

Enhancing global financial statistics after the crisis – what is the focus?

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Abstract

The BIS has significantly enhanced its statistical offering to support monetary and financial stability analyses in the aftermath of the 2007-09 crisis. A substantial part of this work has been undertaken in the context of the Data Gaps Initiative endorsed by the G20, in close coordination with central banks and international organisations. The main steps taken aim at (i) enhancing the provision of data covering financial markets; (ii) measuring the impact of international groups, by going beyond traditional residency-based statistics; (iii) providing adequate series to monitor financial cycles and systemic risk; and (iv) collecting data to support evidence-based financial regulation.

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JEL classification: E00, E32, F30, G01, G15

1. Introduction: the Great Financial Crisis of 2007–09, a wake-up call for statisticians

Many observers will agree that data issues were not the sole, nor even a major cause of the Great Financial Crisis (GFC) of 2007–09. Yet this crisis highlighted important statistical shortcomings (Borio (2013)). Four areas were particularly obvious. The first data issue related to *leverage*. The degree to which agents had borrowed was not correctly appreciated before the crisis; this was particularly the case for banks but also for a wide range of economic agents, especially households. The second area was *financial intermediation*. Countries' statistical apparatus was not sufficient to capture the activities of all the players intervening in financial markets, as highlighted by the increased importance of 'shadow banks' that provide leverage-based maturity and liquidity transformation (FSB (2015)). The third area related to *cross-sector and -border linkages*. Such interconnections proved particularly important in propagating financial stress that originated in a specific sector and in a specific country (ie, the US mortgage industry during the GFC) to the entire globe. A fourth key data gap was related to the monitoring of the situation of individual *firms that proved 'too big to fail'* in times of financial stress.

2. Post-crisis policy response to improve global financial statistics

A key policy response after the GFC was to enhance the availability of global financial statistics. 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 proposals for strengthening data collection – see IMF and FSB (2009). This initial Data Gaps Initiative (DGI-I) endorsed by the G-20 comprised 20 recommendations focussing on three key statistical domains, ie the build-up of risks in the financial sector, international network connections, and vulnerabilities to shocks. This initial phase highlighted the limited availability of reliable and timely statistical data in various domains. To address these challenges, the international community decided to launch in 2016 the second phase of the DGI (DGI-II) to implement “*the regular collection and dissemination of comparable, timely, integrated, high quality, and standardized statistics for policy use*” (IMF and FSB (2015)). Three main areas deserved attention: the monitoring of risks in the financial sector; the assessment of interlinkages; and the adequate communication of official statistics (cf Table 1).

A key support for these global statistical initiatives was, in addition to its endorsement by the G20 economies, the underlying cooperation among various international organisations. To ensure that, the Inter-Agency Group on Economic and Financial Statistics (IAG) was tasked to coordinate and monitor

the implementation of the initiative.¹ This means that improving global financial statistics has become a key objective for all the main international bodies involved in financial stability work.

Table 1: The recommendations in the two phases of the Data Gaps Initiative

First Phase (2000-2005)	Second Phase (2016-20)
I.1: Mandate of the DGI	II.1: Mandate of the DGI
Build-up of risk in the financial sector	Monitoring risks in the financial sector
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
Cross-border financial linkages	Vulnerabilities, Interconnections, and Spillovers
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
Vulnerability of domestic economies to shocks	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
Communication of Official Statistics	Communication of Official Statistics
I.20: Principal Global indicators	
	II.19: International Data Cooperation and Communication
	II.20: Promotion of Data Sharing

3. Large expansion in BIS's international financial statistics after the GFC

BIS's statistics, in particular those on international banking, securities markets and derivatives activity, have been a unique source of information about the global financial system for many decades. They are compiled in cooperation with central banks and other national authorities and are designed to inform analysis of financial stability, international monetary spillovers and global liquidity. After the GFC, the BIS undertook a marked expansion of its statistical offering, by publishing additional data, revamping how these data are disseminated and strengthening their policy orientation (BIS (2015)).

Primus inter pares are the **international banking statistics** (IBS). In particular, the "locational" IBS dataset complements "traditional" monetary and credit aggregates by providing information on

¹ The IAG, established in 2008 to coordinate statistical issues and data gaps highlighted by the GFC and to strengthen data collection, comprises the Bank for International Settlements (BIS), the European Central Bank (ECB), Eurostat, the IMF (Chair), the Organisation for Economic Co-operation and Development (OECD), the United Nations and the World Bank.

banks' cross-border and foreign currency positions. This balance sheets information captures the positions of banking offices located in a given country, following the same residency principles as the System of National Accounts (SNA; cf European Commission et al (2009)). Internationally active banks located in almost 50 countries, including many offshore financial centres, report their outstanding claims and liabilities against counterparties residing in more than 200 countries. Numerous breakdowns have been added after the GFC, so that the new data allow to identify precisely the residence and nationality of the reporting banks, the residence and sector of their counterparties, and the instruments and currencies in which transactions take place. These statistics help to analyse the global geography of the capital flows intermediated by banks and how financial stress can propagate across sectors and borders.

Another key BIS dataset relates to **debt securities** statistics. It captures borrowing in money and bond markets, with a distinction between international and domestic issuance. International debt securities (IDS) are defined as those issued in a market other than the local market of the country where the borrower resides (Gruić and Wooldridge (2012)), and domestic debt securities (DDS) are those issued by residents in their local market, regardless of the currency in which the securities are denominated. Total debt securities (TDS) sum IDS and DDS together as all debt securities issued by residents – cf BIS et al (2015)). This information helps to analyse borrowers' exposures to, for instance, foreign exchange and rollover risks. It also provides light on the evolution of international funding sources, especially the relative contribution of bank and debt financing. In particular, the progressive shift from bank credit towards debt securities financing experienced by major emerging market economies has been described as the “second phase of global liquidity” (Shin (2013)).

A third important statistical area relates to the **derivatives** markets. They are the primary sources for assessing the size and structure of global derivatives markets and provide internationally consistent information. In particular, they shed light on who is transferring risks and on the aggregate amount of risk transferred. They also help to monitor the progress of efforts by policymakers after the GFC to reduce systemic risks in derivatives markets by shifting the clearing and trading of OTC instruments to central counterparties (CCPs) and organised exchanges.

The BIS compiles several sources on derivatives (Tissot (2015)). First, the BIS conducts regular surveys of “amounts outstanding” in over-the-counter (OTC) derivatives markets' segments – eg commodity, equity, foreign exchange, interest rate and, since the GFC, credit default swap (CDS) – and instruments. Various indicators are considered. A first is the *notional amounts outstanding*, which is the nominal value of all the deals concluded and not yet settled. But this indicator is influenced by changing structural factors and exaggerates the real amounts at risk. A second indicator is the *gross market value*, defined as the sum of the absolute values of all open contracts: this represents the maximum loss that market participants would incur if all counterparties failed to meet their contractual payments and the contracts were replaced at market prices. A third indicator is the *gross credit exposures*, calculated as gross market values minus amounts netted with the same counterparty, and across all risk categories. It provides a sense of aggregated dealers' exposures to counterparty credit risk. The BIS OTC amounts statistics are in fact split into two closely-linked datasets. One is the *Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity (amounts outstanding part)*, which is the most comprehensive source. It covers around 1,300 banks and other dealers from more than 50 jurisdictions. The second dataset is the *Semiannual survey of OTC derivatives*, whose coverage was expanded after the GFC and is reported by large dealers in 13 jurisdictions.

Second, the BIS also conduct the *Triennial Survey/turnover part* to measure turnover in derivatives transactions. Turnover is defined as the gross value of all transactions presented as daily averages. So it is a “flow” indicator, in contrast to the “positions data” provided at a point in time by the surveys on outstanding amounts. This turnover survey covers interest rate derivatives as well as all FX transactions in general – including spot transactions, and not just FX derivatives instruments.

Third, the BIS compiles statistics covering derivatives traded on organised exchanges, complementing OTC information. These statistics, derived from various market sources, cover both the turnover and the amount outstanding of derivatives instruments traded on organised exchanges. Their coverage and details have been greatly enhanced since the GFC. The data are rapidly updated every

quarter so they can be particularly useful for monitoring the international derivatives market activity. However the coverage is limited to organised exchanges and does not comprise OTC information.

4. Complementing residency-based indicators with group-level information

After the GFC, increased policy focus on the global financial system led observers to realise that a different type of information was needed, compared to the aggregated, country-based statistics that are usually available. Indeed, worldwide information has to be considered for properly assessing firms' group-level exposures and identifying sources of financial stress – in particular as today's business model of global corporates relies to an important extent on the establishment/acquisition of entities located outside the domestic area. But operations through their foreign affiliates can only be captured by the respective residency-based statistics of the 'host' countries, and not by those of the 'home' country. From this perspective, there must be a paradigm shift in the statistical community (Tissot (2016)): statisticians need to complement their analysis with nationality-based, consolidated group data. This is necessary to understand, for instance, who makes underlying economic decisions, who takes on the final risk and who needs to hold sufficient buffers to cover global potential losses.

The BIS has been at the forefront of these efforts to develop alternative statistics to capture such issues. First in line are the **IBS**, which provide information on cross-border banking positions not only on a 'locational' but on a 'consolidated' basis (BIS (2013)). The consolidated IBS capture the worldwide consolidated positions of internationally active banking groups headquartered in reporting countries, ie excluding intragroup positions and in line with to the consolidation approach followed by supervisors. A bank's foreign claims vis-à-vis a specific country comprise its "pure" cross-border claims on that country's residents but also the claims that are booked locally by the affiliates of this bank – in contrast, such locally-booked claims would not be treated as non-residents' assets in the SNA framework, although they can represent a very sizeable part of consolidated foreign banks' claims. The data are compiled in two different ways, on an immediate counterparty basis and on an ultimate risk basis – that is, taking into account the transfer of the bank's credit exposure on its immediate counterparty to another one through the use of credit risk mitigants such as derivatives and guarantees.

As regards the **IDS**, the fact that they are compiled from a granular, security-by-security database enables unique identification of all bonds issued by the specific residency of the issuer and by its nationality defined as the residency of the parent company controlling it. One can thus compare debt issuance activity from both a residency- and a nationality-based perspective. Data by nationality are useful for identifying links between borrowers in different countries and sectors – for instance, when assessing the international issuance of emerging market borrowers in advanced markets and / or offshore centres, either directly or through their controlled affiliates (Gruić and Wooldridge (2015)).

Turning to BIS **derivatives** statistics, amounts outstanding indicators are reported on a consolidated basis by all the worldwide affiliates (ie the branches and majority-owned subsidiaries) of the head offices located in the reporting countries. Operations between affiliates of the same institution are excluded from the reporting: for instance hedging operations conducted by a local branch with its parent entity, which merely reflects intra-group risk management practices, are excluded. The main exception are the OTC turnover data, reported every three years on an unconsolidated basis by the sales desks of reporting dealers so as to provide a sense of the geographical distribution of market activity.

5. Monitoring the financial cycle and systemic risk

From a financial stability perspective, a key element to consider is the role played by the financial cycle.² It is defined as a succession of long-lasting episodes of financial booms and busts, and characterised by a much wider amplitude and length compared to "traditional" business cycles. Both its upward and downward phases are highly influenced by developments in credit, asset prices and financial conditions more generally. These forces can be self-amplifying, with a feedback loop between overly optimistic perceptions of risk and value, on the one hand, and weak financing constraints, on the other hand – as a result, the financial system is displaying strong "procyclicality" (Crockett, 2000). One key factor is the

² See *Debt and the financial cycle: domestic and global*, in BIS (2014), Chapter IV.

role played by international finance: cross-border bank credit, especially in foreign currency, is often a major driver of domestic credit booms and provides the marginal source of financing in the run-up to financial crises (see eg Avdjiev, McCauley and McGuire (2012)). The increasing influence of global factors on domestic financial cycles highlights the powerful role played by “global liquidity”. This concept refers to the property of the system as a whole, resulting from the interaction of private investors, financial institutions and monetary authorities, and which can facilitate the build-up of vulnerabilities in the form of asset price inflation, leverage, or maturity or funding mismatches (Caruana (2012)). A key element supporting these mechanisms is the role played by international funding currencies, which are increasingly used outside the issuing country's borders (McCauley et al, 2015).

A significant and increasing number of BIS indicators have been constructed to shed light on these various mechanisms. They draw on national data but incorporate estimations by BIS economists and statisticians to construct specific measures – eg aggregate credit, global liquidity indicators, debt service ratios, asset prices, effective exchange rates. In addition, the focus is on long-term series, which are better suited for the analysis of the long financial cycles. Since such information is not easily available across countries, the BIS has therefore expanded its publication of long series, drawing on data provided by its member central banks and applying ad hoc statistical techniques and assumptions.

To identify financial cycles, a first area is to focus on medium-term fluctuations in property prices and credit. As regards **property prices**, they play an important role in influencing trends in aggregate demand and financial positions, with implications for both macroeconomic and financial stability. The BIS has developed since the GFC a detailed residential property price data set covering a large number of countries in the world. More recently, the BIS has also started under the aegis of the DGI to disseminate commercial property prices. As regards **credit**, the BIS publishes quarterly statistics on the borrowing of the government sector and the private non-financial sector in more than 40 economies. “Total credit” comprises financing from all sources, including domestic banks, other domestic financial corporations, non-financial corporations and non-residents. The financial instruments cover (i) currency and deposits, (ii) loans and (iii) debt securities – the sum of these three instruments being defined as “core debt”, which generally represents the bulk of total debt (Dembiermont et al (2015)).

Trends in these credit series, relative to GDP, can facilitate the monitoring of financial developments and the detection of episodes of financial cycles. From a policy perspective, in particular, an excessive level of credit has been found to be a reliable early warning indicator of episodes of stress. Of course, quantifying what “excessive credit” means is not easy. One approach followed by the BIS is to construct **credit-to-GDP gap** series. They help the identification of the rapid build-up in the provision of credit to domestic agents. They also play a prominent role within the Basel III framework, by providing guidance to banking supervisors on the use of the countercyclical capital buffer introduced in 2010 to strengthen banks’ defences against the build-up of systemic vulnerabilities.³

Other useful indicators in this context are **debt service ratios** (DSRs) compiled for the private non-financial sector. The DSR reflects the share of income used to service debt, given interest rates, principal repayments and loan maturities. By providing a comprehensive assessment of credit burdens, it helps to understand the interactions between financial conditions and demand and has proven to be an informative early warning indicator for systemic banking crises (Drehmann et al (2015)).

Credit is also a key component of the **Global Liquidity Indicators** (GLIs) of the BIS. The GLIs are constructed by mixing various statistics, in particular on bank and debt financing. Of particular interest is the international component of credit, ie cross-border lending to non-residents or lending to residents in foreign currency. Although this international component is often small relative to total credit, its swings can amplify domestic trends and appear correlated with financial booms and busts.

Another important element when gauging the impact of financial conditions relate to the exchange rates. The BIS has a long tradition of computing **effective exchange rate** indices for a large number of countries. These indices are expressed on a trade-weighted basis both in nominal and in real terms (ie

³ BIS credit-to-GDP gaps may differ from those considered by national authorities as part of their countercyclical capital buffer decisions (these will also apply judgment in the setting of the supervisory buffers and may use different data series).

adjusted for changes in relative prices). More recently, the BIS has complemented this approach by looking at the impact of exchange rates movements vis-à-vis funding currencies. The BIS “**debt-weighted**” **exchange rates** (DWERs) take into consideration foreign currency-denominated total debt irrespective the residence of lenders (ie excluding external debt denominated in the local currency of the borrowing country but including local debt expressed in foreign currencies). The indices are constructed by considering the bilateral exchange rates against each of the major global funding currencies weighted by their shares in the country's foreign currency debt. These calculations draw heavily on the BIS banking and securities statistics. An important conclusion is that exchange rate movements can have an impact through both a trade and financial channels, often with opposite effects: a depreciation will typically support exports and domestic output, but in contrast it can lead to a tightening in domestic financial conditions when domestic agents have foreign currency liabilities. Using trade-weighted exchange rates and the newly constructed DWERs can help to distinguish these effects (Berger (2016)).

6. Data to support evidence-based financial regulation policies

A major lesson of the GFC was the importance to collect institution-level data from a financial stability perspective. Certainly, such data had been already collected for many years before, as they are indispensable for the supervisory task of micro prudential authorities. The GFC highlighted three key data needs from this perspective.

The first has been the development of policy tools that need to be applied at a granular level. An obvious example is the growing variety of macroprudential measures adopted, focussing on specific instruments, creditor sectors and borrowers. Another relates to monetary policy: the assessment of credit risk is instrumental in determining the quality and conditions of assets used as collateral in monetary operations, and which have been in increasing demand with the new quantitative easing policies.

Second, the GFC highlighted the need for supervising large financial firms at the international level. In particular, an ambitious collection and sharing exercise related to global systemic institutions has been promoted by the FSB and is being conducted with the operational support of the International Data Hub (IDH) set by the BIS (see FSB (2011)). Hub data are shared among national supervisors and macroprudential authorities of the jurisdictions participating in the exercise, and a number of IFIs are also progressively receiving special information derived from it. Actual data have started to be collected for a subset of the global systemically important banks (G-SIBs) that have been characterised as of “systemic importance” (BCCS (2013)). Data collected encompass a variety of micro indicators – based on banks’ assets (exposures), liabilities (funding) and off-balance 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”). The set-up of the Hub was organised along three phases. Phase I, started in 2013, involved the collection of simple I-I (“Institution-to-Institution”) bilateral data to measure the G-SIBs’ exposures to their major counterparts. It also comprised I-A (“Institution-to-Aggregate”) data to assess the concentration of G-SIBs to specific sectors and markets. These latter I-A data are in fact the institution-level data underlying the consolidated IBS of the BIS. The data collected by the IDH have thus progressively become more detailed in parallel with the post-GFC enhancements to the IBS. Phase II, launched in 2014, focused on I-I liabilities, ie information on the largest funding providers of a G-SIB, as well as on its funding structure. After the start of the implementation of Phase III in 2015, additional I-A information will be provided as from 2017 for the consolidated balance sheet of each G-SIBs, with detailed breakdowns by counterparty country, sector, instrument, currency and maturity.

A third area relates to the activities of international standard-setting bodies, especially those hosted by the BIS. Almost all new regulatory initiatives are now supported by some kind of granular data collections. Quantitative impact studies (QIS) have now become a central element of these new indicator-based frameworks developed to, among other tasks, draw the lessons of previous policies, assess the ex-ante impact of new measures, identify additional areas of weakness, and clarify the functioning of regulation by measuring feedback effects, behavioural responses and unintended consequences. Moreover, they facilitate the assessment of the cross-impact of the various regulatory requirements introduced in parallel. The BCBS has been leading ahead in this evolution, and has

developed in recent years a large number of regular monitoring reports on various items such as capital regulation, liquidity rules, the selection and measurement of G-SIBs (BCBS (2017)). Other Basel-based groups are also increasingly participating in this new way of steering and implementing policy.

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