

Data needs and statistics compilation for macroprudential analysis

Overview of the workshop

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Introduction

Macroprudential policy: new data needs after the Great Financial Crisis

The Great Financial Crisis (GFC) of 2007–09 showed that a **system-wide perspective** is needed to properly assess financial stability risks that would otherwise remain buried in institution-level metrics.² This lesson reflects two major characteristics of the financial system. One is its procyclicality: fragilities had increased largely unnoticed over a long period of time before the GFC, as rising leverage sustained valuations. The ensuing financial bust was precipitated by a general deleveraging and sharp corrections in asset prices. The second characteristic is the “cross-sectional” dimension of systemic risk. In particular, interlinkages between institutions played a key role in triggering the GFC, as disruptions from major counterparties hit entities with seemingly sound financial positions.

The implication, as clearly recognised in the aftermath of the GFC, is that a specific set of policy actions are needed to address systemic risk. So-called macroprudential tools have thus become an important element of the toolkit in supporting financial stability. They complement more “traditional” policy tools, such as those used for microprudential supervision, monetary policy, liquidity provision etc. Comprehensive **macroprudential policy frameworks** now set clear objectives, such as strengthening the financial system against shocks, dampening the financial cycle, and identify the relevant instruments.³

Data issues have, however, substantially hindered the operationalisation of these frameworks. For instance, the construction of useful systemic risk indicators requires

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² See J Caruana, “Macroprudential policy: what we have learned and where we are going”, Keynote speech at the Second Financial Stability Conference of the International Journal of Central Banking, Bank of Spain, Madrid, 17 June 2010.

³ See CGFS, “Macroprudential instruments and frameworks: a stocktaking of issues and experiences”, *CGFS Papers*, no 38, 2010.

a large amount of granular information on the financial system, in order to cover its various segments, participants and instruments. Unfortunately, existing statistical sources have shown important limitations in terms of data availability, quality and timeliness, thereby limiting their usefulness. The development of new macroprudential frameworks has thus been accompanied by major efforts to design and collect new data sets. Cases in point have been the actions undertaken in the context of the G20 Data Gaps Initiative (DGI), with close coordination among the various international bodies associated in the Inter-Agency Group on Economic and Financial Statistics (IAG).⁴ These international efforts to close data gaps have accompanied various domestic initiatives; for instance, several national authorities have taken steps to set up useful indicators of procyclicality in the financial system, monitor vulnerabilities at the firm- and household-level, and measure interconnectedness among participants in the financial system.

The workshop: stocktaking after 10 years of data collection

A decade after the GFC, authorities are showing an increasing interest in taking stock of the various post-crisis data collection initiatives. This is particularly true for central banks, which have witnessed a **huge increase in the statistics** they collect. They have also been at the forefront of efforts to ensure greater consistency between new micro-level data sets and more traditional aggregates,⁵ adapt data frameworks to the rapidly evolving financial system,⁶ and exploit granular firm-level data sets for financial stability work.⁷

Three reasons underscore the **importance of taking stock** of the recent data initiatives undertaken to support macroprudential frameworks. First, several projects have come to fruition, and many new data sets are now available for analysis. Second, the process has revealed new data gaps, prompting additional waves of data collection. Finally, the various initiatives have been truly multidisciplinary, involving statistical, economic, monetary and financial stability departments. All this calls for a comprehensive and holistic review.

Against this backdrop, a workshop in Brussels was co-organised by the Irving Fisher Committee on Central Banks Statistics (IFC) with the National Bank of Belgium (NBB) in May 2017. The aim was to share views on strategies, successes and challenges in data collection for macroprudential analysis, revisiting the earlier stocktaking exercises undertaken just after the GFC.⁸ Almost 100 participants from 38 jurisdictions took part, coming from various institutions and backgrounds. As argued by Claudia Buch, IFC Chair and Vice President of Deutsche Bundesbank, in her keynote remarks, this was a timely opportunity to evaluate the post-crisis financial sector reform agenda, and the contribution of statistics collected in the context of the DGI. Three

⁴ See FSB-IMF, "The financial crisis and information gaps", 2009, for the first phase of the DGI; and IMF and FSB, "The financial crisis and information gaps – sixth implementation progress report of the G20 Data Gaps Initiative", 2015, for its second phase (2016–20).

⁵ See IFC, "Combining micro and macro statistical data for financial stability analysis", *IFC Bulletin*, no 41, May 2016.

⁶ See IFC, "Statistical implications of the new financial landscape", *IFC Bulletin*, no 43, March 2017.

⁷ See IFC, "Uses of central balance sheet data offices' information", *IFC Bulletin*, no 45, October 2017.

⁸ For similar discussions at an early stage of the process, see IFC, "Initiatives to address data gaps revealed by the financial crisis", *IFC Bulletin*, no 34, December 2011.

aspects seem crucial. First, the success of the evaluation of financial sector reforms post-implementation will depend on the availability of granular data. Second, assessing risks in the shadow banking sector will call for more intensive use of existing data infrastructure, and the simultaneous development of adequate analytical tools – especially to strengthen the understanding of transmission channels. Third, evaluating shock propagation across borders requires timely entity-level data, putting a premium on accessing and sharing sufficiently granular information and on using common identifiers to link different micro data sets.

The meeting comprised four parts. The first part discussed the implications for statistics of the new macroprudential frameworks. The second part focused on areas where substantial data gaps still constrain macroprudential analyses: namely, the measurement of prices in the real estate sector, the assessment of household vulnerabilities, shadow banking and, more generally, the new patterns of financial intermediation that have emerged post-crisis. The third part was devoted to derivatives markets, with a focus on making use of the new data collected by trade repositories (TRs). The last part dealt with the increasing use of granular, loan-by-loan data sets for macroprudential analysis. The workshop closed with a policy panel discussion, chaired by Marcia De Wachter (NBB), which presented a useful opportunity to review the policy usefulness of the data collected since the GFC.

Key takeaways

The various experiences presented at the workshop highlighted a number of important messages for central bank statisticians:

- Many authorities have **successfully managed to adapt in-house data sets** for new macroprudential purposes. For instance, existing statistics designed to fulfil a specific function have been successfully used to assess certain financial stability risks. Examples include work with credit registers, monetary statistics, financial institutions' supervisory records, or household finance surveys. However, the repurposing of these data sets did require substantial methodological work.
- The data collection exercises launched after the GFC have helped to **close several data gaps**, especially in the areas of shadow banking and large institutions. Particularly in the context of the DGI, globally harmonised information has been made available on non-bank entities involved in financial intermediation⁹ and on systemically important institutions.¹⁰ Moreover, many of these new data sets are highly granular, and can thus shed useful light on the distribution of risks within the financial system.
- **Important data needs remain** despite these efforts. Cases in point are real estate markets, especially as regards information on commercial property

⁹ See the results of the last annual FSB survey on shadow banking in FSB, *Global Shadow Banking Monitoring Report 2016*, May 2017.

¹⁰ See E Bese Goksu and B Tissot, "Monitoring systemic institutions for the analysis of micro-macro linkages and network effects", International Statistical Institute 61st World Statistics Congress, July 2017; and Senior Supervisors Group, "Senior Supervisors Group progress report on counterparty data", January 2014.

prices,¹¹ and derivatives markets, for which there is a clear need to make a better use of the various information collected on derivatives contracts and reported to TRs. Perhaps more importantly, given the growing impact of economic and financial globalisation, the monitoring of global corporations remains challenging: their activities straddle (reporting) borders and are difficult to capture with current residency-based statistical frameworks.¹² There is in particular a clear need to improve the measurement and understanding of cross-border financial and non-financial linkages.

- There is rising demand for **empirical analysis using granular data** to support financial stability work. For instance, understanding how shocks propagate themselves within the financial system may require entity-level information on interlinkages and spillover effects – domestically and even more so internationally. Effective use of such granular data depends on two key requirements. One is well established data-sharing frameworks, both within and between countries,¹³ supported by adequate data dissemination standards.¹⁴ The other is the broader use of global identifiers, such as the Legal Entity Identifier (LEI):¹⁵ this is a clear requirement if granular data sets are to be matched across different sources, so that useful financial stability analyses can be developed.
- A key policy issue is that all these data gaps still significantly hinder the **effective assessment of the impact of the post-crisis reforms**.
- Analysing the new statistics collected since the GFC has raised **a number of important challenges**. A major one is that ensuring consistency between micro and aggregated data sets is often difficult. Moreover, a number of the newly developed granular data sets are very large and require substantial quality checks, with important implications for IT systems. Furthermore, processing and interpreting complex data sets calls for sophisticated techniques and tools. It also puts a premium on rationalising existing data collections through unified reporting schemes as well as on matching existing data sets that can be used as complementary sources.
- Lastly, rapid innovations in financial markets and technology call for **vigilance**. Despite important progress in setting up comprehensive macroprudential frameworks post-crisis and collecting the associated statistics, a fully detailed, real-time heat-map of financial system risks is still far out of reach.

¹¹ Despite the recent expansion of the related indicators disseminated by the BIS (following up on the DGI recommendations) on prices for residential properties and, more recently, commercial property; see www.bis.org/statistics/pp.htm.

¹² See in particular Inter-Agency Group on Economic and Financial Statistics, “Consolidation and corporate groups: an overview of methodological and practical issues”, IAG reference document, October 2015.

¹³ See IFC, “The sharing of micro data – a central bank perspective”, December 2016.

¹⁴ In particular the key Statistical Data and Metadata Exchange (SDMX) standard supported by the international community; see IFC, “Central banks’ use of the SDMX standard”, March 2016.

¹⁵ See Legal Entity Identifier Regulatory Oversight Committee, “Collecting data on direct and ultimate parents of legal entities in the Global LEI System – Phase 1”, 10 March 2016.

Part 1: Databases for macroprudential analysis and policy

The first part of the meeting, chaired by Aurel Schubert, IFC Vice Chair and ECB, discussed the **impact of recent macroprudential frameworks on statistics**. Many jurisdictions are setting up new macroprudential tools, requiring adequate indicators to gauge the build-up of systemic risks and guide appropriate policy responses. One example has been the growing policy need to assess the state of the credit cycle. Other indicators are also urgently needed, for instance, to identify risks in sectors that are critical from a financial stability perspective, such as real estate markets.¹⁶ Yet gathering the data to construct such indicators is not always easy. In many cases, there is a lack of sufficiently long and varied historical statistical series to properly assess developments in the financial cycle. Furthermore, effective macroprudential frameworks require early warning indicators, the definition of adequate policy measures, and ways of assessing their impact. To this end, several authorities have embarked on ambitious compilation exercises to document the various macroprudential tools that have been set up, implemented and assessed.

The first paper, co-authored by the NBB, the ECB and the European Systemic Risk Board (ESRB), reviewed the **indicators set up to guide macroprudential policy** in the European Union (EU). Many relevant macroprudential statistics are already available and compiled by a variety of producers – eg central banks, financial supervisors, international financial institutions as well as commercial data providers. The so-called Macroprudential Database comprised 275 indicators, harmonised across the 28 EU countries and released on a regular basis. However, some important data gaps remained in Europe, especially as regards residential and commercial real estate markets as well as on non-bank financial intermediation. Another important consideration was that the Macroprudential Database had to be updated regularly to effectively capture the evolving financial system.

Several years of macroprudential policy implementation in the EU have also increased the need to track authorities' policy actions. In this regard, the second presentation described the ESRB **database on macroprudential measures**, collected since 2014. This database provides several dimensions, such as the type and timing of each measure implemented, the authority involved, and the intended purpose. A key priority is that the available information is promptly disseminated to support the assessment of the impact of specific measures (including across sectors and borders). For instance, a specific webpage provides updated information on banks' countercyclical capital buffers.

Yet the compilation of macroprudential databases is often **challenging**, as highlighted by the experience of the Central Bank of Montenegro in computing the credit-to-GDP gap – a key indicator used to guide the activation and deactivation of countercyclical capital buffers.¹⁷ The difficulties arose from the short history of the credit series, the need to take into consideration the impact of financial deepening, and the measurement of the financial cycle itself. To deal with these challenges, the central bank was considering a wider set of alternative indicators to assess the build-up of risks in the financial sector and guide countercyclical capital requirements – eg

¹⁶ See CGFS, "Operationalising the selection and application of macroprudential instruments", *CGFS Papers*, no 48, December 2012.

¹⁷ See also the BIS statistics on credit-to-GDP gaps, www.bis.org/statistics/c_gaps.htm?m=6%7C380%7C670.

the actual level of credit provided to the economy, the degree of maturity transformation, and the importance of foreign lending.

The fourth presentation, by Eurostat, discussed the **specific data required to identify risks in the real estate sector**, which can play an important role from a macroeconomic and a financial stability perspectives. There was a need to consider various price indicators for rental properties because of different methodologies and measurement methods – eg weights based on transactions or stocks; standard or quality-adjusted prices etc. For instance a simple transaction-weighted index of unadjusted prices could be useful in tracking the emergence of asset price bubbles in real estate markets. But assessing banks' default risk would require the residual value of their collateral, and thus also of the depreciation of the underlying asset over time to be measured. To this end, it was more pertinent, first, to use quality-adjusted property price indexes and, second, to look at stocks instead of transactions.

Part 2: Identifying and closing data gaps

The second part of the meeting comprised four sub-sessions devoted to areas where data gaps were the most severe for macroprudential frameworks: the real estate sector; the assessment of households' financial vulnerabilities; shadow banking; and new patterns of financial intermediation.

The real estate sector

This session, chaired by Pedro Duarte Neves (Bank of Portugal), discussed the **financial stability implications of property market developments**. From this perspective, one should distinguish between residential real estate (RRE) and the commercial real estate (CRE) sectors. First, the RRE sector was characterised by large investor exposures, since housing represents a large fraction of households' liabilities. In contrast, overall investor exposure to the CRE sector was smaller and more concentrated among specific institutions, such as banks, pension funds and insurance companies. Second, both sectors were subject to significant price movements over the financial cycle, but the CRE sector had tended to display much higher procyclicality. In both cases, authorities were working to close existing data gaps, in particular by making more intensive use of surveys.

The first presentation, by the ESRB, Bank of Italy, and the French Prudential Supervision and Resolution Authority, discussed the **EU agenda to close data gaps** in RRE and CRE markets. This agenda comprised three steps. The first was to precisely define the boundaries between the RRE and CRE markets, which may vary according to the relevant policy perspective. The second step was to select the appropriate indicators to be monitored, such as concentration of loan portfolios; measures of lending standards (eg collateral values, loan-to-value ratios (LTVs)); and indicators of borrower income (eg loan-to-income ratios (LTIs)). Ideally, these indicators should be considered for both the RRE and the CRE sectors; in practice, however, information was scarcer and less harmonised across jurisdictions in the latter case. The third step was to progressively implement an adequate data collection strategy.

Statistics from **commercial data providers** can be successfully explored to address these data gaps, as highlighted in the second presentation, by the Bank of

France. While authorities had relatively good data on the French RRE sector, official information was lacking on CRE. To fill this gap, data on office prices provided by major real estate agencies could be useful for policy purposes. The aim was to use additional sources of information such as notarial databases.

The third presentation, by the NBB, analysed information from the European **Household Finance and Consumption Survey** (HFCS) to assess risk in the Belgian mortgage market. The HFCS is a euro area-wide survey on financial behaviour that provides household-level information on liabilities and assets. The exercise underlined the importance of using such granular data, for instance, to identify households with high mortgage debt but little in the way of liquid assets, or the proportion of mortgage debt at risk in case of macroeconomic shocks.

The fourth presentation, by the Central Bank of the Republic of Austria, also used the HFCS to **simulate the impact of macroprudential policies** on house prices and credit availability. The results suggested that capping borrower income ratios (eg LTIs) had a greater effect on credit take-up than did restrictions on lending standards (eg LTVs). It also underlined that the high granularity of the data allowed the impact of macroprudential policies to be investigated effectively – for instance to assess their specific impact on highly indebted households, on housing prices etc.

Finally, the last presentation by the ECB and the Central Bank of Ireland (CBI), looked at the usefulness of **property market indicators in guiding policy decisions** to activate and deactivate countercyclical capital buffers. It suggested that, for macroprudential authorities seeking to curb the credit cycle in small open economies, housing prices appeared more useful as indicators than, for example, credit-to-GDP gaps.

Households' financial vulnerabilities

The second session, chaired by João Cadete de Matos (Bank of Portugal), discussed the **financial stability risks posed by households' vulnerabilities**. Central banks, especially in Europe, have long-standing experience in surveying household financial behaviour and this has proved of particular interest for assessing the resilience of households to adverse shocks.

The first presentation, by the Czech National Bank, described **stress-testing exercises** to measure households' ability to service debt in case of macroeconomic shocks, such as a rise in interest rates or a fall in incomes. The analysis was based on a specific survey, complemented by other data sources, eg micro-level data sets on mortgage payments and the European HFCS. Such complementarity can be quite useful since the data can provide different types of information (eg transactions versus stocks) and differ significantly in terms of timeliness.

The **importance of using timely data** for vulnerability analyses was reinforced in the second presentation by the ECB. The starting point was the fact that the HFCS represents a rich source of harmonised information on income, wealth and debt, covering many EU countries. It also allows pockets of vulnerability to be identified according to standard metrics, and provides relevant information on the types of household surveyed: size, income, type of debt, employment status etc. But the interest of HFCS data for policy purposes is limited by the survey's three-year publication lag, which could put a premium on timelier but less granular alternative data sets (eg national accounts) or on the use of microsimulation techniques to simulate the behaviour of individual households over time.

The third presentation, by the Central Bank of Luxembourg, nevertheless confirmed the usefulness of the HFCS data set for **measuring household indebtedness** (eg debt-to-assets, debt-to-income, or debt-service) **and liquidity** (eg liquid assets-to-income) ratios. Overstretched households were identified using ad hoc thresholds, and tended to be associated with specific characteristics, eg education. Yet one limitation of this approach was the sensitivity of the estimates to the choice of the selected thresholds.

Similarly, the fourth presentation, a joint work by the Deutsche Bundesbank, the ECB and academic researchers, showed how household-level information can be used to shed light on **households' responses to macroeconomic policies**. In particular, the HFCS survey helped to identify heterogeneous patterns that were useful in clarifying aggregate dynamics.

Lastly, the HFCS can also be used to **investigate the risks of financial exclusion**, as argued by the fifth presentation, from the Bank of France. Financial exclusion, defined as the lack of access to certain basic financial services, was found to be positively correlated with specific households' characteristics such as age, unemployment, income and wealth. Moreover, using the successive waves of the HFCS survey allowed for assessing the contribution of these factors over time.

Shadow banking

Several post-crisis initiatives seek to increase the information available on non-banks' involvement in financial intermediation and their contributions to **maturity and liquidity transformation in the financial system**. In particular, the FSB's annual survey on shadow banking has since provided regular harmonised information on the structure and scale of shadow banking in major jurisdictions. However, and as highlighted in the session chaired by Charles Thomas (US Federal Reserve Board of Governors), these initiatives have not closed all data gaps, especially regarding the measurement of financial innovation, the assessment of interconnectedness at the firm level, and the capturing of country specificities.

The first presentation, by the ECB, analysed the recent **work on shadow banking** conducted in the EU and described ongoing initiatives to close remaining data gaps there. The ESRB measure of the shadow banking sector is based primarily on general financial accounts and monetary statistics data, zooming in on entities actively engaged in credit intermediation. This is complemented by specific efforts to use balance sheet data from securities and derivative dealers (SDDs) and financial corporations involved in lending (FCLs), which is collected through a harmonised Eurosystem survey. Looking ahead, the availability of the additional micro-level data sets compiled in response to new regulatory initiatives – in particular the European Market Infrastructure Regulation (EMIR), the Alternative Investment Fund Managers Directive (AIFMD) and the Securities Financing Transactions Regulation (SFTR) – will further contribute to closing the data gaps related to shadow banks.

The second presentation, by the Bank of Canada, focused on how to monitor **peer-to-peer lending companies**. These institutions are entities that match borrowers and lenders online, frequently outside the boundaries of regulated institutions. Gathering information on this particular activity has become pressing, because it is expanding briskly and because stress episodes have already occurred. These companies provide substantial information on their websites, which can be

mobilised using “big data” techniques (ie web scraping).¹⁸ An alternative way would be for authorities to organise new targeted data collections, through direct reporting by peer-to-peer institutions or indirect reporting by the group of regulated financial institutions participating in such peer-to-peer platforms.

The third presentation, by the ECB, highlighted the significant contribution made by **the OFIs¹⁹ sector** to general shadow banking activities. Usually, this kind of analysis is done by ranking the various sectors according to their direct interlinkages so as to measure interconnectedness – a key element when assessing the systemic importance of a given sector. The ECB analysis was based on a broader measure of interconnectedness between institutional sectors, using “from-whom-to-whom” financial accounts data²⁰ in order to capture the indirect exposures related to the OFIs sector.

The fourth presentation, by the BIS, presented an exercise to **identify relationships** between non-financial institutions and their various types of creditor. The starting point was that information on creditors is absent in firms’ financial statements. But such entity-level records can be matched with security-level data sets, in turn providing information on lenders to corporates. The resulting information allows the situation of a given corporate to be analysed in a very granular way, depending on its funding structure and exposure to specific lenders – including “non-bank” funding providers.

The fifth presentation, by the Bank of Italy, discussed the importance of **retained securitisation by financial vehicles**, which should be included in shadow banking assets under the approach proposed by the FSB. Yet it was important to carefully consider country-specific situations. In Italy, for instance, retained securitisation activity often reflects banks’ debt issuance to obtain securities that could be eligible as collateral in refinancing operations. In that case, the related assets are recorded on bank balance sheets and are thus within the scope of regulators. Moreover, one issue is the valuation of these assets, which can differ markedly, for instance, for securitised non-performing loans that are valued at a discount by the banks but at nominal value by the financial vehicles involved (with the result that the size of the Italian shadow banking sector can be overstated).

New patterns of intermediation

Traditional statistics also face challenges related to **the evolving way the financial system is intermediating between savers and borrowers** – irrespective of the issue of the financial stability risks involved, as analysed above in the session related to shadow banking.²¹ The session, chaired by Bruno Tissot (BIS), was an opportunity to

¹⁸ For an overview of central banks’ ongoing initiatives in the use of big data techniques, see IFC, “Big data”, *IFC Bulletin*, no 44, September 2017.

¹⁹ Other financial intermediaries, except insurance corporations and pension funds (ICPFs).

²⁰ For an introduction to from-whom-to-whom tables, see B Tissot, “Development of financial sectoral accounts: new opportunities and challenges for supporting financial stability analysis”, *IFC Working Papers*, no 15, November 2016.

²¹ The issues analysed here – ie the impact of the changes in the way financial intermediation is being provided from lenders to borrowers – overlapped with the ones dealt with in the session on shadow banking. Shadow banks are understood to be “financial institutions that act like banks but are not

shed light on the new patterns of financial intermediation observed since the GFC and their statistical implications. In particular, there has been a growing demand for data on (non-bank) market-based finance as well as for measuring the interconnectedness of financial market participants. To do so, central banks are seeking to make the most of available granular data sets and combine information across various sources, as well as apply new techniques, eg machine-learning.

The first presentation, by the CBI, discussed the activity of bank-sponsored **special purpose vehicles** (SPVs). Foreign banks often use SPVs incorporated in Ireland to securitise their assets, resulting in sizeable cross-border debt financing. But this activity is unrelated to the financing of the domestic economy, thus calling into question the use of standard, residency-based statistics.²² To better understand the new intermediation patterns, the CBI has been collecting data on debt issuance by SPVs that remains on the balance-sheet of their sponsor banks. This information suggested that foreign banks often used SPVs to circumvent capital flow management measures and high taxation in their home jurisdictions, underlying the importance of looking at those issues in a granular way.

The second presentation, by the NBB, was based on an entity-level analysis, using the Central Balance Sheet Office data set. This granular information showed that a significant part of non-bank financial intermediation in Belgium was provided by **private equity companies**, which should not be considered as being part of the shadow banking sector.

One issue related to the use of large micro databases to **identify new patterns** in financial markets. As argued in the third presentation, by the Deutsche Bundesbank, new “big data” techniques can be quite helpful in addressing the related challenges. In this particular case, machine-learning algorithms were successfully used to enhance the information content of the data set on German banks’ securities holdings.

The fourth presentation, by the ECB, underlined the importance of **intra-group transactions**. This analysis was based on granular information, particularly sourced from monetary and financial institutions’ balance sheets, which showed that EU intra-group loans were quite volatile and had significantly expanded in recent years, reflecting greater banking consolidation.

Part 3: Trade repositories

The lack of **information on derivative transactions** was considered as one of the major data gaps post-crisis. To close it, many jurisdictions have enforced central

supervised like banks”: see L Kodres, “What is shadow banking?”, *Finance & Development*, vol 50, no 2, IMF, Washington DC, 2013. The FSB definition is more detailed: “shadow banking is non-bank credit intermediation involving bank-like activities, such as maturity/liquidity transformation and/or leverage, that can become a source of systemic risk”; see FSB, op cit. A key policy objective is to ensure that new ways of financial intermediation would allow for the “transforming [of] shadow banking into resilient market-based finance”, see FSB, “Recommendations to Strengthen Oversight and Regulation of Shadow Banking”, October 2011.

²² See B Tissot, “Globalisation and financial stability risks: is the residency-based approach of the national accounts old-fashioned?”, *BIS Working Papers*, no 587, October 2016.

clearing requirements through central clearing counterparties (CCPs) and the reporting of standardised OTC transactions to TRs.²³ The resulting large expansion in the data collected has raised significant challenges, as highlighted in this part of the workshop chaired by Alejandro Gaytan (Bank of Mexico).

The first presentation, by the ECB, analysed the **derivatives data collection** process in the EU. In accordance with the European Markets Infrastructure Regulation (EMIR), both counterparties of an OTC derivative transaction must report to an authorised TR. But the processing of this information has raised many problems. One is the limited quality of the data, particularly due to missing values. Another is the difficulty of aggregating granular data points, reflecting the lack of common identifiers for the products, trades and counterparties involved in the transactions. Lastly, the management of the large volumes of data involved has proved technically difficult.

The second presentation, by the Dutch National Bank, argued that TR data can be **used for various policy purposes**, including microprudential supervision, macroprudential supervision, and statistical compilation. Given the sheer complexity of the information collected, a two-pronged approach has been followed. On the one hand, TR data are being exploited as a “regular” statistical source, by running adequate quality checks, aggregation mechanisms and monitoring exercises. On the other hand, ad hoc analysis is performed on specific segments – eg asset classes, instruments – to address specific information needs.

The last presentation, by researchers from University Paris 1 and Trinity College, Dublin, analysed the **importance of CCPs** in the EU. They have helped to increase transparency in OTC derivatives markets, thereby enhancing counterparty risk management. In addition to data quality aspects, an important issue has been the concentration of exposures in CCPs, and regulators have been taking steps to tackle this issue.²⁴

Part 4: Credit register data

Many central banks manage a central credit register (CCR), ie a centralised system for collecting entity-level credit information on loans provided to the economy. As discussed in the last part of the meeting, chaired by Marcia De Wachter (NBB), **detailed loan-by-loan information** from CCRs can be used for many purposes, and particularly for macroprudential work.

The first presentation, by the NBB and ECB, showed how CCRs can be used to **monitor risks in the real estate sector** – eg by providing information on borrower risk profiles, the credit risk taken by lenders, exposure concentrations etc. This underlined the importance of the ongoing initiative to set up a European-wide CCR, AnaCredit.²⁵ One issue is that this new source of information will not comprise a long historical series, an important drawback when assessing the evolution of financial

²³ See IFC, “Central banks’ access to and use of trade repository data”, IFC Report, forthcoming.

²⁴ See CPMI-IOSCO, *Resilience of central counterparties (CCPs): Further guidance on the Principles for Financial Market Infrastructures (PMFI)*, Final Report, July 2017.

²⁵ “AnaCredit” stands for *analytical credit datasets*.

risks over time – given that financial cycles usually have a long amplitude, at least compared with the traditional business cycle. Hence it will be important to combine the information from AnaCredit with data from national CCRs in several European countries. The difficulty is that such domestic sources are not harmonised and exhibit important cross-country differences in terms of data coverage, time span, instrument breakdown and sectoral definitions.

The second presentation, by the ECB, argued that AnaCredit will be instrumental in supporting the **identification of macroprudential risks**. For each loan provided to a corporate, there will be a wealth of information on the parties involved (eg creditor, originator, servicer, debtor). Moreover, this type of highly granular data set can be used flexibly depending on the policy question. It can shed light on distribution risks that are difficult to assess with aggregated data sets; and it could be linked to other granular data sets, multiplying the amount of information available for analysis.

The third presentation, by the Central Bank of the Republic of Turkey, also emphasised the value of **matching CCR data with complementary data sources**. The starting point was that the Turkish register contains detailed information on foreign exchange (FX) loans by residents but does not capture foreign bank lending or non-bank liabilities (eg debt securities). Moreover, it is compiled on a solo basis, ie not at the consolidated level of a firm. To address this gap, the central bank has started a complementary data collection to measure the open FX positions of non-financial firms with the highest FX debt.

The last intervention, by the Bank of Portugal, highlighted the **variety of possible uses for CCR data**. The Portuguese CCR contains detailed liability information (type, status, purpose, maturity, collateral etc) on a borrower-by-borrower basis. While it was initially set up to gauge the creditworthiness of borrowers, as in many central banks, it has since been used for various additional purposes: statistics, research, monetary policy implementation, microprudential supervision and, more recently, financial stability analysis.