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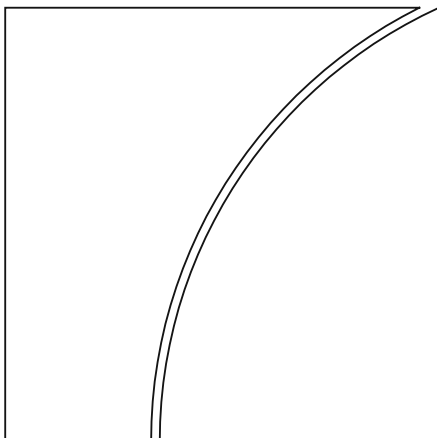
## IFC Working Papers No 15

### Development of financial sectoral accounts

New opportunities and challenges for supporting  
financial stability analysis

by Bruno Tissot

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# Development of financial sectoral accounts: new opportunities and challenges for supporting financial stability analysis

Bruno Tissot<sup>1</sup>

## Abstract

The development of financial sectoral accounts is high on the global policy agenda. These accounts have become a key part of the SNA Framework, drawing from the “traditional” description of real economic aggregates and augmented to present information on financial flows and positions. Several steps have been taken in recent years to refine some aspects of these statistics, with the ultimate goal of building “Integrated sectoral financial accounts”. Such information can be instrumental in supporting financial stability analysis as highlighted during the Great Financial Crisis of 2007-09 and its aftermath. Further progress can be achieved by drawing on the “micro data revolution” currently underway, despite a number of challenges.

Keywords: Financial accounts, financial stability, micro data, great financial crisis

JEL classification: C18, C81, C82, E01, F34, F60

<sup>1</sup> Head of Statistics and Research Support, Monetary and Economic Department, Bank for International Settlements (BIS), and Head of the Secretariat of the Irving Fisher Committee on Central Bank Statistics (IFC). The views expressed are those of the author and do not necessarily reflect those of the BIS or the IFC. The text benefited from valuable comments by Henning Ahnert, Claudio Borio, Sérgio Branco, Christian Dembiermont, Pietro Franchini, Katherine Hennings, Janusz Jabłonowski, Ilja Kristian Kavonius, Stephan Müller, Rita Póiares, Gülbin Şahinbeyoğlu and Charles Thomas as well as from the various contributions by central banks and international organisations to the IFC regional workshops organised on financial accounts in 2014-16. The author also wishes to thank participants at the 34th IARIW General Conference (2016) for useful comments and discussions, especially Professor Utz-Peter Reich, and Burcu Erik, Martina Jasova and Emese Kuruc for statistical support.

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## Introduction

The development of financial sectoral accounts is high on the global policy agenda. These accounts draw from the “traditional”<sup>2</sup> national accounts framework, augmented to present information on financial flows and positions. Several steps have been taken in recent years to refine some aspects of these statistics, with the aim of building “Integrated sectoral financial accounts”. Many advanced economies have already built such a comprehensive framework, for instance in the euro area especially over the past decade.<sup>3</sup> Such information can be instrumental in supporting financial stability analysis as highlighted during the Great Financial Crisis of 2007-09 and its aftermath. Further progress can be achieved by drawing on the “micro data revolution” currently underway, despite a number of challenges.

Section 1 reviews the main concepts related to financial accounts. Section 2 highlights the post-crisis efforts to improve these accounts in the aftermath of the Great Financial Crisis and Section 3 provides a number of examples of the use of the data collected to support financial stability analysis. Section 4 discusses the potential opportunities provided by micro data to enhance the financial accounts framework, and Section 5 concludes.

## 1. Financial sectoral accounts: a multi-faceted concept

### 1.1. The SNA framework as a starting point

The concept of financial accounts has a variety of flavours. It is built on the “traditional” description of real economic aggregates combined with information on financial flows (often called the “*Flow of Funds*”) and positions (the “*Balance sheets accounts*”). A number of actions have been taken in recent years to refine these statistics and to try to build “*Integrated sectoral financial accounts*”.<sup>4</sup>

The starting point for developing financial accounts is the System of the National Accounts (2008 SNA; see European Commission et al (2009))<sup>5</sup> and in particular its measurement of the “real sphere” of the economy through the so-called “*Current accounts*”. These accounts do not describe any financial operations, but there is, however, a close interconnection: many financial operations reflect the decisions taken by economic agents either to borrow from (resp. to lend to) others because they need to use more (resp. less) resources than what they have at their disposal – say, a firm will need to borrow to buy new machines.

<sup>2</sup> The financial accounts are an integral part of the SNA, but they have been developed later than the non-financial accounts (these non-financial accounts are thus commonly referred to as the “traditional” SNA); see also footnote 15 below.

<sup>3</sup> See the *Handbook on quarterly financial accounts for the euro area* (ECB (2012)).

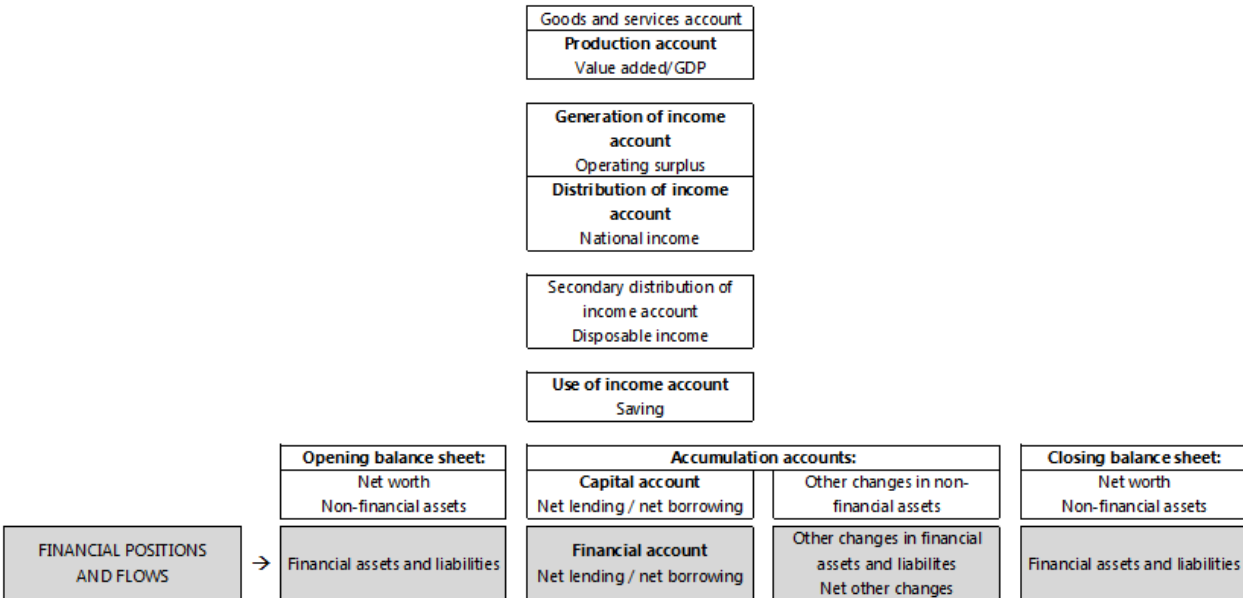
<sup>4</sup> See Shrestha (2011) for a general presentation of financial accounts.

<sup>5</sup> Available at <http://unstats.un.org/unsd/nationalaccount/docs/SNA2008.pdf>. For an introduction to the national accounts framework, see, for instance, Lequiller and Blades (2014) or Carnot et al (2011), Annex I.

Over time, the SNA has developed a specific set of accounts describing the whole spectrum of agents' operations. The first is the *Capital account*, which records acquisitions and disposals of non-financial assets during a specific time period (mainly as a result of transactions with other units). The *Financial account* then registers for each sector acquisitions and disposals of financial assets and liabilities, also through transactions – these financial flows can be the result of “real” economic activities (eg need to finance an investment) or simply reflect economic agents' decisions to lend/borrow financial assets among themselves (the latter type of transactions being particularly relevant among financial institutions). Two other accounts are also important. One is the *Revaluation account*, which records those changes in the values of assets and liabilities that result from changes in their prices: since the prices of assets evolve over time (and quite rapidly for financial assets), the net wealth of an economic agent will vary depending on the valuation gains or losses registered during a given period. Another is the *Account for other changes in volume of assets*, which registers the changes in the amounts of assets and liabilities as a result of factors other than transactions – that is, they do not reflect valuation movements or real transactions of financial instruments (for instance when an asset is written off). All these recorded flows constitute the *Accumulation accounts*, which basically provide the evolution of financial assets and liabilities over a given period due to various possible factors (borrowing/lending decisions, valuation movements, etc.).

The national accounts framework, financial flows and positions<sup>6</sup>

Chart 1



In turn, the financial flows recorded in the accumulation accounts reflect the evolution of the stock (positions) of financial assets and liabilities of economic

<sup>6</sup> Taken from European Commission et al (2009) and Fassler et al (2012).

agents. This constitutes the *Balance sheet accounts*, which record the positions in terms of assets (non-financial and financial) and liabilities (which can only be financial). It is thus a matrix showing the balance sheets of the various institutional sectors, including their assets and liabilities and, as a total, their net worth. A key element is to ensure that flows during a specific period and the positions recorded before (in the *Opening balance sheet*) and after (in the *Closing balance sheet*) are fully consistent (cf Chart 1).

## 1.2. Refinements

There are, schematically, three important challenges with the recording of financial flows and positions. The first is that the granularity of the SNA framework has traditionally been limited; typically the various economic agents have been regrouped in the sectors composed of households, financial corporations, non-financial corporations and government units (and in the rest of the world aggregate for non-residents). But recent financial crises have underscored the importance of developing a more granular approach, esp. regarding the financial sector. This sector plays a key role in intermediating financial transactions and ensuring the matching of lending and borrowing decisions of the various economic agents in the economy; moreover, this intermediary role can have different features depending on what sort of financial institution (eg a bank, a hedge fund) is involved. A second challenge is that financial assets and liabilities comprise a large and increasingly complex world of instruments, which can have different implications for lenders and borrowers. For instance, a liability can be issued in the form of a share, or can be a loan provided by a bank; the nature of the actual commitment will have different implications for the debtor agent. And a third challenge is information on the counterparty. If an agent increases its liability, it may be important to know who is the corresponding agent willing to finance this liability – and support the risk of (no) repayment later on.

Over the years, there have been several refinements to cope with the above challenges and better support financial stability analyses. Significant improvements have been already brought by the last version of the SNA, with the related focus on three main areas: the balance sheet approach, sectoral financial accounts, and from-whom-to-whom tables. The related initiatives have taken place in parallel and the following description is, by design, a simplification of the various efforts undertaken.

A first initiative has been the Balance-sheet approach (BSA) developed in particular by the IMF after the Asian crisis in the early 2000s.<sup>7</sup> The aim of the BSA is to show countries' balance sheets with a specific focus on those financial instruments that can play an important role in triggering crises. This facilitates the monitoring of the sources of financial fragilities, which can schematically be grouped in four categories. One is the *maturity mismatch*, ie when the term of the assets or sources of revenues is longer than the one of the liabilities. Another is the *currency mismatch*, say when a country has to pay its debt in US dollars while its

<sup>7</sup> See Allen et al. (2002) for the analytical framework for understanding crises in emerging markets based on examination of stock variables in the aggregate balance sheet of a country and the balance sheets of its main sectors; Hofer (2005) for a review of the IMF-related work; and Mathisen and Pellechio (2007) on how IMF requirements for SDDS have improved the dissemination of data supporting BSA analyses.

resources are mainly denominated in domestic currency. A third source of fragility is the *capital structure mismatch*, for instance when a firm investing in fixed, illiquid assets is issuing debt to finance them. Yet a last one is *solvency risk*, when liabilities can be repaid, but not immediately, for instance due to the difficulty to liquefy assets rapidly. A large number of countries have started reporting such BSA indicators to the IMF, with specific attention being paid to the maturity and currency composition of the main financial instruments at country level.

A second area of focus has been the development of (relatively granular) sectoral financial accounts. The objective is to have a holistic framework that encompasses economic data for all the various sectors of the economy in an integrated way, ie including the real sector, the external sector, the fiscal sector and the financial sector and its subsectors. To this end, one has to set up a detailed matrix describing all the assets and liabilities, covering the main instruments, and this for each of the main sectors of the economy considered. The aim is to cover all the non-financial accounts – so as to record all physical assets (eg produced and non-produced assets) – as well as the financial accounts – covering financial assets and liabilities, by type of instruments. The SNA recommends presenting this sectoral information on a non-consolidated basis: that is, an asset held by a sector’s unit vis-à-vis another unit of the same sector should not be netted out. Indeed, should one decide to consolidate financial flows between institutional units of the same sector, that would prevent the capturing of intra-sector lending relationships and could be detrimental for financial stability analyses: intra-sector financial flows can be large and have destabilising systemic effects, as observed on the occasion of the Great Financial Crisis (GFC) of 2007/09 (Dembiermont et al (2013)).

The “From-whom-to-whom” approach<sup>8</sup>

Table 1

Lending sector	Financial corporations		Non-financial corporations		Households		Government		Rest of world	
	A	L	A	L	A	L	A	L	A	L
<b>Borrowing sector</b>										
Financial corporations - Instruments										
Non-financial corporations - Instruments										
Households - Instruments										
Government - Instruments										
Rest or world - Instruments										

<sup>8</sup> See European Commission et al (2009) and Fassler et al (2012). A and L denote the assets and liabilities, respectively, of the various sectors listed in the columns of the table, declined by instruments.



The third main initiative has been the development of three-dimensional “*from-whom-to-whom*” (FWTW) tables (see 2008 SNA #2.150). The bottom line is to break down all the financial assets and liabilities of a specific sector by its counterparty sectors. For instance, the sector that holds the liability of a debtor sector will be identified, as will be the sector that has issued the liability owned by a creditor sector as an asset. Hence, the goal is to design the full matrix recording all the financial flows and positions of all the sectors and on a FWTW basis. This matrix has three dimensions, as it shows the assets (and liabilities) of each sector vis-à-vis each counterparty sector, and by type of instrument (Table 1). One source of complexity is that the terms actually used in practice often vary. FWTW tables are for instance referred in the SNA as “*three-dimensional tables of financial transactions and/or of financial positions*” as well as the “*flow of funds matrix*” (2008 SNA #2.150, 153). They can also be described as the “*Detailed Flow of Funds*” or simply as the “*Flow of Funds*”.<sup>9</sup>

### 1.3. Integrated sectoral financial accounts

The result of the various initiatives referred to above is sometimes referred to as the “*Integrated sectoral financial accounts*”. This wording is not exactly a SNA concept, which refers instead to “*integrated economic accounts*”.<sup>10</sup> Those are made up of two components (in practice qualified as “real” and “financial”, respectively):

- (i) the *Integrated presentation of the full sequence of the current accounts*, which basically shows the transactions and other flows for both the uses and the resources in the economy, and for each sector (#2.125 and SNA Table 2.13); and
- (ii) the *Integrated presentation of the full sequence of the accumulation accounts and balance sheets* (#2.126 and SNA Table 2.14), which encompasses in a consistent way assets and liabilities, their respective changes and net worth, again for all institutional sectors.<sup>11</sup>

From this perspective, “*integrated sectoral financial accounts*” can be seen as the presentation of balance sheets (as reported in the financial accounts) that are consistent with real economic developments (as reported in the current accounts),

<sup>9</sup> For details on the three-dimensional FWTW tables, see 2008 SNA #2.10,150 and Chapter 27. The “*detailed flow of funds*” are described in SNA Table 27.4. While the “*flow of funds*” are defined as the three dimensional presentation of financial statistics (#27.9), this concept will in practice often be understood as the simpler set of tables recording the financial flows registered by sector over a certain period and/or the related balance sheet positions measured before and after the occurrence of these flows (ie without necessarily the counterparty information). Lastly, simple accounts without counterparty information are usually referred to as “*accumulation accounts and balance sheets*” (SNA Table 2.14) or “*financial accounts and balance sheets*” (#18.20).

<sup>10</sup> Integrated accounts are described precisely in SNA Chapter 2 (eg #2.75 and #2.125-9).

<sup>11</sup> As regards the meaning of the “*integration*” concept, it is stated that the SNA provides accounts that are comprehensive, consistent and integrated “*in that all the consequences of a single action by one agent are necessarily reflected in the resulting accounts, including the impact on measurement of wealth captured in balance sheets*” (#1.1). To be integrated, “*the same concepts, definitions and classifications must be applied to all accounts and subaccounts*” (#2.3).

and this for all the various sectors.<sup>12</sup> In particular, the detailed three-dimension matrix of the financial accounts – that is, the fully-fledged record of all financial transactions between counterparty sectors on a FWTW basis, both in terms of flows and positions, and by instruments – should be fully consistent with the “traditional” economic (current) accounts in the SNA framework.

A key advantage of this “integrated” approach is to facilitate economic analysis: financial transactions can be identified as the counterpart of real sector operations (for instance a corporate willing to invest and issuing debt instruments held by households) or as “pure” financial transactions (for instance interbank lending). It is also important for consistency. The principle of integrated accounts, to echo the French chemist Lavoisier, is that *nothing is lost, nothing is created, everything is transformed*.<sup>13</sup> In particular, the framework of the financial accounts is a key tool to ensure the consistency of transactions recorded among economic agents, since by definition the asset owned by one economic agent is the liability of another agent (and this for each type of instrument).

A central element supporting the integration of the accounts in the SNA is its underlying “*quadruple-entry bookkeeping*” accounting system (#3.112), which combines two elements:

- (i) The first is the traditional, vertical double-entry bookkeeping principle used in business accounting (#3.113-4). This ensures the consistency of the balance sheet at the level of individual units: each transaction is reflected in a credit and a debit entries in the accounts, and total assets equal total liabilities plus net worth. In particular, the flows recorded during one period have to be consistent with the related balance sheet positions observed both before and after this period.
- (ii) The second element is the horizontal double-entry bookkeeping convention which ensures the consistency of relationships between different institutional units (#3.115). As a result, the recording for each transaction category will be compatible between the two counterparties involved, so that each transaction involving a given unit has its mirror image in another one. For instance, the employee compensation will be recorded twice, both as the compensation paid by the company and as the compensation received by the related household.

In an ideal world, sectoral financial accounts should be integrated in a “strong sense”: ie there would be no discrepancies at all between the financial transactions and the economic activities reported in the underlying national accounts framework, and this across all the sectors of the economy. In practice, however, there are

<sup>12</sup> This approach must satisfy two conditions, being integrated (“*the same concepts, definitions and classifications must be applied to all accounts and subaccounts*”; #2.3) and consistent (“*each economic flow or stock level appearing in the SNA must be measured identically for the parties involved*”; #2.4). Since the two tables are compatible, their common elements (for instance net saving) should be equal or at least discrepancies should be small.

<sup>13</sup> “*Rien ne se crée, ni dans les opérations de l’art, ni dans celles de la nature, et l’on peut poser en principe que, dans toute opération, il y a une égale quantité de matière avant et après l’opération ; que la qualité et la quantité des principes est la même, et qu’il n’y a que des changements, des modifications* » (Lavoisier, 1789).

discrepancies not least because the data are diverse, incomplete, and collected for various purposes and by different actors. Integration is therefore obtained in a “weak sense”, by ensuring the joint efforts of compilers to integrate the accounts as much as feasible (possibly leading to remaining gaps and/or discrepancies). Very often the integration work will focus on specific sectors and/or instruments. Depending on priorities and on the actual size of the discrepancies, some integration will be requested at a certain minimum degree, while other integration efforts will be encouraged on a voluntary basis.

## 2. Post-crisis efforts to improve financial accounts

While this was not, and by far, the main cause of the GFC, public authorities have realised that important information had been missing on the financial system and had to be collected. Hence a key element of the policy response after the crisis was to enhance the availability of financial statistics esp. to address financial stability issues (Borio, 2013). In 2009, the International Monetary Fund (IMF) and the Financial Stability Board (FSB) issued *The Financial Crisis and Information Gaps* report to explore information gaps and provide appropriate proposals for strengthening data collection (International Monetary Fund and Financial Stability Board, 2009). This initial Data Gaps Initiative (DGI-I) endorsed by the G-20 comprised 20 recommendations focussing on three key statistical domains.<sup>14</sup>

This effort was from the onset clearly inserted within the general financial accounts framework. Indeed, a key objective reiterated on this occasion was to develop “integrated sectoral financial accounts” and to complement the “traditional”<sup>15</sup> SNA framework by presenting information on financial flows and positions. In particular, recommendation #15 of the first DGI Initiative invited international organisations<sup>16</sup> to “develop a strategy to promote the compilation and dissemination of the balance sheet approach (BSA), flow of funds, and sectoral data more generally”. In this context, the challenge posed by the lack of data was clearly recognised, especially on households and non-financial corporates; to this end it was highlighted that “data on nonbank financial institutions should be a particular priority”.

As a result, all the G-20 economies have developed plans to improve their financial accounts statistics. A data template on sectoral accounts was finalised in 2012 and available sectoral accounts data have started to be made publicly

<sup>14</sup> For the relevance of the first DGI initiative for financial stability analysis, see Heath (2013).

<sup>15</sup> As stated above, the SNA framework also encompasses the financial accounts. But, in practice, one “traditional” view of the SNA is that it consists only of the real sector, ie the “data on expenditures on goods and services and factors of production” as described in the text accompanying the first DGI recommendation related to financial accounts (IMF and FSB (2009)).

<sup>16</sup> The Inter-Agency Group on Economic and Financial Statistics (IAG) comprises the Bank for International Settlements (BIS), the European Central Bank (ECB), Eurostat, the International Monetary Fund (IMF, Chair), the Organisation for Economic Co-operation and Development (OECD), the United Nations (UN) and the World Bank (WB). It was established in 2008 to coordinate statistical issues and data gaps highlighted by the global crisis and to strengthen data collection.

available through the OECD<sup>17</sup> – in the case of the European Union, country data have been made publicly available since the GFC (ECB (2007)). Specific steps have been taken to report the data for the BSA, and countries adhering to the SDDS Plus<sup>18</sup> are expected to disseminate on a quarterly basis a minimum set of internationally comparable data on sectoral balance sheets, with a focus on the subsector details of the financial corporations. In parallel, significant attention has been paid to the implementation of agreed data templates through outreach, technical assistance, and training.

As a member of the IAG, the BIS has been particularly supportive of these international initiatives, especially through the activities of its Irving Fisher Committee on Central Bank Statistics (IFC).<sup>19</sup> Specific attention was devoted to (1) reviewing best practices and ensure adequate knowledge-sharing among countries; (2) making central bank authorities aware of the related issues and, when relevant, propose recommendations for further progress; and (3) promoting coordination among the various international organisations involved in this area.

The initial phase of the DGI highlighted the limited availability of reliable and timely statistical data in various domains. Moreover, it also showed that imperfect statistical harmonisation at the international level is challenging the collection of comparable data across jurisdictions. To address these challenges, the international community decided to launch in 2016 the second phase of the DGI (DGI-II) in order to implement *"the regular collection and dissemination of comparable, timely, integrated, high quality, and standardized statistics for policy use"* over the next five years (International Monetary Fund and Financial Stability Board, 2015). Three main areas were identified for specific attention, ie the monitoring of risks in the financial sector, the assessment of interlinkages (in terms of vulnerabilities, interconnections and spillovers), and the adequate communication of official statistics (Heath and Goksu (2016)). Table 2 presents the precise list of recommendations as well as their link with the first phase of the DGI.

As for its first phase, the second DGI phase entails considerations that are specifically targeted to financial accounts, with two particular areas of action. Recommendation #5 is related to the shadow banking sector, whose monitoring can be greatly enhanced through the provision of sectoral accounts data. A second recommendation (#8) is more generally to *"Compile and disseminate, on a quarterly and annual frequency, sectoral accounts flows and balance sheet data, based on the internationally agreed template, including (...) other (nonbank) financial corporations*

<sup>17</sup> See OECD (2014) as well as [www.oecd.org/std/na/oecd-national-accounts-financial-accounts-and-financial-balance-sheets.htm](http://www.oecd.org/std/na/oecd-national-accounts-financial-accounts-and-financial-balance-sheets.htm); information is available to a varying extent for Australia, Austria, Belgium, Canada, Chile, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States, as well as for a number of non-OECD countries (eg Brazil, South Africa).

<sup>18</sup> The Special Data Dissemination Standard Plus (SDDS Plus) was established in 2012 and goes beyond the focus of the SDDS by putting an emphasis on countries that have systematically important financial sectors that are integral to the working of the international monetary system. All SDDS subscribers can also, and are encouraged to, adhere to the SDDS Plus.

<sup>19</sup> See Tissot (2014).

sector, and develop from-whom to-whom matrices for both transactions and stocks to support balance sheet analysis."

The recommendations in the two phases of the Data Gaps Initiative

Table 2

<b>First Phase (2009-2015)</b>	<b>Second Phase (2016-2020)</b>
I.1: Mandate of the DGI	II.1: Mandate of the DGI
<b>Build-up of risk in the financial sector</b>	<b>Monitoring risks in the financial sector</b>
I.2: Financial Soundness Indicators (FSI)	II.2: FSI
I.3: Tail risk	
	II.3: FSI Concentration and Distribution Measures
I.4: Aggregate leverage and maturity mismatches	
	II.4: Data for Global Systemically Important Financial Institutions (GSIFIs)
	II.5: Shadow Banking
I.5: Credit default Swaps (CDS)	II.6: Derivatives
I.6: Structured products	
I.7: Securities data	II.7: Securities Statistics
<b>Cross-border financial linkages</b>	<b>Vulnerabilities, Interconnections, and Spillovers</b>
I.8&9: Data for Global Systemically Important Financial Institutions (GSIFIs)	
I.12: International Investment Position (IIP)	II.10: IIP
I.10&11 Coordinated Portfolio Investment Survey (CPIS) & International Banking Statistics (IBS): Participation / Enhancement	II.11: IBS II.12: CPIS
I.13&14: Financial and non-financial corporations' cross border exposures	II.14: Cross border exposures of non-bank corporations
<b>Vulnerability of domestic economies to shocks</b>	II.13: Coordinated Direct Investment Survey (CDIS)
I.15: Sectoral accounts	II.8: Sectoral accounts
I.16: Distributional Information	II.9: Household Distributional Information
I.17: Government Finance Statistics (GFS)	II.15: GFS
I.18: Public Sector Debt Database (PSDS)	II.16: PSDS
I.19: Real estate prices	II.17: Residential Property Prices II.18: Commercial Property Prices
<b>Communication of Official Statistics</b>	<b>Communication of Official Statistics</b>
I.20: Principal Global indicators	
	II.19: International Data Cooperation and Communication
	II.20: Promotion of Data Sharing

Source: Tissot (2016a).

### 3. The usefulness of financial accounts: recent achievements supporting financial stability analyses

Efforts to develop financial accounts have already led to a vast amount of information that can be mobilised for financial stability analyses. In the case of the BIS, such information has been particularly useful in three key policy areas: (1) the monitoring of post-crisis deleveraging patterns (using newly-available financial liabilities data consistent across countries and sectors); (2) the identification of non-bank financial intermediation services provided by so-called “shadow bank” entities (using more granular information on the financial sector); and (3) the propagation of liquidity conditions across countries (using a more precise identification of cross-border and cross-sector financial flows).

#### 3.1 Post-crisis deleveraging patterns

The GFC underscored the central role played by debt in the build-up of crises, and of the necessity for reducing leverage after the ensuing bust. From this perspective, the analysis of pre- and post-crisis debt patterns, both across sectors and countries, was greatly facilitated by the balance sheet information provided by sectoral financial accounts. Recent enhancements implemented in the financial accounts of several countries have therefore been key to facilitate the analysis of post-crisis deleveraging patterns. In particular, they were instrumental in allowing the BIS to compute a new credit dataset that is consistent both across major countries and sectors.<sup>20</sup>

To analyse these issues, it is important to distinguish the evolution of financial positions by sectors. As regards the non-financial private sector, a common pattern is that its debt as a percentage of GDP is expanding rapidly in boom years characterised by rapid credit growth, surging asset prices, accommodative policies and the system-wide build-up of fragilities. This trend quickly reverses after the bust as balance sheets have to be repaired. Yet the rhythm of this deleveraging can vary markedly, depending in particular on policy incentives to ensure that debt is repaid by debtors and /or written off by creditors. Turning to the public sector, its financial position usually deteriorates sharply after the bust and for several years in crisis-hit economies, reflecting the strain on public finances of bailing out the financial system as well as the effect of output losses on fiscal accounts. This can lead to a fast and protracted expansion of government credit-to-GDP ratios, which can in turn bring its own risks in terms of financial stability – cf the long-lasting difficulties experienced by a number of euro area countries in the early 2010s that had let their public debt soar after the GFC.

The result is that, for the economy as a whole, post-financial crisis developments will depend on the combination of private (usually down) and public (usually up) leverage patterns. In aggregate, total debt may remain quite high even many years after the bust. Moreover, history shows that different scenarios can happen (Dembiermont et al (2015)). A widely-recognised example of successful deleveraging occurred in a number of Nordic countries that saw a collapse in their

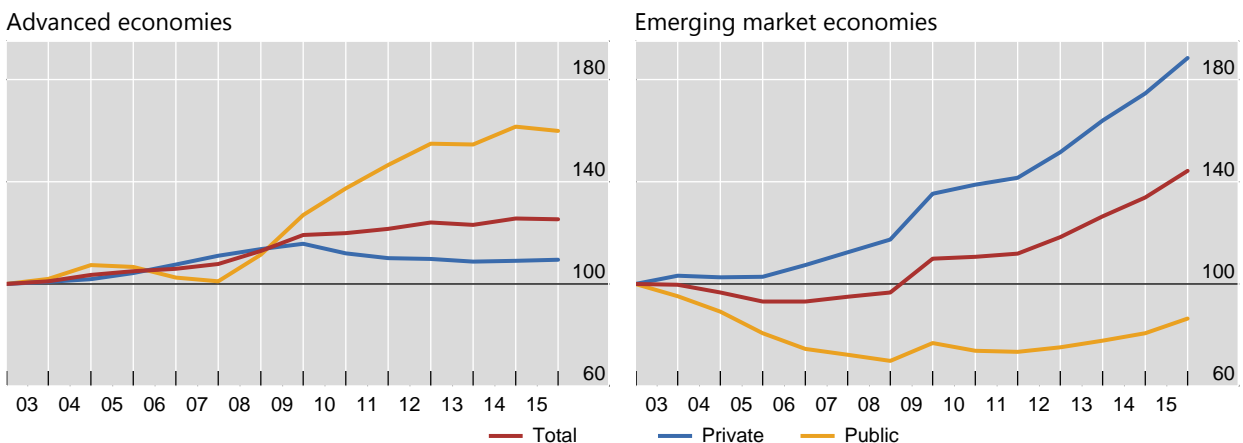
<sup>20</sup> <http://www.bis.org/statistics/totcredit.htm?m=6%7C326>.

banking systems in the early 1990s: private sector debt came down quickly in Sweden and Finland after the crisis and this was accompanied by a sharp deterioration in government accounts. However, this situation did not last too long and the public debt trajectory was able to correct downwards rapidly once most of the deleveraging of the private sector had been completed. A rather opposite example relates to the situation in Japan at the beginning of the 1990s. Private sector deleveraging was quite muted after the crisis, and was mainly concentrated in the non-financial corporate sector. Household debt as a percentage of GDP continued to rise slightly several years after the crisis and did not correct afterwards. The restructuring of the financial system was delayed for a long period of time, with banks continuing to keep a large amount of bad debts in their books. Japan's public debt rose, though less rapidly initially than it did in the Nordic cases, reflecting the slower repairing of banks' balance sheets. But at the end, the government debt position worsened over a much longer period of time and ended up much larger.

## Private and public debt patterns before and after the Great Financial Crisis<sup>1</sup>

2002 = 100

Chart 2



<sup>1</sup> Evolution of total, private (non-financial sector) and public debt in % of GDP in advanced and emerging economies. Weighted averages based on GDP and PPP exchange rates. Market values, except EMEs' public debt in nominal terms.

Sources: BIS; author's calculations.

The increased availability of sectoral financial accounts for a large number of both advanced and emerging economies since the GFC has allowed the BIS to set up a database showing sectoral debt patterns in a way that is as consistent as possible across countries and sectors. This in turn has provided a rich source of information to monitor the post-crisis adjustment process that is still very much underway today. Almost ten years after the bust, overall debt reduction seems to have only just started (Chart 2). Total debt in the non-financial sector of the advanced economies affected by the crisis has continued to expand up to 2016, by about 40 percentage points of GDP since 2007. While there are important differences between jurisdictions, the debt dynamics of the advanced economies in aggregate has resembled more the pattern of those of Japan than of the Nordic countries in the early 1990s. Despite its recent slight decrease esp. in the corporate sector, aggregate private debt has failed to correct significantly. And government debt has continued to rise steadily, in a manner reminiscent of Japan's trend

deterioration in the 1990s (and unlike the large but temporary deterioration followed by a rapid improvement in fiscal positions experienced during the Nordic countries' crisis). Turning to emerging economies, the post-crisis period of very accommodative financial conditions has been accompanied by a sharp rise in private debt, while public debt has been kept under control (but less so in very recent years).

### 3.2 New financial intermediation channels

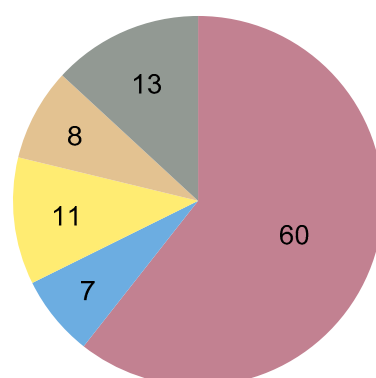
The GFC underscored the importance of innovation in the financial system, which is constantly and rapidly evolving. The increased diversification of actors and products has brought new channels for intermediating funds between borrowers and savers. Various examples include the development of housing finance, the deepening of bond markets, and the banks' move from their "traditional" originate-to-hold intermediation model towards the originate-to-distribute model (eg securitisation).

A key phenomenon has been the expansion of shadow banking entities. This category comprises all entities outside the regulated banking system that perform core banking functions and are therefore very active in providing leverage-based maturity and liquidity transformation (Kodres, 2013). This has led to an increasingly opaque and complex network of interconnected financial relationships across a wide range of institutions, markets and instruments. In turn, the interactions between the financial sphere and the real economy have become more diversified, more complex to analyze, and presumably also conducive to the taking of more financial risks by the various agents.

The financial accounts framework can be mobilised to track these entities when they can be identified and analysed within the "Other Financial Institutions" (SNA 2008 #17.227,9). Since the GFC, the provision of more detailed subsectors within the financial sector has been instrumental in facilitating the identification of these shadow banks and assessing their importance relative to "traditional" banking intermediation channels. In particular, very important subsectors have emerged such as investment funds (eg equity, fixed income), broker dealers, structured finance vehicles, finance companies and money market funds (FSB, 2011a). The FSB has identified five main types of economic functions performed by shadow banks (Chart 3). Based on this metric, shadow banking is estimated to represent around 55 to 60% of GDP in major advanced and emerging economies, and about 10% of all financial assets (compared to about 50% for "traditional" banks").

In practice, however, this identification may still be challenging – cf for instance the difficulties to capture hedge funds with the existing SNA framework, or the role played by affiliates in offshore entities (see below) – and does differ across countries. Substantial work is therefore under way to address this issue and in particular to better capture shadow banking in the SNA, especially by the OECD with the support of the FSB / BIS in the context of the DGI (OECD (2016)).





Economic Function	Definition	Typical entity types
EF1	Management of collective investment vehicles with features that make them susceptible to runs	Fixed income funds, mixed funds, credit hedge funds, real estate funds
EF2	Loan provision that is dependent on short-term funding	Finance companies, leasing companies, factoring companies, consumer credit companies
EF3	Intermediation of market activities that is dependent on short-term funding or on secured funding of client assets	Broker-dealers
EF4	Facilitation of credit creation	Credit insurance companies, financial guarantors, monolines
EF5	Securitisation-based credit intermediation and funding of financial entities	Securitisation vehicles

Notes: National financial accounts data as of end-2014, 26 jurisdictions; other national sources; FSB calculations.

Source: FSB (2015).

### 3.3 Assessing global liquidity

The GFC underscored the fact that financial imbalances can occur simultaneously across countries due to the common influence of global factors. This highlights the powerful role played by “global liquidity”, a concept put forward by the BIS and that encompasses the degree of ease in financial conditions (Caruana, 2012).<sup>21</sup> It refers to the property of the system as a whole, resulting from the global interaction of private investors, financial institutions and monetary authorities, and which in turn is setting the tone in countries’ domestic credit and market liquidity conditions. A key element supporting these transmission mechanisms is the role played by

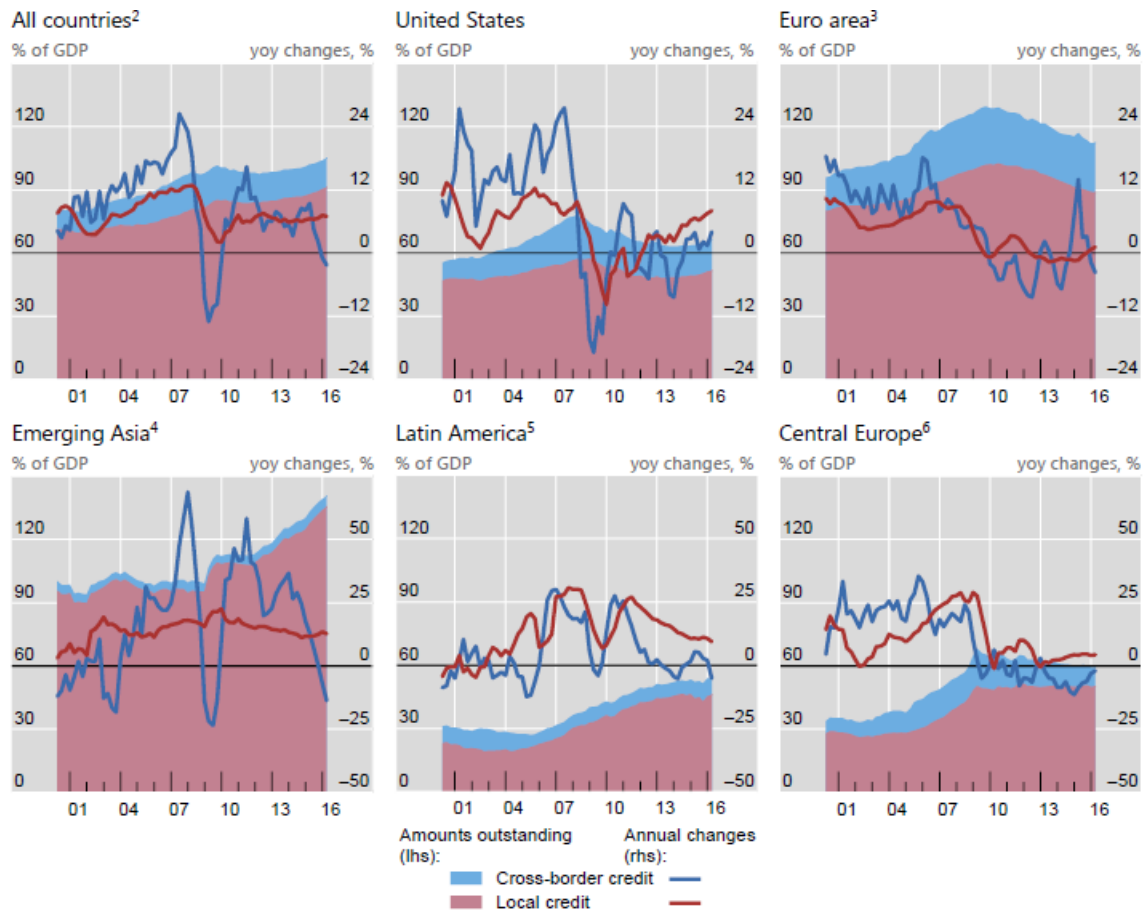
<sup>21</sup> See BIS Global Liquidity Indicators: [www.bis.org/statistics/gli.htm?m=6%7C333](http://www.bis.org/statistics/gli.htm?m=6%7C333).

international funding currencies which are increasingly used outside the issuing country's borders.

## Global liquidity indicators, by regions

Chart 4

*Global bank credit to the private non-financial sector, by residence of borrower: Banks' cross-border credit plus local credit in all currencies<sup>1</sup>*



Further information on the BIS global liquidity indicators is available at [www.bis.org/statistics/gli.htm](http://www.bis.org/statistics/gli.htm).

<sup>1</sup> Cross-border claims of LBS reporting banks to the non-bank sector plus local claims of all banks to the private non-financial sector. Weighted averages of the economies listed, based on four-quarter moving sums of GDP. <sup>2</sup> Australia, Canada, Denmark, Japan, New Zealand, Norway, Russia, Saudi Arabia, South Africa, Sweden, Switzerland, Turkey and the United Kingdom, plus the countries in the other panels. <sup>3</sup> Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal and Spain. <sup>4</sup> China, Hong Kong SAR, India, Indonesia, Korea, Malaysia, Singapore and Thailand. <sup>5</sup> Argentina, Brazil, Chile and Mexico. <sup>6</sup> The Czech Republic, Hungary and Poland.

Sources: BIS credit to the non-financial sector and locational banking statistics (LBS); BIS calculations; BIS (2016).

Here again, the greater availability of data on financial positions and flows both across sectors and across countries has been instrumental in allowing the assessment of global liquidity. In particular, there is more detailed data available to identify cross-border financial flows to the non-financial sector (BIS, 2015), reflecting the evolution of both bank lending and international bond issuance (Shin, 2013). This has enabled the BIS to compute various indicators to assess the respective importance of cross-border and domestic bank credit to non-banks for various

regions (see Chart 4 for one example of these indicators). One important input for analysis is the degree to which monetary conditions in one country influence other domestic conditions via their spillover effects through foreign borrowers. A telling example is the recent estimate that banks and bond investors have increased outstanding US dollar credit to non-bank borrowers outside the United States – including affiliates of US residents – to almost \$10 trillion today, underscoring the importance of the links between US monetary policy and credit extended globally (McCauley et al (2015)).

#### 4. Integrating micro data: new opportunities for improving financial accounts?

In parallel to the renewed policy interest for developing financial accounts, the GFC underscored the importance of micro information. It showed that financial stress experienced at the level of individual entities, transactions or instruments can quickly reverberate into the entire financial system.

The shortcomings of analysis based solely on macro-level data have now been recognised, and statisticians are looking into ways to better incorporate micro data to support research, economic analysis and policy making. The need, as summarised by Borio (2013), is to have *“good information about the system as a whole and the individual institutions within it – that is, we need to see the forest as well as the trees within it”*. Obviously, rapid improvements in technology (the “big data revolution”) also facilitate the taking into consideration of very granular information by macro statisticians, economists and policy makers.

Indeed, the various recommendations of the G-20 DGI have, to a varying extent, a micro and macro aspects, and the second phase explicitly recognises the particular importance of collecting more granular data so as to *“help straddle the divide between micro and macro analysis”*. Yet statisticians are still in an intermediate phase. While the diagnosis is now widely shared, what remains unclear is how to develop new statistical frameworks that can adequately combine micro- and macro-level information (IFC, 2016). This integration task has proved more complex than initially thought. It remains hindered by the limited availability of reliable and timely statistical data in some domains, particularly at the international level. Moreover, imperfect statistical harmonisation is challenging the collection of comparable, entity-by-entity data among financial institutions, not least across jurisdictions. These are obvious difficulties, and it will take time to address them.

Nevertheless, the new data collection exercises undertaken in response to the GFC have highlighted several important contributions of micro data – that is, data that is granular enough to capture the situation of one economic agent within a given institutional sector (one household, one firm etc.). As regards financial accounts more specifically, micro data can provide three main benefits: they can help to improve macro statistics; they can complement them by providing other type of information; and they can offer a new way of looking at economic phenomena (Tissot, 2016a).

## 4.1 Micro data to improve macro statistics

There is a growing recognition of the benefits of collecting micro data as a way to improve the direct collection of statistics and support the development of integrated sectoral financial accounts. These accounts require a wealth of information that can be derived from granular “administrative” datasets, which typically include databases maintained by financial institutions or by public authorities, including public credit registries of individual loans data, security-by-security databases, central balance sheet databases, etc.<sup>22</sup> An important feature of these datasets is that they have a large sample size and relatively high quality information, being used for other purposes than “just” statistics. Moreover, the information can be mobilised in a flexible way so as to compute a wide range of different indicators, even more so when they can be combined to other datasets through a common identifier (Cadete de Matos, 2014). Furthermore, these data sources have generally a good coverage of the relevant economic agents and may have a relatively low compilation cost for statisticians, for instance when their collection is the by-product of an administrative operation (eg inscription to a public register).

But a key challenge is to integrate in a structured, consistent way all the various data available at granular level into a comprehensive macro framework. Financial transactions are usually not registered in line with the SNA standards because they were not initially thought to be part of this framework: concepts (eg risk indicators), reporting entities (for instance within consolidated financial groups), valuations (eg accounting treatments) etc. do not automatically coincide. A second, and related, challenge is the fact that financial data come from heterogeneous sources: for instance information on debt instruments can be derived from a security-by-security database, while other information can come from credit registers, regulatory authorities, etc.; this heterogeneity can undermine international comparisons. Micro data’s inherent complexity can also lead to sizeable delays in the production of the statistics, as they require substantial investment costs (eg IT, algorithmic methods, human resources, skill mix) and can raise important quality issues. Indeed, a number of countries have experienced significant difficulties as they embarked on the collection of, for instance, large-scale exhaustive security-by-security databases. A third challenge is the lack of data. In particular, financial information on households and non-financial corporates can be scarce, esp. when declined by instruments. Yet a last issue is related to legal and confidentiality aspects. Data at the level of individual institutional units can be very sensitive and are usually protected by stringent rules. So far, this has been a key obstacle for the sharing of micro data among statisticians esp. those in charge of compiling financial accounts (IFC (2015a)). Important efforts are ongoing to address these issues by revisiting the implementation of confidentiality rules and using anonymisation/cryptographic techniques.

For sure, micro is not necessarily a synonym of completeness. There are alternative ways to enhance macro statistics without necessarily relying on the collection of a huge amount of exhaustive and granular information. For instance, one can limit the collection of micro data to a selected group of units and

<sup>22</sup> Cf the “administrative records revolution” (Guiso (2015)), with the possibility of a “new age” of combining various, large administrative records, as well as Bean (2015).

instruments, “extrapolated” to the wider economy by using sampling techniques. Surveys are interesting in this context because they can be less costly to collect – compared to setting an exhaustive micro-data collection exercise – and can nevertheless be useful for distributional analysis, as seen below. They may also provide information that is difficult to find elsewhere, such as time use information, self-report assessments, and subjective expectations (Bover, 2015). But they have also a number of drawbacks, especially in terms of timeliness, comprehensiveness, updating (being typically not conducted every year, and the data collected may vary from one survey to another) and accuracy.<sup>23</sup> Moreover, survey data tend to provide information that is not fully consistent with SNA aggregates due to the concepts, definitions and statistical practices employed; accordingly, surveys may not be consistent among themselves, a good example being the consumption and wealth surveys which can have different household samples.

Nevertheless, a number of initiatives have tried to enhance this integration and ensure that the granular data collected are consistent or “matched” with the macro framework (La Cava (2015)). Statistical matching can facilitate the consistency of the granular information collected (with the national accounts-based framework, over time, and internationally), its complementarity (allowing both “top-down” and “bottom-up” types of analysis) and its adaptability. Other avenues can be explored too. One is to link survey data and administrative datasets, for instance credit registers and loan application surveys (Jiménez et al (2014)). Attention has also focused on developing panel databases derived from administrative data sets or diaries, with the same households sampled over time (instead of cross-sectional surveys with different households sampled for each period). The objective is to build longitudinal panel data sets that are sufficiently rich at the micro level, available in a timely manner, and regularly updated over time.

## 4.2 Micro data to complement SNA-type information

The GFC showed that relying on aggregated data provided by the “traditional” SNA framework is not enough. For assessing financial stability fragilities at a macro level, it is often essential to understand what lies behind aggregated numbers and dig into the data in a granular way (Cadete de Matos (2015)). For instance, a country-wide indicator can reflect the homogeneous situation of a group of economic agents or, in contrary, the combination of idiosyncratic positions. Non-linearity effects mean that, on average, the implication of an aggregate number will differ from the picture that one can derive from the sum of individual situations.

### *“Pure” micro information*

Micro data can bring this kind of more granular information that is needed. A first avenue is obviously to collect “pure” micro information that is relevant from a macro perspective. Fragilities can arise at the level of specific institutions (eg Lehman Brothers) or financial market segments or instruments (eg US subprime mortgages) that will have implications for the financial system as a whole. Such micro-level information can have a systemic importance but be masked by “traditional” macro,

<sup>23</sup> For instance surveys can suffer from bias, measurement errors, and representativeness problems (Meyer et al (2015)).

aggregated indicators. This raises a particular challenge for financial stability purposes, since fragilities may differ significantly across economic agents both at a point in time as well as over time. From this perspective, aggregated information can prove meaningless and even sometimes misleading if it masks needed information.

Obviously, national financial supervisors are the first in line to require access to institution-level information to monitor systemic risk in their own jurisdictions. At the international level, the collection of micro data for global systemic institutions has been promoted by the FSB and is being conducted with the operational support of the International Data Hub (IDH) set up by the BIS in the context of the DGI-I recommendations #8 and #9 (see FSB (2011b) for the initial overview of this project). By nature, the focus has been on consolidated financial institutions, ie the headquarters and their affiliates, irrespective of the location (residency) of these affiliates. Because of their sheer confidentiality, the data to be collected have to be closely monitored by the senior authorities supervising the major financial centres, who are responsible for deciding whether to share institution-level information deemed relevant for the stability of the global financial system. Strict procedures have to be set up to ensure the accuracy, confidentiality, completeness and timeliness of these statistics, which can have a very important market value.

Data have started to be collected for a subset of the global systemically important banks (G-SIBs) that have been deemed of “systemic importance” by the FSB and the BCBS (BCBS, 2013).<sup>24</sup> The data encompass a variety of micro indicators – based on banks’ assets (exposures), liabilities (funding) and off-balance sheet figures (contingent positions) – aiming at assessing interlinkages among the institutions surveyed as well as with their key counterparties (“network effects”) and the concentration of these institutions in specific sectors and markets (“size effects”).

In terms of analytics, the value of these micro data will depend on circumstances, eg the need for a specific monitoring of a single institution or of the exposures of a number of them to a given counterparty or risk factor, etc. Making sense of the data and presenting them in a synthetic way is therefore quite challenging: it requires developing ad hoc analytical tools and metrics to capture “micro specific” situations that are of system-wide relevance. The purpose is not to simply consolidate the micro data collected and analyse the aggregated situation of all G-SIBs taken together; it is rather to filter the (large) amount of data available and extract the specific information deemed important for macro financial stability analyses at a specific point in time.

### *Distribution information*

Another, more intermediate approach, is to compute distribution information. Instead of collecting detailed, institution-by-institution data (which may not be very easy from an operational perspective...), the purpose is to have indicators on how average macro indicators reflect the particular “micro” situation of individual

<sup>24</sup> Updated details on the BCBS assessment of the systemic importance of global banks using indicator-based measurements (including the list of the related institutions) can be found on <http://www.bis.org/bcbs/gsib/index.htm>.

entities; attention will thus focus on the distribution of these indicators for the group of economic agents being considered.<sup>25</sup>

An important area of focus relates to disparities between various groups of households, especially in the context of the growing interest for revenue and wealth inequality in the aftermath of the GFC (Domanski et al (2016)). Another example is when household debt is low on average but concentrated on a very specific type of borrowers (cf the US subprime market at the time of the GFC). Yet distribution issues may also be very relevant for non-households: for instance, it can be useful for supervisory purposes to assess the relative importance of the subgroup of banks that have a very low capital ratio – compared to the average measured for the banking sector as a whole – and that are thus more vulnerable to episodes of financial stress.<sup>26</sup> More generally, macroeconomic averages can hide important patterns that may be usefully analysed in a more disaggregated way. For instance, the evolution of financial positions and flows are partly driven by income expectations (eg rates of return) that can significantly differ across the various types of economic agents (or financial assets); looking at sectorally-aggregated flow of funds data (*what has happened?*) may thus well limit the understanding of the factors driving the financial transactions (*why it has happened?*).<sup>27</sup>

“Traditional” macro indicators usually provide little information on how general aggregates are distributed. They have three main characteristics: a country of residence (US), a point in time (2014), and a specific indicator value (average capital ratio of banks). The objective is therefore to add a fourth dimension (eg by providing ranges or quartile information) to assess the distribution of the indicator. The aim is to be able to explore the heterogeneity hidden behind aggregate numbers and in particular to analyse the tails of distributions.

A number of recommendations of the DGI-I have indeed been focusing on the development of distribution information. A case in point was the general recommendation (DGI-I #16) for *“statistical experts to seek to compile distributional information alongside aggregate figures, wherever this is relevant... [and in particular]... to link national accounts data with distributional information”*. The new, second phase of the DGI is focusing more specifically on income, consumption, saving, and wealth, for the household sector (DGI-II #9). Work on distribution information is also required in other areas, in particular to ensure the regular collection of concentration and distribution measures for financial soundness indicators (FSIs; see International Monetary Fund (2006)). The objective is to complement the overall assessment of financial sector risks (based on aggregate measures) by adding information on the risks posed by institutions that can cause system-wide disturbances (DGI-II #3).

<sup>25</sup> For sure, such distribution information can be easily computed if one has access to granular information that can be aggregated in some form. However, one can also compute distribution information by drawing on coarser indicators (eg partial surveys) – hence the interest to distinguish between these two levels of information (ie distribution information versus micro, unit-level data) as discussed here.

<sup>26</sup> For an example of the regular monitoring of G-SIBs data, see BCBS (2015).

<sup>27</sup> For a recent discussion on the need for new tools to detect (unknown) patterns that may not be apparent at higher levels of aggregation in published data, see Florczak et al (2016).

This work is clearly important for policy purposes as it provides information that is not easily captured by standard financial accounts. Distributional data have for long been a useful input to help to better calibrate policies. For instance, the allocation of debt and wealth among households can affect the monetary transmission mechanism.<sup>28</sup> Moreover, the need for distribution information is likely to become even more pressing in the post-crisis period. Cases in point are monetary policy issues related to the impact of the newly-developed unconventional tools as well as the effects of low interest rates on the distribution of wealth and income. Another growing area of interest is related to the new impetus given to financial stability analyses and policies. The way assets and incomes are distributed in a population is a key element to consider when assessing the “macro” impact of a financial shock (eg house price correction, increase in interest rates). And the increased use of macroprudential tools, which are often targeted at specific groups of economic agents (eg “speculative” investors), markets/sectors (eg housing) and/or instruments (eg mortgages), will in itself call for more distribution information.

Obviously, some kind of access to institution-level data is instrumental to facilitate the production of distribution information, which can be easily derived from granular data obtained through surveys, administrative databases, or even web-based indicators (“big data”; see IFC (2015b)). The task, however, is not straightforward, as it requires a good understanding of the links between the “macro” world (often SNA-based) and “micro”, granular databases. One challenge relates to the type of data that can be mobilised in these integration exercises, as they may not be consistent between the micro and the macro levels. Another is that the distribution of the variable of interest may be quite different even for relatively comparable indicators. For instance, low-income households are often characterised by a relatively high home ownership rate, so that they differ from the group of low-housing wealth households, as argued by La Cava (2015). As a result household wealth distribution may diverge from their income distribution. The bottom line is that distribution information is a new data dimension that makes data analysis richer... but also more complex.

### 4.3 Micro data can move the knowledge frontier

Micro data offers new possibility in economic thinking. The access to granular information provides perspectives for aggregating data in different ways and thereby to analyse economic issues from another, possibly radically different angle. A case in point relates to analyses focusing on the global financial system as a whole (Heath (2015)), which cannot be solely analysed through aggregated, country-based statistics. Indeed, the GFC showed the importance of collecting information on global, group-level balance sheets for properly assessing firms’ economic behaviour and their potential financial stresses. A growing part of corporates’ domestic activities is now governed by parent companies located abroad, rather than by the (resident) reporting institutional units. Symmetrically, residents’ actions are increasingly influencing the actions of other “controlled” agents located in other sectors and/or countries.

<sup>28</sup> For an analysis of how the understanding of the impact of monetary policy requires an appreciation of heterogeneity across households, see for instance Sufi (2015).



Given that the controlling and controlled units forming a corporate group usually belong to different economies and different sectors, the aggregation of group-level information cannot be consistent with the traditional *residency-based* SNA framework. This framework records assets and liabilities of the economic units that are resident in a specific economic territory, information that is progressively losing its relevance with globalisation (UNECE (2011)). What is needed is to capture the claims and liabilities of groups' affiliates that can have an important impact at the level of the parent company, since it is accountable for the business of all the entities under its control and is ultimately bearing the related risks. That requires consolidated group-level, risk-based data, an approach which is often described as "*nationality-based*": the information of the various institutional units belonging to a group characterised by a specific "nationality" has to be collected and consolidated independently of the residency of each of these units (IAG, 2015).

In order to construct such nationality-based statistics, one needs to access granular, institution-level data. A number of data sets have been developed along these lines, especially at the BIS for banking (McGuire and Wooldridge (2005)), securities (Gruić and Wooldridge (2015)) and derivatives (Tissot (2015)) statistics. Certainly, the computation of such datasets is posing significant challenges.

One issue is comparability. A particular effort has been made to coordinate banks' compliance with reporting guidelines so as to achieve international comparability. But accounting standards continue to differ across regions; while some convergence is being called for by the international community, the concrete application of these standards in each domestic jurisdiction is often judgement-based and may still leave substantial room for differences across countries. A second issue is how to collect consistent group-level information when the group is made of various entities located in different countries, acting in different sectors, and using various legal structures. This puts a premium on developing some kind of identifier to avoid double counting – a challenge that is common to all global data collections involving institution-level data. A key requirement is to identify, in all the micro data collected, each institution precisely and the aggregation rules to be applied.

Fortunately, the international community is developing tools to facilitate such exercises. In particular the recently introduced Legal Entity Identifier (LEI) code will help to uniquely identify legally distinct entities that engage in financial transactions; in addition, work is ongoing to develop principles and standards for aggregating this information at the level of ultimate parents of legal entities.<sup>29</sup> Furthermore, additional progress is under way regarding the standardisation of reporting financial operations – including the definition of a unique transaction identifier (UTI) and unique product identifier (UPI). This will further facilitate the ability to share granular data and combine them in new, still unpredictable ways.

The bottom line is that micro data are a prerequisite and trigger for new types of economic analysis. By getting rid of "traditional" country boundaries, nationality-based consolidated data facilitate the understanding of who makes underlying economic decisions, who takes on the final risk and who needs to hold sufficient buffers to cover global potential losses (Tissot (2016b)). This, in turn, is moving the knowledge frontier. By allowing the identification of the ultimately responsible unit,

<sup>29</sup> See <https://www.leiroc.org/>, and in particular LEI ROC (2016).

one can analyse the ways in which economic decisions are made and, in times of stress, which area is ultimately impacted. Such information is crucial for fiscal, monetary and prudential authorities alike (Cecchetti et al (2011)). It can be mobilised to enhance the stability of the financial system at the macro level. For example, it facilitates the monitoring of the borrowing activities of global groups outside their resident markets through their offshore affiliates. It can also help identifying spillover effects from national policies to other areas.

## 5. Conclusion

The development of financial sectoral accounts has, rightly, become a top policy priority at the global level. Several steps have been taken in recent years to refine the initial national accounts framework and present additional and more detailed information on financial flows and positions.

Already, this information is proving particularly useful for supporting financial stability analyses, such as the assessment of deleveraging across countries and sectors in the aftermath of the Great Financial Crisis, the spillover of domestic conditions to the global financial system, and the assessment of the shadow banking sector. All this work has benefited from the progress achieved in compiling financial accounts in recent years.

Yet there is still further work to do. A key aspect is to take advantage of the “micro data revolution” that is currently underway. The collection of granular data can help to have better macro statistics. It can complement the SNA-based, macro approaches especially to assess the systemic risks posed by individual institutions, financial instruments and markets. And perhaps more importantly, it can allow new types of economic analyses.

Looking beyond the area of national accounts, international statistical initiatives have underlined five key benefits of micro data for financial stability analysis – ie access to needed entity-level information, distribution information, better macro statistics, better policy making, and improved economic knowledge (Table 3).

The role of micro data in international statistical initiatives to address financial stability issues

Table 3

Area	Initiatives <sup>(1)</sup>	Access to granular data	Information on distribution (4 <sup>th</sup> dimension)	Enhanced macro statistics	Policy assessment	Knowledge frontier
Quality of statistics	II-1			✓		
FSI indicators	II-2, 3 (I-2, 3)		✓		✓	
G-SIFIs	II-4 (I-8, 9)	✓			✓	✓
Shadow banks	II-5 (I-4)	✓		✓	✓	✓
Derivatives	II-6 (I-5)	✓		✓	✓	✓
Securities	I-6, II-7 (I-7)	✓		✓		
Sectoral accounts	II-8 (I-15)			✓		
Distribution information	II-9 (I-16)		✓		✓	✓
International statistics (eg IIP, IBS, CPIS, CDIS, GFS, PSDS, RPPI, CPPI)	II-10, 11, 12, 13, 15, 16, 17, 18 (I-10, 11, 12,17, 18, 19)			✓		
Cross-border exposures	II-14 (I-13, 14)	✓		✓		✓
Granular identifier (eg LEI)	II-4, 5, 6, 14	✓				✓
Data sharing	II-19	✓		✓		✓
QIS exercises	Basel III, II-4, other regulatory work	✓			✓	✓

(1): I- and II- relate to, respectively, the first and second phases of the Data Gaps Initiative (DGI) endorsed by the G-20.

Source: Tissot (2016a)

## References

Allen, M, Rosenberg, C, Keller, C, Setser, B and N Roubini (2002): *A Balance Sheet Approach to Financial Crisis*, IMF Working Paper WP/02/210.

Bank for International Settlements (2015): *Enhanced data to analyse international banking*, Quarterly Review, September.

——— (2016): *Highlights of global financing flows*, in BIS Quarterly Review, September (Annexes - BIS Statistics: Charts).

Basel Committee on Banking Supervision (2013): *Global systemically important banks: updated assessment methodology and the higher loss absorbency requirement*, July.

——— (2015): *Basel III Monitoring Report*, September.

Bean, C (2015): *Independent review of UK economic statistics: interim report*, December.

Borio, C (2013): *The Great Financial Crisis: setting priorities for new statistics*, Journal of Banking Regulation. Also available as BIS Working Papers, No 408, April.

Bover, O (2015): *Measuring material conditions: income, consumption, and wealth*, discussion at the Third IMF Statistical Forum, November.

Cadete de Matos, J (2014): *Innovative solutions in compiling and disseminating financial accounts*, Banco de Portugal.

——— (2015): *The information model at Banco de Portugal – using micro-data to face central banks' challenges*, in IFC Bulletin, no 40, November.

Carnot N, Koen V and B Tissot (2011): *Economic Forecasting and Policy*, 2nd edition, Palgrave Macmillan.

Caruana, J (2012): *Assessing global liquidity from a financial stability perspective*, speech at the 48th SEACEN Governors' Conference and High-Level Seminar, Ulaanbaatar, November.

Cecchetti, S, I Fender and P McGuire (2011): *Toward a global risk map*, in European Central Bank, "Central bank statistics – what did the financial crisis change?", Proceedings of the Fifth ECB Conference on Statistics, pp 73–100. Also available as BIS Working Papers, no 309, May.

Dembiermont, C, M Drehmann and S Muksakunratana (2013): *How much does the private sector really borrow – a new database for total credit to the private non-financial sector*, BIS Quarterly Review, March, pp 65–81.

Dembiermont, C, M Scatigna, R Szemere and B Tissot (2015): *A new database on general government debt*, BIS Quarterly Review, September, pp 69–87.

Domanski, D, M Scatigna and A Zabai (2016): *Wealth inequality and monetary policy*, BIS Quarterly Review, March, pp 45–64.

European Central Bank (2007): *The introduction of quarterly sectoral accounts statistics for the euro area*, Monthly Bulletin, November.

——— (2012): *Handbook on Quarterly Financial Accounts for the Euro Area: Sources and Methods*.

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

Fassler, S, Mink, R and Shrestha, M (2012): *An Integrated Framework for Financial Positions and Flows on a From-Whom-To-Whom Basis: Concepts, Status, and Prospects*, IMF Working Paper No. WP/12/57, February.

Financial Stability Board (2011a): *Shadow banking: strengthening oversight and regulation* – recommendations of the Financial Stability Board, October.

——— (2011b): *Understanding financial linkages: a common data template for global systemically important banks*, Consultation paper, October.

——— (2015): *Global Shadow Banking Monitoring Report*.

Florczak, A, J Jabłonowski and M Kupc (2016); *In pursuit of patterns of economic behaviours using cluster and correspondence analysis*, in IFC Bulletin, no 41, May.

Gruić, B and P Wooldridge (2015): *BIS debt securities statistics: a comparison of nationality data with external debt statistics*, in IFC Bulletin, no 39, April.

Guiso, L (2015): *Using Households Microdata to Understand Households Decisions*, presentation at the Third IMF Statistical Forum, November.

Heath, R (2013): *Why are the G-20 Data Gaps Initiative and the SDDS Plus Relevant for Financial Stability Analysis?* IMF Working Paper WP/13/6.

——— (2015): *What has capital flow liberalization meant for economic and financial statistics?*, IMF Working Paper 15/88.

Heath, R and E B Goksu (2016): *G-20 Data Gaps Initiative II: Meeting the Policy Challenge*, IMF Working Paper 16/43.

Hofer, A (2005): *The International Monetary Fund's Balance Sheet Approach to Financial Crisis Prevention and Resolution*, Monetary Policy & the Economy, Oesterreichische Nationalbank, issue 1, pp 77–94.

Inter-Agency Group on Economic and Financial Statistics (2015): *Consolidation and corporate groups: an overview of methodological and practical issues*, IAG reference document, October.

International Monetary Fund (2006): *Financial Soundness Indicators: Compilation Guide*, March.

International Monetary Fund and Financial Stability Board (2009): *The Financial Crisis and Information Gaps*, Report to the G20 Finance Ministers and Central Bank Governors, October.

——— (2015): *The Financial Crisis and Information Gaps – Sixth Implementation Progress Report of the G20 Data Gaps Initiative*, September.

Irving Fisher Committee on Central Bank Statistics (2015a): *Data-Sharing: issues and good practices*; Report to the BIS Governors prepared by the Task Force on Data Sharing.

——— (2015b): *Central Banks use of and interest in big data*, IFC Report, October.

- (2016): *Combining micro and macro statistical data for financial stability analysis*, IFC Bulletin, no 41, May.
- Jiménez G, S Ongena, J-L Peydró and J Saurina (2014): *Hazardous Times for Monetary Policy: What Do Twenty-Three Million Bank Loans Say About the Effects of Monetary Policy on Credit Risk-Taking?*, *Econometrica*, Volume 82, Issue 2, pages 463–505, March.
- Kodres, L (2013): *What Is Shadow Banking?* *Finance & Development*, IMF, June, Vol. 50, No. 2.
- La Cava, G (2015): *The development of databases linking micro and macro data – an Australian perspective*, in IFC Bulletin, no 40, November.
- Lavoisier, A (1789) : *Traité élémentaire de chimie*, Paris: Chez Cuchet.
- Legal Entity Identifier Regulatory Oversight Committee (2016): *Collecting data on direct and ultimate parents of legal entities in the Global LEI System – Phase 1*, March.
- Lequiller, F. and D. Blades (2014): *Understanding National Accounts: Second Edition*, OECD Publishing.
- McCauley, R, P McGuire and V Sushko (2015): *Global dollar credit: links to US monetary policy and leverage*, BIS Working Papers, no 483, January.
- McGuire, P and P Wooldridge (2005): *The BIS consolidated banking statistics: structure, uses and recent enhancements*, BIS Quarterly Review, September, pp 73–86.
- Mathisen, J and A Pellechio (2007): *Using the balance sheet approach in surveillance: framework, data sources, and data availability*, IMF Working Paper, WP/06/100.
- Meyer B, W Mok and J Sullivan (2015): *Household Surveys in Crisis*, NBER Working Paper No. 21399, July.
- OECD (2014): *National Accounts of OECD Countries, Financial Accounts, 2006-2013*.
- (2016): *How to capture shadow banking in the system of National Accounts? A study on the delineation of shadow banking in national accounts, including a proposal for additional breakdowns*, June.
- Shin, H S (2013): *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.
- Shrestha M (2011): *Strengthening Sectoral Position and Flow Data in the Macroeconomic Accounts — A Way Forward*, in the Proceedings of the IMF-OECD Conference on Strengthening Sectoral Position and Flow Data in the Macroeconomic Accounts (<http://www.imf.org/external/np/seminars/eng/2011/sta/index.htm>).
- Sufi, A (2015): *Out of many, one? Household debt, redistribution and monetary policy during the economic slump*, BIS Andrew Crockett Memorial Lecture, June.
- Tissot, B (2014): *Development of financial sectoral accounts: progress and challenges*, International Statistical Institute Regional Statistics Conference, November.
- (2015): *Derivatives statistics: the BIS contribution*, Invited Paper Session 089, International Statistical Institute World Statistics Congress 2015.

—— (2016a): *Closing information gaps at the global level – what micro data can bring*, in IFC Bulletin, no 41, May.

—— (2016b): *Globalisation and financial stability risks: is the residency-based approach of the national accounts old-fashioned?*, BIS Working Papers no 587, October.

United Nations Economic Commission for Europe (2011): *The impact of globalization on national accounts*.