1,06	0	0	100
CG	8,62	10,41	27,49	23,69	17,85	9,69	0,92	0,82	0,21	0,31	100
CH	7,37	11,85	28,15	24,13	15,96	9,7	0,89	0,76	0,38	0,8	100
CI,CJ,CK,CL	8,38	11,39	29,06	22,68	17,72	7,38	1	1,38	0,19	0,81	100
DE	9,45	16,38	29,68	27,52	12,07	3,73	0,23	0,76	0	0,17	100
F	5,16	10,77	23,04	25,3	19,45	12,34	1,38	1,45	0,51	0,6	100
G45	2,98	5,73	23,23	31,32	18,92	12,87	2,2	1,41	0,78	0,55	100
G46	6,12	9,66	29,9	26,37	16,44	8,23	1,15	1,26	0,4	0,47	100
G47	6,71	15,71	36,61	24,08	9,71	5,28	0,96	0,46	0,17	0,3	100
H	9,02	11,24	32	29,82	10,34	6,42	0,66	0,43	0,04	0,04	100
I	4,6	14,96	26,34	35,29	10,23	7,29	0,38	0,64	0	0,26	100
J	8,44	22,55	27,13	20	12,15	7,42	0,87	0,58	0,15	0,73	100
L	4,16	21,8	29,16	28,68	12,42	2,77	0,11	0,59	0	0,32	100
Mc,N	8,06	21,36	28,89	22,83	10,46	6,49	0,67	0,58	0,2	0,46	100

Based on the results, it was found that the small and medium-sized enterprises faced a higher risk of bankruptcy than large enterprises, which was due to the fact that large enterprises have a higher rate of self-financing. About 76% of enterprises were included in classes 1-4, which are characterised by low risk; those enterprises employed 76% of all employees.

Evaluation of the risk

Source: author's own calculation

Graph 14



Figures 14-15 show a ranking of the sections of activities, which was determined based on the percentage of enterprises included in the categories where the probability of bankruptcy did not exceed 0.1% and those where it was equal to or higher than 1%. The lowest risk of bankruptcy was identified in the case of the pharmaceutical sector (especially large enterprises) which, as has been mentioned, did not finance its activities with debt to such a high extent as other sectors. Of note is the fact that the pharmaceutical sector is one of the fastest growing manufacturing sectors both in Poland and abroad. The sector with the highest risk, where the PD was equal to or higher than 1%, was the mining section. Based on the Polish Financial Supervision Authority, the industry with the lowest credit quality was recorded in mining (the share of non-performing loans exceeded 20%). It was followed by the motor vehicles trade sector and the construction sector. The liquidity risk in the construction industry is still present and concerns mostly smaller entities, which are dependent on timely payments by general contractors or owners. This sector still generates many overdue liabilities, which also affects the situation of companies from other sectors of the economy that cooperate with construction companies.

Evaluation of the risk of bankruptcy (% of the total number of employees) in 2015

Source: author's own calculation

Table 2

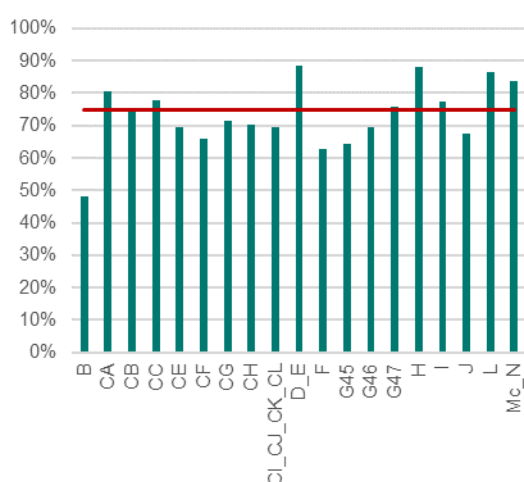
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	TOTAL
Total	9,78	7,00	31,84	26,62	20,47	3,19	0,40	0,36	0,08	0,26	100
B	1,82	1,50	28,66	16,33	48,44	1,37	0,07	0,07	0,00	1,73	100
CA	12,98	7,42	28,60	31,66	16,80	2,16	0,06	0,20	0,00	0,12	100
CB	11,13	12,98	28,97	21,44	17,00	6,38	0,79	0,49	0,45	0,37	100
CC	11,36	5,76	34,71	26,10	16,31	4,65	0,28	0,59	0,09	0,16	100
CE	16,48	4,67	29,49	19,01	28,65	1,12	0,42	0,13	0,00	0,03	100
CF	20,90	10,42	17,28	17,53	32,24	0,35	0,48	0,79	0,00	0,00	100
CG	10,99	4,70	32,58	23,08	23,83	3,94	0,35	0,36	0,10	0,07	100
CH	8,79	7,11	27,62	26,84	23,95	4,28	0,36	0,48	0,20	0,37	100
CI,CJ,CK,CL	9,94	4,94	28,78	26,05	26,79	2,41	0,37	0,31	0,02	0,40	100
DE	7,74	5,72	49,34	25,83	9,61	1,35	0,19	0,18	0,00	0,04	100
F	12,06	5,68	20,84	24,06	27,56	7,41	0,93	0,85	0,30	0,30	100
G45	2,43	2,56	23,77	35,46	24,51	8,16	1,45	0,93	0,39	0,33	100
G46	5,97	5,57	28,80	29,25	23,65	4,75	0,73	0,74	0,19	0,35	100
G47	8,37	4,72	26,02	36,77	21,43	1,78	0,38	0,23	0,05	0,25	100
H	6,92	4,92	44,91	31,31	9,37	2,04	0,34	0,16	0,01	0,02	100
I	14,19	6,02	28,63	28,76	19,28	2,49	0,43	0,15	0,00	0,06	100
J	14,95	10,67	27,33	14,63	29,64	2,02	0,24	0,14	0,02	0,36	100
L	8,80	16,91	36,05	24,83	10,97	1,42	0,07	0,75	0,00	0,19	100
Mc,N	11,58	12,18	38,78	21,12	12,53	3,06	0,23	0,18	0,04	0,28	100

Evaluation of the risk

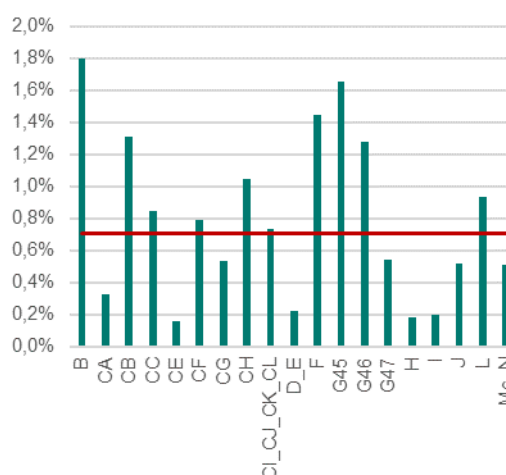
Source: author's own calculation

Graph 15

in the first two classes in which the PD does not exceed 0.01% (% of the total number of employees) in 2015



in the last three classes in which the PD is equal to or higher than 1% (% of the total number of employees) in 2015



Do financial constraints affect decisions making by prospective exporters?

In addition, the hypothesis was verified that the financial constraints of enterprises affect decisions making by prospective exporters (Chaney, 2013) and sales in foreign markets (Manova, 2013). Manova (2013) claims that enterprises need to borrow to cover part of the variable costs related to production for export. This results in a decrease in export intensity in relation to a situation where the company would only aim to maximize profits. However according to Chaney (2013), that companies cover production costs with the use of profits obtained as a result of sales on the domestic market, which suggests that the company's productivity is more important in the case of export intensity.

The results of studies conducted so far are not conclusive. Bellone et. al. (2010), when analysing new French exporters, did not obtain the impact of investment financing on export intensity, while they received a strong dependency indicating the impact of financial constraints on entering foreign markets. Similar results for Chinese companies were obtained by Egger and Kesina (2014). However, Minetti and Zhu (2010) research on Italian companies supports the Manova hypothesis. The authors prove the negative impact of credit restrictions on both the export decision and the size of export sales. The same conclusions are drawn by Kiendrebeogo and Minea (2013), which study concerns Egyptian companies. Therefore, both for developed and developing countries, the results of research are not conclusive, which makes the study on Polish data becomes a very interesting research topic.

The empirical analysis of export decision and export intensity was conducted based on unit panel data, unbalanced, originating from balance sheets and profit and loss accounts of Polish enterprises, presented in the Statistical Office reports. As far as financial leases are concerned, data annual statements of the period 2005–2015 (about 50,000 enterprises each year).

Parameters were estimated using the robust system GMM (Generalised Methods of Moments) estimator (see: Arellano & Bover, 1995; Blundell & Bond, 1998). In addition, a resistant variance-covariance matrix was used. The estimation method was selected correspondingly to the definition of response variables and the problem of endogeneity identified and confirmed in tests. The correctness of the instrument mix was verified by means of the Sargan test, conducted to check if the condition of orthogonality between the instruments and the random component was satisfied. This condition was verified using a test for autocorrelation in differences of remainders from the model. The model design assumption require that there can be no correlation of the remainder component of degree 2 and higher degrees.

Using a large panel data of Polish firms, there was evidence that financial constrains matter for export participation and sales in foreign markets. This result corroborates the idea that the relevance of financial constraints was due to the presence of sunk entry costs. Enterprises need to borrow to cover part of the variable costs related to production for export.

Do financial constraints affect decisions making by prospective exporters?

Source: author's own calculation

Table 4

Variables	Export decision $\begin{cases} 1 & \text{if Export sales} > 0 \\ 0 & \text{otherwise} \end{cases}$		Export intensity $\frac{\text{Export sales}}{\text{Sales}}$	
Export decision ($t - 1$)	0,699	(0,048)***		
Export intensity ($t - 1$)			0,639	(0,044) ***
PD (Indicator built on the basis PD model)	-0,177	(0,056)***	-0,184	(0,073) **
Size = $\ln(\text{Number of Employees})$	0,048	(0,006)***	0,040	(0,008)***
Productivity = $\ln((\text{Value Added})/\text{Employee})$	0,039	(0,006)***	0,028	(0,008)***
Wage per employee = $\ln(\frac{\text{Wage}}{\text{Employee}})$	-0,019	(0,014)	-0,023	(0,008)***
Test	Test statistic [p-value]			
Time Dummies	156,01	[0,0000]	99,01	[0,0000]
Sargan Test	67,21	[0,6054]	93,63	[0,2214]
Arellano-Bond Test $m1(p)$	-4,58	[0,0000]	-4,08	[0,0000]
Arellano-Bond Test $m2(p)$	0,79	[0,4245]	0,23	[0,8138]

* Significant at 10%, ** Significant at 5%, *** Significant at 1%. Mean error values are enclosed in round brackets, p values – in square brackets.

Conclusion

The article presents a methodological framework for the analysis of sectoral risk and an evaluation of the financial condition in sectoral level and assess the contribution of different sectors to the overall level of risk.

In 2015, the net operating margin achieved by large enterprises decreased to the lowest level since 2005. Its continuous increase has been observed in the SME sector since 2013. The highest margin, in the case of both large enterprises and small and medium-sized enterprises, was observed in the last year of the analysis in the manufacturing industry (especially in the case of large enterprises in the wood, paper products and printing sector a, and in the case of small and medium-sized enterprises in the pharmaceutical sector). In the remaining sections, the energy, water and waste services sector was the most prominent. On the other hand, among service companies, the highest margins among large enterprises were achieved by entities providing services in the real estate market and among SME - by entities providing accommodation and communication services.

In 2015, mining was not profitable, in the case of both large enterprises and small and medium-sized enterprises. Negative financial profits were also achieved by large energy, water and waste enterprises. High values of economic and financial returns were achieved in the manufacturing industry (especially the textiles, clothing and footwear sector and the metallurgical sector - in the case of SMEs, and the textiles, clothing and footwear sector - in the case of large enterprises) and in the construction industry.

In 2015, companies in the SME sector were characterised by higher financial independence. In the last years of the analysis, the decrease of financial independence among large enterprises was accompanied by an increase in the net financial debt indicator. In the case of both large enterprises and small and medium-sized enterprises, the highest levels of financial independence were present among enterprises in the manufacturing industry (especially the pharmaceutical sector). As for other sections, in the case of large enterprises, high values of financial independence were also observed in energy, water and waste services, and in the case of SMEs - in the energy, water and waste sector.

In the case of service enterprises, companies providing services to the real estate market were characterised by the highest level of financial independence. On the other hand, higher values of the self-financing indicator were observed among large enterprises. This was due to, most of all, the situation of industrial enterprises (in the textiles, clothing and footwear sector and the pharmaceutical sector) and energy, water and waste sector.

The highest costs of debt servicing were faced by large enterprises. In 2015, the highest average interest was observed in the case of service companies (especially in the information and communication section) and mining and quarrying companies. A large majority of the companies was able to cover the interest with the profits they earned (with the exception of large mining and quarrying companies). Higher values of the interest coverage ratio were achieved by enterprises in the SME sector.

In 2015, credits and loans and deferred revenue had the largest share in long-term financing sources. In the case of large enterprises, credit was used mostly by service companies, especially companies conducting activity related to accommodation and food service activities services. In the SME sector, credits were the largest part of liabilities in the mining sector. In the case of large enterprises, the largest share of deferred revenue in liabilities was observed in the service sector (especially among companies providing services to the real estate market and companies in the transportation and storage sector); in the case of small and medium-sized enterprises, it was energy, water and waste services.

The most important element of short-term liabilities were liabilities on account deliveries and services and liabilities on account of credits and loans. Commercial credits constituted the highest share of liabilities in the construction industry and in the manufacturing industry, especially the textiles, clothing and footwear sector. Short-term loans constituted the highest share of liabilities, both in the large enterprise sector and in the small and medium-sized enterprise sector, in the manufacturing industry, while they constituted the lowest share of liabilities in the energy, water and waste sector.

In 2015, the value of the days sales outstanding ratio decreased only slightly. The average period in which enterprises had their funds blocked in receivables was equal to 39 days. The highest values of the ratio were observed in the case of enterprises providing business services, companies active in the information and communication

sector, and construction companies. The smallest problems with debt collection were observed in the case of entities that conducted activities in the accommodation and food service activities sector. The average time after which non-financial enterprises paid their liabilities was 52 days. The highest value of the days payable outstanding ratio was achieved by companies providing services to the real estate market and by mining companies. On the other hand, energy, water and waste sector companies paid their liabilities the quickest.

Based on the results of the evaluation of the risk associated with the financial condition of enterprises, it was found that small and medium-sized enterprises faced a higher risk (the evaluation consisted of two parts: evaluation of the financial strength and prediction of bankruptcy). In 2015, the highest percentage of small and medium-sized enterprises with negative value of net goodwill was observed in the service sector (the accommodation and food service activities sector, the information and communication sector, and the business service sector); in the case of large enterprises, it was observed in the information and communication sector and in the mining sector. In 2015, the lowest risk of bankruptcy was observed in the *pharmaceutical industry* (where the probability of bankruptcy did not exceed 0.1%) and the highest risk of bankruptcy - in the *mining sector* (where the PD was equal to or higher than 1%).

Based on the literature review two stylised facts emerge: exporters perform substantially better than their non-exporting competitors; there are wide cross-country differences in enterprise export behaviour. Exporters were characterised by better financial equipment. Using a large panel data of Polish firms, there was evidence that financial constraints matter for export participation and sales in foreign markets. This result corroborates the idea that the relevance of financial constraints was due to the presence of sunk entry costs. Enterprises need to borrow to cover part of the variable costs related to production for export.

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Annex

Sectoral groupings

1. Manufacturing industry:

NACE	Sectoral groupings
CA	Agri-food industries
CB	Textiles, clothing and footwear
CC	Wood, paper products and printing
CE	Chemicals industry
CF	Pharmaceuticals industry
CG	Manufacture of rubber and plastics products
CH	Metallurgy and metalworking
CI,CJ,CK,CL	Metal manufactures

2. Services:

NACE	Sectoral groupings
G	Wholesale and retail trade, repair of motor vehicles and motorcycles
H	Transportation and storage
I	Accommodation and food service activities
J	Information and communication
L	Real estate activities
Mc,N	Business service sector: professional, scientific, technical, administration and support service activities

3. Others:

NACE	Sectoral groupings
B	Mining and quarrying
D, E	Energy, water and waste
F	Construction

IFC - Central Bank of Armenia Workshop on *"External Sector Statistics"*

Dilijan, Armenia, 11-12 June 2018

Sectoral risk assessment: Evidence from Poland¹

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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.

NBP

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dr Natalia Nehrebecka

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Contents of the presentation

I Introduction

- Aim and Motivation

II Data description & Methodology

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IV Conclusion

Aim and Motivation

- Macroeconomic conditions in which companies operate are an important aspect in the analysis of the factors affecting the *financial condition* of enterprises, *the risk of bankruptcy*, and *transition of enterprises from the high-risk group to the group of enterprises whose financial condition is good, and vice versa*.
- The *IRB* credit risk evaluation concept is based on the assumption that the risk to the credit portfolio may result from two sources:
 - *systemic risk*, which is caused by unexpected macroeconomic and market changes. The risk is faced by all borrowers; however, the level of susceptibility of individual borrowers to this risk may be different;
 - *idiosyncratic risk*, which is the outcome of various unique threats faced by individual borrowers.
- In case of non-financial firms *their default display positive correlations within and across industries*. Their dependence structure might be driven by *sectoral (systematic) risk factors*. (Das et al. 2007; Saldías 2013).

Aim and Motivation

- This study presents a methodological framework for the analysis of sectoral risk and an evaluation of the financial condition on sectors level.
 - This study also presents the **Probability of Default (PD) Model** for non-financial corporations in Poland.
- In addition, the hypothesis was verified that the **financial constraints of enterprises** affect decisions making by prospective exporters (Chaney, 2013) and sales in foreign markets (Manova, 2013).
 - Manova (2013) claims that enterprises need to borrow to cover part of the variable costs related to production for export. This results in a decrease in export intensity in relation to a situation where the company would only aim to maximize profits.
 - However according to Chaney (2013), that companies cover production costs with the use of profits obtained as a result of sales on the domestic market, which suggests that the company's productivity is more important in the case of export intensity.

Data sources

- The empirical analysis is based on individual data on:
 - **Balance sheet and profit and loss account (F-02 statement)** – (*source: Statistical Office*)
 - **Prudential Reporting (NB300)** – (*source: Narodowy Bank Polski*)
 - **Balance of payments** – (*source: Narodowy Bank Polski*)
 - **Financial and behavioral data** – (*source: BISNODE POLAND*)

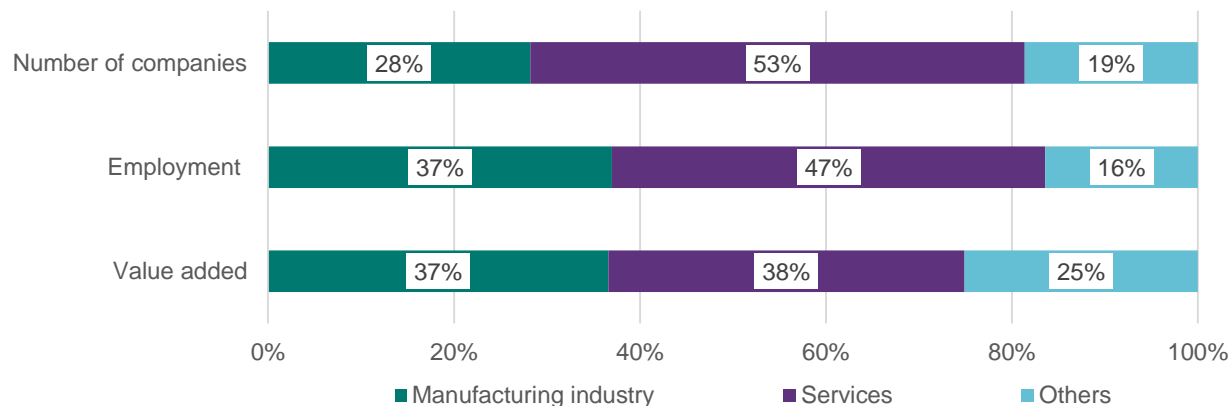


Figure 1. Share of firms by sector activity

Data sources

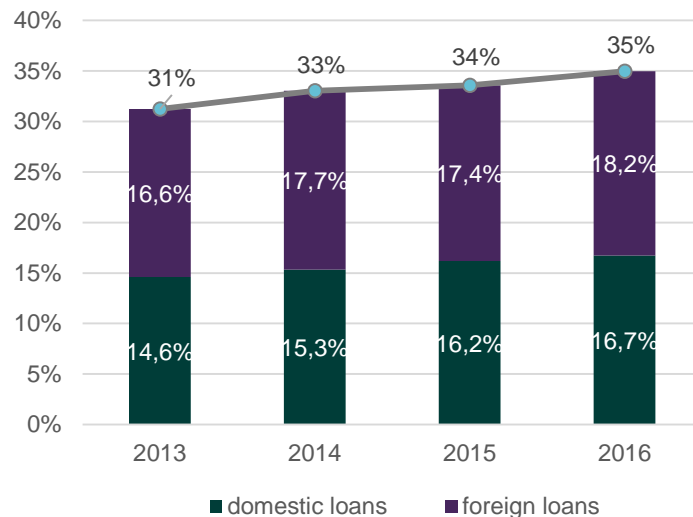


Figure 2. Domestic and foreign debt non-financial enterprises (% of GDP)

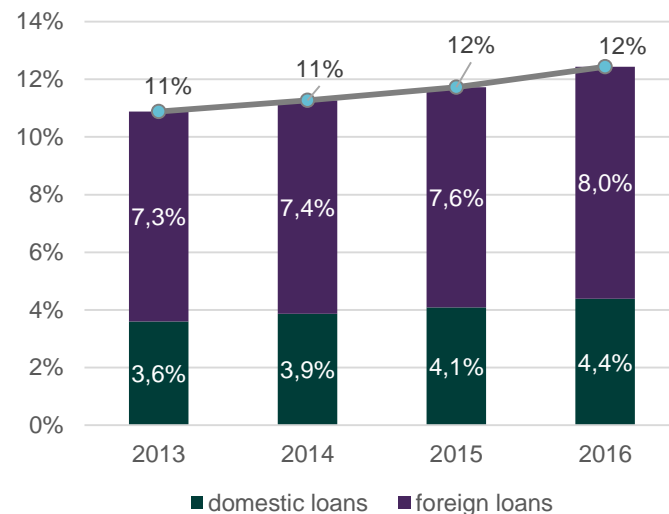


Figure 3. Non-financial corporations having both domestic and foreign debt

(domestic and foreign debt non-financial enterprises as % of GDP)

Source: Balance of payments, Prudential Reporting (NB300)

Data sources

Table 1. Insolvency rate and Default rate

Year	Number of obligors	Thereof Insolvent	Thereof defaulted with at least one bank	Insolvency rate	Default rate
2007	8 164	54	307	0,66	3,76
2008	9 938	18	507	0,18	5,10
2009	11 494	68	918	0,59	7,99
2010	10 824	37	635	0,34	5,87
2011	11 286	46	619	0,41	5,48
2012	12 302	111	731	0,90	5,94
2013	12 450	80	681	0,64	5,47
2014	12 376	64	624	0,52	5,04
2015	13 091	47	501	0,36	3,83
2016	14 191	31	504	0,22	3,55

Source: Prudential Reporting (NB300), BISNODE

Risk assessment

- The evaluation consists of two parts.
 - **The first part** presents the financial strength depending on the **net value of enterprises**.
 - The financial strength defines the financial capacity of enterprise.
 - **The second part** presents *PD* model.
 - *PD* model consists of the next part:
 - **Quantitative** – financial factors
 - **Qualitative** – behavioral factors
 - Localization of the entity, industry, size of employment, legal form, year of establishing, description of the owner, payment morality
 - **Sector riskiness**
 - Industry variables
 - **Combined**

$$y = F^{\alpha} B^{\beta} S^{\gamma}$$

Main steps in developing a rating system



Sample design

- Models were estimated on databases which included *all companies that went default as well as randomly chosen healthy companies*.
- Companies that declared defaults made up for **20%** of the created samples.
 - This approach is common for scoring methods where 'bad' entity constitute only a small share of the whole population and it has the purpose of improving the statistical characteristics of the applied tools.
- Then the dataset was randomly split into **development** and **validation sample** containing 70% and 30% of the data, respectively.
- Prior to the estimation of the model, it was tested in order to ascertain whether the constructed sample was representative, following the results of:
 - the non-parametric *Wilcoxon-Mann-Whitney* test, *Kolmogorow-Smirnow* test and the parametric *t-Student* test for equality of averages for the continuous variables
 - and the χ^2 *Pearson* test, the *Population Stability Index (PSI)* for the discrete variables.

Methodology

- In order to construct a default prediction for a company **a logistic regression was used**. Models were estimated on categorized variables transformed using the weight of evidence (*WoE*) approach.
- The categorisation was based on the division with the highest Information Value (*IV*), which measures the statistical Kullback-Leibler distance (*H*) between the *defaults* and *non-defaults*.
- Due to **a high number of financial indicators describing a** company's condition (explanatory variables) in the initial analysis, the predicting power of each was determined firstly (*Gini coefficient*, *Information Value Indicator*) followed by clustering in order to limit the size of the analysis.
 - Thanks to this variable selection procedure it was possible to avoid the collinearity problem, which was assured by calculating the appropriate *Variance Inflation Factor* statistics.

Financial strength

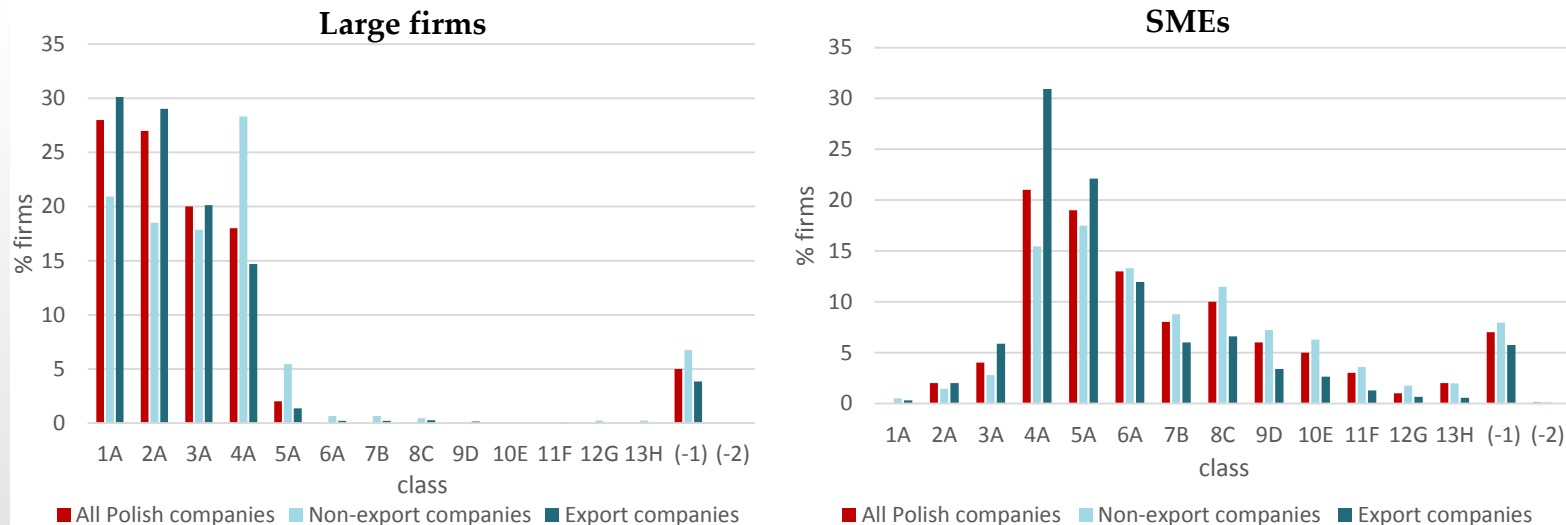


Figure 4. Financial strength in 2015 - non-export/export companies (% firms)

PD model

Table 2. Bankruptcy rate (% of the total number of enterprises) during one year (2015)

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Total
Total	0	0	0,01	0,015	0,02	0,18	0,76	1	1.5	6,19	0,36

Table 3. Evaluation of the risk of bankruptcy (% of the total number of enterprises) in 2015

Sectors	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Total
Total	7,26	14,29	28,87	25,32	14,22	7,57	0,89	0,88	0,26	0,44	100
B - Mining and quarrying	6,91	10,55	24,73	24,73	17,82	11,27	0,73	1,82	0	1,45	100
CA - Agri-food industries	12,52	16,94	26,39	25,78	12,87	4,64	0,13	0,39	0	0,35	100
CB - Textiles, clothing and footwear	6,23	16,77	28,21	20,33	14,1	10,93	1,27	1,02	0,64	0,51	100
CC - Wood, paper products and printing	7,44	9,15	28,5	26,71	16,37	8,93	0,67	1,41	0,37	0,45	100
CE - Chemicals industry	8,99	9,89	30,79	24,04	18,2	5,84	1,12	0,9	0	0,22	100
CF - Pharmaceuticals industry	14,89	18,09	18,09	25,53	17,02	4,26	1,06	1,06	0	0	100
CG - Manufacture of rubber and plastics	8,62	10,41	27,49	23,69	17,85	9,69	0,92	0,82	0,21	0,31	100
CH - Metallurgy and metalworking	7,37	11,85	28,15	24,13	15,96	9,7	0,89	0,76	0,38	0,8	100
CI,CJ,CK,CL - Metal manufactures	8,38	11,39	29,06	22,68	17,72	7,38	1	1,38	0,19	0,81	100
DE - Energy, water and waste	9,45	16,38	29,68	27,52	12,07	3,73	0,23	0,76	0	0,17	100
F - Construction	5,16	10,77	23,04	25,3	19,45	12,34	1,38	1,45	0,51	0,6	100
G45 - Motor vehicles trade	2,98	5,73	23,23	31,32	18,92	12,87	2,2	1,41	0,78	0,55	100
G46 - Wholesale trade	6,12	9,66	29,9	26,37	16,44	8,23	1,15	1,26	0,4	0,47	100
G47 - Retail trade	6,71	15,71	36,61	24,08	9,71	5,28	0,96	0,46	0,17	0,3	100
H - Transportation and storage	9,02	11,24	32	29,82	10,34	6,42	0,66	0,43	0,04	0,04	100
I - Accommodation and food service activities	4,6	14,96	26,34	35,29	10,23	7,29	0,38	0,64	0	0,26	100
J - Information and communication	8,44	22,55	27,13	20	12,15	7,42	0,87	0,58	0,15	0,73	100
L - Real estate activities	4,16	21,8	29,16	28,68	12,42	2,77	0,11	0,59	0	0,32	100
Mc,N - Professional, scientific, technical, administration and support service activities	8,06	21,36	28,89	22,83	10,46	6,49	0,67	0,58	0,2	0,46	100

PD model

Figure 5. Evaluation of the risk in the first two classes in which the PD does not exceed 0.01% (% of the total number of enterprises) in 2015

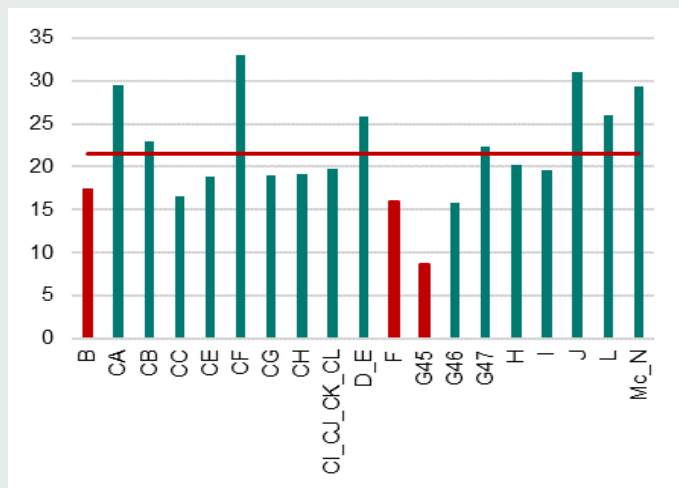
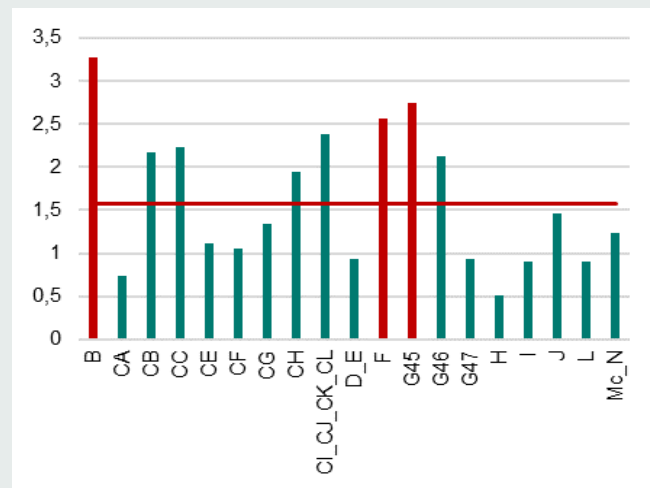


Figure 6. Evaluation of the risk in the last three classes in which the PD is equal to or higher than 1% (% of the total number of enterprises) in 2015



Do financial constraints affect decisions making by prospective exporters?

<i>Variables</i>	<i>Export decision =</i>		<i>Export intensity =</i>	
	$\begin{cases} 1 \text{ if Export sales} > 0 \\ 0 \text{ otherwise} \end{cases}$		$\frac{\text{Export sales}}{\text{Sales}}$	
Export decision ($t - 1$)	0,699	(0,048)***		
Export intensity ($t - 1$)			0,639	(0,044) ***
PD (Indicator built on the basis PD model)	-0,177	(0,056)***	-0,184	(0,073) **
Size = $\ln(\text{Number of Employees})$	0,048	(0,006)***	0,040	(0,008)***
Productivity = $\ln((\text{Value Added})/\text{Employee})$	0,039	(0,006)***	0,028	(0,008)***
Wage per employee = $\ln(\frac{\text{Wage}}{\text{Employee}})$	-0,019	(0,014)	-0,023	(0,008)***
Time Dummies	156,01	[0,0000]		
Test Sargan	67,21	[0,6054]	93,63	[0,2214]
Test Arellano-Bond $m1(p)$	-4,58	[0,0000]	-4,08	[0,0000]
Test Arellano-Bond $m2(p)$	0,79	[0,4245]	0,23	[0,8138]

estimated by *System GMM*

Conclusions

- Based on the results of the evaluation of the risk associated with the financial condition of enterprises, it was found that ***small and medium – sized enterprises*** faced a higher risk (*the evaluation consisted of two parts: evaluation of the financial strength and prediction of bankruptcy*).
- In 2015, the highest percentage of ***small and medium – sized*** enterprises with negative net value of enterprises was observed in the service sector (*the accommodation and food service activities sector, the information and communication sector, and the business service sector*); in the case of ***large enterprises***, it was observed in the information and communication sector and in the mining sector.
- In 2015, the lowest risk of bankruptcy was observed in the *pharmaceutical industry* (especially in the case of large enterprises) and the highest risk of bankruptcy - in the *mining sector*.

Conclusions

- Based on the literature review two stylised facts emerge:
 - exporters perform substantially better than their non-exporting competitors;
 - there are wide cross-country differences in enterprise export behaviour.
- Exporters were characterised by better financial equipment.
- Using a large panel data of Polish firms, there was evidence that financial constraints matter for export participation and sales in foreign markets.
 - This result corroborates the idea that the relevance of financial constraints was due to the presence of sunk entry costs.
 - Enterprises need to borrow to cover part of the variable costs related to production for export.

DZIĘKUJĘ BARDZO!



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Experience in Chilean FDI measurement: better data for better interpretation¹

María Isabel Méndez Ferrada,

Central Bank of Chile

¹ This paper 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.

EXPERIENCE IN CHILEAN FDI MEASUREMENT: BETTER DATA FOR BETTER INTERPRETATION

María Isabel Méndez Ferrada

Central Bank of Chile

ABSTRACT

Foreign Direct Investment (FDI) is very relevant in both the Chilean Balance of Payments (BOP) and International Investment Position (IIP). However, relationship complexity that defines ownership structures of multinational companies, together with transaction multiplicity that takes place under these structures, hinder the level of coverage and accuracy in measurement using available sources of information. This article's objective is to share Chilean experience regarding methods employed to ensure information quality provided by the sources. Along with this, we submit the Chilean FDI collection frameworks, the Central Bank's role and information sources, in terms of its main characteristics, use and statistical data treatment which guarantees a good measurement.

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1. INTRODUCTION

A. MOTIVATION

Foreign Direct Investment is a variable of great interest to economic analysts and the general public. In Chile, investment by non-resident foreigners has a strong impact on productive sectors: Mining, Financial services, Electricity, Gas and Water, Transportation and Industries. On the other hand, Chilean investments abroad, though to a lesser extent, have been introduced into other economies, particularly Latin American ones, in areas such as Mining, Business, Services and Trade.

Cross-border transactions generated by these investments are most relevant in the Chilean Balance of Payments financial account (BOP) and have a similar impact in the International Investment Position (IIP) and in the current account investment's primary income. However, measuring these investments in both flows and stocks is not simple. The complexity of relationships defining multinational corporate structures, coupled with the multiplicity of transactions that materialize under these structures, hinder their degree of coverage and accuracy that can be captured through sources available for this purpose.

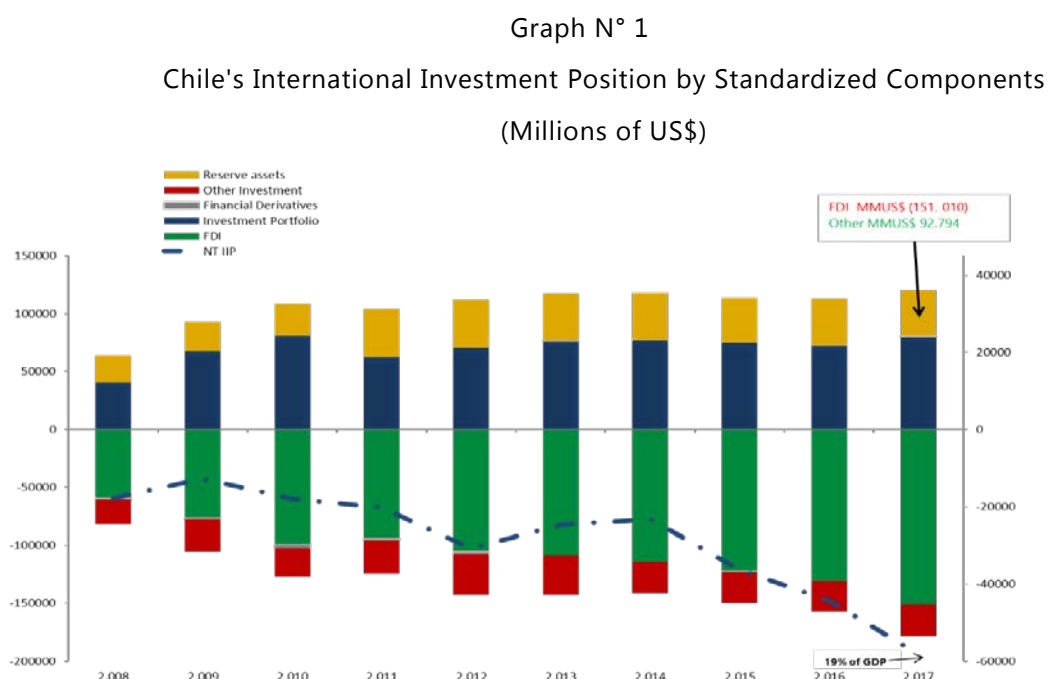
The Central Bank of Chile, responsible for the calculation and dissemination of FDI statistics, has developed a compilation strategy to ensure this measurement's quality and accuracy. In methodological terms it means the application of statistical techniques for analysis, validation and imputation of data in order to provide basic information with robustness. The exercise is based on a structured set of related data that provides background information on companies and their corporate structure, which are used as benchmarks in the decision-making process of compilation and gathering. In addition, it has a monitoring and contact policy with the most important companies in order to achieve highest data accuracy from the source. The following article aims to share Chilean experience in these matters.

B. CHILEAN FDI IN NUMBERS

In Chile, foreign direct investment is a relevant indicator for the national economy. Large investments that have entered the country to finance production and services projects (financial services mainly), have supported the development of these sectors. On the other hand, to a lesser extent, direct investment abroad has also reached interesting levels in recent years, although it does not reach investment magnitude that comes to the country from abroad.

a. FDI determines the International Investment Position (IIP)'s net debit balance in Chile^{1,2}

International Investment Position (IIP) in Chile reflects a net debit balance which is explained by the FDI, as shown by the series presented in graph number 1. In 2017 this balance reached US\$ 58,216 million, representing GDP 19.9%. Of this total, the FDI's negative net balance was US\$ 151,010 million, which was not compensated by the positive net balance of other functional categories as a whole (US\$ 92,794 million).



Source: Central Bank of Chile

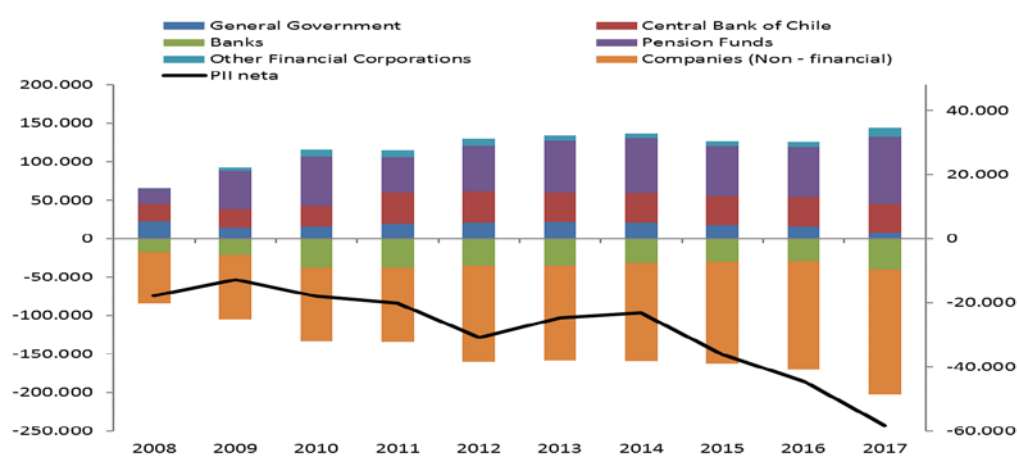
Institutional sector which explains the IIP's net debit balance are non-financial companies who are, indeed, the largest recipients of foreign investment in the country. In 2017, the IIP's net debit balance in this sector was US\$ 162,483 million (graph 2), of which US\$ 122,949 million corresponds to direct financing from abroad. Regarding the type of financing that Chilean subsidiaries receive from their foreign investors, the majority corresponds to capital contributions, although since 2013 there has been financing by debt, as can be seen in graph 3.

¹ Balance of payments (BOP) and international investment position (IIP) statistics are compiled according to criteria and recommendations of the Balance of Payments and International Investment Position Manual, 6th version (BPM6) of the International Monetary Fund (IMF).

² The aggregated FDI statistics are disseminated with the monthly publication of Balance of Payments Financial Account and quarterly along with the Balance of Payments and International Investment Position. These figures are reviewed in accordance with the Central Bank's policy. The publications calendar and revision policy are available in: <http://www.bcentral.cl/web/guest/calendario-estadistico>

Graph N° 2

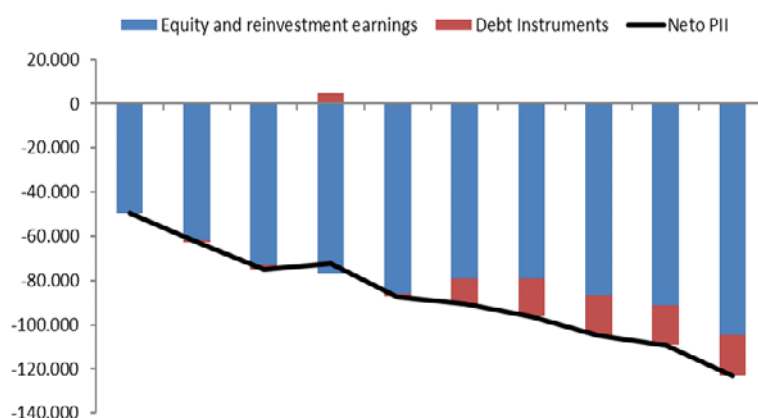
Chile's International Investment Position by Institutional Sector
(Millions of US\$)



Source: Central Bank of Chile

Graph N° 3

Chile's International Investment Position of Companies Sector by Instrument
(Millions of US\$)



Source: Central Bank of Chile

b. Detailed FDI statistics³

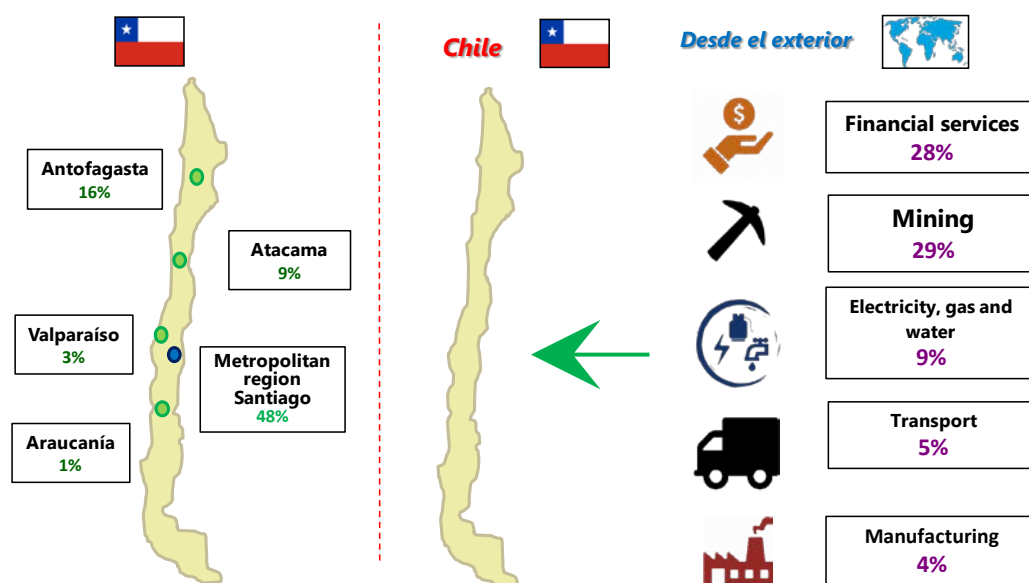
In addition to aggregated FDI statistics regularly disseminated by the Bank, detailed information is published annually which allows us to better characterize and understand this phenomenon in the country.

In Chile investment projects are carried out throughout the territory, however, according to 2016 results, country regions where foreign direct investment is mainly reflected are: Metropolitan (capital), the regions of Antofagasta and Atacama (North) and, to a lesser extent, in Valparaíso and La Araucanía. By economic sector, the main activities financed by foreign capital in our country are Financial services and Mining. Other sectors such as Electricity, Gas and Water (EGW), Transport and Industry also benefit from this financing (See figure 1).

Although there are no crossed statistics (published) for these two variables (economic sector and region), it is possible to relate the fact that the North's main investments are precisely mining, given region conditions, while the financial sector stands out in the capital.

Figure N° 1

Chile's 2016 FDI by Region and Economic Sector
(Percentage of total FDI Stock in Chile)

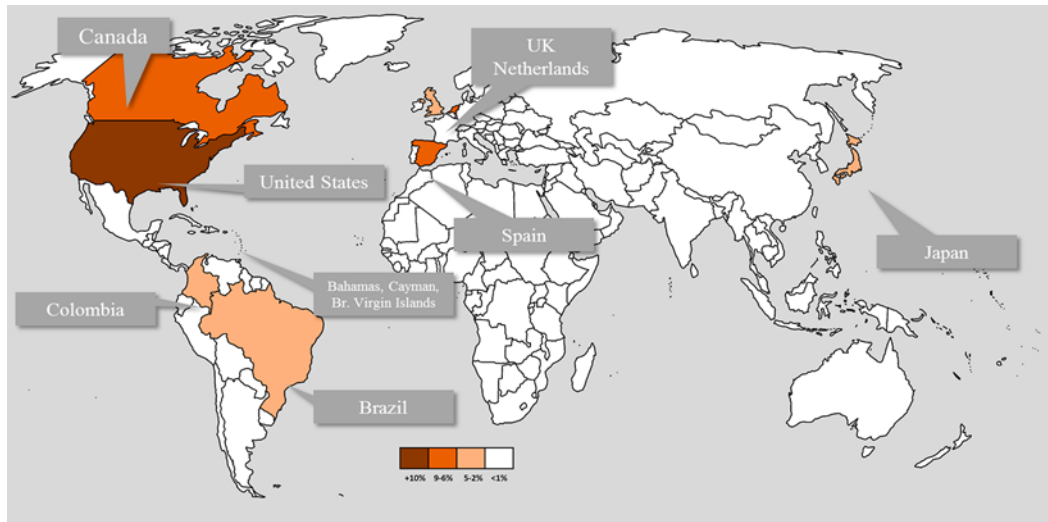


Source: Central Bank of Chile

In terms of investment origin, the main countries from which these investments come from are, as shown in figure 2: Canada, United States, Spain and some regional partners such as Brazil and Colombia.

³ FDI statistics by partner country and by industry are compiled under recommendations of the OECD Benchmark Definition of Foreign Direct Investment, fourth version (BMD4) and published annually on the Bank's website, in the following link: http://si3.bcentral.cl/estadisticas/Principal1/Excel/SE/BDP/xls/IED_pais_sector_region.xlsx

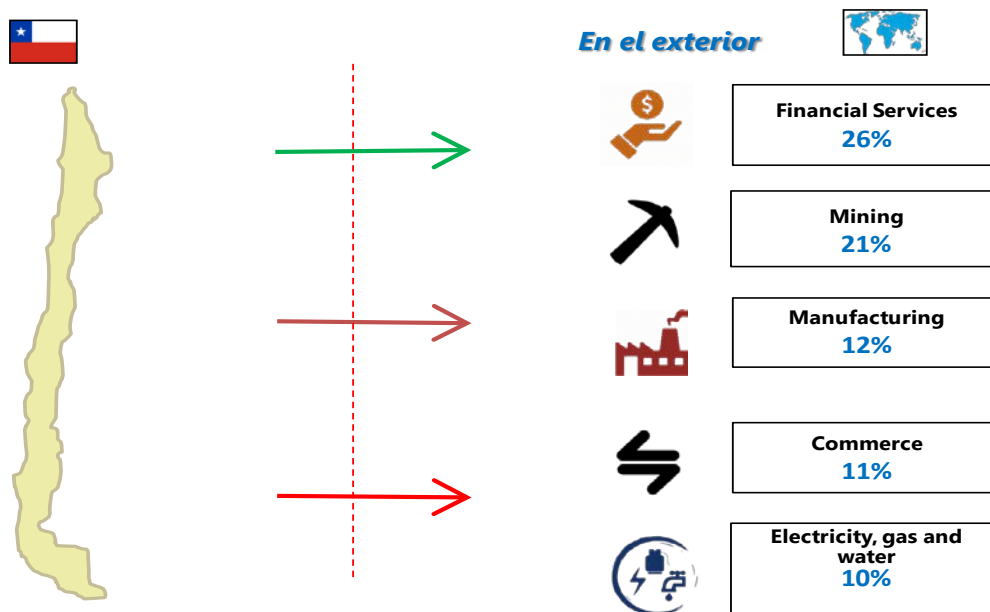
Figure N° 2
Chile's 2016 FDI by Country of Origin
(Percentage of total FDI Stock in Chile)



Source: Central Bank of Chile

Regarding investments maintained by Chile abroad, these are mainly concentrated in the Financial and Mining Sectors. They are followed by Industry, Commerce and EGW in relevance. Figure 3 shows the relative importance of each sector according to 2016 results

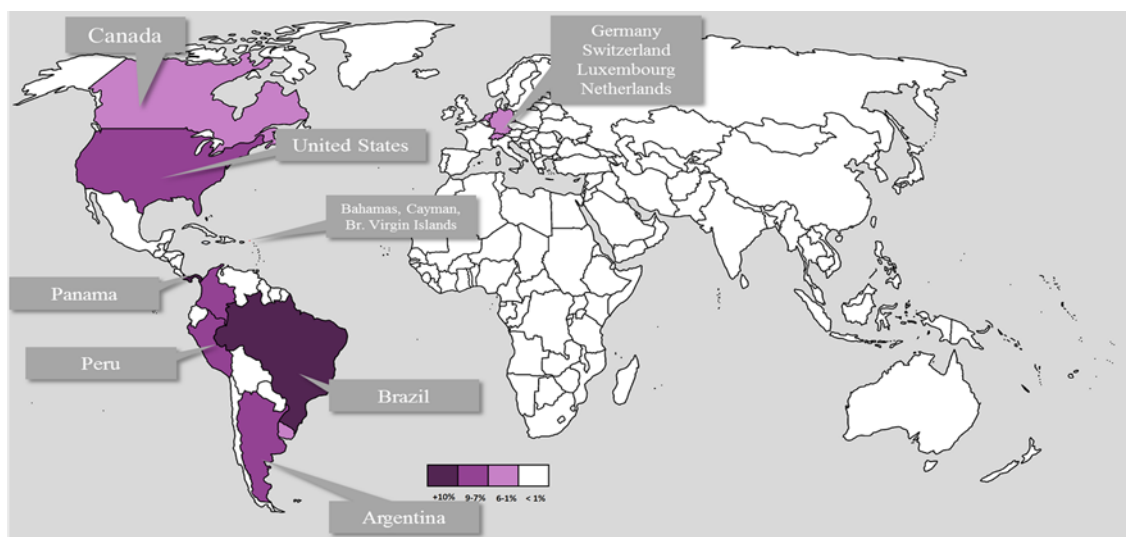
Figure N° 3
2016 FDI abroad by Economic Sector
(Percentage of Total FDI Stock in Chile)



Source: Central Bank of Chile

By geographical destination, the investment of our economy's residents is preferably done in Latin America, as can be seen in figure 4.

Figure N° 4
Chile's 2016 FDI by Country of Destination
(Percentage of total FDI Stock in Chile)



Source: Central Bank of Chile

In the remainder of this document we will see framework for FDI data collection in the Chilean economy and the Central Bank's role (section 2) and then, in section 3, review sources of information used in the compilation of these statistics. Section 4 describes strategies the Bank has adopted to ensure FDI measurement quality, particularly foreigner investment made in the country, and project improvement regarding the subject. The document ends with a summary of the main points addressed in section 5's closing comments.

2. FRAMEWORK FOR COLLECTION OF INVESTMENT DATA IN CHILE

A. CENTRAL BANK'S ROLE IN THE ELABORATION AND DISSEMINATION OF MAIN MACROECONOMIC STATISTICS

The Central Bank of Chile (CBCH) is an autonomous body governed by its 1989 Organic Constitutional Law (LOC) N° 18,840, which establishes its nature, objectives, faculties and responsibilities, as well as its power and available resources to meet these objectives and functions.

The LOC (Article 53) and National Statistical Compilation Plan⁴ establish that the Central Bank is responsible for compiling and publishing the country's main macroeconomic statistics in a timely manner, including National Accounts, Balance of Payments, Monetary Statistics or other global systems of economic or social accounting. This LOC also establishes public entity obligation to report to the Central Bank. However, there are no legal precepts that force private institutions to report to it for statistical purposes, except in matters pertaining exchange regulation.

In Chile there is freedom of exchange, thus every natural or legal person can freely carry out international exchange operations. These include the purchase and sale of foreign currency, as well as acts and conventions that create, modify or expire a payable obligation in foreign currency, though they do not necessarily involve transferring funds or money orders from Chile abroad or vice versa. The above notwithstanding, Bank may impose exchange restrictions under certain circumstances, such as an obligation to use the Formal Exchange Market (FEM)⁵ and report in case of specific transactions.

Regulation of international exchange operations is expressed in the Compendium of International Exchange Regulations (CIER), which we will address in point B, below.

B. COMPENDIUM OF INTERNATIONAL EXCHANGE REGULATIONS (CIER)

The CIER corresponds to an integrated information framework associated with international exchange transactions, which includes: (i) the code system for daily reports of these transactions being carried out in the Formal Exchange Market (FEM), (ii) additional questionnaires used for consulting further detail on specific operations, and (iii) instructions and regulations. Corresponds to a simile of what is known as the International Transaction Reporting System (ITRS).

In 2001 capital controls in Chile were liberalized, resulting in the reformulation and adaptation of the old Exchange System Position to serve its new role in support of the Bank's regulatory tasks in exchange matters and as a source of information for statistical purposes. Among the adaptations made to the CIER are balance, flow and income reports from investments abroad, as well as transport and insurance services.

In 2010 some modifications associated to forms that collect foreign direct investment information were incorporated in order to capture background information recommended in the OECD's Benchmark Definition of Foreign Direct Investment (version 4). Information collected based on reformulated questionnaires was applied for the first time in the 2012 compilation, year of MBP6's implementation.

⁴ The National Plan of Statistical Compilation, annually published by the National Statistics Institute of Chile, accounts for responsibilities of public institutions (and select private ones) in the country's compilation of statistics.

⁵ FEM entities that can operate in Chile are listed in Chapter I Annex 5, Index of the Compendium of International Exchange Regulations (CIER). Chapter III of the same compendium, Annex 1, establishes the requirements to be part of Chile's FEM.

The CIER⁶ is structured in chapters and annexes according to the different exchange issues it addresses. It includes a description and instruction manual along with specific questionnaires for operations in which the Bank requests further detail. Chapters XII and XIV manage regulations associated with investments abroad, as well as investments from abroad. This framework provides, in the Chilean's case, information for the compilation of direct foreign investment as explained in the following section.

3. DATA SOURCES FOR MEASUREMENT IN CHILE OF DIRECT FOREIGN INVESTMENT

Basic information for the compilation of Chilean Foreign Direct Investment (FDI) statistics mainly comes from data collected in the exchange regulation framework carried out by the Central Bank through CIER. Although this is a fundamental tool in data collection, in some cases it does not cover the level of detail required by the compilation, so additional collection instruments are necessary to cover the measurement, as is the case of surveys.

In the following section we will review FDI compendium consultation forms, structure and coverage, and the annual FDI survey in Chile.

A. CIER QUESTIONNAIRES ASSOCIATED WITH INVESTMENTS IN CHILE AND ABROAD

a. Investments abroad – CIER Chapter XII

CIER's Chapter XII establishes rules applicable to currency remittance or disposition of funds that people residing in Chile send or use abroad for the purpose of making investments, establishing deposits or granting credits. These operations must be carried out through the Formal Exchange Market (FEM).

Chapter XII includes the following documentation: a section with the general dispositions and 4 forms (questionnaires) through which details of foreign exchange investment transactions of Chilean residents abroad are requested, particularly direct foreign investment.

General dispositions indicates regulations related to procedures, terms, conditions and forms that people must use to provide the Bank with information on the operations referred to in Chapter XII of the compendium.

Foreign exchange transactions associated with foreign investment are collected through certain codes⁷ when transactions are carried out through the FEM. Requested annexes associated with these operations are:

- Annex 1: Investments made and payments received directly abroad.
- Annex 2: Investments of insurance, mutual and investment fund companies abroad.

⁶ The CIER standard and forms are available on the Central Bank's website:

<http://www.bcentral.cl/web/guest/politica-financiera>

⁷ Exchange position codes employed to record these operations in the FEM are detailed in Annex 1 of CIER's Chapter I: http://www.bcentral.cl/documents/20143/32019/bcch_archivo_091606_es.pdf/cd2db162-5cf3-48e7-eef0-db6c834a6ff0

- Annex 3.1: Report of investments abroad.
- Annex 3.2: Supplementary information on assets informed in this manual's Chapter XII, Annex 3.1.

Annexes 3.1 and 3.2 are key in FDI data collection. Through them, information is collected on abroad investments of the companies' sector, both direct foreign investment as well as of other types maintained abroad: investment in shares, loans granted, deposits, etc. While annex 3.1 collects aggregated information and has a higher periodicity, annex 3.2 queries additional information on operations reported through annex. 3.1 on an annual basis. Table 1 summarizes information that is collected from these forms, their periodicity and some characteristics⁸.

Table N° 1
Information Compiled Through Annexes 3.1 and 3.2 of CIER's Chapter XII

Annex	Data collected	Other characteristics
Annex 3.1	1) Equity and debt instruments 2) Stocks at the beginning and end of period 3) Transactions (contributions/withdrawals) 4) Utilities/losses 5) Dividends/Interests	- Reports are submitted to the Bank on a quarterly basis (45 days after quarterly closing and 60 days after in the year end). - Reports are accumulated to each period. - The report is divided into two sections, one for FDI and the other covers remaining instruments. - Queried regarding relationship with the investment's counterpart.
Annex 3.2	Detail by instrument: 1) Annual stocks by country 2) Annual stocks by economic sector	- The report is annual (60 days after the year's end). - Queried regarding relationship between investment reporter and counterpart.

Source: Self made

b. Investments from abroad - CIER's Chapter XIV

CIER's Chapter XIV regulates normative pertaining to international exchange operations related to loans, bonds, deposits, investments and capital contributions that generate obligations for Chilean residents with the abroad⁹. That is to say, it regulates investments that non-resident foreigners make in the country, as well as debt operations that national residents contract with other economies.

⁸ The annexes associated with this chapter are available on the Bank's website:
<http://www.bcentral.cl/web/guest/cnci-manual-de-procedimientos>

⁹ More information on Chilean investment entry mechanisms in the document "Direct Foreign Investment in Chile: Input Mechanisms and Compilation for the Balance of Payments" of Chackiel and Orellana, 2014. Economic and Statistical Studies N.°109 - November 2014.

<https://si3.bcentral.cl/estadisticas/Principal1/Estudios/SE/BDP/see109.pdf>

Chapter XIV includes the following documentation. A section with general dispositions and 6 forms (annexes) through which details of exchange operations related to resident obligations with the abroad are requested.

The main requested annexes associated with these operations are:

- Annex 1: Information on credits, bonds and payment plans.
- Annex 2: Information on payments of external credits made directly abroad.
- Annex 4: Investments, deposits and capital contributions not entered into the country and/or paid abroad.

Unlike what happens with Annexes 3.1 and 3.2 of Chapter XII, the forms associated with Chapter XIV do not provide details for operations pertaining to FDI equity contributions collected through codes of exchange positions¹⁰. Specific information of these questionnaires is associated mainly with foreign debt operations.

To complement Chilean FDI information, the Annual Survey of Foreign Investment in the economy is used, which will be detailed below.

B. ANNUAL FOREIGN DIRECT INVESTMENT SURVEY IN CHILE

The FDI survey complements information needs not covered by data collected under CIER's chapter XIV.

Here are some characteristics of the survey:

- a. The survey is carried out annually and aimed at companies that receive direct investment. They are consulted regarding their external liabilities of the period prior to the consultation year.
- b. In 2017, 462 companies were consulted regarding their results in 2016 with a response rate of 77%. The FDI stock of these companies represented 80% of total FDI stocks in the country, collected in the BOP's aggregate measurement.
- c. Enquiring about investment sector, the country's region where project investment is materialized, transactions and equity and debt positions are carried out with the headquarters and related enterprises.
- d. The latest series of detailed FDI statistics published covers the 2009 to 2016 period. These figures are published with annual lag.
- e. The questionnaire currently used was implemented in the IMF's BPM6 adoption exercise, and recommendations of the OECD BMD4, criteria that Chile incorporated from official 2012 BOP and IIP measurements. The main criterion incorporated in the form was the Framework for Direct Investment Relations¹¹ (FDIR).

¹⁰ The codes of exchange position used to record these operations in the FEM are detailed in Annex 1 of CIER's Chapter I:

http://www.bcentral.cl/documents/20143/32019/bcch_archivo_091606_es.pdf/cd2db162-5cf3-48e7-eef0-db6c834a6ff0

¹¹ This framework indicates criteria to determine if a financial transaction on cross-border property becomes a direct foreign investment relationship. In addition to the parent company's relationship with its subsidiary, it recognizes the subsidiary relationships with parent and related companies, that is, those that have the same direct or indirect investor, but none of which is an immediate or indirect investor of the other.

- f. The first consultation carried out under this framework was in 2010. In 2014, two modifications were incorporated into the questionnaire. The first to collect further detail regarding the investment's economic sector and the second is an additional query that requests information regarding the country regions where investment projects are located.

Table 2 shows survey structure with a brief description of these. See main sections detailed in annex 1.

Table N° 2
Sections of the FDI Survey in Chile (2017 version)

Section	Description	Comment
Section A	Company background and who answers the survey.	This information feeds the directory of companies.
Sections B and C	Unit of measurement and patrimony.	
Sections D and E	Economic activity and region where the investment project is located.	Reporting company is asked to classify at least three levels of activity and sub activity according to ISIC rev. 4. In addition, they are asked to indicate the main country region where investment is made.
Section F	Contributions of capital from the parent company or related.	Reporting company is asked to report its capital and debt identifying the FDI relationship it maintains with its foreign counterpart.
Section G	Debt (bonds, loans, commercial loans and other payable bills) with headquarters or related.	
Section H	Respondent's comments or observations.	Reporter is asked to give more details about their answers in prior sections or to express any information they consider relevant.

Source: Self made

Sections F and G are the heart of the form as they collect data on FDI equity and debt with country breakdowns and identifying relationships. Section F has two subsections, F.1 and F.2, to distinguish between equity contributions with both the parent and related companies. While section G separately enquires through different debt instruments: bonds, loans, credits between suppliers (foreign trade) and other liabilities. For simplicity's sake, both sections integrated in table 3 are presented.

Table N° 3
Sections F and G of Chile's FDI Survey

	Beginning Balance	Contributions/ Disbursements	Withdrawals/ Payments	Other Variations	Final Balance	Profits/Losses or Interest	Percentage regarding final balance		
							Direct/indirect controller	Subsidiaries	Related Company
Country 1									
Country 2									
Country 3									

Source: Self made

Data collected through survey sections provides a very complete, consistent and comprehensive FDI information database at the microdata level. However, all basic information requires statistical processes and analysis to ensure data validity. In the annual FDI survey's case, these processes are aimed at validating: (i) that elementary relationships are met (Final Balance = Beginning Balance + transactions +

other variations, or that the other variations are kept at reasonable levels regarding initial stock, for instance); (ii) that changes in the investment's country of origin are well registered (that both rebates of positions in the country of investment exit and transactions that explain liabilities that come from a new country of origin are recorded accurately); or (iii) ensure report continuity (companies do not respond every year, generating information discontinuity), among other things.

To ensure the integrity and consistency of background data collected through survey, the Bank's external statistics area applies a very thorough analysis and validation process to information, thus ensuring both basic data quality and robustness of the compilation. Process is explained in section 4.

4. STRATEGIES TO ENSURE FDI MEASUREMENT QUALITY IN CHILE

The FDI survey is a base for detailed measurements of direct foreign investment in Chile, as noted in previous sections.

Like any data collection instrument, before being used in the compilation it requires information validation processes and estimates of missing data or corrections.

Below we present the statistical process followed in the detailed calculation for Chile's FDI, whose purpose is to optimize basic information and deliver a quality measurement through 3 areas of work: method, information and continuous improvement.

A. COMPILATION METHOD AND PROCESS FOR EXECUTING THE CALCULATION

Validations and imputations

In terms of methods and processes, the most important tasks have been carried out at the microdata level through validation, imputations and analysis of basic data procedure.

First of all, there is a standardized exercise to diagnose basic data, using predefined criteria to accept, eliminate and replace information from the source, according to survey field and section. Together with this, references were established to be used in comparison, validation and decision making.

Sources or references used in the procedure include:

- Company historical background, which are part of the external statistics records (information from previous surveys, past and current corporate structures).
- Reports, company's financial statements and administrative records such as: Internal Revenue Service (IRS) and the Financial Market Commission (FMC)¹².

Table N°4 presents the main validation and attribution mechanism according to survey field and section.

¹² The Financial Market Commission (FMC) is a body of the public sector whose mission is to ensure the proper functioning, development and stability of the financial market, in addition to ensuring that the people or entities audited, from its induction until the end of its liquidation, comply with laws, regulations, statutes and other provisions that govern them.

Table N° 4
Review, Validations and Imputations Outline Carried Out on Basic Information
Reported in the Survey.

Section	Field	Validation	Reference	Type of check	Imputation/Decision
B, F and G	Currency	The measurement unit used in answers in sections F and G does not correspond to the one declared by company in section B.	Previous surveys.	Comparison of measurement unit used in previous surveys.	Correct according to history and coherence.
D	Economic sector	Companies' self-classification check.	Economic classifiers used in macroeconomic measurements (CAE, see note 17), Internal Revenue Services (IRS).	Company information is compared with standardized classifications and activity category according to IRS.	Classification is updated in case of inaccuracy.
F and G	Stocks	Consistency: "Final Balance = Beginning Balance + Transactions + Other Variations"	Survey data.	If equality is not met, the equation is adjusted.	Differences are imputed to transactions.
	Continuity	Some companies do not answer every year.	Previous surveys, information from Internal Revenue Services (IRS) or Financial Market Commission (FMC)	It's validated, using information from IRS and FMC, if the company is operating in the period analysed. Continuity is reviewed at the country level.	Imputation of stocks at the country level are attributed according available data from surveys.
	Countries	Changes in countries from which the investment originates.	Previous surveys.	Historical country structure and company background are compared (corporate structures, company geographic disposition).	If country change is consistent, stock rebates and increases are adjusted through flows. If it is not coherent, country historical structure of countries is attributed.
F.2 and G	Relationships	Changes in historical relationships.	Previous surveys.	Historical country structure and company backgrounds are compared (corporate structures, company geographic disposition).	If relationship change is consistent, the information is updated. If it is not coherent, historical relationship is attributed.

Source: Self made

Methodology

Methodologically speaking, the latest method optimizations have pertained primary income calculation and reinvestment of earnings for non-mining companies and not belonging to the banking sector¹³, together with debt improvements. In the first case, income and reinvestment of earnings, estimation of these variables for companies without information was refined, structuring the process and establishing reference groups for said estimation. At the same time, in order to maintain consistencies between external sector measurements, FDI debt from the compilation of External Debt was correlated with

¹³ Mining sector and bank income is derived from the aggregate BOP calculation, which is based on accounting information from these sectors. The distribution by countries in both cases is achieved using survey structures.

calculation of FDI debt stocks from the detailed calculation (country - sector) that the survey information is based on. This last exercise was carried out for loans and bonds.

a. Primary income calculation and reinvestment of earnings.

In the Chilean balance of payments, calculation of reinvestment of earnings is residual, first estimating incomes and then, by difference, between the period's profits and dividends paid. In the case of the calculation detailed by country and sector, a similar calculation is made, but at company level, based on information provided by the survey. In cases where the survey does not provide any background information, missing utilities are estimated based on information available in the same survey.

The calculation is based on two aspects: (i) considers additional sources to complete missing data and (ii) estimates by sector, as described below.

a.1. Basic information corresponds to company income and dividends reported through the survey, which is grouped by company and economic sector. When data is not available from the survey, information is supplemented with financial statement data. In the case of paid dividends, information on change position (ITRS) is also used.

a.2. For the cross of sector i with company j , profit ratio is defined as: $\text{ratio}_{ij} = \text{profit}_{ij} / (\text{initial equity stock})_{ij}$. Extreme ratio values for sector i are eliminated, and a representative ratio for the sector is calculated as a median, based on calculated ratios. This value, the median, is used to estimate company income in sector i , without information. Implicitly reinvestments are obtained (primary income - paid dividends).

a.3. If the number of companies by sector with income information turns out to be unrepresentative, an average ratio based on the companies' annual sample is used as an estimate, excluding the sector.

b. FDI debt

The calculation of External Debt identifies debt derived from direct investment. There is information of debt stock by company associated with FDI for bonds and loans ¹⁴.

For consistency purposes in the calculation of external statistics, obligations pertaining loans and bonds obtained from the survey are replaced by external FDI debt statistics¹⁵. Debt associated with commercial loans, financial leasing and other payable bills is taken from what is reported in the annual FDI survey.

Systematization

In terms of information management, there is a data storage system organized in databases (ACCESS bases) that stores all information gathered from surveys, as well as imputations made to basic information at microdata level.

The information is codified (each survey section and field), versioned according to survey and review year. It should be noted that a homologation progress of survey fields and sections has also been carried out since the structure has been modified over the years (point f on survey characteristics in section 3, subsection B). Base keeps track of changes and of analyst responsible for updates.

Data is accessed through predefined queries according to aggregation or desired detail. It is expected to pass these processes to more efficient statistical programs such as SAS¹⁶ in the mid-term.

¹⁴ The basic data on debt in loans and bonds contracted with external creditors originates from annexes 1, 2 and 4 of CNCI's chapter XIV referred to in section 3.

¹⁵ There are no relevant inconsistencies between data, CNCI and Survey in general.

¹⁶ SAS (Statistical Analysis System) is a software for data analysis consisting of module sets capable of delivering results from different processes such as regression, variance analysis, basic statistics, frequency distribution,

B. DIRECTORY OF COMPANIES AND CORPORATE STRUCTURE INFORMATION.

The advantages of having a good company directory are important in the context of macroeconomic measurements, such as having good methods and calculation processes.

Indeed, a good directory can be used in the measurement of all products in a statistical area allowing homogenous information for all, avoiding duplicated information or partial data updates. Ensures consistency in definitions, in methodologies and classifications used; it is the basis for sample selection (sample used in the annual FDI survey, for instance), and the identification of subgroups with specific characteristics.

Within the agenda of the external statesmen area, directory maintenance is carried as a part of permanent team tasks. Each of these exercises aims to add tool potential, thus the most recent maintenance has been focused on: modernizing the repository that stores this information, incorporating background information to better characterize companies and updating activity classifiers in line with those used in National Accounts.

Directory of External Statistics Companies

The directory is based on information regarding companies that carry out international exchange operations through the formal exchange market. It is reviewed and updated in terms of eliminating duplicate information, completing pending information and incorporating new information.

Information stored for each company considers: company identification number (ID), company name, validity (start date/expiration date), FDI company (start/end), resident (yes/no), institutional sector, public/private company, active/liabilities, economic activity (CAE¹⁷, ISIC), export/import, responsible (in case of modifications).

The storage of information is handled in a database under a star model, which can be defined as a central set of considered as main variables connected to classification boards that allow adding and crossing information in different ways. Currently information is worked with ACCESS database, but is planned to transfer to another platform, probably SAS.

Corporate structure

The way multinational companies organize themselves largely determines how capital flows move between investors and direct investment companies. For this reason, it has been deemed important to understand their corporate structure, amongst aspects to be known about the companies, and handling this precedent linked to characterization managed by the directory of enterprises.

There have been three corporate information collection exercises of FDI companies in Chile (2015, 2016 and 2017). In the first two exercises, 2015 and 2016, a set of corporate diagrams of Chile's main investment companies was achieved. In the last exercise of 2017, it was sought to manage storage and characterization system that would allow the automated structure schematization and a follow-up and

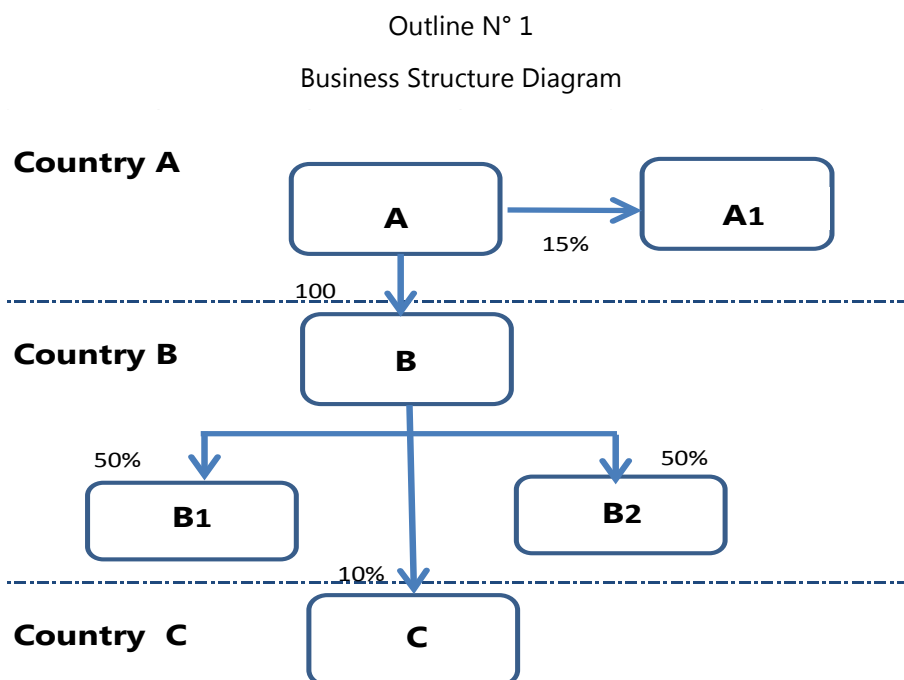
multivariate procedures capable of handling large information volumes. The Central Bank Statistical Division is in a plan to integrate its collection and compilation processes in SAS

¹⁷ CAE (Economic Activity Classifier). This classifier sorts companies according to their economic activity and corresponds to the official used in the compilation of National Accounts in Chile. It is based and correlated to the International Standard Industrial Classifier (ISIC review 4).

updating protocol was defined, so that it would be a tool of permanent use in decision making regarding gathering and compilation processes.

Characteristics of the corporate structure's base

- It feeds off of information from company reports and financial statements, backgrounds (news, company websites or other) taken from the Internet, administrative records (IRS, FMC). With this information, a series of indicators are constructed to identify the role played by companies that are part of a corporate group.
- Company groups and subgroups are defined identifying their relationship, that is, whether they are investors or investment companies regarding the company in Chile.
- The information, for now, is stored codified and organized in Excel files. Through a process, related information is unified in such a way that a special program (VISIO¹⁸) uses it to generate diagrams with the society structure of the group or subgroup.
- Let's suppose we have company A in country A, which has subsidiary B in country B (compiling economy) and subsidiary A1 in the same country (A). In turn, company B has direct investments in country C, materialized in company C, and investments in its own country (B) in companies B1 and B2, as shown in outline 1.



Source: Self made.

¹⁸ VISIO is an Office tool that enables, simplifies and communicates complex information with diagrams of linked data.

- e. To be able to represent these outlines in an automated way through the VISIO program, some indicators of position and relation between companies were defined and the new dataset was stored in a matrix manner as shown in outline 2.
- f. Main indicators are "group_ID" that defines the corporate group to which companies belong and "ID_geo" that indicates where they are geographically, that is, whether in the compiling economy (code 0) or outside the country. If it is outside the country, code 1 will indicate that it's a foreign investor and code 2 is a subsidiary company for the compiling economy, country B in our example. In outline 2 we can see that matrix 1 reflects this background and that matrix 2 records company relationships through voting power percentage that parent companies maintain with their subsidiaries. Both matrixes are correlated and provide information to draw the corporate outline.

Outline N° 2
Information Matrixes

Matrix 1

Comany name	ID	Country	ID_group	IED_geo
Company A	11111	A	25	1
Company A1	11143	A	25	1
Company B	22222	B	25	0
Company B1	22254	B	25	0
Company B2	22286	B	25	0
Company C	33333	C	25	2

Matrix 2: Relationship between companies

	Company A	Company A1	Company B	Company B1	Company B2	Company C
Company A	-	15%	100%	50%	50%	10%
Company A1	-	-	-	-	-	-
Company B	-	-	-	50%	50%	10%
Company B1	-	-	-	-	-	-
Company B2	-	-	-	-	-	-
Company C	-	-	-	-	-	-

Source: Self made

C. REVIEW OF FDI SURVEY FORMS - EVALUATION STAGE

Along with maintaining measurement standards (methodologies) and updated information (directories) that ensure compilation quality, it is also important to continuously monitor the information collection instruments. This is how the FDI survey has not been a static instrument over time, but has undergone modifications in order to capture more and better information on Chile's FDI. Such was the case of incorporating consultations on economic activity with a higher level of sector specification and consultations on the region where the investment project was carried out in 2014. All of which makes the captured data a powerful and reliable element that responds to analyst and user demands.

Following above considerations, the form is being reviewed again in order to continue improving and enhancing it. This time focus is on facilitating respondent reports in the following areas:

- A simpler and more direct in line form with the company's accounting record.
- Improve form's online interface by providing the respondent with better descriptions and information that simplifies survey completion.
- Strengthen closeness with respondent through contact that allows supporting them by answering questions about the form (meetings with leading companies, for example).

As part of the project definition, starting an evaluation stage that will lead to the definition of what should be part of the work plan has been considered beforehand.

This stage, currently under development, has considered training compilers in matters of accounting regulation. Understanding accounting systems is basic for the connection between compiler and reporter, and fundamental in the definition of a simplified questionnaire such as the one proposed. In this sense, training activities have already been organized for analysts on these issues, taking advantage of external experiences as Bank interns.

On the other hand, meeting cycles have been organized with the main companies receiving foreign investment in Chile, collecting their opinions on the survey which will be an input in defining an updated form.

At the end of this phase an evaluation will be carried out and define an implementation plan according to what the evaluation indicates.

5. CLOSING COMMENTS

- Foreign direct investment (FDI) is a relevant statistic in the globalized economy, especially linked to the financing of Multinationals. The different ways in which these companies who cross production frontiers are organized have an impact on FDI measurements.
- In Chile, FDI is particularly relevant within macroeconomic variables that impact the country's economy, specially investment that comes from abroad. In terms of results, investment of non-residents in the country are so relevant that they determine IIP net debit balance.
- Central Bank is responsible for the compilation and timely publication of the country's main macroeconomic statistics: National Accounts, Balance of Payments and Monetary Statistics. Although there are no legal precepts that obligate private institutions to report to the Bank for statistical purposes, exchange regulation allows consulting for specific details in certain operations. Within this framework it is possible to have information for the statistical investment compilation in Chile and abroad.
- In the case of investment in Chile, questionnaires under the foreign exchange regulation (Compendium of International Exchange Regulations, CIER) do not allow sufficient detail in the case of financing operations through capital contributions. For this reason, we have a complementary collection tool such as the annual survey of direct foreign investment.
- FDI survey queries the investment sector, country region where the investment project is carried out, transactions and equity positions and debt with the parent and related companies. Data collected shows results of the period prior to the consultation year.
- Like any data collection instrument, before being used in the compilation, collected data goes through a process of validation and analysis in order to ensure measurement quality. This process includes a structured exercise of validations and imputations, calculation automation and continuous methodology improvement.
- Together with the above, an up-to-date directory of companies and information on corporate structures applied in decision-making at the stages of gathering and compilation are maintained.
- Lastly, tasks to improve the FDI survey in Chile form are developed in order to maintain an updated collection tool that allows gathering better information to answer to user and analyst demands.

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(<https://si3.bcentral.cl/estadisticas/Principal1/Estudios/SE/BDP/see109.pdf>)

I. General Background

A. Company Identification

A.1. Company Name		A.2. ID Company
<input type="text"/>		<input type="text"/>
A.3. Address	A.4. Commune	
<input type="text"/>	<input type="text"/>	
A.5. City	A.6. Central phone	A.7. Reported period
<input type="text"/>	<input type="text"/>	<input type="text"/>
A.8. Name of respondent		A.9. Position
<input type="text"/>		<input type="text"/>
A.10. Direct phone	A.11. E-mail	
<input type="text"/>	<input type="text"/>	
A.12. Headquarter name in Chile		A.13. ID Headquarter
<input type="text"/>		<input type="text"/>
A. 14. Accounting currency		
<input type="checkbox"/> National currency (Chilean pesos)	<input type="checkbox"/> Foreign currency (USA dollar)	
<input type="checkbox"/> Foreign currency (Euro)	<input type="checkbox"/> Foreign currency (Other). Specify:	<input type="text"/>

ANNEX 1: QUESTIONNAIRE OF THE FOREIGN INVESTMENT SURVEY IN CHILE (2).

II. Specific Background. Indicate the amounts according to the accounting currency of the company reported in A.14.

B. Currency unit

B.1. Indicate the unit of currency in which the information is expressed (mark with an x as appropriate)

- ☐ Pesos (\$)
- ☐ Thousands of pesos
- ☐ Millions of pesos
- ☐ Dollar (USA)
- ☐ Thousands of dollars
- ☐ Millions of dollars
- ☐ Euros
- ☐ Thousands of Euros
- ☐ Millions of Euros

C. Company's Equity

C.1. Indicate the company's equity

D. Economic Sector and Recipient Company Region

D.1. Indicate your main economic activity (without considering subsidiaries)

Level 1 Sector

Level 2 Subsector

Level 3 (Optional)

D.2. Indicate the main region where the foreign investment materializes

ANNEX 1: QUESTIONNAIRE OF THE FOREIGN INVESTMENT SURVEY IN CHILE (3).

E. Economic Activity and Region of Subsidiaries

E.1. Indicate the number of direct subsidiaries in Chile ¹

E.2. Indicate additional information about its direct subsidiaries in Chile

N°	ID	Name	Total equities of the subsidiary	Share%	Level 1 Sector	Level 2 Subsector	Level 3 (Optional)	Region of materialization
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

¹ Companies over which your company has a stake equal to or greater than 10% of the property.

ANNEX 1: QUESTIONNAIRE OF THE FOREIGN INVESTMENT SURVEY IN CHILE (4).

F. Equity shares

F.1. Shares and equity interests greater than or equal to 10% of the voting power (direct investor)

F.1.1. Country of the immediate investor	F.1.2 Final investor country ²	F.1.3 Beginning Balance	F.1.3.b. Difference between initial balance and previous period final balance (+/-)	F.1.4. Purchases / capital contributions (+)	F.1.5. Withdrawals of capital (-)	F.1.6 Other variations (+/-)	F.1.7. Profits or losses accrued in the period	F.1.8. Dividends paid in the period	F.1.9. Final Balance

F.2. Shares and other equity interests of less than 10% of the voting power

F.2.1. Country of residence of the related company	F.2.2. Beginning Balance	F.2.2.b. Difference between initial balance and previous period final balance	F.2.3. Purchases / capital contributions (+)	F.2.4. Withdrawals of capital (-)	F.2.5. Other variations (+/-)	F.2.6. Final Balance	F.2.7. Profits or losses accrued in the period	F.2.8. Percentage regarding final balance		
								F.2.8.1. % Indirect controller	F.2.8.2. % Subsidiaries	F.2.8.3. % Related company

² This information is not considered in the measurement, because this question has a low answer rate.

ANNEX 1: QUESTIONNAIRE OF THE FOREIGN INVESTMENT SURVEY IN CHILE (5).

G. Debt Instruments

G.1. Bonds and promissory notes held by residents abroad

[illegible]

G.2. Loans received from abroad for foreign trade financing

[illegible]

ANNEX 1: QUESTIONNAIRE OF THE FOREIGN INVESTMENT SURVEY IN CHILE (6).

G.3. Other loans received from abroad

[illegible]

G.4. Other liabilities

[illegible]

ANNEX 1: QUESTIONNAIRE OF THE FOREIGN INVESTMENT SURVEY IN CHILE (7).

[illegible]

IFC - Central Bank of Armenia Workshop on *"External Sector Statistics"*

Dilijan, Armenia, 11-12 June 2018

The measurement challenges of FDI in Chile: searching for better data for a better interpretation¹

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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.



The measurement challenges of FDI in Chile: searching for better data for a better interpretation

Balance of Payments Department
Management in Macroeconomic Statistics
Statistics Division



Agenda

- I. Context
- II. The Chilean FDI in numbers
- III. FDI data compilation framework in Chile
- IV. FDI annual survey in Chile
- V. Strategies to ensure the quality of the measurement



Context

FDI in the global economy



FDI a relevant statistic in the globalized economy



Multinationals the power unit of the system

- Production of goods and services outside of the compiler economy.
- Capital flows go beyond the frontiers to finance production.



Corporate networks difficult to understand

- The multinationals are organized in different, diverse and curious ways.
- The capital flows move from the matrix to the investment company through countries and intermediate companies in very diverse ways (SPEs is an example).



The data collection to measure FDI is not easy

- The sources and records are not able to capture all business dynamic.
- The respondents do not relate the company accounting with statistical records well.

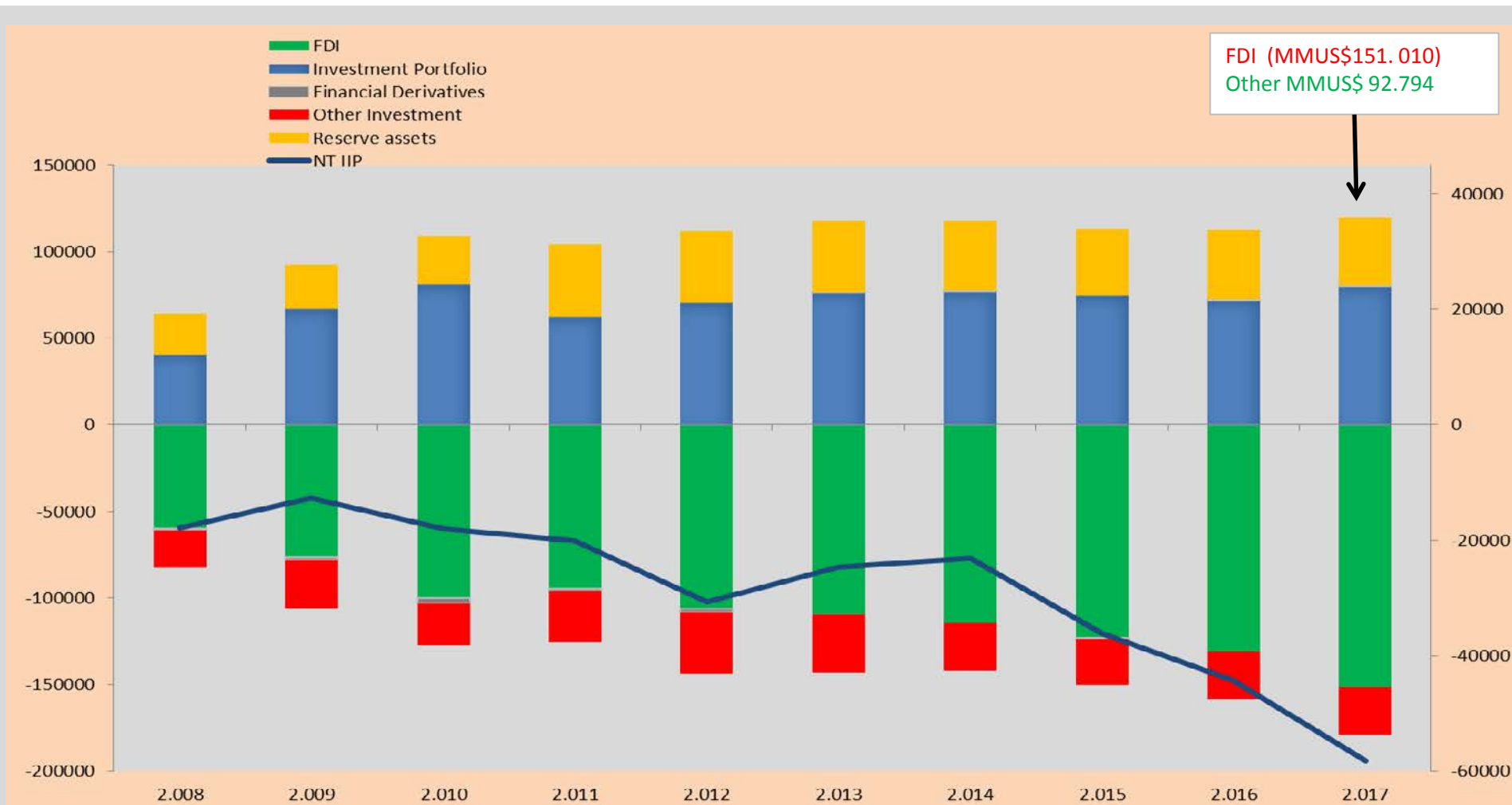


Chilean FDI in numbers

In Chile the FDI is the most important account in both BOP and IIP

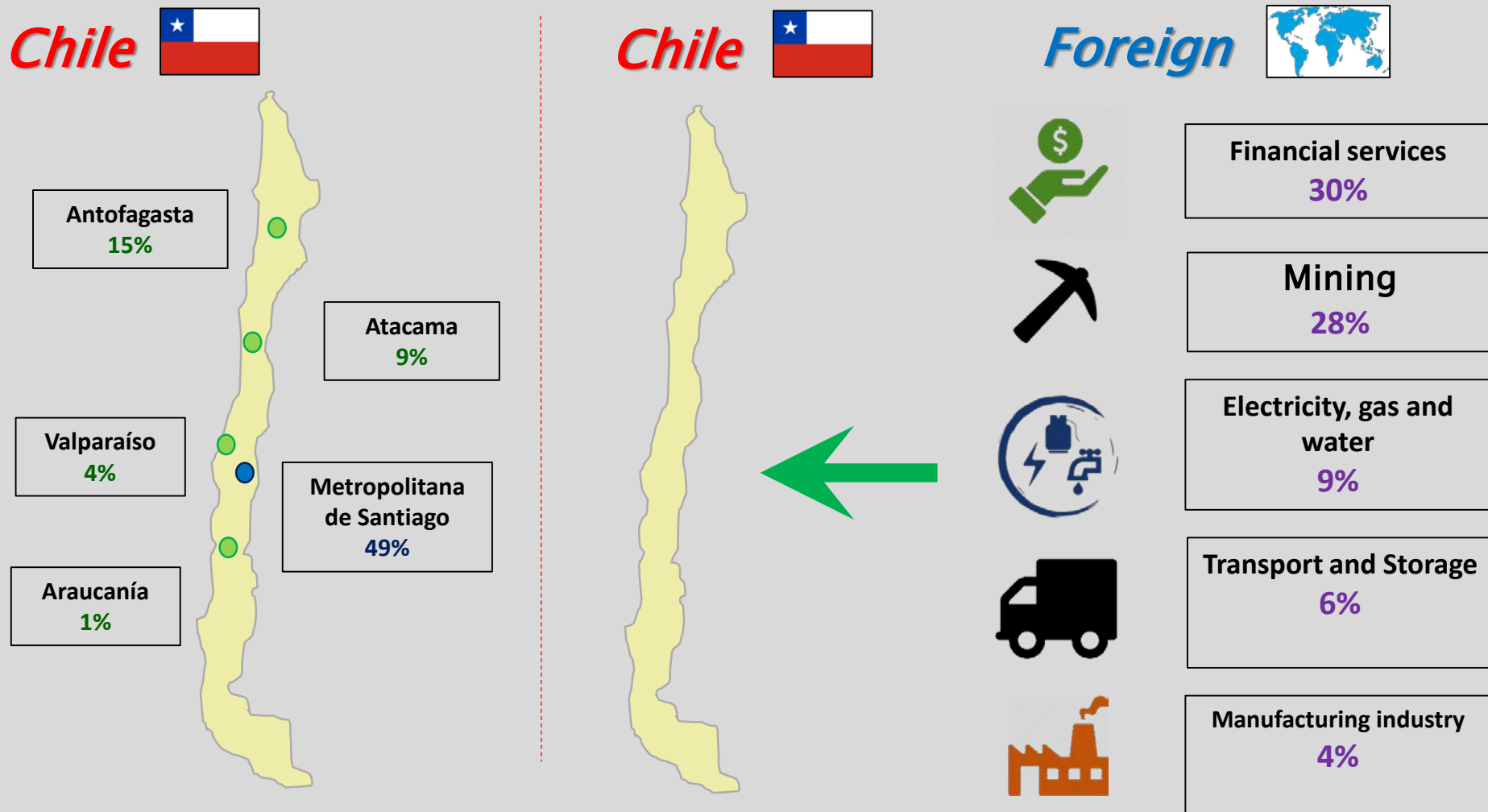


FDI determines the Chilean net debtor position



Source: Central Bank of Chile

FDI in Chile by region and by industry...

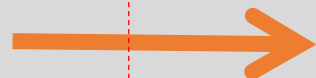
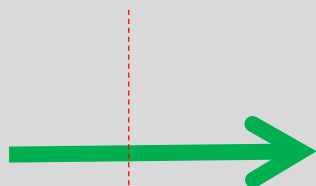


Source: Central Bank of Chile



Chile invests abroad mainly in financial services, mining, industry, commerce

Chile



Foreign



Financial services
26%



Mining
20%



Manufacturing industry
12%



Commerce
11%

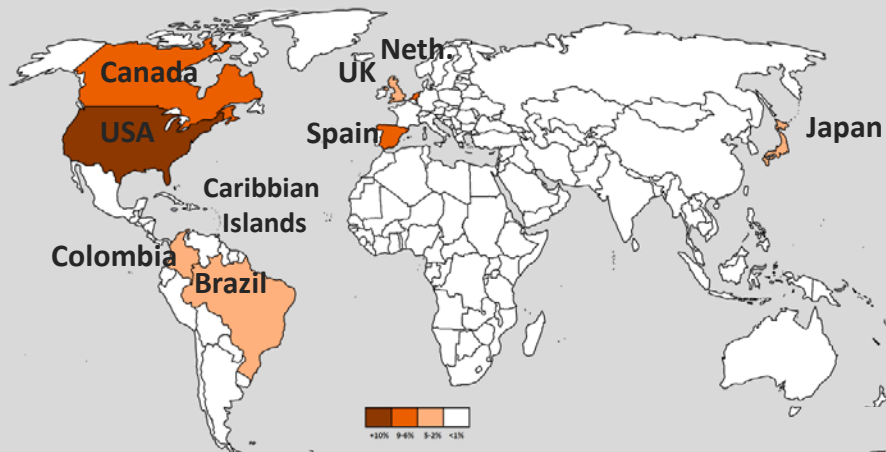


Electricity, gas and water
10%

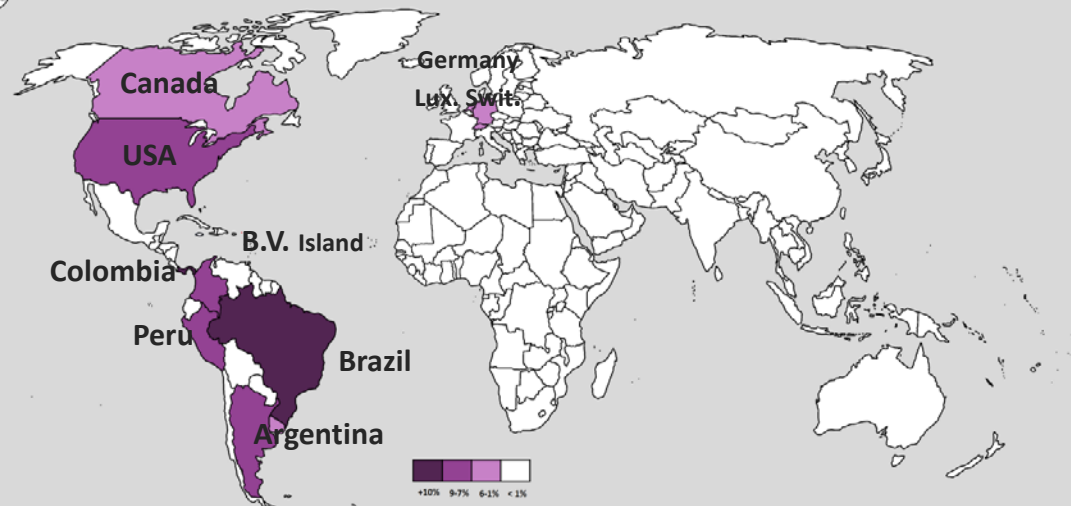


FDI by partner country

FDI in Chile



FDI abroad



FDI data compilation framework in Chile

According to its Organic Law and to the National Statistics Compilation Plan, the CBCH is responsible for the timely compilation and publication of Chile's main national macroeconomic statistics



There is no obligation to inform for statistical purposes, but a collaborative statistical culture exists in the economy agents

- The Central Bank is an autonomous body governed by its Constitutional Organic Law 18.840 of 1989 (COL, LOC in Spanish). Provisions for producing statistics are included in the COL.
- The National Statistics Compilation Plan assigns the CBCH the task of compiling and disseminating NA, monetary, and BOP statistics. Article 53 establishes mandatory data reporting by public entities to the CBCH.
- There are no legal precepts empowering the CBCH to require private institutions to respond to data requests solely for statistical purposes, except for information on foreign exchange transactions.
- Although the regulations of the issuing institute are based on the general basis of freedom in exchange matters, the Central Bank may impose exchange restrictions under certain circumstances: the obligation to report certain transactions and the use of the Formal Exchange Market.
- The regulation of international exchange operations is expressed in the Compendium of International Exchange Regulations (CIER).



Mechanisms for reporting data on investment in the CBCH

Entry of investment in the economy

- The investments that enter to the country for an amount greater than US\$ 10.000 must be duly reported to the BCCH and made through the FEM, as well as, the operations with funds disposed abroad and the payments or remittances of foreign currencies corresponding to said operations.
- All regulations on this matter are found in chapter XIV of the CIER.
- Until December of 2015, the DL600 also governed as an mechanism for the capital entries from abroad. The DL600 was a contract between the state and the investor that guaranteed rights and obligations for both parties. Guaranteed a special tax regime for investors, but prior authorization is needed to send remittances of capital and income abroad.

Investment abroad

- Investments, deposits and credits that residents in Chile maintain abroad must be reported to the Central Bank, with a threshold of US\$ 10.000. Investments with provision of funds abroad are included.
- The payments or remittances in currencies that the residents bring into the country or send to abroad, by their investments, must be made through the FEM.
- All regulations on this matter are found in chapter XII of the CIER.



FDI annual survey in Chile

Important tool that provides details by country, by industry and by region of the investments that come from abroad



Characteristics of the survey

- The survey is carried out annually, and it is aimed at companies that receive direct investment from abroad.
- In 2017, 462 companies were surveyed. They were asked for their results in 2016 with a response rate of 77%. The stocks of the companies that responded represent around 80% of the FDI total stock in Chile in 2016.
- Consultation on transactions and stocks by instrument (equities and debt), by partner country, by industry and by region.
- The information collected is the basis for compiling the report on FDI under the framework of the BDFDI4 criteria of OECD.
- The last published series covers the period 2009 - 2016. It is published with annual lag.



Section F.1 Equities from direct investor in direct investment enterprise

	Beginning of period IIP	Equity contributions	Withdrawals of equity	Gains /losses	Paid Dividends	OCH	End of period IIP
Country 1							
Country 2							

- 1) Data consistency: beginning of period IIP versus the end of the previous period IIP; report currency between periods; or unbalance between IIP (beginning and end of period), transactions and other variations.
- 2) Changes in the countries where the investment comes from without records of reduction of stocks.
- 3) Other changes of volume can contain income.
- 4) Companies do not respond every year. This situation produces discontinuity in information.



Section F.2 Equities between fellow companies and Section G Debts Instruments

Equities or Debts	Beginning of period IIP	Contrib. or Disburs- ment	Withdrawals or Payments	O CH	End period IIP	Gains /losses or Interests	Percentage in relation to end of period IIP		
							Indirect investor*	Affiliates	Fellow Company
C 1									
C 2									
<p>1) The respondents get confused when trying to divide the final IIP (equities or debt) of the period according to the type of fellow enterprise.</p> <p>2) Trade credit and advances are confused with other accounts payable.</p>									

* Indirect/direct investor in the case of debt instruments



Strategies to ensure the quality of the measurement

Validations and imputations; better information to characterize companies and review forms



Analysis of data and statistical tools help to give solution to the problems of the data collection

Validations and imputations

Based on historical background, administrative records, reports and financial statements of companies.

Units of measurement of the report, region, sector.

Depuration of stocks (OCH, incomes).

Continuity of the stocks by country.

Depuration of relationships.

Methodology

Income estimates based on average income: country * sector * company; sector * companies; company.

Use of external debt calculations for FDI debt.

Systematization

Use of data model and process automation.



Updating of directories and the base of corporate structures (work in progress)

Directory Review

Unique directory of companies and financial institutions.

Company characterizations: Company's effective date, FDI (yes/no), contact information, registration of updates, etc.

Integration to data model.

Corporate structure.

Based on financial statements, memories, Internet.

Three exercises have been made: 2015, 2016 and 2017.

It is linked as features to the business directory.

Groups of companies are built identifying their relationship, if they are investors or investment enterprise in regard to the company resident in Chile.

Storing in databases allows the schematization of information.



Mapping system

DataBase 1: Company Information

ID	ID_MAP	NAME	ID_GEOGRAPHIC	COUNTRY	VERSION
•	•	•	0	•	•
•	•	•	1	•	•
•	•	•	2	•	•

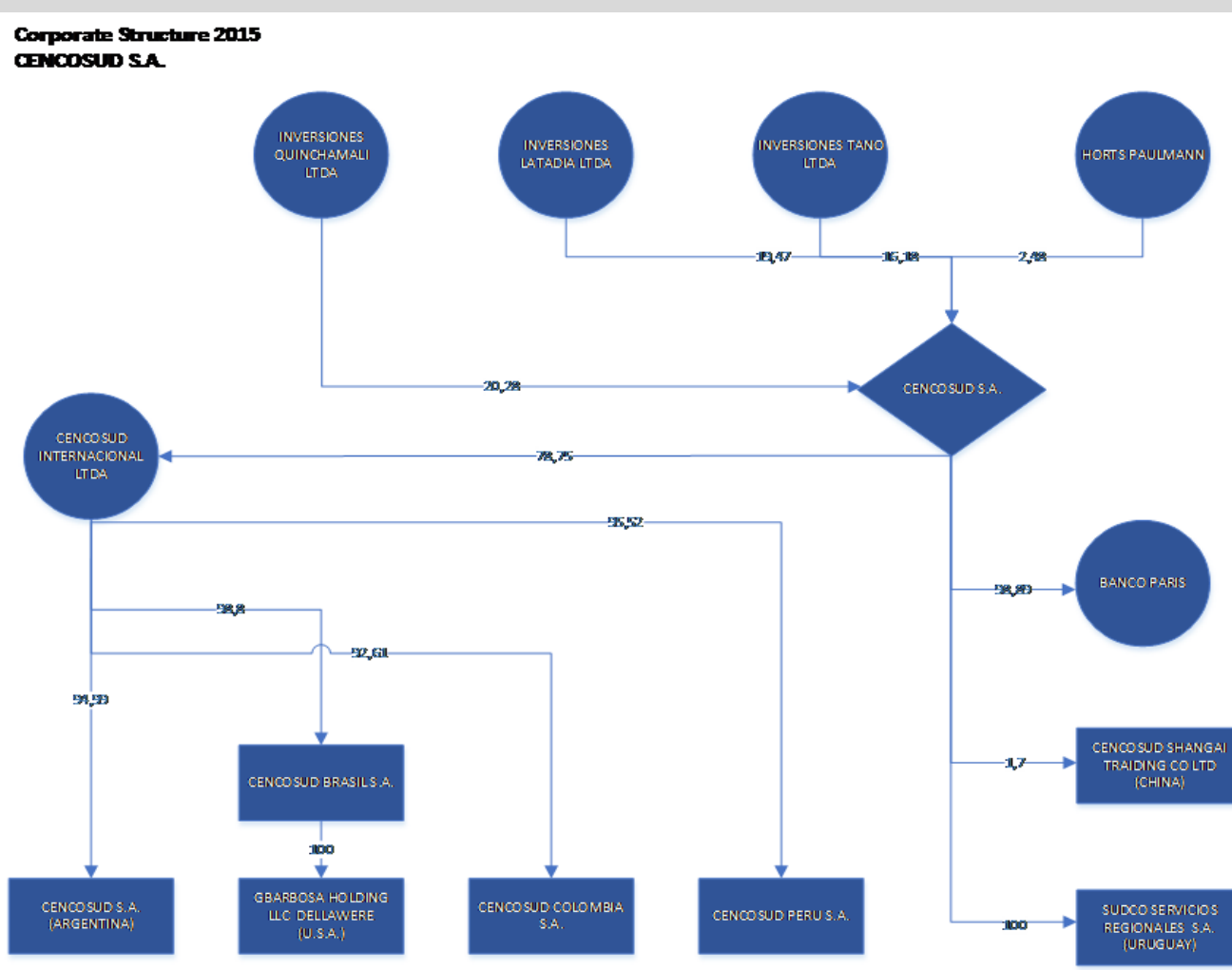


DataBase 2: Control over Subsidiaries

CONTROLLER	SUBSIDIARY	% FDI	GROUP
•	•	100%	•
•	•	43%	•
•	•	27%	•



Example of a corporate structure



Source: Elaborated based on the company financial state (2015)



Review of forms in evaluation stage

Objective

- i) Facilitate the responses with a more simple questionnaire.
- ii) Questions in line with business accounting.
- ii) Strengthen closeness with the respondent.

Workplan

- i) Training in accounting regulations.
- ii) Redefinition of the questionnaires.
- iii) Test of the questionnaires through a pilot plan with most important companies.
- iv) Strengthen data collection area.



Thanks for your attention!!!
María Isabel Méndez
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IFC - Central Bank of Armenia Workshop on *"External Sector Statistics"*

Dilijan, Armenia, 11-12 June 2018

BIS statistics on international debt issuance¹

Bruno Tissot,

Bank for International Settlements

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.



BANK FOR INTERNATIONAL SETTLEMENTS

BIS statistics on international debt issuance

Bruno Tissot

Head of Statistics and Research Support, BIS

Head of the Secretariat of the Irving Fisher Committee on Central Bank Statistics (IFC)

IFC-Central Bank of Armenia Workshop on External Sector Statistics, 11-12 June 2018

The views expressed are those of the author and do not necessarily reflect those of the BIS or the IFC.



Overview

- 1. Importance of the global bond market**
- 2. BIS securities statistics**
- 3. International security: definition & identification**
- 4. Benefits of a security-by-security database**
- 5. Conclusion – Overall set of BIS statistics to assess external credit**



1. Importance of international debt market – Policy issues

- **Four main factors of differentiation between domestic and international markets:**
 - **Currency**; though growing local currency issuance offshore
 - **Primary market** (ISIN)
 - **Secondary market** (exchanges, though importance of OTC transactions)
 - **Governing law** (risks associated with policy measures)
- ❖ *Historically, bonds registered & traded outside the country used to be governed by foreign law and denominated in foreign currency*
- ❖ *Bonds issued in local market typically tended to be issued in local currency under the local law*

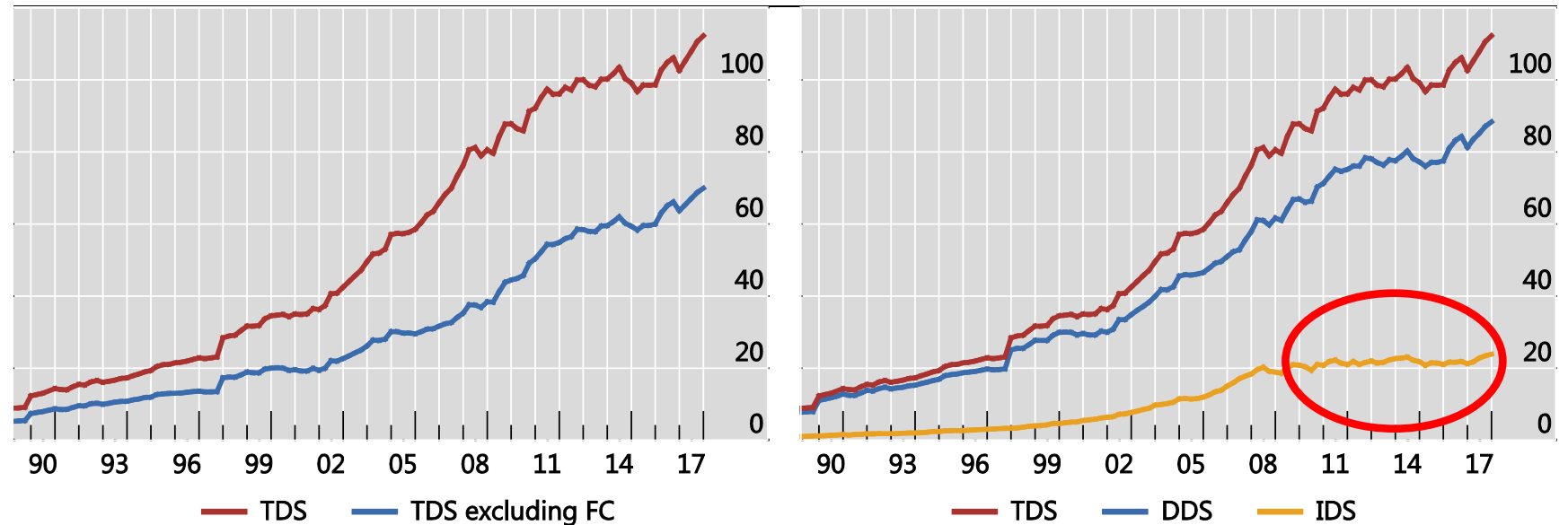


1. Importance of international debt market - Size

Size of the global bond market estimated by combining the various BIS datasets

Global debt securities markets by market of issue¹

Amounts outstanding, in trillions of US dollars²





DDS = domestic debt securities; IDS = international debt securities; TDS = total debt securities; FC = financial corporations.


¹ Sample of countries varies across breakdowns shown. For countries that do not report TDS, data are estimated by the BIS as DDS plus IDS. For countries that do not report either TDS or DDS, data are estimated by the BIS as IDS. ² At quarter-end. Amounts denominated in currencies other than the US dollar are converted to US dollars at the exchange rate prevailing on the reference date.


Sources: Dealogic; Euroclear; Thomson Reuters; Xtrakter Ltd.; national data; BIS debt securities statistics; BIS calculations.


2. BIS Statistics on Debt Securities: Dissemination


 About BIS


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Statistics

Debt securities







About debt securities statistics

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Debt securities statistics

Updated 5 June 2018

Our data

Table	PDF	BIS Statistics Explorer
Global tables		
C1 Summary of debt securities outstanding	 PDF	
C2 Central government debt securities markets	 PDF	 CSV
Country tables - detailed view of debt securities markets		
C3 Debt securities issues and amounts outstanding, by residence and nationality of issuer	 PDF	
<div>Select country</div>		

Browse and download data

Debt securities statistics can be browsed using the [BIS Statistics Explorer](#) and [BIS Statistics Warehouse](#), as well as downloaded in a [single CSV file](#).

Contact



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2. BIS Statistics on Debt Securities: 3 datasets

- **National data** (aggregates reported to BIS):
 - **Total** debt securities (TDS): 43 countries, mostly industrialised
 - **Domestic** debt securities (DDS): 33 countries, mostly EMEs
 - BIS disseminating role - G20 Data Gaps Initiative
- **International** debt securities (IDS, granular)
 - BIS "own" security-by-security dataset



2. BIS Statistics on Debt Securities: Challenges

- **Different reporting**
 - 59 countries report DDS or TDS
 - International data presented by the BIS for >140 countries
 - Potential overlap between IDS and DDS
- **Various reporting practices**
- Example: **valuation**
 - IDS face value
 - DDS / TDS nominal or face value or market value



3. What is an international debt security? Previous definition

- **“Traditional” definition of international issue:** targeted at international investors
 - Securities issued in a foreign market
 - Or: securities issued in a local market, if denominated in a foreign currency or underwritten by one foreign bank
- **Domestic issue:** in local currency, placed with local investors



3. What is an international debt security? Challenges with the old definition

- Limited **comparability** across countries
- **Underestimated foreign holdings** of securities issued by residents
- **Overestimated bonds targeted at international investors** but purchased by residents



3. What is an international debt security? Current definition

- Current (new) definition: an international security is **issued in a foreign market** ie outside the market where the borrower resides
- Focus on the **primary market, based on issuer residence**
 - Domestic market: where residents issue
 - International market: where non-residents issue



3. What is an international debt security? Current definition

- In practice: compare **3 characteristics** of each security with the residence of its issuer
 - registration domain
 - listing place
 - governing law

IDS: if at least 1 characteristic has a different location compared to the issuer's residence



3. What is an international debt security? Remaining challenges

- For about **half of the IDS** all the 3 characteristics allow to identify a foreign market (ie the location is different from the residence of the issuer)
 - For one third at least one characteristic is different
 - If inconclusive, the security is classified as an IDS
- Significant degree of **uncertainty**
 - across data sources
 - within datasets



4. Analytical value of BIS's international security-by-security dataset

- Multiple **indicators**: gross/net issues, repayments, amounts
- Multiple **breakdowns**: instrument, currency, maturity bands, interest rate, rating, guarantees
- Very flexible, allows to address various **policy questions**
 - **Currency mismatches**
 - Issuance both by **residence and nationality** (defined as the residency of the controlling parent)
 - Since 2015, **sector classification** based on the activity of the issuer's parent entity

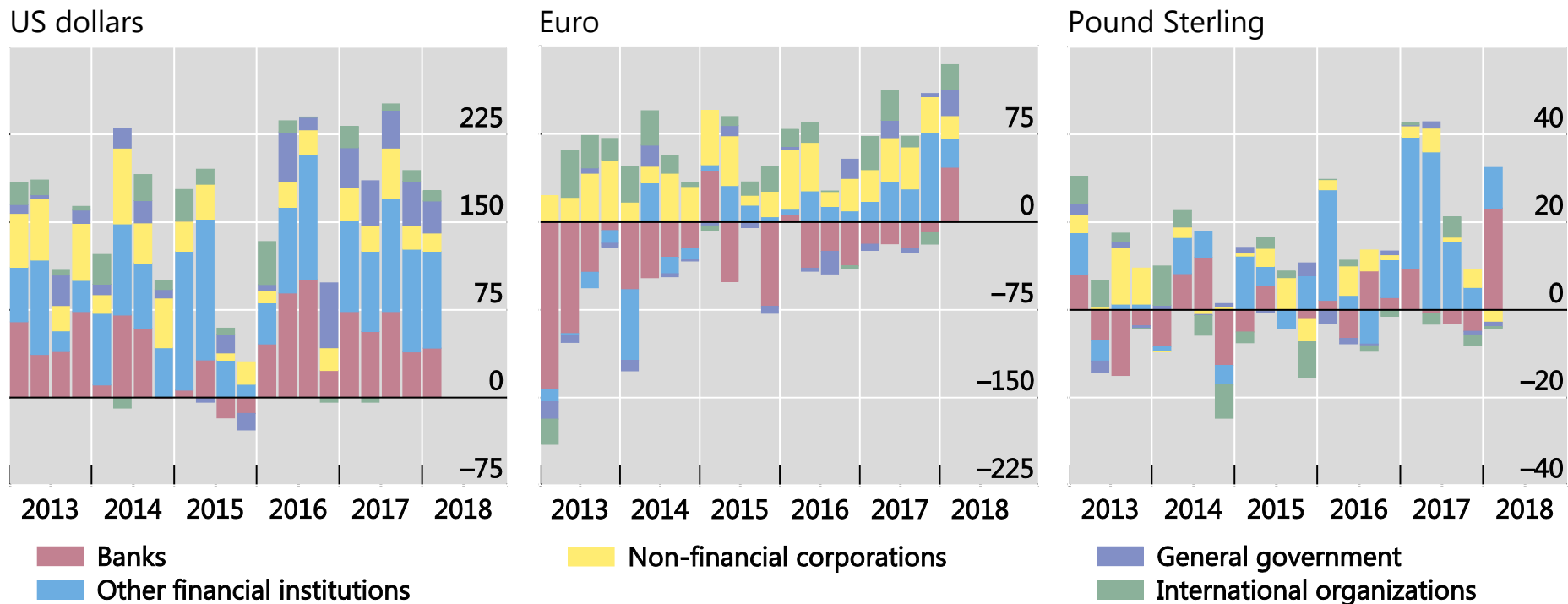


4. Example of analysis (i): Who issues what?

Net issuance of international debt securities

By issuer sector and currency of denomination, in billions of US dollars

\$ is the major issuance currency, but there are others



Further information is available at www.bis.org/statistics/secstats.htm.

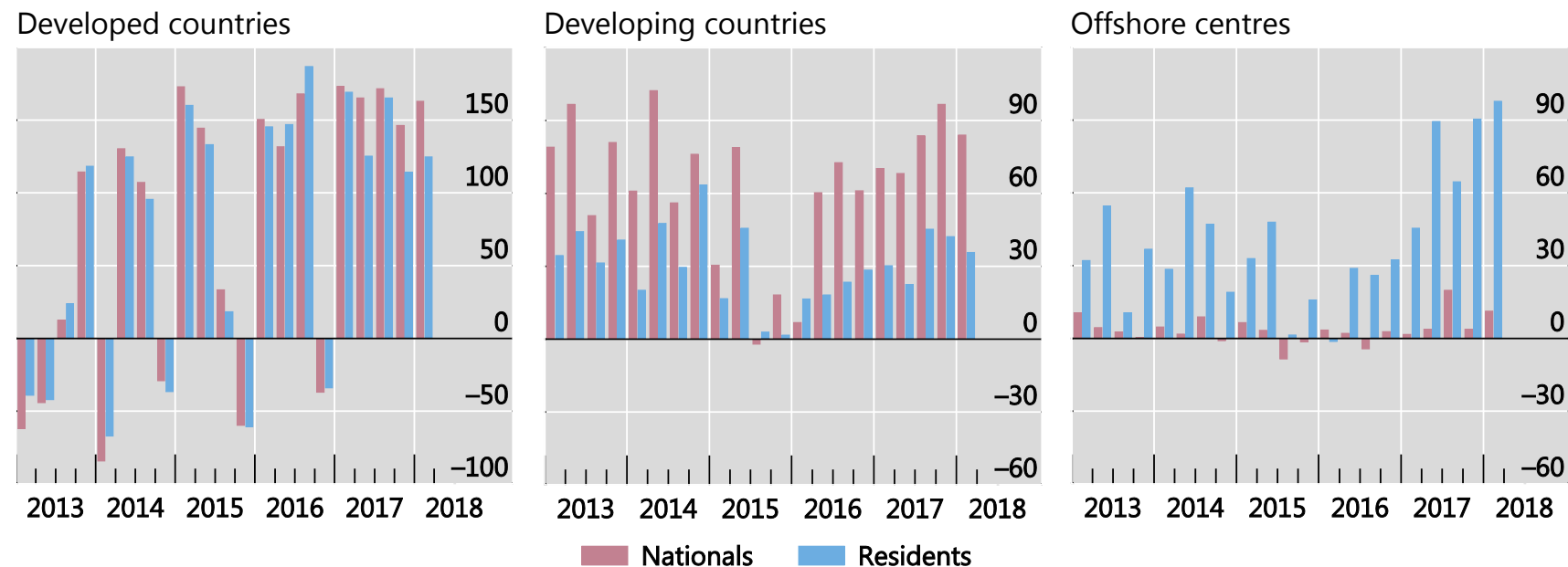
Sources: Dealogic; Euroclear; Thomson Reuters; Xtrakter Ltd; BIS debt securities statistics.

4. Example of analysis (ii): Who issues for whom?

Large activity in offshore centres by foreign affiliates

International debt securities issued by financial and non-financial corporations¹

Net issuance by region, in billions of US dollars²



Further information is available at www.bis.org/statistics/secstats.htm.

¹ Excluding general government. ² For a list of countries in each region, see Table C1 (<http://stats.bis.org/statx/srs/table/c1>).

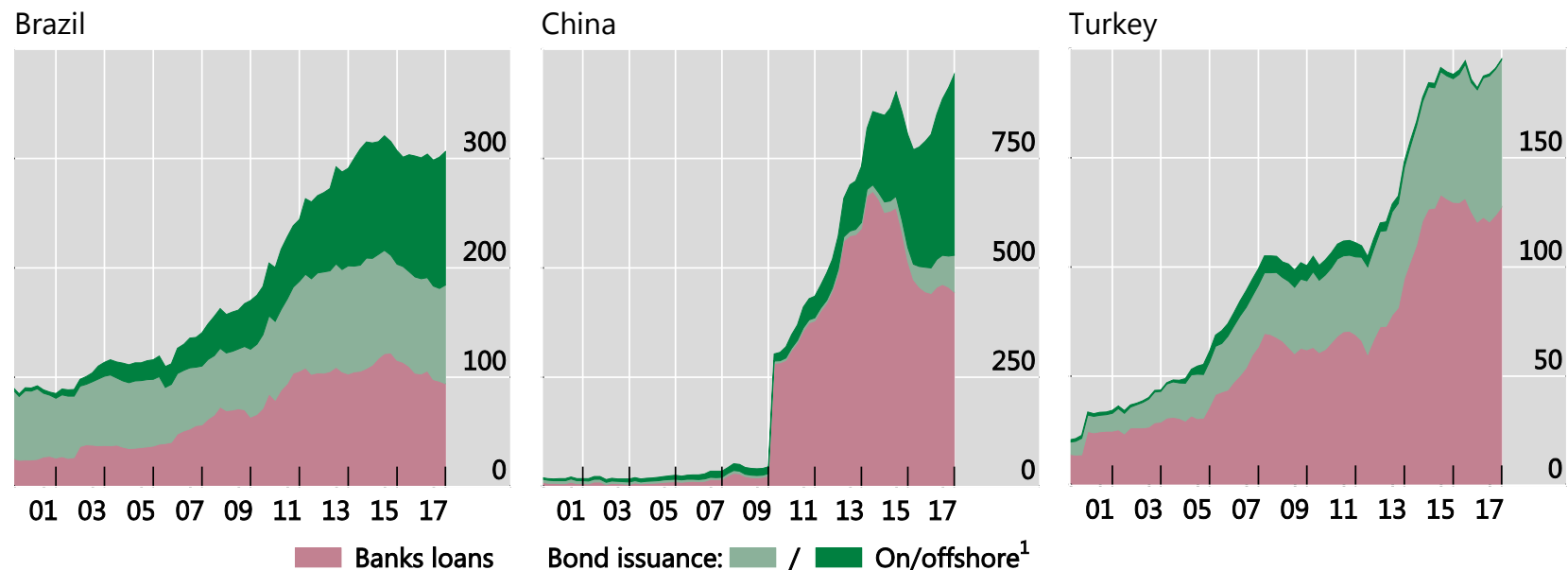
Sources: Dealogic; Euroclear; Thomson Reuters; Xtrakter Ltd; BIS debt securities statistics.

4. Example of analysis (iii): Where are issuers issuing?

- **Debt issuance: the 2nd phase of global liquidity**
- **Issuance by (non-resident) affiliates can be large**

US dollar-denominated credit to non-banks, including offshore issuance

In billions of US dollars



For definitions and sources, see www.bis.org/statistics/gli.htm. Breaks in series occur in the period in which data on LLFX become available for the respective country: for Brazil, Q4 2002; for China, Q1 2010; for Turkey, Q4 2000.

¹ Offshore bond issuance is defined as the outstanding US dollar-denominated bonds issued offshore (ie outside the country listed in the panel title) by non-banks with the nationality listed in the panel title.

Source: BIS global liquidity indicators.

5. Conclusion – Overall set of BIS external sector statistics

- **Debt securities** are one part of BIS's statistical offering
- **International Banking Statistics**
 - Balance sheets of internationally active banks
 - Geographical & currency composition of assets & liabilities
 - Locational statistics: include intragroup business (differs from consolidated statistics)
- **Long series on credit to the private non-financial sector**
 - 44 economies, advanced and emerging
 - Provided by domestic banks, other sectors of the economy and non-residents
 - All financial instruments eg credit covers loans but also debt securities



5. Conclusion – Overall set of BIS external sector statistics

- Three indicators of **global liquidity** (ie *"the ease of financing in global financial markets"*)
 - **Banks' international claims:** cross-border claims denominated in all currencies plus local claims in foreign currencies
 - **Banks' total claims** on the private non-financial sector
 - **Total credit by currency** of denomination, extended by all (foreign and domestic) lenders:
 - loans extended by banks
 - purchases of debt securities (proxied by issues of debt securities)

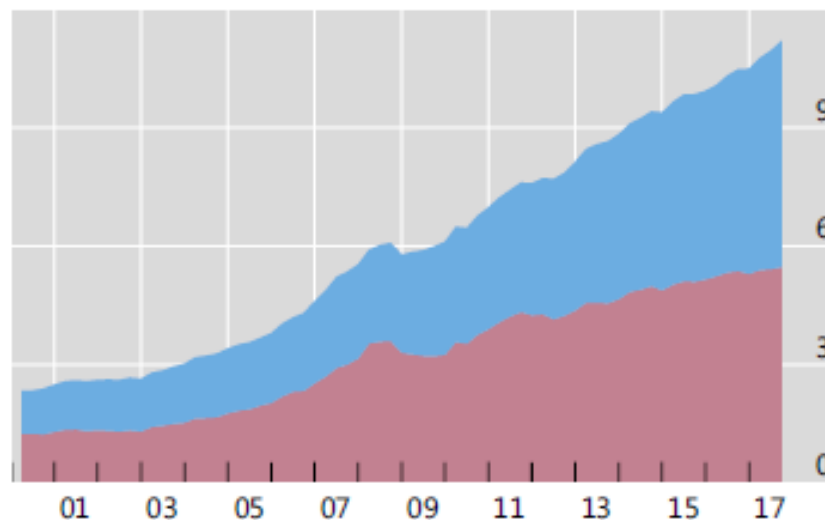


5. GLIs indicators to assess spillovers of domestic policies

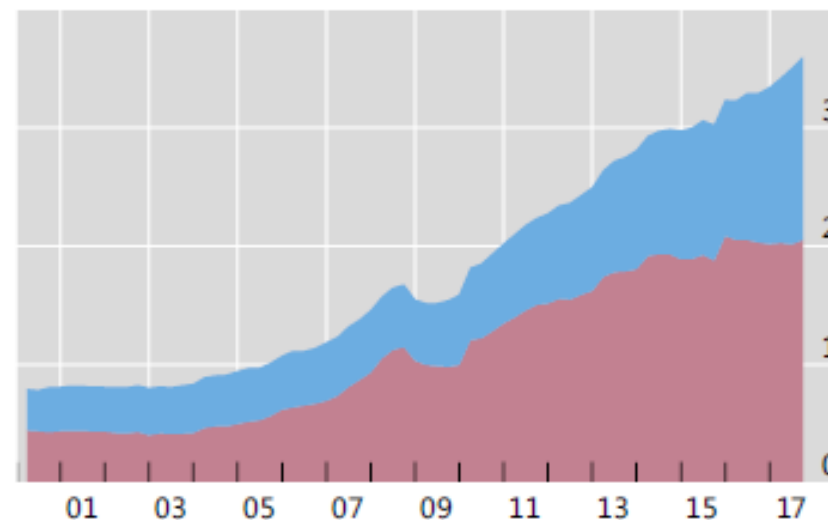
US dollar-denominated credit to non-banks outside the United States¹

Amounts outstanding, in trillions of US dollars

World



EMEs



■ Bonds issued by non-banks ■ Bank loans to non-banks²

Further information on the BIS global liquidity indicators is available at www.bis.org/statistics/about_gli_stats.htm.

¹ Non-banks comprise non-bank financial entities, non-financial corporations, governments, households and international organisations. ² Loans by LBS-reporting banks to non-bank borrowers, including non-bank financial entities, comprise cross-border plus local loans.

Sources: Datastream; Dealogic; Euroclear; Thomson Reuters; Xtrakter Ltd; national data; BIS locational banking statistics (LBS); BIS calculations.

\$ credit to non-banks outside US represents more than \$ 10 trillion



Thank you!!

Questions?

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BIS Statistics:

Debt securities: www.bis.org/statistics/secstats.htm?m=6%7C33%7C615

Global liquidity indicators: www.bis.org/statistics/about_gli_stats.htm?m=6%7C333%7C689

References:

- "[Changes to the BIS international debt securities statistics](#)", *BIS Quarterly Review*, September 2015.
- "[BIS debt securities statistics: a comparison of nationality data with external debt statistics](#)", *IFC Bulletin*, no 39, April 2015.
- "[Enhancements to the BIS debt securities statistics](#)", *BIS Quarterly Review*, December 2012.
- "[Financial stability and local currency bond markets](#)", *CGFS Publications*, no 28, June 2007.

