Supplement to the Statistical Bulletin 1

Papers presented by the statistics department in national and international *fora*

April 2018

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Foreword

The current issue of the *Supplement to the Statistical Bulletin* compiles a number of articles and technical papers prepared by the staff of the Statistics Department of the Banco de Portugal, which were presented in 2017 at various national and international *fora* and reflect the diversity of the statistics under the Statistics Department's responsibility.

This issue of the Supplement comprises four sections: **I** Commitment to Communication and Cooperation; **II** Micro-databases – Potential for statistics; **III** Indicators of macroeconomic imbalances and **IV** Compiling statistics – Special case studies.

To guide the reader throughout the collection of papers, a brief summary is provided for each one.

I Commitment to Communication and Cooperation

Cadete de Matos, João and Proença, Bruno, "Making sense of central bank data – The Banco de Portugal's experience in communicating statistics", UNECE Workshop on Statistical Data Dissemination and Communication, Geneva, Switzerland, June 2017

Central banks statistics are of chief interest to policy-makers, financial analysts and other market participants. Other stakeholders – like the media, the Academia, and the public at large – can also benefit from such data to inform their analysis, research and decision-making.

Banco de Portugal (hereinafter referred to as "the Bank") is a major provider of official national statistics and a contributor to the statistics of the Euro area. Therefore, the Bank has to make certain that its statistical communications to those multiple user segments are of the highest quality and fit for purpose, which involves keeping the statistics relevant, timely and accurate, and produced in compliance with the best practices in this field.

With this in mind, the bank's has evolved from the traditional, one-way, statistical dissemination model to more collaborative communication channels, making good use of innovative communication tools and formats, *inter alia*: (i) workshops and seminars with representatives of other national central banks to share experiences in the various statistical domains for which the Bank is accountable; (ii) conferences directed to specific user groups (e.g., non-financial corporations, as in the case of the conferences of the Bank's Central Balance Sheet Office); (iii) interviews (e.g., to newspapers and national television), speeches or briefings focused on particular statistical issues; (iv) meetings with journalists from specialised media to discuss and clarify distinctive statistical developments; (v) visits to universities to sensitize students about actual and potential uses of official statistics; and (vi) stalls and posters at specific events.

That being said, press releases/conferences are still the main vehicle through which the Bank transmits its statistical messages. Here, the Bank has adopted a flexible and user-friendly approach to communicate statistics, complementing the release of new data with the associated metadata, comments on data developments and trends, and contextual information, using familiar language and terms. In a similar vein, recent data releases have been accompanied by video-recording of communications of statistics, which allow for possible upload in content communities (e.g., video-sharing websites). It is the Bank's intention to further explore this approach in the future.

Keeping its *Statistical Bulletin* relevant is also a continuing concern of the Bank. Improvements to the (electronic) publication in terms of its content and layout are frequent and very much appreciated by the users, according to the available customer feedback. By combining data, tables, graphics and comparisons, the *Statistical Bulletin* has succeeded in maximizing its potential to transmit various types of useful information to the users, as in the case, for instance, of the sections on main (economic and financial) indicators and on non-financial sector indebtedness.

To conclude, a brief reference to the Bank's "BP*stat* | Statistics Online", a dissemination service, created in 2006, that provides statistical information (data and metadata) organized in domains and allowing for both time series and multidimensional exploration. The main objective of this service has been to provide quick and easy access to the statistical series produced by the Bank, as well as to a number of key statistics and economic indicators compiled by other national and international institutions. BP*stat* has also been available in a mobile media version since 2012. Regardless of the continuous effort to broaden and improve its content, in particular in the graphic and search components and access to metadata, this dissemination service will soon (in the course of the current year) be substituted by a dedicated website (a statistics portal) that will allow for greater user-friendliness and interactivity with the users, while providing innovative analytical and visual content.

Cadete de Matos, João, Monteiro, Olga and Dias, André, "Strategic coordination of a National Statistical System: the case of the Portuguese Statistical Council", ISI 2017: World Statistics Congress, Marrakech, Marrocos, July 2017

Official statistics are a public good. To ensure that this purpose is rightfully achieved, it is essential to have a strong National Statistical System, in which a commitment of all parties involved is a necessary condition to meet its full potential. The design of such a system should provide: (a) a clear division of responsibilities and work between the participating institutions; (b) a framework for adopting common methodologies, concepts and nomenclatures and sharing lists of statistical units and administrative data; and (c) an institutional setup where producers and users of official statistics interact productively.

In this context, this paper explores the role and the importance of the Statistical Council as a strategic coordination body of the Portuguese Statistical System. To this extent, we discuss the enhancements of official statistics that this forum promotes and highlight the role of this body in the development of core projects with spillovers across all stakeholders of the National Statistical System.

II Micro-databases – Potential for Statistics

Cadete de Matos, João and Nunes, Lígia Maria, "Upgrading Financial Accounts with Central Balance Sheet Data – What's in it for central banks' policy?", International Statistical Institute: Regional Statistics Conference, Bali, Indonesia, March 2017

Good statistics are a precondition to good policy-making. Thanks to their comprehensiveness and methodological soundness, financial accounts provide a powerful tool in helping to assess the influence of monetary policy actions on the different economic sectors, in a context characterized by their increased financial interconnectedness and threats to financial stability. To achieve fully

integrated and consistent financial accounts, Banco de Portugal benefits from the richness in statistical content of its Central Balance Sheet Database which is based on census data submitted by virtually all resident corporations through the so-called IES – Informação Empresarial Simplificada (literally meaning "Simplified Corporate Information") reporting scheme. Based on our experience, this paper aims to illustrate the advantages and potential uses of corporate accounting data by financial accounts compilers, namely in the processes of improving the consistency and for data quality control purposes.

Cadete de Matos, João and D'Aguiar, Luís, "Assessing financial inclusion in Portugal from the central bank's perspective, "International Statistical Institute: Regional Statistics Conference, Bali, Indonesia, March 2017

The paper discusses the evolution of financial services in Portugal and, in particular, the role and contribution of Banco de Portugal as a financial services provider – with emphasis on the services offered by its Central Credit Register and within the context of its Banking Conduct Supervision activities, and how they have been used to pre-empt over-indebtedness and to monitor the access to financial services, while shedding light into the usage of innovations in the payment systems. Finally, an attempt at documenting and measuring the evolution of financial inclusion in Portugal is made on the basis of the results of the Banco de Portugal's Survey on the Financial Literacy of the Portuguese Population.

Teles Dias, Luís and Silva, António Jorge, "Upgrading Financial Accounts with Central Balance Sheet Data – What's in it for central banks' policy?", International Statistical Institute: Regional Statistics Conference, Bali, Indonesia, March 2017

The Great Financial Crisis and the ensuing unconventional monetary policy response from central banks have increased the demand for comprehensive, high quality and more detailed statistics. In this context, traditional aggregate statistics have proved insufficient to monitor and interpret the multiple aspects of the monetary transmission mechanism and the evolution of credit to companies and households. This paper presents the recent developments that have occurred in Banco de Portugal in the area of monetary and financial statistics as a response to these new challenges. In a nutshell, it was considered important to complement the traditional aggregate monetary and financial statistics with more granular data, so as to increase the flexibility and timeliness of the data, while fomenting the integration of micro and macro level information. This strategy allowed for, *inter alia*, the development of (i) new or upgraded statistics, (ii) easier and faster responses to ad hoc requests and (iii) more user-tailored analyses – all features that have proved essential for effectively addressing the challenges posed by the post financial crisis.

Cadete de Matos, João and Cardoso Dias, André, "The Portuguese Central Credit Register as a key input to the analysis of financial stability… and beyond!", IFC – National Bank of Belgium Workshop on "Data needs and Statistics compilation for macroprudential analysis", Brussels, Belgium, May 2017

The Portuguese Central Credit Register (CCR) is a powerful multi-purpose tool, which contains monthly granular information on credit on a borrower-by-borrower basis and that includes, in some cases, details that provide loan-by-loan information with a virtually complete coverage. These features have enabled the Banco de Portugal to use its CCR data for a variety of purposes, from,

inter alia, the compilation of very comprehensive and detailed statistics on credit, to the promotion of a better understanding of the risks underlying banks' balance sheets.

In this paper, we explore the richness of the Portuguese CCR, which is leveraged by its integration with other large granular datasets managed by Banco de Portugal (e.g. the data from the Bank's Central Balance Sheet Data Office). Furthermore, we highlight the way its features and ongoing reformulation – to meet the reporting requirements set by the AnaCredit Regulation and to fulfil additional data needs – have been key to monitor monetary and financial phenomena and to help the Banco de Portugal in meeting its mandate of ensuring the stability of the national financial system.

Lima, Filipa, Poiares, Rita and Silva, António Jorge, "Tailoring national financial accounts to the users' needs using administrative and other large granular datasets", ISI 2017: World Statistics Congress, Marrakech, Marrocos, July 2017

Economic and financial reality is increasingly more complex and portraying it in a precise and timely fashion challenges the statistical function of central banks. Furthermore, users have been requesting ever more comprehensive and detailed information. In this context, it is crucial to develop tools that allow users to see the details without losing sight of the big picture. National financial accounts are of particular interest when dealing with these challenges, as they provide an overall view of the financial interlinkages between institutional sectors helping in the identification of sector vulnerabilities, imbalances and potential over-exposures to certain financial instruments. Banco de Portugal places a strong emphasis on the compilation of national financial accounts, namely, by making extensive use of administrative and other large granular databases. In this paper we show how these databases – which include, among other sources, the Central Balance Sheet Database, the Securities Statistics Integrated System and the Central Credit Register –, are being used to tailor the national financial accounts statistics to the specific users' needs. Additional insights brought by the Household Finance and Consumption Survey are also illustrated.

Ferreira, Carla, Magalhães, Cloé, Pinto, Luís and Lourenço, Mário, ", Looking into R&D intensity in Portugal in the last years", JOCLAD 2017 – XXIV Jornadas de Classificação e Análise de Dados, Porto, Portugal, April 2017

This paper presents some results regarding the economic and financial behavior of manufacturing companies based on their technological intensity, using OECD's classification of these activities. Results show that profitability levels are higher among high Research and Development (R&D) intensity sectors of activity, which present a greater link with the export sector. These sectors' performance regarding bank loans and foreign direct investment on these activities are also discussed.

III Indicators of macroeconomic imbalances

Cadete de Matos, João, Menezes, Paula and Nunes, Lígia Maria, "Why do external statistics matter? – A multidimensional approach in a context of macroeconomic imbalances", ISI 2017: World Statistics Congress, Marrakech, Marrocos, July 2017

The recent financial crisis highlighted the importance of an early detection and mitigation of macroeconomic vulnerabilities. In this context statistical compilers and analysts were challenged to develop enhanced methodologies and indicators, namely under the scope of external statistics. This paper proposes a multidimensional assessment of the external debt imbalances achieving a comprehensive and consistent approach by analysing not only the decomposition of the current and capital account balances but also how the economy is financed. This is possible through a deep insight of the financial account. Due to the existent interconnections one might analyse the current and capital account and whether a given deficit or surplus is explained by the component of goods and services or by the component of current income generated by the direct or portfolio investment, as an example. Simultaneously it is possible to observe in more detail the type of financial instruments; identifying if the net acquisition or disposal of financial assets is explained by the behaviour of a given institutional sector; detecting risk exposure of investment by country or identifying bilateral asymmetries that might exist with other commercial partners. It is a comprehensive and integrated approach rich of a variety of dimensions.

Silva, António Jorge, Nunes, Lígia Maria and Cardoso Dias, André, "External statistics and national financial accounts as leading indicators for the assessment of economic vulnerabilities", ISI 2017: World Statistics Congress, Marrakech, Marrocos, July 2017

The Global Financial Crisis has reinforced the need and relevance of the development of early warning systems, which enable the detection, and, to the extent possible, the prevention of severe internal and external economic vulnerabilities. In this context, several initiatives at the international level have been pursued. For instance, the European Union has implemented, in December 2011, a surveillance mechanism that attempts to meet this identified need - the Macroeconomic Imbalances Procedure (MIP). Banco de Portugal contributes to this Procedure with the compilation and development of external statistics and national financial accounts, which are used in the MIP scoreboard. Furthermore, in 2015, Banco de Portugal has overhauled its *Statistical Bulletin* by introducing a Chapter on Main indicators, which now includes information that allows an improved assessment of the current economic conditions, and facilitates international comparisons. In this paper, we discuss the relevance of these statistics as leading indicators for economic assessment and present the results of the recent overhauling process.

Falcão Silva, João and Lopes, Vânia, "How to use International Banking Statistics?, JOCLAD 2017 – XXIV Jornadas de Classificação e Análise de Dados, Porto, Portugal, April 2017

International Banking Statistics were created to monitor the activity of banking systems, providing internationally comparable measures of their exposure to several risks. In this article we focus on the consolidated banking statistics analysis and show that the Portuguese banking system country risk has changed over the years.

IV Compiling statistics: Special case studies

Teles Dias, Luís and Cardoso Dias, André, "Money talks – Nowcasting real economic activity with payment systems data", International Statistical Institute: Regional Statistics Conference, Bali, Indonesia, March 2017

Payment systems play a central role in the functioning of modern market economies, by enabling the transfer of money and financial instruments between economic agents in a safe and efficient way. In this context, researchers have devoted a great deal of attention to the assessment of the spillover effects that the development of payment systems could induce in an economy and on the demand for currency. More recently, the usage given to the data generated by these systems have been considerably broadened, to encompass issues as, *inter alia*, the assessment of financial integration and nowcasting private consumption. In this paper, we explore possible uses of payment systems data in the specification of coincident and/or leading indicators for key macroeconomic aggregates – such as the gross domestic product and private consumption of households. Given the strong connection between the phenomena underlying these data and the above-mentioned macroeconomic variables, we highlight the comparative advantages of this information in relation to competing indicators, which is based on its inherent quality, competitive costs and high frequency. In addition, we present the payment systems data available in Portugal, with particular emphasis on Automated Teller Machine and Point of Sale driven data, and describe how the current institutional environment and the recent enhancements in the reported information have gained further importance and relevance in meeting Banco de Portugal's main goals.

Nunes, Lígia Maria, Silva, António Jorge and Cardoso Dias, André, "Sentiment surveys in Portugal – description and empirical analysis", ISI 2017: World Statistics Congress, Marrakech, Marrocos, July 2017

Sentiment surveys are a powerful tool to capture economic agents' expectations and activities, which makes them particularly useful for policy makers in interpreting and analysing economic conditions, especially since the global financial crisis, often labelled as a "confidence crisis".

This paper empirically assesses the role of confidence in explaining private consumption and analyses to what extent the Portuguese consumer confidence index can bring additional information beyond variables which are usually found to have some power in explaining the real expenditure of households. When relevant, we draw some comparisons of this phenomena in the euro area through similar studies previously conducted.

Cadete de Matos, João, Branco, Sérgio, Morais, Filipe and Mota, Sónia, "Challenges with the delineation of public sector: borderline between the financial corporations and general government sectors", Meeting of the IMF Government Finance Statistics Advisory Committee (GFSAC), Washington, D.C., USA, March, 2017

Sector classification issues related with the borderline between financial corporations and general government sectors have been particularly relevant in Europe, in the context of government interventions in financial institutions, since 2008. These interventions led, among other, to nationalizations, bank resolutions and the creation of special purpose entities, creating complex classification issues that have led to different interpretations across the statistical community. This

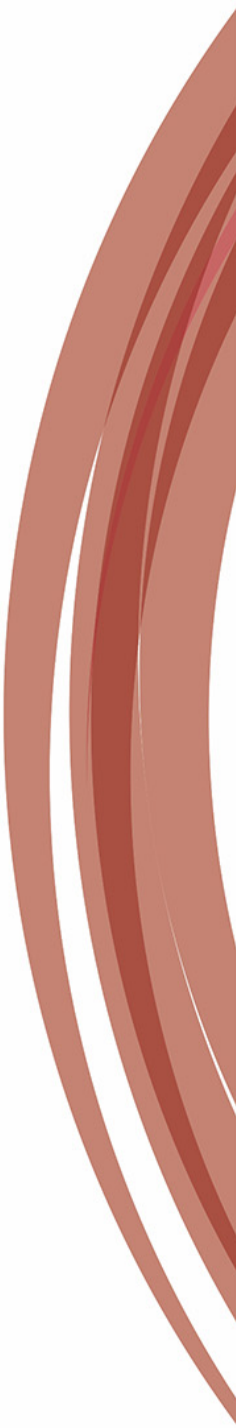
paper aims to discuss, in the light of the international statistical manuals, the different views concerning the sector classification of entities, namely concerning captive financial institutions, defeasance structures and protection funds. In this context, we argue that a review of the rules on sector classification of entities, so that they can be clearer and more objective, would be a beneficial action for the quality of statistics. Statisticians should also be concerned both with the correct sector classification and with the consistency across different statistical domains, guaranteeing thus a unique classification of entities.

Cadete de Matos, João and Branco, Sérgio, "Experience of Banco de Portugal on the compilation and publication of data regarding government finance statistics", Meeting of the IMF Government Finance Statistics Advisory Committee (GFSAC), Washington, D.C., USA, March, 2017

Government debt is one of the most relevant macroeconomic indicators. It is used to evaluate the financial health of governments and, often, of the country as a whole. However, different definitions of government debt can be found in macroeconomic statistics, alternating from the most commonly used concept of debt in Europe – Maastricht debt – and other definitions of government debt depending on the different coverage of entities and instruments considered and the different ways to value them.

This note presents several concepts and definitions of debt measures departing from the Maastricht debt concept (see Figure 1). Additionally, this analysis is supplemented by looking at net debt measures and explores the challenges in the treatment of contingent liabilities in the definition of public debt.

The experience of Banco de Portugal in measuring some of the indicators mentioned above and usefulness of public sector aggregates is also presented in this note. In this respect, it should be emphasized that Banco de Portugal is publishing on a monthly basis the Maastricht debt, including the Maastricht debt net of deposits of the central government, after 30 days of the end of the reference month. Other statistics concerning the non-financial public sector indebtedness are also released on a monthly basis. The demand for these statistics, and the number of headlines they generate, reveal that they are, in fact, widely appreciated by the users.



I Commitment to communication and cooperation

Making sense of central bankdata – The Banco de Portugal's experience in communicating statistics

Strategic coordination of a National Statistical System: the case of the Portuguese Statistical Council

Making sense of central bank data – The Banco de Portugal's experience in communicating statistics*[1]

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"Statistical information is necessary to decide what policy actions to take, to explain them publicly, and to assess their effects after the event. Unless policy can be justified and explained, it will not be understood and the institution carrying it out will lack credibility"

Alexandre Lamfalussy

1 Introduction

Statistics are everywhere. Yet, on their own, statistics are just numbers. And numbers alone do not tell a story – to mean something, their inner value must be brought to life. This could be a major challenge for an efficient statistical communication. Indeed, communicating is about catching the addressee's attention and statistical communication is no different: it is about providing the story behind the numbers in an easily understood, attention-grabbing and entertaining fashion; and it is about encouraging the media and others recipients to consider how statistics might add impact to every reality they have to work with.

Central banks, in their different capacities, both as users and producers of statistical data, should look for the continuous improvement of the way they communicate statistics. Firstly, because it is part of their mission to inform the general public about, *inter alia*, the economy or the financial situation of the country. Data on credit stocks and on interest rates is just an example of information that could guide citizens in making purchases or asking for a loan, and in taking many other economic and financial decisions that might impact significantly their lifecycles. Secondly, but not less important, because central bank statistics are of chief interest to policy-makers,

* UNECE Workshop on Statistical Data Dissemination and Communication, Geneva, Switzerland, June 2017.

1 The authors would like to thank Luís D'Aguiar, Lígia Maria Nunes, André Cardoso Dias and Luís de Carvalho Campos for their valuable comments and contributions. The views expressed in this paper are those of the authors alone and not necessarily of the Banco de Portugal and of the Eurosystem.

financial analysts and other market participants. Lastly, but not least, because other stakeholders like the media or the Academia can also benefit from such data to inform their analysis, research and decision making.

This variety of involved stakeholders increases the complexity inherent to statistical communication. If on the one hand, a well-thought out communication plan is not limited to define the target audiences but also focuses on how to reach them effectively, on the other hand, the communication channels chosen depend on the nature of the relationships with those specific audiences.

Against this background, we discuss in this paper the communication strategy that Banco de Portugal (hereinafter also referred to as "the Bank") has been following to bring together producers and users of central bank statistics and to foster the understanding and more frequent use of such data. To that extent, section 2 outlines the strategic communication plans pursued by the Bank, and describes concrete initiatives currently in place aimed at publishing and promoting statistical content in a simpler and clearer fashion. Section 3 measures the success of some such initiatives already taken by the Bank to promote its statistics and finally, section 4 sheds light on the next strategic communication steps that are currently being envisaging over the medium/long term.

2 The Banco de Portugal's strategic orientations regarding statistical communication

The legal framework currently in force requires the Bank to produce and disseminate statistics in multiple domains, which span from traditional aggregated data – such as, monetary and financial statistics, external statistics or national financial accounts –, to very detailed, micro-data-based, statistics – as it is the case with the statistical outputs built on the Bank's Central Balance Sheet Database.

Pursuant to its attributions, the Bank produces statistical data that are accurate, reliable, internationally comparable and consistent. Moreover, it is the Bank's premise to produce and disseminate its statistics with complete transparency in line with the international reference manuals applicable. In particular, this means that, *inter alia*: (i) statistics are compiled on an objective basis; (ii) choices of sources and statistical methods, as well as decisions about the dissemination of statistics, are determined by statistical considerations only; (iii) information on the methods and procedures used (metadata) is publicly available, (iv) statistical release dates and times are pre-announced in the Bank's official website; (v) advance notice is given on major revisions or changes in methodologies; and (vi) errors discovered in published statistics are corrected at the earliest possible date and publicised. These practices strengthen the Bank's integrity, independency and unbiasedness.

Over the last decades the Bank has been facing many different statistical and communication challenges, which have reinforced the need and the resolve to constantly question its communication strategy and enhance it.

More recently, in the context of the Great Financial Crisis, there was an increased demand for comprehensive, high quality and more detailed statistics – e.g. in the euro area, the pursuit of unconventional monetary policies by the European Central Bank and the creation of the Single Supervisory Mechanism have been particularly relevant in stressing the need to go beyond the aggregates in the domain of monetary and financial statistics.

Concurrently, the users' interest for the statistics published by the Bank have been increasing significantly, as shown by the existing quantitative indicators on the demand for statistical data and metadata, and for statistical services made available by the Bank.

Moreover, the challenges brought about by an ever-evolving information society are driving radical change in the lives of citizens and businesses, with the constant creation of new products and services fuelled by innovation. In this context, the Bank understood that it had to be ready for these and other emerging challenges to maximise the potential benefits of the new technologies of communication and social media.

To this extent, the Bank realized that, in this new era, it needed to react more quickly to new inquiries, demands and concerns of its audiences, which is why it started to look for new ways of disseminating statistical data and communicating with the public. This new emphasis on communication strategies aimed to promote the public understanding of the Bank's mission and functions, through a transparent information policy that enhances the right balance between accountability and independence, but at the same time, sophistication and modernity.

In what concerns its statistical function, the Bank has been evolving from a traditional, one-way, statistical dissemination model to more collaborative communication channels, thus making good use of innovative tools and formats.

In this respect, there are already some tangible initiatives in place which are worth highlighting, *inter alia*:

- The publication on the Bank's official channel on Twitter[2] and on YouTube of statistical content, such as videos, announcements of new studies, reports and data, etc.;
- The organization of domain-specific workshops and seminars with representatives of other national central banks, to share experiences in the various statistical domains for which the Bank is accountable;[3]
- The setting up of conferences directly targeted to specific user groups (e.g., non-financial corporations, as in the case of the conferences of the Bank's Central Balance-Sheet Office), with the objective of bringing together users and producers of statistical data on specific economic sectors;[4]
- The setting up of interviews (e.g., to newspapers and national televisions), speeches and briefings focused on particular statistical issues, aimed at sharing the Bank's knowledge on statistical topics of interest to the public at large (e.g. the dynamics of remittances or the international investment position);

2 Following its strategic orientation of greater openness to society and in line with other Eurosystem central banks (including the ECB), Banco de Portugal created, in February 2017, its channel on Twitter (https://twitter.com/bancodeportugal). With this initiative, the Bank intended to disseminate all the information that could improve the knowledge and understanding of the population about its *modus operandi* and about its contributions to society. All initiatives of the Bank that are placed on the site, such as studies, reports, interventions or interviews of the members of the Board of Directors are object of specific tweets announcing their publication and mentioning the appropriate links.

3 A good example of this initiative was the organization of the Workshop on Integrated Management of Micro-databases, which brought together senior experts of more than four dozens of countries around the world and promoted the debate on how to best manage the information available at central banks to meet the user's needs.

4 For instance: the regular organization of sector-specific conferences between the Bank, industrial organizations and academics with expertise on such sectors, to discuss the dynamics of such sectors and how to best embrace their upcoming challenges.

- The organization of regularly scheduled meetings with media representatives, both from general and specialised media, to discuss and clarify distinctive statistical developments and to foster the message pass-through role of the media;
- The realization of thematic sessions in universities, carried out by the Bank's statistical representatives, to sensitize the students about the actual and potential uses of the official statistics produced by the Bank;
- The use of stalls and posters at specific events, targeted at addressing particular statistical issues to foster the understanding and uses of the Bank's statistical outputs;
- The publication of statistical press releases at the same moment that new data are divulged, where one can find related relevant metadata, brief insights on the data developments and trends, and contextual information, using predominantly non-technical language and terms. Most of these press releases are standardized, which is important for consistently meeting user-expectations from month to month. Additionally, these normalized press releases ensure the transparency quality dimension of statistics, since there is no hidden information from one month to another.
- The production of short videos, to be disseminated in the Bank's online channels, describing the latest statistical developments in a particular domain and briefly explaining the causes of such phenomena, in order to further promote an increased awareness and understanding of the Bank's statistics.
- The continuous improvement of the *Statistical Bulletin*. According to the available customer feedback, the frequent content and layout improvements to the (electronic) publication have been very much appreciated and encouraged by the users. By combining data, tables, graphics and comparisons, the *Statistical Bulletin* has succeeded in maximizing its potential to transmit various types of useful information to the users. This policy has already a visible impact, for instance, in the sections on the main macroeconomic indicators and on the indebtedness of the non-financial sector.

Overall, the main guiding principle behind all these initiatives is the recognition of the need to simplify and reduce messages to the most important facts. By reducing complex information the Bank increases the success of the messages conveyed and escapes from overwhelming the public with excessive information, especially the non-professional users who usually need a simpler and more "digested" message.

3 Measuring the success of current communication initiatives

Measuring the success of each communication initiative is at the heart of a good communication strategy. Indeed, it is considered a good practice for statistical disseminators to monitor the impact of their statistical outputs on the different communication channels.

In this respect, the Bank understands that evaluating the outreach of the published message – how far it has gone and how many people it has affected positively – is just as important as publishing its content. Accordingly, the Bank periodically collects data that allows it to understand the success of the promoted initiatives.

To this extent, looking to the Internet traffic or to the number of followers and visualizations in social media can be considered a helpful tool to determine the most demanded data and information.

In November 2016, on the occasion of its 170th anniversary, the Bank launched a new institutional website with a contemporary design, refreshed content and navigation logic tailored to users' needs, which enables it to keep up with new trends in digital channels, making information more accessible and communication more effective.

Since then and, until the end of May 2017, the website counts with almost 9 million of page views.

Figure 1 shows that during the period under analysis, the *Statistical Bulletin* is being the most demanded statistical content in the Bank's website, followed by BP*stat* | Statistics Online.

Figure 2 shows the engagement rate of the 5 main statistical tweets. Public debt, balance of payments and securities issued statistics are the most outreached.

Figure 1 • Top 5 statistical web site page views | From November 2016 until the end of May 2017

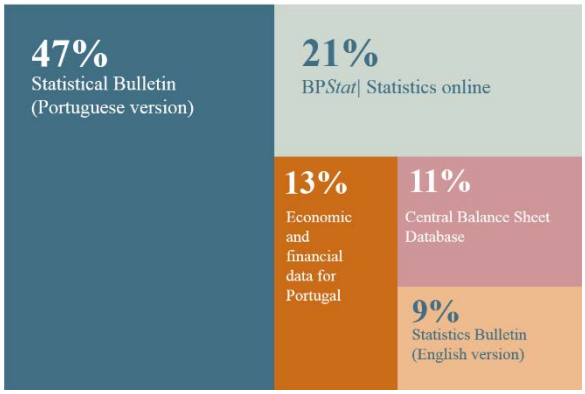
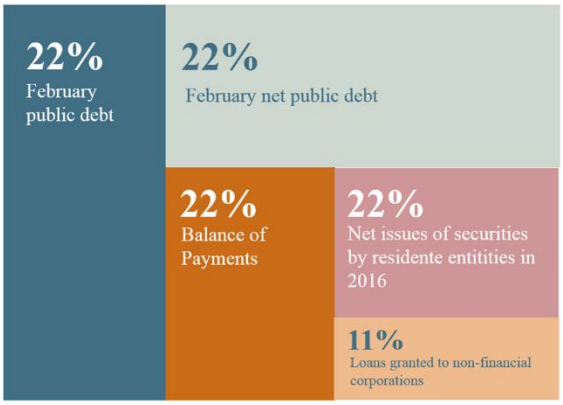


Figure 2 • Figure 2 • Top 5 statistical Tweets – Engagement rate[5] | From February 2017 until the end of May 2017



5 Engagement rate is computed as the "number of engagements" divided by "impressions". Engagements are defined as the total number of times a user interacted with a Tweet (retweets, replies, follows, likes, links, cards, hashtags, embedded media, username, profile photo, or Tweet expansion). When we say "impression", we mean that a tweet has been delivered to the Twitter stream of a particular account.

In the same vein, it is worth for a statistical disseminator to evaluate the impact of its statistical releases in print and electronic media from the point of view of both the number of "hits" and the quality of coverage. Monitoring coverage can help managers determine if more work is needed to coach journalists or key stakeholders about better ways of conveying the meaning of numbers in language that laypeople can understand.

Figure 3 shows the evolution of the number of published press news that were written based on statistical information released by the Bank. As one can notice, about 50 per cent of them have at least one reference to the Banco de Portugal's Statistical Press Releases. Indeed, this initiative is being very welcomed by journalists given that, in general terms, Statistical Press Releases answer to the very nature of their data requirements: "fast", "spot-on" and "easy-to-read" information. Mainstream media reporters constantly exert pressure on the Bank to get faster explanations on data developments or additional details, which would allow them to publish the news while the subject is still trending. As soon as the statistical data are disclosed by the Bank, the reporters have to write an as concise and accurate as possible news release or article, to be swiftly broadcasted by radio or television, and/or posted on the Internet – including social media – and to accommodate the need for mobile and smartphone users to have constantly updated and easy-to-read information.

Figure 4 shows the amount of news published daily during the month of April 2017 as well as the dates of publication of data and respective Statistical Press Releases.

Figure 3 • Published news based on Banco de Portugal's statistical information

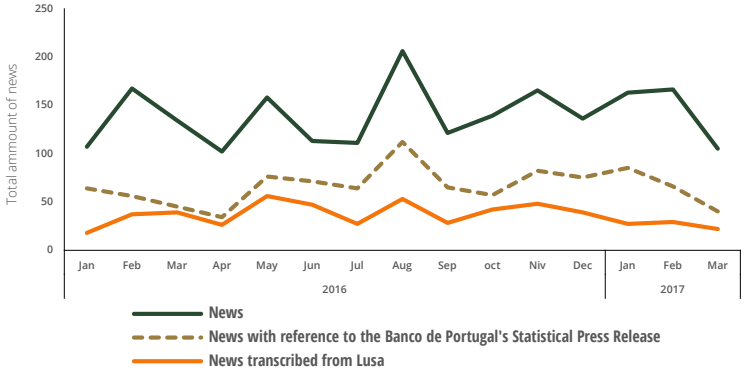
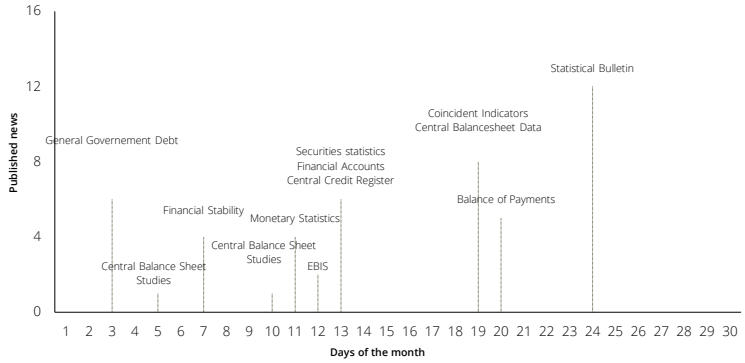


Figure 4 • Date of the release of statistical outputs and related published news | April 2017



4 Next steps and medium/long term vision

As a part of the above discussed challenge of communicating statistical content in a more attractive and understandable manner, the Bank currently envisages to develop new initiatives to bring statistics closer to the citizens and to deliver content in a user-friendlier way, thus meeting more closely the above debated contemporaneous statistical communication challenges.

Having acknowledged that statistical information has to be explained to the public at large – rather than just being presented as a collection of numbers in a table or chart – and the intuitive principle that people tend to pay closer attention when an interesting story is told, the Bank plans to strengthen the application of storytelling techniques when delivering statistics, while preserving accuracy and reliability.

To make this vision a reality, the Bank currently foresees the development of three impactful projects in the domain of statistical communication: the creation of a strategy to publish regularly different infographics alongside their relevant statistics; the publication of short and thematic statistical videos, explaining, in non-technical language, statistical issues of interest for the general public; and the launch of a Statistics Portal.

In the spirit of the aforementioned initiatives, the Bank has decided that one of the best ways to easily convey the latest statistical developments it publishes is through an intuitive schematic representation – an infographic – which portrays the underlying phenomena in a visually creative and clear fashion, with or without a "story" – or main message – behind it. By accompanying the publication of the Bank's official statistics with such infographics, the Bank would both promote the increased awareness of its statistics – given that infographics are very easily spread throughout the several communication channels used by the Bank – and, more importantly, the understanding of such information in a meaningful and functioning way.

Although this principle is quite simple in concept, its fulfilment is still proving to be rather difficult, given that, *inter alia*, it demands hard and soft skills that are not typically available among the staff of a central bank's Statistics Department. To that extent, the Bank is already working to promote internal seminars aimed at training its staff with a view to create the communication of the (near) future.

Following the recent publication by the Bank of short videos aimed at maximizing its statistical communications outreach and the relative success that this initiative has achieved, the Bank is also considering to create a new video publication series, focusing on thematic inter-temporal statistical

issues of interest to the public at large. The rationale behind this idea is to convey relevant explanations in a rather clear, non-technical and easily understandable way, drawing on the same storytelling basis as the infographics and further promoting awareness and understanding about the Bank's statistics. Moreover, it would also have the advantage of being relatively "timeless", thus optimising its use not only across the Bank's digital communication channels, but also in the context of the currently developed initiatives with statistical stakeholders.

Finally, the Bank is also making significant efforts to substitute its main online statistical communication tool – the BP*stat* – by a new, state-of-the-art, statistics portal, with significantly higher statistical and visual contents. Concurrently, the principles underlying this process are the same as those of the Banks's statistical communication strategy – a deep concern for user-friendliness, increased awareness and usability of the statistics of the Bank – and several analytical and visual features have already been discussed and tailored to meet such critical communication challenges, such that the Bank is already finalizing the informational and technological architecture features, with a view to launching the a new statistical portal very soon.

All in all, with these initiatives the Banco de Portugal is changing the way it relates to the general public: from boring to dynamic, from longstanding to modern. In an ever-changing world, central banks' communications have to be effective, simple and credible. It's not only an instrument, it's not an add-on of the core business; much rather it's a core task and an important asset treasured by our audiences.

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Strategic coordination of a National Statistical System: the case of the Portuguese Statistical Council*[1,2]

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Abstract

Official statistics are a public good. To ensure that this purpose is rightfully achieved, it is essential to have a strong National Statistical System, in which a commitment of all parties involved is a necessary condition to meet its full potential. The design of such a system should provide: (a) a clear division of responsibilities and work between the participating institutions; (b) a framework for adopting common methodologies, concepts and nomenclatures and sharing lists of statistical units and administrative data; and (c) an institutional setup where producers and users of official statistics interact productively.

In this context, this paper explores the role and the importance of the Statistical Council as a strategic coordination body of the Portuguese Statistical System. To this extent, we discuss the enhancements of official statistics that this forum promotes and highlight the role of this body in the development of core projects with spillovers across all stakeholders of the National Statistical System.

Keywords: Statistical Council; statistical coordination; statistical system; official statistics

* ISI 2017: World Statistics Congress, Marrakech, Marrocos, July 2017.

1 The views expressed in this paper are those of the authors alone and not of the Banco de Portugal or of the Eurosystem.

2 The authors would like to thank Mr. Luís D'Aguiar and Mr. António Agostinho for their valuable insights and suggestions.

1 Introduction

Official statistics are compiled to be ultimately disseminated, free of charge, to the public at large. In that sense, official statistics can be regarded as a de facto public good, since, according to the Fundamental Principles of Official Statistics,[3] no citizen is to be excluded from its "consumption". To that extent, policy makers are challenged to construct a National Statistical System (NSS) that is able to meet such statistical demands effectively and efficiently, to maximize the user's satisfaction at minimum overall social costs.

To reach this fundamental goal, it has become increasingly more evident that it is essential to foster the cooperation between national statistical authorities, thus generating synergies that mutually benefit the work of the institutions involved and enhance the quality of their respective statistical outputs – while preserving in all respects the independence of each of them.

This cooperation between National Central Banks (NCBs) and National Statistical Offices (NSOs) can accommodate many different purposes and may assume several different forms: (i) sharing of responsibilities under the framework of the national statistical programme; (ii) cooperation agreements or memoranda of understanding (MoUs); (iii) service contracts; (iv) cooperative data collection; (v) exchange of information and best practices; (vi) technical assistance and common training initiatives; and (vii) contribution to the joint development of international standard classifications and systems and to the activity of the various international organizations. Still, regardless of the particular form of cooperation between statistical authorities chosen, it is vital that such organizational arrangement remains focused upon optimising the efficiency of the statistical production processes.

Several countries have been strengthening the cooperation between their statistical authorities and evolving from informal to more formal arrangements. This is the case of Portugal, where, over time, the cooperation between the Banco de Portugal[4] (the Portuguese NCB) and other official entities – especially Instituto Nacional de Estatística (INE), the Portuguese NSO – has been progressively strengthened under the steering of a crucial strategic coordination body: the Conselho Superior de Estatística (hereinafter referred to as "the Statistical Council").

The Statistical Council is entrusted with the guidance and the coordination of the Portuguese NSS and is responsible for defining the general guidelines and relevant priorities of the national statistical activity. This entity, in which most of the relevant national statistical stakeholders (e.g. statistical authorities, academia, industry and unions) participate, is also responsible for the coordination of the statistical system and of its technical improvements, which makes it a key driver for the promotion and enforcement of statistical cooperation between the relevant entities.[5]

Within this background, the paper explores the role and the importance of the Statistical Council as the strategic coordination body of the Portuguese NSS. To that extent, section 2 outlines the institutional framework of the Statistical Council and section 3 highlights how this framework has fostered institutional cooperation initiatives and their impact. Finally, section 4 concludes and draws a set of recommendations aiming at successfully meeting the contemporaneous challenges of statistical agencies.

3 "[...] official statistics that meet the test of practical utility are to be compiled and made available on an impartial basis by official statistical authorities to honour citizens' entitlement to public information.", in UN's Fundamental Principles of Official Statistics, available at http://www.unece.org/stats/archive/docs.fp.e.html.

4 For a complete description of the Banco de Portugal's duties as a statistical authority, please consult https://www.bportugal.pt/en/page/estatisticas.

5 For a broader description of the Statistical Council's mission, please see: http://cse.ine.pt/xportal/xmain?xpgid=cse_home&xpid=CSE&xlang=en

2 The Portuguese National Statistical System and the Statistical Council

The principles, rules and structure of the Portuguese NSS are defined in the Law 22/2008[6], known as the National Statistical System's Law. This law fully endorses the Fundamental Principles of Official Statistics adopted by the United Nations Statistical Commission, the European Statistics Code of Practice and the European System of Central Banks's public commitment with respect to its statistical function.

Within this framework, the Portuguese NSS is composed by the Conselho Superior de Estatística (the Statistical Council) and the statistical authorities, namely: (i) Banco de Portugal; (ii) Instituto Nacional de Estatística (INE); (iii) the Regional Statistical Services of the Autonomous Regions of the Azores and Madeira; and (iv) the entities which are delegated by INE to produce official statistics.

The Statistical Council is the State body that oversees and coordinates the NSS and, currently, it has five Standing Sections dealing with Statistical Coordination, Statistical Confidentiality, Economic Statistics, Social Statistics and Territorial Base Statistics. In turn, these Standing Sections can have their own specialised Working Groups and the Statistical Council can also create task forces and organize seminars and workshops related to relevant themes for official statistics. In this important coordinating body, most of the relevant national statistical stakeholders participate, i.e. not only the aforementioned statistical authorities, but also other entities such as data producers' and data users' representatives – among them government departments, industrial associations, trade unions and universities – are invited[7] to contribute to the work of the Statistical Council.

Pursuant to the attributions conferred by the NSS law, some of the main Statistical Council's tasks are:

- Defining and approving the general guidelines of official statistical activity and the relevant priorities;
- Ensuring the respect for the core principles set forth in the NSS law;
- Appraising the plan and the budget of the statistical activity of the statistical authorities and their respective progress reports;
- Issuing recommendations within the scope of the definition of statistical methodologies, concepts and nomenclatures, for the use of administrative records to produce official statistics and ensuring their implementation;
- Issuing an opinion on the proposals for the delegation of powers of the INE to other entities, so that they can produce and disseminate official statistics.

In this framework, it is worth highlighting the work of the Statistical Coordination Standing Section, chaired by the Banco de Portugal, towards the mission of the Statistical Council, namely concerning the fulfilment of the tasks above mentioned.[8]

Additionally, the Statistical Council is also entitled to be consulted within the scope of the legislative procedure pertaining to statistical matters. Indeed, the approval of draft decree-laws setting up

6 https://cse.ine.pt/ngt_server/attachfileu.jsp?look_parentBoui=67938460&att_display=n&att_download=y..

7 Such members are appointed for three-year terms of office, renewable for equal periods.

8 Please consult http://cse.ine.pt/xportal/xmain?xpid=CSE&xpgid=cse_main&cont_cse=277894&cse_smenu.boui=3109257&cse_smenu.selected=13670308&xlang=en for a complete overview of this Section's duties

statistical services or containing rules governing statistical activities shall necessarily be preceded by a consultation to the Statistical Council. The recommendations and deliberations of the Statistical Council are, in turn, to be published in *Diário da República* (the Official Gazette of the Portuguese Republic).

At this point, it is now clear that this body allows for the sharing of production experiences as well as for the analysis and discussion of important statistical results with the other relevant stakeholders, which enables, *inter alia*, (i) the anticipation of the user's data needs, (ii) the calibration of the national strategy for official statistics (both in terms of focus and of role); and (iii) the widening of the communication channels with businesses, policy makers and research communities.

Notwithstanding, one of the most important and impressive features of the Statistical Council's work concerns the emphasis given to promoting cooperation initiatives between statistical authorities, in particular between the Banco de Portugal and INE. In the next section, we highlight how the Statistical Council has been shaping up this strategic cooperation efforts and highlight its spillover effects across the NSS.

3 Institutional cooperation

There is ample motivation for actively fostering cooperation between statistical authorities, both at the national and at the international levels. Indeed, the recent experiences have proved that it allows for an effective clarification of the responsibilities committed to each of the agencies involved in producing and disseminating statistical data and that it is also an important element in improving data coherence as regards terminology, classifications, definitions and other relevant metadata, thus facilitating the integration of data produced from different sources. In addition, institutional cooperation promotes steady efficiency gains throughout the statistical system, by reducing possible duplication of effort in reporting, hence contributing to a better allocation of resources, minimizing the respondents reporting burden and avoiding data redundancy.

Typically, an effective institutional cooperation promotes the exchange of data and experience among statistical agencies, with mutual benefits: that is the case, for instance, when NSOs provide specialized data to NCBs for policy purposes or when NCBs help NSOs to develop particular statistical capacities.

To this extent, in the framework of the aforementioned collaboration types and under the strategic guidance of the Statistical Council, Banco de Portugal and INE have established several agreements for the purpose of statistical production.

A protocol to fulfil Portugal's commitment to the International Monetary Fund's dissemination Standards which also includes the Ministry of Finance, has allowed Portugal to comply, in 2015, with the requirements for adherence to the IMF's Special Data Dissemination Standard (SDDS) Plus – the highest tier of the Data Standards Initiatives –, thus being part of the first set of countries joining the IMF's newest data initiative, at its birth. At the time, from the first set of 8 countries that complied with SDDS Plus, only Portugal met all of the 9 new data categories, which further reinforces the impact and the importance of such protocol.

A protocol for the transmission of the European System of National and Regional Accounts establishes and systematize the compilation process of national accounts: the non-financial accounts are compiled by INE, while the financial accounts are compiled by Banco de Portugal.

This working arrangement has enabled Portugal to fulfil all of its obligations in the framework of the ESA 1995 and 2010 transmission programme.

A protocol for the quarterly survey of non-financial corporations aims to obtain quarterly accounting data from companies in an efficient way that fosters the reduction of the reporter's burden. It has been particularly important for the production and dissemination of quarterly statistics on non-financial corporations.

In the field of Balance of Payments, several formal and informal agreements exist between Banco de Portugal and INE, such as those related with International Trade Statistics (2007) and FATS-Foreign Affiliates Statistics (1999). A Travel survey (involving also the Turismo de Portugal) was launched in 2004. The INE is responsible for the collection and dissemination of the International Trade statistics in Goods and Banco de Portugal for the compilation and dissemination of the Balance of Payments statistics that includes the Goods Account. As an example concerning Trade Statistics, on a monthly basis, the INE provides to Banco de Portugal information on the amount of imports and exports in goods by country.

A protocol for the Household Finance and Consumption Survey follows the international version of the Household Finance and Consumption Survey proposed by the Eurosystem and was adapted to the Portuguese reality. The aim of the survey is to collect data on the household's financial and economic situation as well as additional demographic and social data. This information should allow characterizing the situation and financial decisions of households, particularly regarding wealth, indebtedness and consumption/saving decisions. It should be noted that microeconomic data allow us obtaining information that cannot be obtained on the basis of aggregated data.

Additionally, several initiatives involving INE and Banco de Portugal and other institutions, under the strategic guidance of the Statistical Council, had an important impact in the Portuguese Official Statistics.

At the beginning of 2006, an institutional cooperation agreement in the field of general government statistics was signed between the Banco de Portugal, INE and the Ministry of Finance. In March of 2017 it was signed a new institutional cooperation protocol in this field, including also 10 other entities – e.g. the Portuguese Public Finance Council, the Directorate General of Local Government, the Portuguese Treasury and Debt Management Agency, the Regional Statistical Services of the Autonomous Regions and the Court of Auditors. In the spirit of the previous agreement, this protocol seeks to promote institutional cooperation and data quality in the field of general government statistics, with a particular emphasis on the data requirements pursuant to the Excessive Deficit Procedure and to the European Semester and on the transmission mechanisms underlying the source information.

Furthermore, the Banco de Portugal, INE, the Ministry of Finance and the Ministry of Justice have also developed a joint project aiming at defining a harmonized solution for the collection of annual data from the financial statements of non-financial corporations. This resulting system is known as IES (Informação Empresarial Simplificada), which literally means Corporate Simplified Information, and was formally introduced through the Decree-Law 8/2007. IES is the electronic submission of accounting, fiscal and statistical information that companies regularly have to remit to the above mentioned authorities. Through IES, companies can fulfil their reporting obligations to four authorities through one single electronic submission at one moment in time. This initiative integrates a set of measures that have progressively streamlined administrative and legal procedures for companies, thus reducing their reporting burden.

Moreover, drawing up on the successful experience of institutional cooperation in the implementation of IES, the work of the Statistical Council, and of its Standing Sections, has also led to the creation of the Information System of the Portuguese Classification of Economic Activities (SICAE – Sistema de Informação da Classificação Portuguesa de Atividades Económicas[9]), which was implemented through the Decree-Law 247-B/2008. This constitutes a good example of the use of administrative data for several purposes (including statistical production) and of excellent institutional cooperation, led by the Statistical Council and involving the Banco de Portugal, INE and several Ministries.

With SICAE, there is a single site where one can obtain updated information on the economic activity classification (CAE – Classificação Portuguesa de Atividades Económicas) code (harmonised with NACE's classification and adapted to the Portuguese context[10]) of any company, association, foundation and other collective persons. With SICAE, obtaining information about the CAE code of any entity is: (i) simpler, because only the CAE code in SICAE is valid for all legal purposes; (ii) up to date, because all the amendments to the CAE code are automatically entered in SICAE; (iii) faster, because all the information in SICAE is freely accessible and free of charge and available through a simple search; (iv) accessible, because the CAE code of any entity is now permanently available for consultation in a single place.

The common application of the Harmonized European Policy for Regular Revisions, which is defined in the framework of the Committee on Monetary, Financial and Balance of Payments Statistics, is also a good example of institutional cooperation between the INE and the Banco de Portugal, by fully implementing those guidelines for statistics under their responsibility.[11]

Another domain of institutional cooperation in the statistical field worth emphasizing refers to the efforts of technical assistance envisaged by the Portuguese statistical authorities. This has comprised the arrangement of bilateral visits and the organization/participation in seminars and workshops with foreign entities, with a view to promote the sharing of best practices, thus mutually benefiting the participating institutions. In fact, over the past 20 years, Banco de Portugal has cooperated with institutions from 61 countries around the world and several protocols have been signed with some of them (e.g. Brazil and Cape Verde), which have contributed to the development of their respective National Statistical Systems.

Finally, the INE and the Banco de Portugal contributed to the foundation in 1989 of the School of Statistics and Information Management of Universidade NOVA de Lisboa. Today, the NOVA Information Management School (NOVA IMS) is one of the most reputed schools in the world educating managers trained to lead and guide the compilation, analysis, exploration and use of information. In order to strengthen the relationship between the academy and central banks, the Banco de Portugal cooperated with NOVA IMS in the development of a Postgraduate Course on Statistical systems, specializing in central bank statistics, backed by the European Central bank and the Irving Fisher Committee on Central Bank Statistics, and which earned the EMOS (European Master in Official Statistics) accreditation, by the European Statistical System (ESS).

9 For more information on the SICAE, please consult http://www.sicae.pt/default.aspx

10 Statistical Classification of Economic Activities, in line with the European Commission's Regulation 1893/2006.

11 For more details on the Banco de Portugal's revision policy please consult https://www.bportugal.pt/sites/default/files/anexos/documentos-relacionados/policy_revisions.pdf

4 Conclusions

To be better prepared to meet successfully the challenges ahead, statistical authorities should consider being more pro-active and more outward-looking, which implies:

- Deepening further the degree of institutional cooperation – both at national and international levels;
- Attempting to identify, as early as possible, the likely changes and the true underlying economics of the events and transactions which have to be measured;
- Promoting mutually beneficial interrelationships with the relevant users (and with the data providers as well);
- Increasing the technical skills (including training and education in information and communication technologies) and the conceptual and analytical capabilities of its staff;
- Defining a communication strategy that is capable of matching the users' expectations towards the way data are delivered, and of converting data into knowledge.

Moreover, institutions with statistical responsibilities can only benefit from being engaged in processes of institutional cooperation, both nationally and internationally. These processes promote an efficient use of resources, avoiding duplication of efforts and reducing the reporting burden. They thus benefit the many agents that intervene in the various stages of the production cycle, from data collection to statistical dissemination. Cooperation also enhances the sharing of best practices through multilateral contacts and technical cooperation on a bilateral basis. That said, it is clear that, to fully reap the benefits of such initiatives, it is important to have a body responsible for overseeing the National Statistical System, to bring together the main stakeholders and coordinate with them, through active and open discussion, the most relevant strategic priorities.

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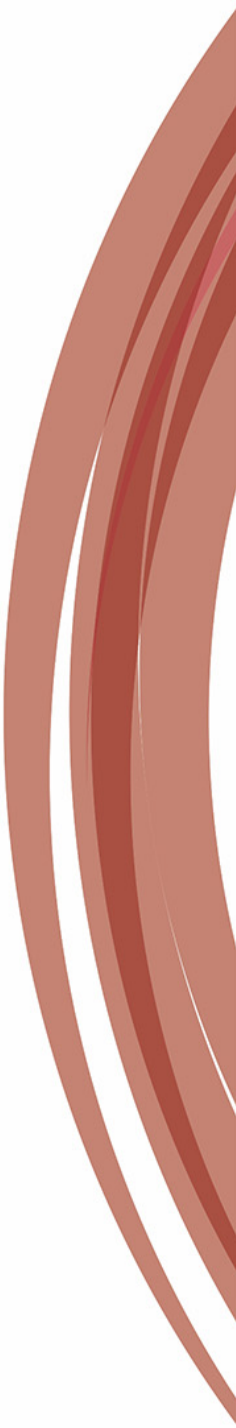

II Micro-Databases: Potential for statistics

Upgrading Financial Accounts with Central Balance Sheet Data – What's in it for central banks' policy?

Assessing financial inclusion in Portugal from the central bank's perspective

Upgrading monetary and financial statistics in the wake of the financial crisis – There's life beyond aggregate data?

The Portuguese Central Credit Register as a key input to the analysis of financial stability... and beyond!

Tailoring national financial accounts to the users' needs using administrative and other large granular datasets

Looking into R&D intensity in Portugal in the last years

Upgrading Financial Accounts with Central Balance Sheet Data – What's in it for central banks' policy?*[1]

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Abstract

Good statistics are a precondition to good policy-making. Thanks to their comprehensiveness and methodological soundness, financial accounts provide a powerful tool in helping to assess the influence of monetary policy actions on the different economic sectors, in a context characterized by their increased financial interconnectedness and threats to financial stability. To achieve fully integrated and consistent financial accounts, Banco de Portugal benefits from the richness in statistical content of its Central Balance Sheet Database which is based on census data submitted by virtually all resident corporations through the so-called IES – Informação Empresarial Simplificada (literally meaning "Simplified Corporate Information") reporting scheme. Based on our experience, this paper aims to illustrate the advantages and potential uses of corporate accounting data by financial accounts compilers, namely in the processes of improving the consistency and for data quality control purposes.

Keywords: accounting information; micro databases; sectoral accounts; non-financial corporations

JEL classification: E52; E58

* International Statistical Institute: Regional Statistics Conference, Bali, Indonesia, March 2017

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1 Introduction

The global financial crisis of 2008 highlighted the need to better identify the build-up of risks in the financial sector and to understand financial connections among the resident sectors of an economy and between them and their counterparties in the Rest of the World.

Under this context, several initiatives were taken aiming the enhancement of the availability of financial statistics, especially of those related to financial stability issues and systemic risk assessment. This effort was, from the onset, clearly inserted within the general financial accounts framework through the encouragement to the development of integrated sectoral accounts and the compilation of flow of funds schemes (vd. recommendation 15 of the G20 data gaps initiative). Financial accounts, an integrated part of the national accounts, are a simplified statistical representation of the financing structure and net financial assets of the various institutional sectors which allow an overview of the uses of the financial surpluses and the way deficits are financed. Complemented with counterpart information, from-whom-to-whom matrices become possible to be compiled. On the basis of these matrices, it is additionally possible to build flow of funds schemes recognised by showing the interlinkages between institutional sectors and, therefore, as a powerful tool to support decision making processes at a macroeconomic level.

The definition of such ambitious statistical output, given the demand for complete information for all institutional sectors, financial instruments and counterparts, was accompanied by the recognition of the challenges imposed by the lack of so detailed data, especially for some institutional sectors, as the Non-Financial Corporations (NFC) and the Households (HH) (Tissot, 2016).

As a way to overcome this concern, the collection of micro data has been increasingly encouraged and their benefits are being globally recognised: the information required to compile integrated sectoral accounts and flow of funds schemes can be easier derived from granular administrative datasets, given that these data sources have generally a good coverage of the relevant economic agents.

At this respect, the Statistics Department has a remarkable experience in managing administrative databases, which are taking on a predominant role in the achievement of fully integrated and consistent national financial accounts. Among them we highlight the Securities Statistics Integrated System (SSIS) – a security-by-security and investor-by-investor database of both securities holdings and issues; the Central Credit Register (CCR) – which contains granular information on e.g. credit exposures; and the Central Balance Sheet Database (CBSD) – an economic and financial database based on annual and quarterly accounting data on individual Portuguese NFC, which will be discussed in greater detail in the Section 3.

The next section of this paper presents briefly the experience of Banco de Portugal (the Bank) as a financial accounts compiler and Section 4 addresses the use of CBSD data to the compilation of national accounts.

2 The Portuguese solution to compile national financial accounts

Following a protocol signed in 1998, in Portugal, the responsibility of the production and dissemination of national accounts is shared between the Portuguese National Statistical Institute, for the non-financial accounts, and the Bank, in charge of the financial accounts compilation. This

last process is carried out, on a quarterly basis, by a multidisciplinary team denominated Estrutura de Missão das Contas Financeiras (EMCF). This successful arrangement was put in place at the Statistics Department by the end of 2009, and has proved the importance of the involvement of all the divisions of the Department. The EMCF is chaired by the National Financial Accounts Head of Unit and encompasses both national financial accounts experts – permanently allocated to these tasks – and experts from the different underlying primary statistics. Within this new format, all team members become stakeholders of national financial accounts statistics and therefore also actively engaged in collectively contributing to the end-product: for instance, experts from the Central Balance Sheet Statistics Unit provide not only primary data but also are specifically responsible for the compilation of the NFC sector account, and more generally co-responsible for national financial accounts (Matos, 2016a).

Financial accounts data include both the financial transactions and stocks of the different institutional sectors. Its compilation is done on a quadruple-entry basis, whereby each transaction is recorded for the two institutional sectors involved and as a change in both assets and liabilities. In practice, this is achieved by constructing highly detailed from-whom-to-whom matrixes with information on creditor and debtor sectors, financial instrument and assets/liabilities. For the flow of funds representation, the availability of the information on a from-whom-to-whom basis is crucial.

The most important internal data required for the compilation of this output are monetary and financial statistics, balance of payments and international investment position statistics, CBDB and securities statistics. Regarding external sources, information for general government accounts is one of the main inputs. As mentioned above, micro-databases have an unquestionable valuable to ascertain counterparts and construct from-whom-to-whom matrixes, allowing the Bank to go beyond its statistical reporting obligations.

3 The Central Balance Sheet Database: the IES and the ITENF

As mentioned, the Central Balance Sheet Database of Banco de Portugal is an economic and financial database on Portuguese NFC. The data sources used to feed the CBSD are based on annual and quarterly accounting data on an individual basis.

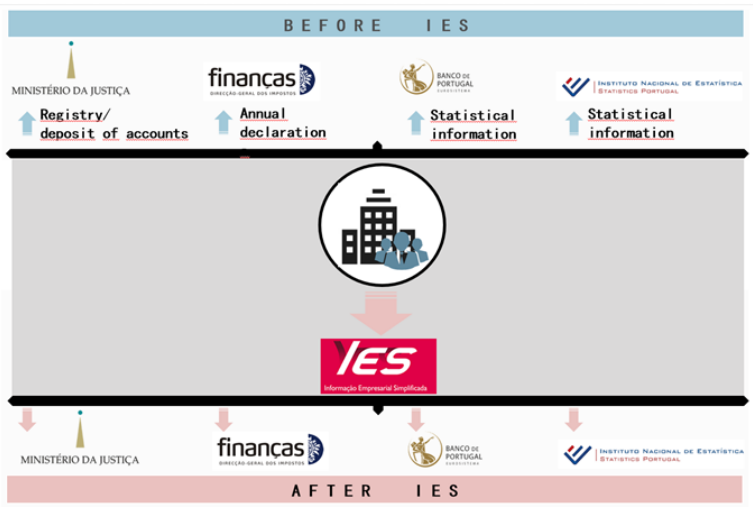
For annual data the CBSD is based on information on the annual accounts of corporations reported within a scope of Annexes A and R of IES – Informação Empresarial Simplificada (literally meaning "Simplifies Corporate Information"). IES was an innovative solution launched in 2007, as a result of a joint effort by four public entities in Portugal: the Ministry of Justice, Portuguese Tax and Custom Authority, the Portuguese National Statistical Institute and the Bank. Formerly, in order to fulfil their statutory obligations, corporations were obliged to remit, in separate and independent reports, nearly the same information about their annual accounts to the aforementioned four public entities, in four different moments in time and according to four different formats. The submitted data was not completely harmonized, once each public entity had different requirements (Figure 1).

IES has brought about several advantages for all stakeholders involved. Firstly, it has contributed significantly to streamline companies reporting requirements, decreasing their reporting burden and also avoiding redundancies, by allowing companies to fulfil all the different reporting obligations through one single paper-free report. The statement containing the annual business

accounting data is submitted online by each company, once a year, with a delay of about seven months after the end of the reference period. Secondly, it came to make it simpler to those public entities, since they no longer directly request the annual data included in IES. Data is now more "friendly", i.e., it is now much easier to conduct analysis and guarantee the quality of the data because it is reported online and in a harmonized template.

The information collected through IES is chiefly of an accounting nature, based on the financial statements and the respective annexes set out in the accounting standards. Additionally, it also comprises a range of data with further detail on the activity and situation of the corporations, as necessary for statistical purposes.

Figure 1 • The reporting of corporate information before and after IES



The CBSD annual output includes a very significant observed component obtained via data submitted under IES. In the last years a coverage of about 95% of the total corporations was achieved.

This observed component also allows the estimation of the residual component for non-response, which aims to obtain the main variables of the balance sheet and profit and loss account for corporations that have not fulfilled the reporting requirements or in cases of delayed delivery of IES reporting.

The starting point for the treatment of this last component is the information available in the reference population of the NFC sector and in the census databases managed by the Bank.

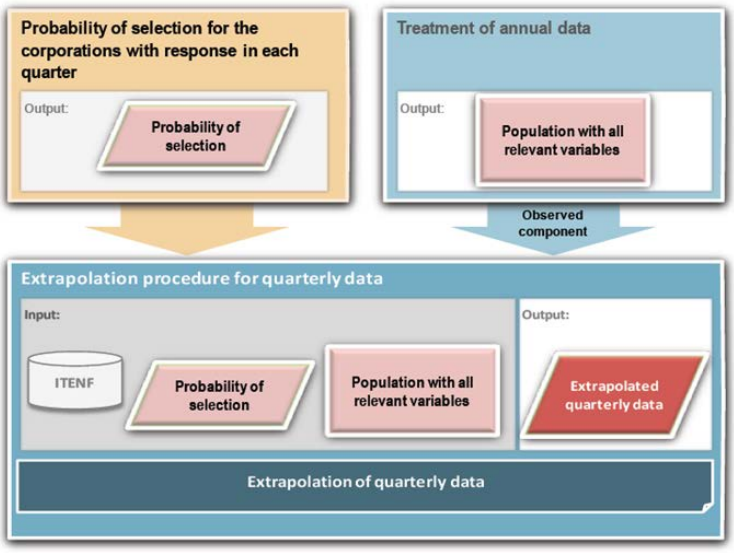
The first step consists in obtaining an estimate for total assets of corporations not reporting to IES, by resorting to IES information on the same corporation for a previous period, or information on that corporation in other Banco de Portugal databases (SSIS and CCR). The second step corresponds to estimate a set of relevant information on these corporations not reporting IES, using as ancillary information the NACE – Rev.2 and turnover from the reference population, SSIS and CCR data and the total asset estimates in the previous step. In the end, estimations are calibrated so as to maintain, to the extent possible, the initial classification of the corporations by quantitative stratum (turnover and total assets).

This information is indispensable for the extrapolation process and conciliation between annual and quarterly data. This procedure makes it possible to complete the annual database but, give the small weight of the non-response component, it does not introduce changes in the development of the main indicators observed in responses to the IES.

For quarterly data, the CBSD is feed with information reported through the Quarterly Survey to NFC (here in after denominated ITENF, from the Portuguese designation *Inquérito Trimestral às Empresas Não Financeiras*), a statistical operation jointly developed between Banco de Portugal and the Portuguese National Statistical Institute, with a main objective of collecting a range of accounting variables related to the activity and financial situation of a sample of companies. In recent years, significant improvements have been introduced in the methodology associated with the definition of the ITENF's final sample. The current approach, since it does not correspond to a classical sampling design, makes necessary to estimate probabilities of selection of corporations, which are key to calculate the extrapolation factor assigned to each corporation.

The extrapolation procedure is based on the account variables reported by the respondents of the ITENF (Figure 2). In addition, the probabilities of selection used are those previously calculate to determine the extrapolation factor of each corporation, as well as data on the reference population on the NFC sector, updated with information for all relevant variables. This extrapolation procedure makes possible to obtain estimates for variables of interest, for total corporations in the sampling-frame. However, total output for the corporations in the sampling frame does not substantially differ from the population of NFC, in terms of total assets and turnover.

Figure 2 • Extrapolation Procedure for Quarterly Data



Extrapolated data are thus used as data for total NFC, which is undoubtedly a great plus to the production of NFC statistics and also to the elaboration of different and flexible statistical products – *inter alia*, quarterly national financial accounts, which will be discussed in the next section.

Given the existence of both annual and quarterly data sources, different values are obtained at year-end between annual and quarterly indicators. In this context, a conciliation procedure is used,

which is known as benchmarking. The data sources used in benchmarking are the outputs of procedures regarding annual and quarterly data. This conciliation method makes it possible to adjust the quarterly time-series obtained by extrapolating ITENF to the annual time-series obtained from IES, which are considered as benchmarks. In order to carry out this adjustment, a set of constraints to be fulfilled by final data are defined:

- Aggregation constraints which ensure that the quarterly time-series is consistent with the annual time-series. They are defined according to the type of variable: for stock variables, the value at the end of the fourth quarter shall be equal to the value at the end of the year and for flow variables, the value of the annual time series shall correspond to the accumulated value in the year for the quarterly variable.
- Contemporaneous constraints of accounting balance which ensures that an accounting balance condition between the balance sheet and the profit and loss account is met in each period. This condition is particularly relevant in the case of variables in the ITENF, where the extrapolation procedure may give rise to imbalances between the balance sheet and the profit and loss account, since the balance sheet variables (stocks) and activity variables (flows) are obtained through the implementation of different procedures. On the other hand, the estimate based on aggregation constraints alone does not ensure intra-annual data balance.
- Assessment of final data: the final result for each aggregate consists in a range of quarterly time series based on a balance sheet and a profit and loss account without imbalances, which combine the annual value obtained in IES with the intra-annual dynamics resulting from the extrapolated ITENF.

4 National financial accounts compilation using CBSD data

The information derived from the above described extrapolation procedure has assumed an increasingly role in the compilation of quarterly national financial accounts, as a direct source for NFCs account and an indirectly contributor to the HH account compilation.

There are two main complementing elements to compile NFCs and HHs accounts: counterpart information and own data sources.

Counterpart information refers to the appropriation of information from other sectors, in the cases where it is deemed of a superior quality, and whenever the counterpart is NFC or HH. Typically, both the NFC and the HH sector lie at the bottom of the hierarchical chain of counterpart information. This means that these sectors normally take the information of other sectors as given and incorporate it directly. More specifically, compilation of NFCs' accounts takes on board counterpart information from:

- Financial corporations, i.e., balance sheet statistics from Monetary Financial Institutions (and from Other Financial Institutions);
- General government statistics;
- Rest of the World account, i.e., balance of payments and international investment position statistics.

In other words, NFC compilation takes on board the counterpart information of all other sectors/ statistical domains except for HHs. In turn, HH account compilation uses counterpart information of all other sectors.

The second approach pertains to the use of data sources which are specific to these two sectors.

This is where the information derived from CBSD comes to play in terms of NFCs' account compilation. Finally, the SSIS provides information on securities holdings and issuance for the two sectors.

The interesting element of CBSD data is that it is not only an own source for NFCs, but it also provides indirectly contributes to the HH account compilation as counterpart information, to the extent that some types of operations between the NFCs and the HH sector are collected. There are two ways in which the information used from CBSD to compile the NFCs' account is also relevant for the HH sector:

- It helps identify HH equity stakes in NFCs, i.e., HH equity assets in NFCs' equity liabilities. In a country such as Portugal, where the structure of NFCs is heavily tilted towards small and medium-sized corporations, these figures represent an important share of HH equity holdings as well as of NFCs' equity liabilities.
- Secondly, loans received/granted by NFCs and granted/received by HHs are also collected in IES and are therefore used to determine assets and liabilities of NFCs and HH loans.

5 Conclusions

The achievement of Portuguese fully integrated and consistent financial accounts, was only made possible due to the richness of the statistical content of the CBSD run by the Bank. This huge potentiality is due to the relevant data on the population of corporations in Portugal for a relatively long period, as a result of the excellent coverage of IES, which allows the Bank to access to new and more complete information on the Portuguese NFC and, more recently, by the appropriate methodology for the selection of corporations within the scope of the ITENF and the respective extrapolation procedure.

Alone or combined with other information, CBSD data also proved to be a great value for pursuing the statistical central bank statutory obligations. The use of this information for the compilation of the NFC and HH sectors' financial accounts is an example of the statistical possibilities of such census information.

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Assessing financial inclusion in Portugal from the central bank's perspective*

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Abstract

The paper discusses the evolution of financial services in Portugal and, in particular, the role and contribution of Banco de Portugal as a financial services provider – with emphasis on the services offered by its Central Credit Register and within the context of its Banking Conduct Supervision activities, and how they have been used to pre-empt over-indebtedness and to monitor the access to financial services, while shedding light into the usage of innovations in the payment systems. Finally, an attempt at documenting and measuring the evolution of financial inclusion in Portugal is made on the basis of the results of the Banco de Portugal's Survey on the Financial Literacy of the Portuguese Population.

Keywords: financial inclusion; financial services; payment systems; central credit register.

1 Introduction

Financial inclusion – loosely defined here as the ability of individuals or enterprises to obtain formal financial services that are appropriate to their needs, including access to credit and bank accounts, payments facilities, insurance, and other risk management services – is essential in fostering the development and competitiveness of an economy and in mitigating the asymmetries in the distribution of income across and within countries. However, while there has been some progress worldwide toward wider access to formal financial services, significant challenges remain – e.g., more than two billion adults do not have access to formal or semi-formal financial services; they are the financially excluded in a world where access to financial services can mean the difference between surviving or thriving (ATISG, 2010). What is more, financial exclusion seems to be no longer only a phenomenon in developing and emerging countries, especially in the aftermath of the 2007-08 financial crisis. Indeed, as Coffinet & Jadeau (2017) discuss, the data currently available show that, even in developed countries, many people remain excluded from the financial system, to basic banking products, as is clearly the case with a plain transaction account.

* International Statistical Institute: Regional Statistics Conference, Bali, Indonesia, March 2017.

The increased awareness of this problem led policymakers, regulators and development agencies globally to consider the promotion of financial inclusion as a priority. The G-20, for instance, has identified financial inclusion as a key driver of economic growth, reduced economic vulnerability for individual household, poverty alleviation, and improved quality of life for people around the world. On the occasion of its Seoul Summit in 2010, a number of initiatives directed to improving access to financial services and expanding opportunities for poor households and micro-, small- and medium-sized companies was approved (the Financial Inclusion Action Plan, the Global Partnership for Financial Inclusion and a flexible SME Finance Framework).

Against this background, the paper describes the provision of formal financial services in Portugal and, in particular, the role and contribution of Banco de Portugal as a financial services provider – with emphasis on the services offered by its Central Credit Register and within the context of its Banking Conduct Supervision activities, and how they have been used to pre-empt over-indebtedness and to monitor the access to financial services, while shedding light into the usage of innovations in the payment systems. The focus of the paper will be more on the provision of financial services rather than in measuring the access to them, in view of the methodological difficulties inherent to the measurement of access to finance as well as the lack of comprehensive and reliable data (e.g., on the people using financial services, the types and quality of services they receive and the price they pay for such services, and also the barriers they face to broader access). That said, the absence of significant non-price barriers for firms and households in the use of financial services in Portugal, on the one hand, and the fact that the provision of financial services may be seen as an indication of the potential access to financial services, on the other hand, give justifying argument for the approach that has been followed. Notwithstanding, an attempt at documenting and gauging the evolution of financial inclusion in Portugal will be made, on the basis of the results of the Banco de Portugal's Survey on the Financial Literacy of the Portuguese Population.

2 The evolution financial services provision in Portugal

The provision of financial services in Portugal has been growing at a fast pace since 1986, the year that marked the Portuguese accession to the European Economic Community (EEC). This trend was fuelled by a substantial increase in the use of technological innovations (mainly in telecommunications), which made it possible to implement teleprocessing networks, either within the larger banks or through interbank links, with visible benefits to the supply of financial services, particularly in the field of retail payments. This increase was backed by the creation of SIBS ("Sociedade Interbancária de Serviços"), a company that was founded in 1983 by a number of resident banks (as of today, the company's shareholders stand for practically the whole retail banking sector in the country). Its aim was to introduce a single payment platform that met the banking establishments' needs while developing their facilities and technology, and extending their international scope.

In 1985, this network became operational under the Multibanco designation. Multibanco, a sophisticated network shared by every bank operating in the economy that fully integrates automated teller machines (ATMs) and electronic funds transfer at point of sale (EFTPOS) terminals, profoundly transformed the way retail payment operations were carried out in Portugal. Since its implementation, new features have been constantly added to the system (involving no extra costs to its users): in addition to cash deposits/withdrawals and balance/transactions

inquires, customers can also do money transfers (both to other customers in the same bank and to other banks), deposit and order cheques, pay utilities bills, pay services and purchases, pay taxes and Social Security contributions, top-up mobile phones, transport ticketing and event booking and ticketing.

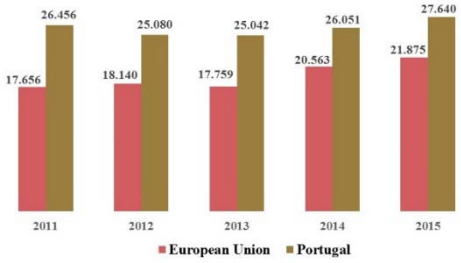
The activity of SIBS was instrumental in generating economies of scale deriving from a more rational and effective use of the financial, technical and human resources needed to develop more advanced payment instruments and systems. Also, SIBS made the Multibanco network open to all those taking part in payment systems operations, which allowed for network economies and the safety inherent in a single system. In addition, this scheme has returned to its users a substantial part of the productivity gains generated from on-going technological and organisational developments, both directly, through the supply of a service that is ever wider, of better quality and at a better price, and indirectly, through increasing efficiency in the banking system as a whole.

Quantitative relevance

The Payments and Settlement Systems Statistics dataset of the European Central Bank Statistical Data Warehouse offers ample coverage about the characteristics and the dimension of the Portuguese payments system as well as of the other European Union Member States.

Figure 1 • ATM demographic coverage | Number of ATMs per million inhabitants

Figure 2 • POS demographic coverage | Thousands per million inhabitants



Looking into this dataset, one sees that, *inter alia*, the value of transactions carried through card payments with cards issued by resident Payment Service Providers (PSPs) in Portugal has been growing steadily between 2011 and 2015, totalling 65.4 EUR billions in 2015 (55.7 EUR billions in 2011); also, the demographic and geographic coverage of the ATM and POS networks are shown to rank amongst the highest in the European Union and the Euro area. The number of ATMs provided by resident PSPs in Portugal reached 15.6 thousands in 2015 – roughly 1500 per million inhabitants (the 2nd highest demographic coverage in both the European Union and the Euro area) and 169 per 1,000 sq. km. In addition, the number of POS terminals provided by PSPs in Portugal amounted to 286.4 thousands in 2015 – approximately 27,640 per million people (the 6th highest demographic penetration in the European Union and the 5th in the Euro area) and 3,106 per 1,000 sq. km. The number of cards with a cash function issued by resident PSPs totalled almost 20 million in 2015 (19 million in 2011), while the number and related value of transactions with cards issued by PSPs totalled, respectively, about 1,375 million in this year (1,237 million in 2011) and approximately Euro 65.4 billion (55.7 EUR billions in 2011).

A Banco de Portugal's study conducted in 2016 estimated that, during 2013, the usage of the different payment instruments represented a cost of 1.6 per cent of the country's Gross Domestic Product (GDP), which was shared almost equally between the banks, non-financial firms and consumers. Moreover, the study also found that the share of this costs that were supported by the banks – estimated at 883,4 million euros – have surpassed the direct and indirect benefits generated by the usage of different payment instruments – which only amounted to an estimate of 627,2 million euros. However, when the same analysis was broken down by the different instruments, it became clear that the debit cards and the cheques were, for banks, the only "profitable" payment instrument as their benefits covered their costs in 130 per cent and 100 per cent, respectively. Conversely, cash was the payment instrument which generated the greatest gap between costs and benefits, as the costs coverage rate was only 5 per cent.

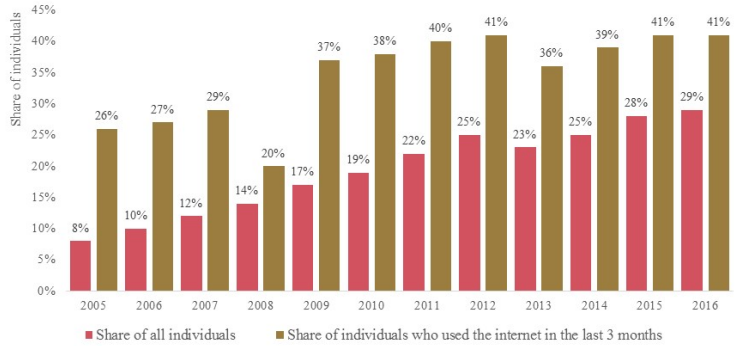
The same study also found that, from a cost perspective, the debit card is relatively more socially efficient than cash – representing, respectively, a cost of 50 and 53 cents per transaction – and that, for payments below 1,89 euros, cash is the less socially costly payment instrument. Above this threshold, the debit card was found to always be the less socially costly payment instrument.

Home banking and mobile banking in Portugal

The availability of Information and Communication Technologies (ICT) has also led the Portuguese banks to make considerable efforts to modernise customer access to financial services in new, cheaper ways, and to more people. As a complement to in-person services, online connections with corporate customers, home banking and mobile banking (m-banking) are now extensively available in Portugal and increasingly used by firms and households.

Indeed, the information currently available on the on-line bank penetration in Portugal (from the "Statista" website) shows that, in 2016, 29 per cent of all individuals used the internet for on-line banking, and that such usage was higher for those who had used the internet within the last three months, at 41 per cent (see figure 3).

Figure 3 • Online banking penetration in Portugal | 2005-2016



Source: https://www.statista.com/statistics/380873/online-banking-penetration-in-portugal/

With m-banking, banks get information to their customers no matter where they are and at reduced costs. This is vital for a number of banking services (e.g., alerts), as well as for traditional marketing campaigns.

From the demand-side viewpoint, people often do not have time to get to a bank branch, and the Internet may not be an option in some cases – circumstances that favour the use of a more straightforward channel. For a sizeable part of the Portuguese population, using mobile phones to have access to certain financial services, like checking bank balances or conduct other basic operations, should be like a second nature. The Portuguese are clearly a tech-savvy nation. Indeed, the European Commission's *Report on the Implementation of the Telecommunications Regulatory Package*, published in 2015, outlined that Portugal stands out from the EU average when comparing the fixed broadband coverage (100 per cent vs. 97 per cent), the share of households subscribing high-speed connections (54 per cent vs. 26 per cent for connections faster than 30 megabits per second (Mbps) and 22 per cent vs. 9 per cent for connections faster than 100 Mbps) and the coverage of LTE Mobile broadband[1] (94 per cent vs. 79 per cent). Notwithstanding, the report also details that Portugal is still relatively behind the European Union (EU) average in the penetration of mobile broadband networks (46 per cent vs. 72 per cent).

The continuous expansion of Internet banking and m-banking in Portugal should contribute to improve noticeably the access to financial services, by offering services that are, concurrently, more affordable and more suited to the prospective customers, particularly to that segment of the so-called "marginally banked" (i.e., people with a deposit account that have no electronic payment facilities and no payment card or cheque book) and for those who have a bank account but rarely use the related electronic payment facilities and cards.

In view of the above, it is safe to say that the Portuguese retail payment system is widely recognised today as a highly developed system, in terms of technology, accessibility, time-saving features and nationwide coverage. The system processes millions of operations on a daily basis, both counter-based at thousands of bank branches and electronically through the ATM / POS system. Finally, its overall quality can be recognised by what is in relative terms a very small number of complaints on the part of the banks' clientele.

3 The role of the Banco de Portugal as provider of financial services

Banco de Portugal is the Portuguese central bank and is an integral part of the European System of Central Banks (ESCB). As such, it pursues the objectives and participates in the performance of the tasks en-trusted to the ESCB, particularly the maintenance of price stability, which is viewed as a pre-condition for increasing economic welfare and the growth potential of an economy. The Banco de Portugal is also accountable for the efficient and safe functioning of the country's payment systems – including the issue of banknotes and clearing services –, an essential condition for the sound operation of the economy. In addition, the Banco de Portugal provides a wide range of services to the banks – e.g., the running of the Central Credit Register (including the centralization of information on protested bills and on cheque defaulters) – and to the non-financial companies – e.g., the maintenance of its Central Balance-Sheet Data Office and the production of specific sectoral studies. Moreover, the Banco de Portugal supervises the resident credit institutions and other financial companies, thus providing for the stability and the soundness

1 In telecommunication, Long-Term Evolution (LTE) is a standard for high-speed wireless communication for mobile phones and data terminals, based on the Global System for Mobile (GSM) / Enhanced Data (rates for) GSM Evolution (EDGE) and Universal Mobile Telecommunications System (UMTS) /High Speed Packet Access (HSPA) technologies. It increases the capacity and speed using a different radio interface together with core network improvements. (Wikipedia).

of the financial system and ensuring the efficiency of its operation, the safety of deposits and of depositors and the protection of consumers of financial services. Also, Banco de Portugal regulates, oversees and sanctions the conduct of credit institutions, financial companies, payment institutions and electronic money institutions offering retail banking products and services. It also promotes the financial information and education of bank customers. Last but not least, another service provided by the Banco de Portugal to the community includes the compilation, analysis and dissemination of monetary, financial, exchange and balance-of-payments statistics, which are instrumental to decision-making and, in this way, influence the financial activity in the economy.

Services related with the Central Credit Register

The Central Credit Register (CCR) is a database managed by the Banco de Portugal on the basis of credit-related information (including potential liabilities, such as, unused amounts on credit cards and open credit lines) that is supplied by its participants (all resident credit-granting institutions). The main aim of the CCR is to provide information to assist the participants in their appraisal of the risks attached to extending credit. To this end, the participants can assess aggregate information on the credit liabilities of each client *vis-à-vis* the financial system. Moreover, any individual person has the right to be informed about the data recorded in his/her name in the CCR and, where necessary, ask the participant responsible for the reporting to Banco de Portugal to correct and update such information. The Banco de Portugal is legally authorised to use the CCR information for: (i) the supervision of credit institutions and other financial companies; (ii) the analysis of the stability of the financial system; (iii) monetary policy operations and intra-daily credit; and (iv) the compilation of official statistics –e.g., on the distribution of credit by branch of activity.

The CCR database fulfils all the requirements for data protection, as laid down by the National Commission for Data Protection.

Banco de Portugal ensures the centralisation and the subsequent dissemination throughout the banking system (generally on a daily basis) of credit incidents (protested bills) submitted to the Notary Public Offices by financial institutions, thus providing the financial institutions with additional means to better evaluate the risks of their active operations.

Banco de Portugal is also responsible for checking compliance with the duties assigned to the credit institutions as regards the use of cheques. In particular, Banco de Portugal centralises the information reported by credit institutions and discloses through the banking system the list of cheque defaulters.

Services related with the market conduct supervision of credit institutions

In a market characterized by contractual freedom and financial innovation, it is incumbent upon the Banco de Portugal to check for compliance with the minimum requirements of information to customers on the financial conditions applied to the different operations and services, as well as on the respective risks – a mission that will hereafter refer to as banking conduct supervision, as opposed to prudential supervision, which is more focused on guaranteeing the soundness of financial undertakings and contributing to the stability of the financial system. Informed decision-making by the banks' clientele, especially aware of the risks inherent to financial products and services, is a key requirement to the efficient operation of the retail financial markets and to mitigate the level of risk in the financial system. Indeed, the disclosure by credit institutions of relevant information concerning their products and services, in a transparent, intelligible and standardised way, promotes such decision-making. However, the dissemination of information

along those lines may not be enough, given that the clients' decisions are also determined by their level of financial literacy. Therefore, it is also necessary to foster financial education among the public at large.

Banco de Portugal's banking conduct supervision is structured on the basis of a number of reciprocally complementing guiding rules, ranging from the requirement for credit institutions to observe the principle of transparency and rigour when informing their clients along the various stages of the marketing of banking products and services, to the development of the normative framework that governs the conduct of credit institutions in the retail financial markets. Concurrently, they include monitoring compliance with regulations – e.g., via surveillance activity related to the commercialization or promotion of financial products and services, by responding to clients' complaints and through comprehensive on-site inspections – as well as fixing cases of non-compliance and, in the most serious situations, applying administrative sanctions. Another guiding principle consists of promoting the quality of the demand for financial products and services, by fostering initiatives that contribute to raising the clients' competences in assessing costs, expected income and risks related to those products and services.

4 Measuring financial inclusion in Portugal

The international financial crisis has highlighted the importance of financial literacy and informed decision making by bank customers as a form of fostering financial inclusion and improving the efficiency and stability of the financial system. In this context, central banks and financial supervisors have attributed increasing importance to initiatives promoting financial literacy and becoming more involved in the definition and implementation of national strategies on financial education. The promotion of financial literacy contributes to foster the benefits of the instruments regulating transparency and duties of information of credit institutions and, therefore, to the more efficient functioning of financial markets. Citizens who are better informed have greater capacity to understand the information that is conveyed to them by the credit institutions, helping, thereby, to monitor the markets. By choosing financial products that are suited to their risk profile and financial needs, bank customers allocate their funds in the most efficient manner and contribute to the stability of the financial system.

In recognition of the importance for the citizens of taking informed and careful decisions in the management of their personal finance, the Banco de Portugal decided, in 2010 and in 2015, to carry out a Survey on the Financial Literacy of the Portuguese Population, taking into account the principles and best practices adopted internationally. The Survey was structured so as to enable obtaining information about the financial attitudes, behaviour and level of understanding of financial matters by the population. Through the assessment of the various dimensions of the concept of financial literacy, the Survey contributes towards identifying the population groups and financial topics with the most significant gaps in terms of literacy. This represents an important means of diagnosis of the degree of financial literacy of the population and, as such, is an indispensable step towards the definition of financial education priorities.

Outcome of the Survey

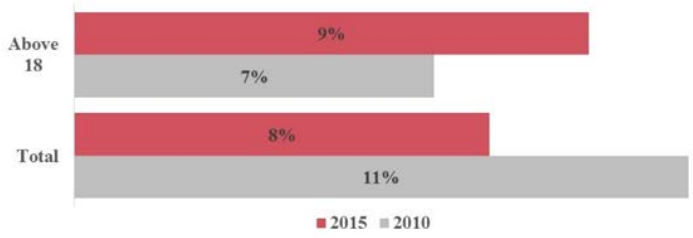
The results shown by the 2015 Survey are positive with respect to financial inclusion, where the degree of use of the banking system by the population is particularly high, and show a gradual improvement when compared to the results of the 2010 survey. This is also an important indicator of social integration, which compares very favourably in international terms. The degree of financial

inclusion, ascertained namely through the percentage of citizens with access to a bank account, is in line with that of other developed countries. Likewise, the data on the use of electronic means of payment confirms the importance that bank customers in Portugal attribute to electronic currency.

Inclusion in the banking system

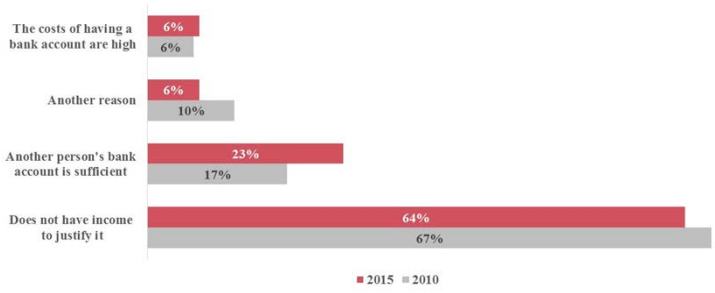
In 2015, approximately 9 per cent of the respondents did not hold a current account, which represented an increase of around 2 percentage points when compared with the record of 2010. However, when we consider only the interviewees above the age of 18, the percentage of those without a current account falls to 6,5 per cent, thus representing only a reduction of 1 percentage point since 2010. Moreover, in 2015, 55,3 per cent of the total of respondents who do not have a current account were aged 16 and 17 or over 70, as opposed to 50 per cent in 2010.

Figure 4 • Percentage of interviewees without a current account



As the reason for not having a current account, 64,2 per cent of the individuals indicated that their income was insufficient to justify it – which represented an improvement of 3,2 percentage points when compared to 2010 – and 23,4 per cent referred that another person's account was sufficient – an increase of 6,7 percentage points since 2010.

Figure 5 • Reasons for not having a current account



Holding of a bank account

For the interviewees with a bank account, the average number of accounts recorded in 2015 was 1,3, slightly below the average registered in 2010 (1,4 accounts). Approximately 74 per cent of those who have a bank account have only one account, account and 23 per cent hold two accounts. Moreover, it was found that 57,5 per cent stated using the account more than once a

week and that the number of bank accounts and the frequency of their use were positively correlated with the schooling (and income) level. This latter result derives from the positive relationship between these two last indicators.

Figure 6 • Number of bank accounts

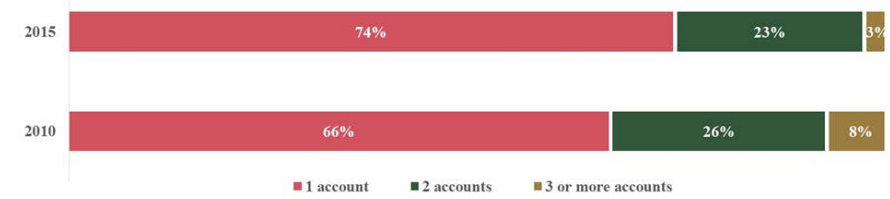
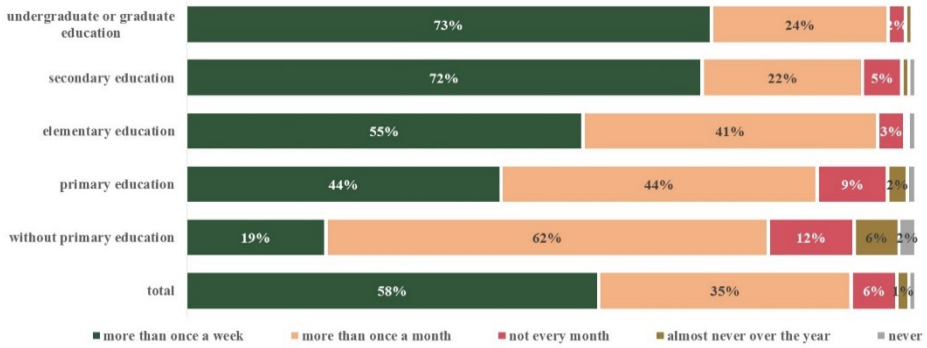


Figure 7 • Frequency of the use of bank accounts, by education

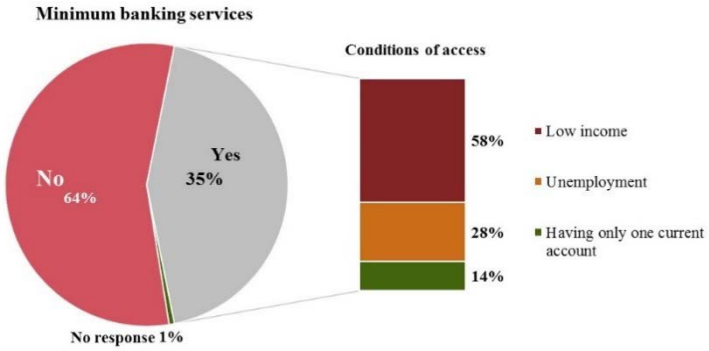


Access to minimum banking services

The minimum banking services system promotes financial inclusion, by enabling access to a current account and respective debit card, with annual costs not above 1 per cent of the guaranteed minimum monthly remuneration. In order to have an account under this system, customers are merely required not to have another bank account.

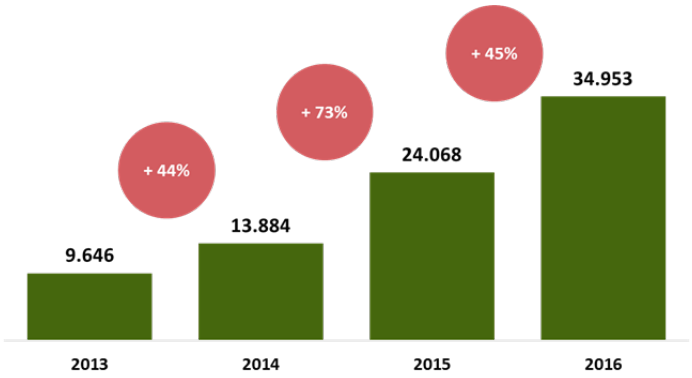
The degree of information on this right is still somewhat low, since 63,7 per cent of the respondents stated not knowing of its existence and the related access conditions, which, nevertheless, represents a positive improvement when compared to the same response rate in 2010 (71 per cent).

Figure 8 • Knowledge of minimum banking services and related conditions



Of the respondents who stated knowing the minimum banking services (mainly individuals with primary or elementary education), only 14 per cent gave the correct answer "having only one current account" when questioned on the conditions of access to this system. This leads to the conclusion that only 5per cent of the total respondents actually revealed knowing what are the minimum banking services, which, albeit is a seemingly low result, is already a great improvement since 2010, when only 1,4 percent of the interviewees knew what were minimum banking services. Indeed, this improvement has also been translated through the steep growth of the number of accounts of minimum banking services, given than, only in the past four years, the number of such accounts has more than tripled.

Figure 9 • Evolution of the number of minimum banking services accounts



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Upgrading monetary and financial statistics in the wake of the financial crisis – There's life beyond aggregate data*[1]

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Abstract

The Great Financial Crisis and the ensuing unconventional monetary policy response from central banks have increased the demand for comprehensive, high quality and more detailed statistics. In this context, traditional aggregate statistics have proved insufficient to monitor and interpret the multiple aspects of the monetary transmission mechanism and the evolution of credit to companies and households. This paper presents the recent developments that have occurred in Banco de Portugal in the area of monetary and financial statistics as a response to these new challenges. In a nutshell, it was considered important to complement the traditional aggregate monetary and financial statistics with more granular data, so as to increase the flexibility and timeliness of the data, while fomenting the integration of micro and macro level information. This strategy allowed for, *inter alia*, the development of (i) new or upgraded statistics, (ii) easier and faster responses to ad hoc requests and (iii) more user-tailored analyses – all features that have proved essential for effectively addressing the challenges posed by the post financial crisis.

Keywords: monetary policy; central bank's statistics; monetary and financial institutions' balance sheet; credit analysis

JEL classification: G20; E42

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1 The analysis, opinions and findings of this paper represent the views of the authors, which are not necessarily those of the Banco de Portugal or of the Eurosystem.

1 introduction

The Great Financial Crisis (GFC) has underscored the gaps in the availability of key information for policy making and for the timely assessment of risks in and across countries. In fact, several aspects of the economic and financial developments, and particularly, the accumulation of risks and imbalances in some sectors and/or financial instruments, were not easily identified by the traditional aggregate statistics.

In 2009, the G-20 Finance Ministers and Central Bank Governors, having recognised the existing limitations, endorsed a set of 20 recommendations to close the data gaps identified in order to support enhanced policy analysis (the so-called "G20 Data Gaps Initiative[2]"). Several of the Recommendations focused on improving the data available on the financial sector and financial institutions given the central role that the monetary and financial sector represent to economies, and its part on the GFC. Monetary and financial statistics (MFS) are particularly relevant in supporting policy making, specifically that of a central bank – they deliver an absolutely critical set of information that provides a comprehensive picture of monetary developments, contributes to the monitoring of the transmission mechanism of monetary policy, helps assessing financing conditions in different sectors of an economy and monitoring financial integration.

In this paper we will present the main developments that have recently occurred in the area of MFS in Banco de Portugal (hereinafter referred to as the "Bank"). Some developments were a response to euro area policy initiatives, such as the creation of the Single Supervisory Mechanism (SSM) or the decision to establish a European analytical credit System (AnaCredit[3]), but, mostly, they are the continuation and deepening of a strategy based on a rich ensemble of granular databases and on the integration of such databases. This strategy allows to complement the traditional aggregate monetary and financial statistics with more detailed data, which increases the flexibility as regards the compilation of new statistics and a more rapid response to ad hoc data requirements from the users, while fostering the integration of micro and macro level information.

These efforts have been producing results, as put forward in this paper. In Section 2 we will provide a brief review of the impacts the Single Supervision Mechanism and the pursuit of unconventional monetary policy in the euro area, in the perspective of a national central bank's statistical function, Section 3 delves on the main developments in the Banks' MFS and presents some examples of the results that we have obtained and Section 4 concludes.

2 The Single Supervisory Mechanism and unconventional monetary policy – a brief review

As work progressed on the G-20 Data Gaps Initiative, policy necessities did not wait for the identified data gaps to be filled. On the contrary, partly as a response to the GFC, several policy initiatives have been put forward and the demand for comprehensive, high quality and more detailed statistics has been made even more evident. In the euro area two developments have been particularly relevant in stressing the need to go beyond the aggregates in the domain of MFS:

2 For more background information on this initiative please see: http://ec.europa.eu/eurostat/statistics-explained/index.php/G20_Data_Gaps_Initiative_(DGI)_%E2%80%93_background.

3 The name AnaCredit stands for "Analytical Credit Datasets".

(i) the pursuit of unconventional monetary policies by the European Central Bank (ECB) and (ii) the creation of the SSM.

Unconventional monetary policies

Following the GFC, central banks around the world moved beyond their traditional operating framework and implemented unconventional monetary policies. These policies include zero or negative reference rates, long-term liquidity provision to banks and expanded asset purchase programs.

In order to thoroughly understand how these unconventional monetary policies affect the funding conditions for households and non-financial corporations (NFCs) and the overall economic prospects – i.e., how the monetary transmission mechanism works under these new circumstances – there has been a call from economists and policy makers for unconventional data, which are not aggregate but granular. As highlighted by Ms Sabine Lautenschläger[4], member of the ECB Executive Board, "conducting (...) unconventional monetary policy is rather difficult when decisions have to be taken on the basis of conventional data, i.e. traditional aggregate statistics".

Traditional aggregate statistics, although of high quality and internationally harmonised, refer to the average of the distributions and, hence, are not the most adequate to explore the heterogeneity hidden behind the aggregates. In fact, given that in many situations it is the tails of the distribution that provide the most important information, it is clear why these data became crucial in the context of the recent GFC.

For instance, an overall growth in credit to NFCs, which could typically be interpreted as a positive development in the credit markets after a financial crisis, may in fact hide significant differences in the evolution of credit to different types of NFCs. Particularly, the funding may only be directed at large, established firms, while small and medium sized NFCs may have been left out, or, similarly, funding may be flowing to firms with a top-tier credit rating while the rest of firms may be facing constraints to their activities because of a lack of credit. In such cases, looking only at the aggregates or looking into the detailed granular data may lead to very different conclusions by policy makers in terms of policy stance and the risks that may be building up to financial stability.

Single Supervisory Mechanism

As part of the answer to the GFC, and with the ultimate goal of building a stronger and sounder banking system in the euro area, the EU decided to establish a single supervisory mechanism in the euro area, involving the national supervisors and the ECB[5]. This Eurosystem's newly entrusted financial supervision demands high quality and harmonized data from all the banks established in the euro area and has benefited significantly from exploring important synergies with the statistical reporting. In fact, integrating both functions – bank supervision reporting and banking statistics – allows reaping large benefits, which positively affect both the data compilers and the reporting entities: the former benefit from the existing infra-structure and the expertise accumulated over time; the latter benefit from a reduced reporting burden through the mitigation of data redundancies and overlapping.

4 Lautenschläger, S. (2016).

5 The SSM started in the 4 November 2014. For more information on banking supervision in Europe please see https://www.bankingsupervision.europa.eu/home/html/index.en.html.

In order to maximize the synergies, new bodies were created at the European level. In particular, the recently created Working Group on Supervisory Statistics is tasked with the collection, production and dissemination of supervisory data harmonised under the European Banking Authority's Implementing Technical Standards and any other additional supervisory data necessary for the SSM. Additionally, the Statistics Committee endorsed the creation of the Task Force on European Reporting Framework (TF ERF), following a recommendation by the "Groupe de Réflexion" on the integration of statistical and supervisory data, thus recognizing the importance of data requirements harmonization. According to its mandate, the TF ERF shall design integrated reporting schemes, covering a wide range of different statistics, namely credit institutions balance-sheet statistics, money and interest rates, securities holdings and credit statistic, while liaising with SSM structures and other groups to maximize the potential of its work.

The data needs of the SSM can thus be seen as an interesting opportunity to maximize synergies between supervision and statistical activities. Mr Pedro Duarte Neves, Vice-Governor of Banco de Portugal, identified three areas in which such synergies may be achieved[6]:

- Concerning data collection and information systems, integrating the reports for both functions will generate large benefits, not only for the data compilers but also for the reporting entities. In this context, highly granular data collection schemes are proving to be fundamental
- A wide range of analytical studies, which have been crucial for supervision and financial stability, benefit significantly from micro data. These analyses reveal the heterogeneity hidden behind aggregate numbers and allow for a better understanding and monitoring of the financial system, thus providing the supervisor a closer and more comprehensive perspective of the financial sector and of its relations with the other sectors in the economy.
- The core supervisory data, granular credit data and ad-hoc data sets, collected and treated by statistics, will generate value not only for the direct supervision but also for the horizontal functions of the SSM, including sector-wide reviews and for identifying trends and emerging risks."

3 Beyond the aggregates – granular data in Banco de Portugal

The use of integrated micro-databases for statistical purposes constitutes the cornerstone of the Bank's long-term strategy as regards not only the statistical function, but also other areas within the central banks' competencies – *inter alia* monetary policy, financial stability, supervision and research. The following databases play a vital role in such a strategy:

- The Central Credit Register (CCR), which contains granular information on credit on a borrower-by-borrower basis (and, in some cases, including details that provide loan-by-loan information) with a virtually full coverage.
- The Central Balance Sheet Database (CBSD), which holds accounting and financial information covering almost exhaustively the existing resident NFCs.
- The Securities Statistics Integrated System (SSIS) database, a security-by-security and investor-by-investor system of both securities holdings and issuances. SSIS complements the CCR data

6 Neves (2014).

on loans with data on securities and, from a portfolios' perspective, it is a powerful tool to measure the exposure of banks and non-banks to specific issuers; also, putting together the information contained in SSIS and CCR provides a more complete overview of the exposure and indebtedness of the financial system as a whole.

In addition, following a data request in the context of the Economic and Financial Assistance Programme to Portugal[7] and, to better assess current credit conditions of the NFCs sector and monetary policy transmission, the Bank started collecting individual data on new bank loans and their respective interest rates. This new database covers all new operations starting with reference period December 2014 (in its initial stage it was confined to banks with monthly volumes of new loans of €50 million or higher). Combining these individual data with reference data and data available in other databases, we are able to study how interest rates vary according to the characteristics of the firms.

The Portuguese Central Credit Register – a multipurpose tool

Central credit registers are a fundamental tool that facilitates the monitoring of credit risk and its evaluation by banks when granting new credits and allows an overview of credit exposures and the level of indebtedness of both resident and non-resident borrowers *vis-à-vis* national financial intermediaries.

The compilation of comprehensive statistics on credit granted is one of the various goals of the Portuguese CCR. With this in mind, credit instruments and other variables related to the classification of loans are defined in such a manner that they are meaningful for economic analysis. Also, borrowers have to be classified according to proper statistical criteria (e.g., by institutional sector, sector of economic activity, firm size and region of residence). Since the participating institutions only report the borrowers' identifications (i.e., their taxpayer numbers), the statistical classification of the resident borrowers is made in the Bank, mostly by means of a business register.

Statistical information based on the Portuguese CCR data is made available to users on a monthly/quarterly basis. In both cases, the main focus is loans granted by the financial sector to the resident entities classified as NFCs, non-profit institutions serving households and households.

The set of statistical indicators disclosed monthly includes:

- Outstanding amounts of loans granted and the correspondent annual change of rate;
- Overdue loans ratios;
- The percentage of borrowers with overdue loans.

These indicators are compiled for borrowers belonging to the NFCs and households sectors. In the former sector, information is also broken down by firm size. Furthermore, there is a specific set of indicators related to the evolution of credit to exporting companies – this information allows to monitor the access of credit to NFCs which have a significant share of its business with non-resident counterparties and may thus be more insulated from domestic woes. In case of households, a breakdown according to the purpose of the loan is also included. Data using the

7 For more information on the Portugal's Economic and Financial Assistance Programme please see: https://www.bportugal.pt/en/page/efap-and-post-programme-surveillance.

above-referred metrics are provided for non-profit institutions serving households without additional breakdowns.

More detailed information is disseminated on a quarterly basis, both for the outstanding amounts of regular loans and for loans in default. In the latter case, two indicators are published: overdue loans ratio and percentage of borrowers with overdue loans.

In the case of NFCs, for the referred metrics, data is further broken down by:

- Region of residence of the company headquarters (according to NUTS[8] classification);
- Economic activity sector (according to NACE[9] sections);
- Brackets of total amount of loans per borrower.

As to households, data are further broken down by:

- Purpose of the loan;
- Region of residence (according to NUTS classification and by municipality);
- Brackets of total amount of loans per borrower.

The Bank has recently enlarged the set of statistical indicators on loans that are compiled on the basis of CCR data[10], and has published such information starting on the 1st quarter of 2016. Additional breakdowns of the loans granted by the financial sector have been made available:

- Information related to the main financial products, loans' original and residual maturities and guarantees has been included;
- Loans granted to non-financial corporations are broken down by corporation size and a distinction is made between public and private corporations;
- Indicators about the relationship between entities of the financial sector and their credit clients and about the activity of the CCR has been introduced

The high-quality figures that can be obtained from specific breakdowns of CCR credit data are of great importance for economic analysis and for quality control. In addition, the use of the CCR has made it possible to reduce the reporting requirements in the context of the Bank's MFS, thus alleviating the participants' reporting burden and curtailing data redundancy.

The impact of AnaCredit in the Portuguese CCR

In order to obtain a better overview of the level of indebtedness of the borrowers across European Union Member-States the European System of Central Banks has been exploring, since 2007, the potential statistical use of CCRs. In particular, it sought to understand to which extent their content may be enhanced and adapted to euro area and European Union statistical needs, to minimise the statistical reporting burden and to increase transparency.

Against this background, the ECB launched the so-called AnaCredit project in 2011, together with experts from both the statistical and credit registers' areas of a number of euro area and non-euro

8 Nomenclature of Territorial Units for Statistics.

9 Statistical Classification of Economic Activities in the European Community.

10 For more information, please see: https://www.bportugal.pt/sites/default/files/anexos/documentos-relacionados/pr_22_2016_crc.pdf

area national central banks. Following this avenue, a joint Statistics Committee / Financial Stability Committee Task Force on Analytical Credit Datasets (co-chaired by the Banco de Portugal) was established in 2013. The overarching aim of this task force was the setting up of a long-term framework for the collection of harmonised granular dataset on bank loans in the euro area.

With a view to fulfilling the AnaCredit's requirements, the Portuguese CCR will be redesigned and will adopt a new philosophy: a loan-by-loan basis. Although the first stage of AnaCredit will comprise only loans granted by banks to legal entities, the Portuguese CCR will keep the current coverage both in terms of participating institutions and borrowers.[11]

The redesign of the Portuguese CCR is not only due to the need to adapt to the AnaCredit's requirements; rather, there will be a paradigm shift for the Bank in which the CCR will be the single entry point for all credit data that is reported to the Bank, thus creating a multipurpose hub of credit information that will be used by the several functions of the Bank.

In-house credit assessment system

The Bank has recently taken decisive steps towards further exploring the informational potential of the CCR and balance sheet databases by developing an in-house credit assessment system (ICAS)[12]. This system will provide the Bank with its own internal credit risk assessment system, thus reducing its dependence on external sources. Against the background of the recent economic and financial crisis and the shortage of assets liable to be used as collateral in monetary policy operations, these systems have recently been gaining importance within the Eurosystem, as can be seen by the increasing number of national central banks that have introduced them. In fact, at the current juncture, a more pressing business case for ICAS stems from monetary policy purposes, for which ICAS will provide an evaluation of debtors' credit notation.

But the benefits of such a system are not exclusive to monetary policy. In fact, there is a broad range of advantages to different business areas, in particular regarding financial supervision and stability. First and foremost, for financial supervision the credit notations derived from ICAS could be used as a benchmark to gauge those provided by institutions with their own internal notation system. Furthermore, the computation of sectoral default probabilities could also be envisaged, providing a useful input for stress-testing. As to financial stability, the monitoring of developments of the non-financial sector (and the potential building-up of imbalances) would benefit from an indicator of NFCs credit risk, which could serve, at least, two purposes: (i) to identify situations of potential financial fragility in a set of companies of a particular economic activity sector; (ii) to contribute to assess other risks stemming from the NFCs sector. Other business areas such as economic analysis and statistical functions would also stand to gain from ICAS's outputs.

4 Conclusions

The Great Financial Crisis and the ensuing response from central banks have increased the demand for comprehensive, high quality and more detailed statistics. In this context, traditional aggregate statistics have proved insufficient to monitor and interpret the multiple aspects of the monetary transmission mechanism and the evolution of credit to companies and households. The Banco de Portugal's statistical function has been following a strategy based on the integrated

11 For more details on this project and on the Portuguese CCR as a multipurpose tool please see Matos (2015).

12 https://www.bportugal.pt/en/comunicado/press-release-banco-de-portugal-new-house-credit-assessment-system-icas

management of micro-databases and has recently deepened this strategy in the area of monetary and financial statistics. Complementing aggregate data with more granular data is not only an answer to the need for more flexible and detailed information, it is also a movement towards a more efficient and reliable system. Particularly, when it is possible to substitute the several reports of aggregate data representing different perspectives on a given reality (for instance, credit), with a single report of granular data. In those instances, of which the Portuguese Central Credit Register is an example, central banks can have one multipurpose granular database, consistent and coherent, which can be used by the several functions of the Bank, with each one of those functions analysing the granular data by its own perspective thus increasing not only the flexibility of the data, but also the efficiency of the reporting systems.

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The Portuguese Central Credit Register as a key input to the analysis of financial stability... and beyond!*[1,2]

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Abstract

The Portuguese Central Credit Register (CCR) is a powerful multi-purpose tool, which contains monthly granular information on credit on a borrower-by-borrower basis and that includes, in some cases, details that provide loan-by-loan information with a virtually complete coverage. These features have enabled the Banco de Portugal to use its CCR data for a variety of purposes, from, *inter alia*, the compilation of very comprehensive and detailed statistics on credit, to the promotion of a better understanding of the risks underlying banks' balance sheets.

In this paper, we explore the richness of the Portuguese CCR, which is leveraged by its integration with other large granular datasets managed by Banco de Portugal (e.g. the data from the Bank's Central Balance Sheet Data Office). Furthermore, we highlight the way its features and ongoing reformulation – to meet the reporting requirements set by the AnaCredit Regulation and to fulfil additional data needs – have been key to monitor monetary and financial phenomena and to help the Banco de Portugal in meeting its mandate of ensuring the stability of the national financial system.

Keywords: Credit register data; AnaCredit Regulation; Macroprudential analysis; Microdata

JEL classification: C80; E50

* IFC – National Bank of Belgium Workshop on "Data needs and Statistics compilation for macroprudential analysis", Brussels, Belgium, May 2017.

1 The analysis, opinions and findings of this paper represent the views of the author, which are not necessarily those of the Banco de Portugal or of the Eurosystem.

2 The authors would like to thank to Marta Veloso, Flávia Serras and Rita Biscaya for their valuable insights and suggestions.

1 Introduction

The Portuguese Central Credit Register (CCR) is an information system managed by the Statistics Department of the Banco de Portugal (hereafter referred to as "the Bank"), which contains granular information on credit granted by the institutions participating in the system – all resident credit-granting institutions – on a borrower-by-borrower basis and that includes, in specific cases, details which provide loan-by-loan information, with a virtually complete coverage.

It is currently regulated by the Decree-Law no. 204/2008, by the Bank's Instruction no. 21/2008, and it is also mentioned in the Bank's Organic Law (Art. 17º - 1). The use and access to CCR data is compliant with the provisions laid down in specific data protection and use laws emanated by the Portuguese Parliament and by the National Commission for Data Protection (by National Commission for Data Protection's Authorization no. 4241/2011).

CCR data is used by the Bank not only for the compilation and dissemination of statistics, but also for a multitude of other purposes, such as for microprudential supervision of credit institutions, for monetary policy making, for economic research and for the macroprudential analysis and policymaking. In this context, this paper seeks to explore the richness and the usefulness of the Portuguese CCR in meeting these tasks, with a special focus on its role in the tasks pertaining to financial stability.

To that extent, this paper is organised as follows: the next section presents an overview of the Portuguese CCR and how its data are being used by the Bank for the compilation of statistics, monetary policy making, economic research and microprudential supervision; section three focuses on the role of the CCR in supporting the Bank in macroprudential analysis and policymaking; section four highlights the premises and the expected results of the ongoing CCR reformulation and its connection with the AnaCredit project; lastly, section five concludes.

2 The Portuguese CCR at a glance

2.1 Overview

The main purpose of the CCR is to offer its participants relevant data for their assessment of the risks underlying the provision of credit – i.e. aggregate information on the credit responsibilities of each client (borrower) *vis-à-vis* the participant institutions as a whole.

The CCR was firstly established in 1978 and initially it covered only the credit liabilities of non-financial corporations (NFCs). Later on, in 1993, began the collection of the same data for households and thereafter, in 1996, was issued an authorization for the compilation of statistics on credit based on the CCR. Subsequently, in 1999, the Statistics Department of the Banco de Portugal was assigned the responsibility for the management of this database and of all its related services.

Since 1999, a number of significant developments were introduced aiming at further improving the CCR's coverage and usability, namely: (i) the establishment of a bilateral exchange of individual

credit data among the 7 signatories of the respective Memorandum of Understanding (in 2005),[3] (ii) the incorporation of the potential credit liabilities of personal guarantors (in 2007)[4], and (iii) the implementation of a new information system that introduced additional breakdowns at the level of credit data and a greater efficiency in identifying private individuals (in 2009).

More recently, the Banco de Portugal has also successfully implemented a number of changes to the CCR which are equally worth highlighting:

- Its coverage was expanded to cover new reporting institutions (e.g. NFCs that buy credit portfolios to the resident financial sector);
- A new analytical data system for data analysis and exploration was developed;
- Additional details were included to allow for the individual identification of the loans used as a collateral in the Eurosystem's monetary policy operations; and
- Additional breakdowns were introduced (e.g., new collateral types, original and residual maturity brackets, special characteristics on non-performing loans and restructured loans).

Against this background, the entities that currently participate in the CCR are all the resident financial institutions granting credit – i.e., banks (including savings and mutual agricultural credit banks) and other credit institutions (e.g., financial leasing companies, factoring companies, credit financial companies and credit-purchase financing companies) . Concomitantly, the borrowers registered are resident or non-resident entities, both private individuals and legal persons, to whom credit has been granted by the participant institutions. In this system, resident borrowers are uniquely identified through their tax payer number, while non-resident borrowers are identified through a set of elements provided by the participant entities, which include a code – unique for each borrower in each reporting institutions – and the name, country of residence and identification document of the non-resident borrowing entity.

Moreover, to ensure a level playing field between all the participating entities, the Bank guarantees that these institutions are entitled to access aggregate information on the credit liabilities of each borrower[5] *vis-à-vis* the CCR's reporting institutions as a whole. Concurrently, the borrowers also have the legal right to access their own information stored in the CCR and, in case of missing or wrong information, they must address the reporting institution to change or update their information, since the Bank is not legally authorized to correct the information by itself.

In this framework, the CCR's participants have to report their borrower's loans according to a predefined list of attributes and dimensions, using the following variables:

- Type of liability of the borrower – identifies the type of commitment the borrower has *vis-à-vis* the credit institution (e.g. individual credit, joint credit, personal guarantee);

3 The seven initial Signatories of the 2005 Memorandum of Understanding on the exchange of information among CCRs were the National Central Banks (NCB) of Austria, Belgium, France, Germany, Italy, Portugal and Spain. A few years later, the NCBs of the Czech Republic and Romania also joined this group.

4 The CCR database contains information on the actual and potential credit granted by its participants (mainly resident financial institutions) to borrowers. Actual credit includes all the loans granted by the participants and truly taken up – inter alia, loans for house purchase, loans to purchase cars, furniture and other consumer goods or services, loans for the acquisition of shares or bonds, payment of bills of exchange or other commercial bills, overdrafts, leasing or factoring operations, and balances on credit card transactions. Potential credit encompasses all the irrevocable commitments by participants, such as available credit on credit cards, credit lines, pledges granted by participants and other credit facilities which may become actual credit.

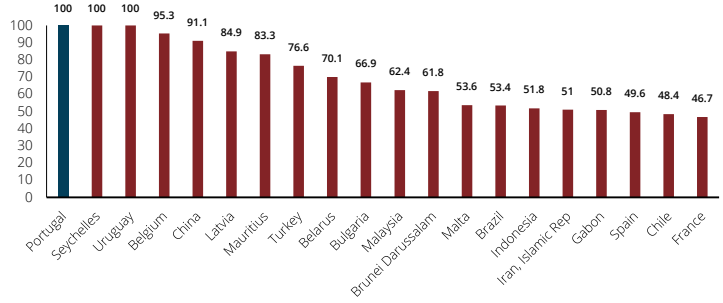
5 Or of each potential client, when such client asks for a loan or explicitly authorizes the entity to access its information.

- Status of the loan – shows the type of liability underlying the relation between the participant and the borrower and to what extent the repayment schedule is being respected (e.g., drawn credit in a regular situation, undrawn credit, overdue loans, written-off loans);
- Type/purpose of the loan – identifies the credit instrument used and, in some cases, its end-purpose (e.g., consumer credit and car credit, credit card, factoring with or without resource, housing loans);
- Original and residual maturity – classified according to a list of predefined brackets;
- Number of days the loan is past due – in the event of a default, this variable shows the number of days since the loan has defaulted in accordance with a list of predefined brackets;
- Currency – i.e. the currency in which the loan is denominated;
- Type and value of the collateral or guarantee securing the loan (if it exists);
- Identification of relevant special characteristics underlying the loan – this information is reported with a view to be used internally by the Bank in the identification of, *inter alia*, securitised loans (derecognized and non-derecognized), syndicated loans, loans used as collateral for monetary policy operations, non-performing loans;
- Value of monthly repayments – reported exclusively for specific types of personal loans.

Apart from this information reported by the participants, this system also collects data on the insolvency status of the borrower – for private individuals, companies or other legal entities – which is provided by the Portuguese Courts of Law.

All things considered, the aforementioned data is reported by the participants to the CCR on a monthly basis – until the 6th working day after the end of the reference period – for all the credits where the outstanding amounts of the borrower's actual or potential liabilities exceed fifty euros. This very low threshold, together with a full coverage in terms of participants and borrowers, has allowed the Portuguese CCR to lead the world ranking of public credit registries in terms of their coverage[6] (please see Figure 1).

Figure 1 • Credit registry coverage (as a % of the adult population)



Source: Doing Business 2017, World Bank.

6 The credit registry coverage reports the number of individuals and firms listed in a credit registry's database as of 1 January 2016, with information on their borrowing history within the past five years, plus the number of individuals and firms that have had no borrowing history in the past five years, but for which a lender requested a credit report from the registry in the period between 2 January 2015 and 1 January 2016. The number is expressed as a percentage of the adult population, according to the World Bank's World Development Indicators. A credit registry is a database managed by the public sector that collects information on the creditworthiness of borrowers (individuals or firms) in the financial system and facilitates the exchange of credit information among banks and other regulated financial institutions. For more details on the methodology underlying the calculation of the credit registry coverage, please consult http://www.doingbusiness.org/data/exploretopics/getting-credit/faq.

At the current juncture, the CCR processes over 20 million records in each reporting period which pertain to approximately 6.2 million borrowers with either actual or potential credit data and are drawn from 185 reporting institution.

Having thoroughly described the CCR's framework and the data it contains, it is now pertinent to ascertain to what extent it is used by the Bank and its relevance in meeting its mandate.

2.2 Using the CCR in meeting the Bank's mandate

2.2.1 Compilation and dissemination of statistics

The above mentioned authorization issued in 1996 reflected one of the main goals foreseen for the CCR: the compilation of comprehensive statistics on credit granted. Bearing in mind this objective, several credit instruments and other variables related to the classification of loans were defined, in such way that they are meaningful for economic analysis. In addition, the database also included a classification of borrowers classified according to appropriate statistical criteria[7] (e.g., by sector of economic activity, by institutional sector, by corporation size and by region of residence).

Currently, the statistics compiled by the Bank based on the CCR data, whose main focus is the loans granted by the resident financial CCR's participants to the resident entities classified as NFCs, non-profit institutions serving households and households (NPISH), are made available to the public at large on a monthly or quarterly basis, depending on the statistics involved. Indeed, the set of statistical indicators published by the Bank on a monthly basis includes:

- The outstanding amounts of the loans granted and their correspondent annual rate of change;
- The ratio of overdue[8] loans.
- The percentage of borrowers with overdue loans.

Such indicators are compiled for borrowers belonging to the NFCs, NPISH and households institutional sectors. Moreover, for the NFCs sector, this information is also broken down by corporation size[9] (micro, small, medium-sized and large corporations), by corporation statute (public and private corporations) and also made available for private exporting corporations[10]. For households, the statistics compiled also include a breakdown according to the purpose of their respective loans.

On a quarterly basis, the Bank publishes more detailed statistical information based on its CCR, both for NFCs and for the households sectors. In the case of NFCs, statistical data is broken down by:

- Region, according to the NUTS II and III classification[11] of the NFC's headquarter;

7 Since the participating institutions only report the borrowers' identifications (i.e., their taxpayer numbers), the statistical classification of the resident borrowers is made in the Bank, mostly by means of a business register managed by the Statistics Department.

8 Overdue loans correspond to the outstanding amount of loans which were contractually due and have not been paid (past due).

9 This classification is based on the European Commission's Recommendation 2003/361/EC of 6 May 2003, which addresses the definition of micro, small and medium-sized enterprises.

10 The definition of "exporting corporations" is applied to all enterprises who meet the following criteria: a) at least 50% of their turnover comes from the export of goods and services or b) at least 10% of their turnover comes from the export of goods and services being the value more than 150 thousand euros.

11 Nomenclature of Territorial Units for Statistics.

- Economic activity sector (according to NACE[12] sections, with further detail for the manufacturing industry);
- Corporation size;
- Financial product of the loan
- Brackets of credit amount, for the level of indebtedness of the NFCs *vis-à-vis* the resident financial sector;
- Original and residual maturity;
- Type of guarantee.

As for the Households sector, statistical data is available with the following breakdowns:

- Region breakdown, according to the NUTS II and III classification and, for some indicators, by municipality;
- Purpose and financial product of the loan;
- Brackets of credit amount, for the level of indebtedness of the debtors classified in the households sector *vis-à-vis* the financial sector;
- Original and residual maturity;
- Type of guarantee.

In general, five indicators are published regularly for both institutional sectors: the outstanding amounts of the granted loans, the amount overdue loans, the ratio of overdue loans, the number of borrowers and the percentage of borrowers with overdue loans. As for the data broken down by original and residual maturity, it is only made available the amounts outstanding of loans granted, for each bracket of maturity; concurrently, for the type of guarantee breakdown, the Bank only releases the percentage of credit amount of each type of guarantee in the total loans granted.

In addition, on an annual basis, some additional indicators on the relationship of the borrowers with entities belonging to the financial sector – within the loans context – are published. Such indicators are presented both for the households sector and for the NFCs sector (which are also further broken by corporation size). Such indicators are:

- The average number of entities belonging to the financial sector with which each credit client has credit relations;
- The average percentage of loans granted by the entity with the largest share;
- The average indebtedness of the credit clients.

Apart from being able to produce high quality fit-for-policy statistics, the CCR has also been able to bring about a reduction of the reporting requirements underlying the Bank's data collection for Monetary and Financial Statistics (MFS), thus alleviating the participants' reporting burden and curtailing data redundancy. Indeed, a good example of such feature was the source used for the breakdown by branch of economic activity of the credit granted to NFCs. From 1990 to 2002, this breakdown was included in the MFS reporting requirements, but the data collected showed a number of quality weaknesses, which were due to the need to aggregate the information according

12 Statistical Classification of Economic Activities in the European Community.

to several statistical criteria prior to its submission to the Bank by the reporters. Against this background, and since the CCR, as mentioned above, also provides an alternative source for the same data, but with higher quality – given that it is a micro data based system –, the Bank decided, in 2003, to discard this breakdown in the MFS data collection system and use exclusively the data of the CCR for this purpose.

Having thoroughly discussed the statistical potentialities of the CCR, it is now pertinent to discuss to what extent this data can be used for other tasks of the Bank and its impact. Concomitantly, in the next sections we discuss how the CCR's data has been used for economic research, monetary policy making and banking supervision purposes and some of the findings that it has enabled.

2.2.2 Economic research

Article 12 e) of the Bank's Organic Law states that the Bank is incumbent to "Advise the Government in the economic and financial fields [...]". In this capacity, the Bank's economic researchers have been using the CCR's micro data for several technical papers and empirical analysis, by, *inter alia*, regularly bringing together this data with other micro data sources as, for example, the Bank's Central Balance Sheet Database (CBSD).

Indeed, a good example of this exercise is the combination of CCR data with firm-by-firm accounting information drawn from the Central Balance Sheet Database, for internal research purposes pertaining to the analysis of the drivers of credit risk for non-financial corporations. Moreover, even though the study of household data is severely more restricted by legal constraints, there have also been significant efforts to identify what drives households to default.

In the same vein, another notable example on the utility of the CCR's data for economic research is found in Augusto & Félix (2014). In this paper, the authors investigated the impact of the recent bank recapitalization on the firms' access to credit between the first quarter of 2010 and the fourth quarter of 2013. Since the main dataset used for this study was the Bank's CCR, its granularity allowed the usage of sophisticated micro-econometric approaches to find the effects of the bank recapitalizations on the supply of credit. To that extent, the study included two firm distress indicators based on the firms' overdue credit (as reported to the CCR) and a sample of 201,768 non-financial corporations and 327,777 loans (firm-bank pairs). The results suggested that firms have on average two banking relationships and that that bank bailouts fostered an increase in the supply of credit and that this effect, which was verified for the sectors of manufacturing and trade, was negatively connected with the capital buffer of recapitalized banks. Moreover, the paper found no evidence that the bank recapitalizations contributed to a more selective behavior in granting credit to towards distressed firms when compared to other firms.

In a similarly minded study, Farinha & Félix (2014) studied the importance of credit demand and credit supply-related factors in explaining the evolution of credit granted to Portuguese small and medium-sized enterprises (SMEs). The findings of their study indicated that the interest rate is a strong driver of the demand for credit of SMEs, as well as their internal financing capacity. Moreover, it was found that the credit supply to SMEs mostly depended on the firms' ability to generate cash-flows, to repay their debt and on the amount of assets available to be used as collateral. To achieve such findings, a model was estimated for the period between 2010 and 2012, and its estimated coefficients were then used in the computation of the probability of credit rationing. In addition, the model produced in the study also suggested that a considerable fraction of Portuguese SMEs were affected by credit rationing in the surveyed period.

2.2.3 Monetary policy making

In light of the monetary policy making duties conferred by the Bank's organic law, the Bank has been using the CCR as an auxiliary tool for the identification of loans used as collateral in the Eurosystem's financing operations, since the CCR collects the necessary information to evaluate the risks associated with the acceptance of bank loans as collateral in monetary policy credit operations.

Indeed, the general documentation of the Eurosystem's monetary policy instruments and procedures requires that:

- All Eurosystem credit operations are based on adequate collateral;
- Such collateral assets fulfill a number of criteria in order to be eligible to be used in the Eurosystem's monetary policy operations;
- A single framework for the definition of collateral eligibility is common to all Eurosystem credit operations.

In this context, such single framework encompasses two distinct asset classes:

- Marketable assets;
- Non-marketable assets (e.g., credit claims).

Since February 2012, the NCBs are temporarily allowed to accept as collateral for Eurosystem credit operations additional performing credit claims. Such credit claims shall also meet specific eligibility criteria proposed by the NCBs and approved by the ECB's Governing Council.

Currently, each NCB is responsible for the eligibility assessment of a subset of assets. To this extent, the Bank is responsible for the eligibility assessment of the marketable assets traded in Portugal and of the non-marketable assets granted by domestic counterparties and presented as collateral to the Bank.

To meet such endeavor, the Bank is using its CCR on the eligibility assessment (and ex post verification) of credit claims – i.e. verifying the existence and confirming the major characteristics of such credit claims –, on the elaboration of collateral generation capacity estimates of domestic counterparties for credit claims, asset backed securities (ABS) and covered bonds, and to simplify the report for monetary policy purposes.

2.2.4 Microprudential supervision

Pursuant to its attributions in the field of micro-prudential supervision, the Bank has also been using the CCR's data in the evaluation of credit risk and of the concentration of risk exposures, both at micro and macro level, as well as for the improvement of the effectiveness of on-site inspections.

However, it is also relevant to mention the Bank's work in developing an Early Warning System (EWS), whose aim is to find companies evidencing a high likelihood of defaulting as a result of an excessive level of indebtedness. This system seeks to encourage credit institutions to be more proactive in identifying and setting forth the appropriate procedures and solutions in the treatment of the companies in such situations.

This EWS, which assesses the ability of the company to generate cash flows and its existing capital structure, incorporates information available on the Portuguese CCR and on the CBSD in the

calculation of a set of five financial ratios, which are computed for each company, irrespectively of their industry or sector:

- Two financial ratios (Total Debt to EBITDA[13] and the EBITDA Interest Coverage), which are classified as core ratios, in accordance with Standard & Poor's Corporate Ratings Framework;
- Three additional supplementary ratios are considered, since they promote a better understanding of the company's financial risk profile and capture other critical risk dimensions, such as its profitability and leverage: FFO to Total Debt[14], Gearing, Return on Capital.

Having thoroughly discussed the current uses of the CCR for the compilation of statistics, economic research, monetary policy making and micro-prudential supervision, it is now pertinent to focus with greater detail to what extent the CCR's data is employed to ensure financial stability.

3 Using the Portuguese CCR to ensure financial stability… and beyond

In the previous section, we discussed the nature of the Portuguese CCR and how the Bank has been leveraging this tool to meet its tasks pertaining to the production of official statistics, economic research, monetary policy and microprudential supervision. However, one of the most relevant tasks entrusted to the Banco de Portugal through its Organic Law is ensuring "the stability of the national financial system, performing for this purpose, in particular, the functions of lender of last resort and national macro-prudential authority" and participating "in the European system for the prevention and mitigation of risks to financial stability and in other bodies pursuing the same goal". To meet this challenge, the Bank resorts to a number of different inputs and techniques that allow for a systemic view of the financial systems and of the build-up of systemic risks.

In this context, the above exposed statistics based on the CCR are an instrumental input and extensively used, since they allow for a crucial crossing and analysis of the various dimensions and characteristics attached to the loans, debtors and/or creditors. Indeed, in light of its intrinsic homogeneity and of the possibility to compare its data with other databases, the CCR data allows for a complementary analysis to the "traditional" aggregated data by providing the underlying distribution measures and by enabling the enhancement of the testing and monitoring (e.g., stress testing) of the banks' results in ever-changing and increasingly complex scenarios.

Concretely, these data are used, *inter alia*, in the support to the following tasks:

- Assessment of the risks stemming from the household and NFCs sectors, through the examination of the distribution measures of the loan/debtor classes, according to, when applicable, their economic activity sector, type and number of guarantees, exposure size, firm size, performing/non-performing status and other characteristics;
- Identification of the financial situation of NFCs, by distinguishing the different financial situation of NFCs through their positive, null or negative changes in borrowing. The CCR is also used in the support to this task to allow for a breakdown by economic activity and by firm size and it is also complemented and cross-checked with data from the Bank's CBSD;

13 EBITDA is an acronym for "Earnings Before Interest, Taxes, Depreciation and Amortization".

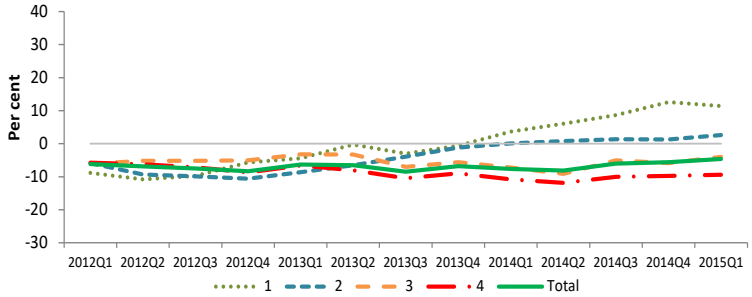
14 FFO ("Funds from Operations") is given by (EBITDA – Net Interest – Income Taxes).

- Analysis of the NFCs' credit performance in the wake of credit restructuring;
- Evaluation of the effects of the age of the NFCs on their credit spreads – in this case, the CCR is also complemented by the Bank's interest rate statistics database;
- Monitoring of the credit tendencies of the largest indebted NFCs;
- Exploration of the credit history of high growth corporations.

Indeed, Lima & Drumond (2015) discussed the insufficiencies attached to aggregated data when assessing financial stability and showed how microdata databases, such as the CCR, enable an assessment of the causes of the movements behind the aggregates and thus uncover the potential buildup of imbalances. Moreover, they also recognize that some macroprudential tools require specifically the use of characteristics that are only available in granular datasets – such as the collateral amount of real estate and debt instalments.

Using data drawn from the CCR, the authors concluded that the credit granted by Portuguese banks to non-financial corporations during the recent crisis diminished more significantly in the non-tradable sectors, whereas the credit granted to exporting firms, which are less dependent on the domestic economic recovery, increased. The authors then went on to estimate a z-score model, based on data from the CCR and from the CBSD, which then allowed to conclude that the most of credit granted was being channelled to less risky firms and that the underlying interest rates were decreasing both for high and low credit risk NFCs.

Figure 2 • Total loans granted by risk category/year-on-year growth rate by risk classes (1 – less risky firms, 4 – riskiest firms)



Source: Lima & Drumond (2015).

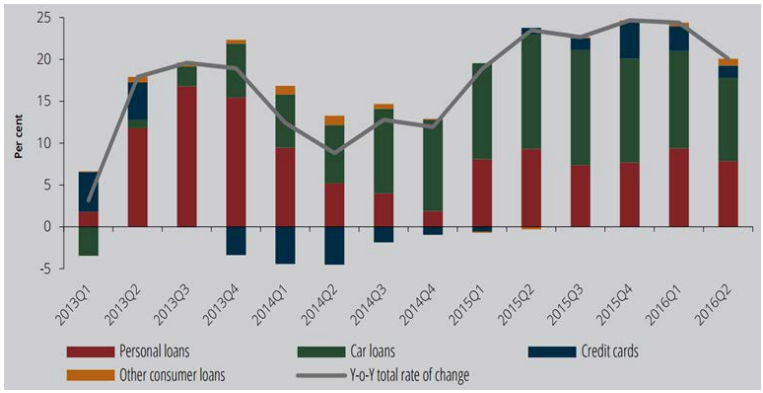
Notwithstanding, to assess the necessity of additional prudential measures to increase the pace of the deleveraging of NFCs, Lima & Drumond (2015) argued that additional micro data, which also focuses on the credit institution's balance sheets, are needed. To that extent, the authors underline, yet again, the importance of the CCR and of the Bank's Large Exposure Database to assess the coverage rate of non-performing loans (NPL) in the credit institutions' balance sheets and to estimate the potential impact of writing of such loans on their capital position, while emphasizing the role of the "Corporate Debt Restructuring Monitor" in the assessment of the developments of the NFCs' indebtedness and NPLs.

Another good example of the usefulness of the CCR in meeting the Bank's financial stability mandate is its role in supporting the systemic analysis expressed in the Bank's biannual Financial Stability Report. For instance, the latest version of such report – published in November of 2016 –

even included a special section on the recent developments in consumer credit, in light of the systemic impact that excessive credit growth and leverage can exert on an economy.

For this study, the Bank's researchers resorted to the Bank's CCR in order to examine the loans broken down by loan segment[15] and type of institution granting the credit, on a quarterly basis. The results have shown that, while the share of loans for consumption and other purposes in total household debt is relatively low – below 20% –, its recent increase was mainly driven by car loans (Figure 3 and 4), which reflected the effect of the anticipation of the decision to buy a car, in the wake of the entry in force – in April of 2016 – of an increase in the Vehicle Tax. Moreover, this analysis has also uncovered that such loans were mainly taken from credit institutions not belonging to the eight largest banking groups and were mainly granted to households whose total indebtedness was less than € 50.000 (Figure 5). This observation also allowed to infer that the greater access to credit of households with little or no credit could stem from two causes: (i) such households were previously refused in their attempts to seek and were now being funded by credit institutions; or (ii) such households did not seek or need credit in the past.

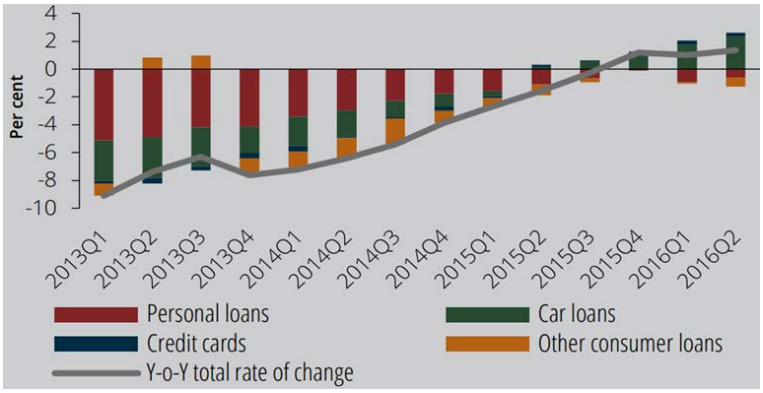
Figure 3 • Contributions to the year-on-year rate of change in new consumer loans (flows), by consumer loan segment



Source: Banco de Portugal | *Financial Stability Report* – November 2016.

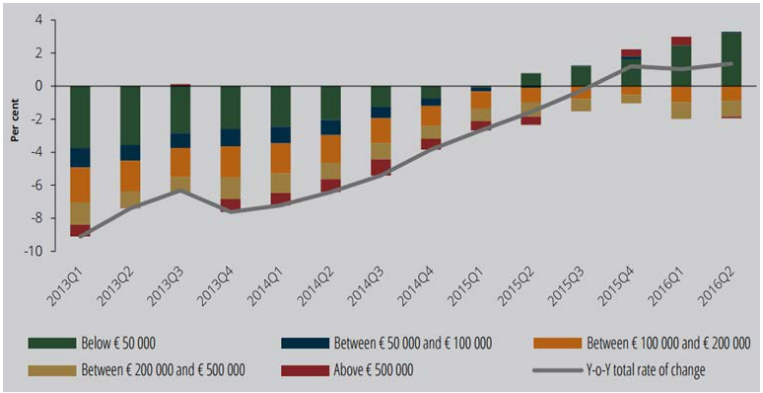
15 Four segments of consumer loans were taken into account: (i) personal loans; (ii) car loans; (iii) credit cards; and (iv) other consumer loans.

Figure 4 • Contributions to the year-on-year rate of change in the stock of consumer loans, by consumer loan segment



Source: Banco de Portugal | *Financial Stability Report* – November 2016.

Figure 5 • Contributions to the year-on-year rate of change in the stock of consumer loans, by class of total household indebtedness



Source: Banco de Portugal | Financial Stability Report – November 2016

All in all, the study concluded that the recent increase in consumer credit, and particularly car loans, was likely to be interconnected with temporary factors and targeted to lowly indebted households and that, taking into account the relatively low importance of consumer credit in the household's and banking system's balance sheets, there was no expected increase in the risk to financial stability on the short run.

3.1 The In-house Credit Assessment System

The different microdata databases currently available at the Bank and the choice for an integrated management of information model has, as Lima & Drumond (2015) argue, allowed the Bank to meet the needs of its ever-challenging statistical stakeholders and enabled the Bank to go beyond the aforementioned tasks, by supporting and participating in a set of new initiatives at the Eurosystem level.

Indeed, in the framework of the European Credit Assessment Framework, the Bank has set up an In-house Credit Assessment System (ICAS), by further exploring the informational potential of the CCR and of its CBSD.

In the wake of the recent economic and financial crisis and inherent shortage of assets eligible to be used as collateral in monetary policy operations, these systems have been gaining importance in the Eurosystem, as shows the increasing number of Eurosystem NCBs who have either introduced them or are planning to introduce in the near future[16]. The Bank's ICAS, which was formally made available to credit institutions on November of 2016, provides the Bank with its own internal credit risk assessment system, thereby curtailing its dependence on external credit assessment providers.

At the current juncture, a more compelling use case for ICASs is related to monetary policy making, for which the ICAS will provide an evaluation of NFCs credit notation, to assess whether the debt issued by such entities is eligible to be used as collateral in the Eurosystem's monetary policy operations. However, the merits of such a system are not exclusively related to monetary policy making, as there are a number of advantages that this system offers to different business areas, especially those connected to micro and macroprudential supervision.

In the field of microprudential supervision, the credit notations derived from the ICAS can be used not only as a benchmark for those provided by credit institutions – which are obtained through their own internal assessment systems –, but also as a method to assess the quality of each credit institution's credit portfolios, while contributing to the early identification of specific risks to which these institutions may be exposed to. Furthermore, the ICAS can also support the identification and analysis of the risks and weaknesses attached to different economic sectors and assist in the preparation of the Portuguese financial sector's response to them, hence proving as an important input for stress-testing.

Concurrently, in the domain of macroprudential supervision, the data stemming from the Bank's ICAS can also be employed as a tool to monitor the developments the non-financial sector and their associated potential build-up of imbalances. This is done not only through the credit risk indicators on non-financial corporations generated by the ICAS, but also interconnected with the judgement of the Bank's risk assessment experts. To this extent, the purpose of this tool is twofold: on the one hand, to evaluate the frailty of specific economic activities through the economic and financial analysis of the companies that constitute them; and, on the other hand, to support the assessment of other systemic risks building-up in the NFCs sector, thus providing additional insights on the main risks and threats to financial stability.

To this extent, the CCR's data is a quintessential input in allowing the ICAS to fulfil its potential uses, as the default observations used in the ICAS are determined using the CCR and are in line with the Basel III default definition (and its guiding principles for the identification of defaults). Moreover, the CCR's data is also a key input for the calibration of the econometric models developed for the ICAS and also to assess the firm's scoring performance. Concretely, the CCR data that assists the ICAS is, *inter alia*:

- Data on legal proceedings (legal defaults);
- Data on all remaining elements of the reference default definition.

In addition, the remaining standard credit information expressed in section 2 (e.g., non-performing loans, loan volume, number of banks and write-offs) is also used by the ICAS's analysts to feed their qualitative analysis on the NFC's creditworthiness, which then allows to support their decision to revisit (or not) the company's rating upwards or downwards.

16 Currently, eight Eurosystem NCBs have their own ICASs: Belgium, Germany, Ireland, Spain, France, Italy, Austria, Portugal and Slovenia.

Finally, after carefully discussing how the CCR is used to support the fulfilment of the Bank's mandate, it is now pertinent to understand how the ongoing CCR reformulation will add value to the existing data solutions and deepen the support that it provides to such areas of the Bank.

4 The new CCR

As discussed in the previous sections, central credit registers, such as the CCR, are a crucial tool for Central Banks that allow to monitor and manage credit risk, while providing provide a thorough description of the credit exposures and the level of indebtedness of both resident and non-resident borrowers *vis-à-vis* the national financial intermediaries.

Having recognized the importance of such tools, and in order to grasp an enhanced overview of the level of indebtedness of the borrowers across the Member-States of the European Union (EU), the European System of Central Banks (ESCB) has been exploring, since 2007, the potential statistical use of CCRs at the EU level. Particularly, it sought to understand the content of national CCRs could be enhanced and adapted to euro area and European Union statistical needs, such that it fostered the reduction of the reporting burden of the participants and promoted an increase in transparency.

Against this background, the European Central Bank (ECB) launched, together with experts from both the statistical and credit registers' areas of a number of euro area and non-euro area NCBs, the so-called AnaCredit[17] project in 2011. This project will create a new database which will be fed from new or already existing data in NCBs, that will allow to generate a harmonised repository of credit information to support the main central banking functions, in particular, monetary policy making and macroprudential supervision.

The recent crisis showed how important good and detailed statistics are as a basis for decision making process, by giving more transparency for all the stakeholders. Therefore, AnaCredit will improve the statistical information basis for the Eurosystem in a significant way.

To fulfil the AnaCredit requirements, the CCR is currently being redesigned and will adopt a new philosophy: a loan-by-loan basis. Although the first stage of AnaCredit will only consider loans granted by credit institutions to legal entities, the CCR will keep its current extensive coverage, both in terms of its participating institutions and borrowers, in an attempt to cover all the attributes for nearly all this universe.

The implementation of the new CCR information system has already been initiated and is also taking into careful account other data needs (non-related with AnaCredit) and specific functionalities identified as relevant by its participant institutions and users. The resulting new data model will include not only the 94 attributes requested by AnaCredit but also other credit data needed by the Bank internal users, which will lead to a rationalization of the data requests to financial intermediaries, through the usage of a single entry point in the Bank for credit data, thus achieving a high standard of data integrity.

Concomitantly, the new CCR retains some rules of the current CCR: (i) different reporting rules for static and dynamic data; (ii) identification of borrowers through a unique code (the use of the taxpayer number will continue to be mandatory for residents in Portugal); (iii) statistical classification of borrowers will be made in the Bank through its business register; (iv) the monthly backflow data to the financial system will be approximately the same; (v) corrections to reported

17 The name AnaCredit stands for "Analytical Credit Datasets".

data will be made only by the reporting institutions; and (vi) the system itself should be composed by two components (transactional and analytical).

In order to improve the performance of the Bank's tasks related with monetary policymaking, risk management, statistical compilation, supervision and financial stability, the new CCR will cover more than 180 attributes. This means that when a loan is eligible to report to the CCR (the 50 euros threshold will be kept), the participant institutions will have to report information on the instrument, the debtor(s), the protection/guarantees, the accounting and risk information. Moreover, to meet a need of the financial intermediaries, the CCR will also deal with daily data on relevant credit events, thus fostering a better evaluation of the credit risk of the credit clients and also enabling the Bank to follow the credit evolution on the financial system with a much smaller time lag.

The new CCR system is expected to "go live" in June of 2018, one quarter before the beginning of the AnaCredit reporting reference period. There will be no overlap with the current system since a test phase is planned to be included in the project development.

5 Concluding remarks

Upon its creation, the main objective of the Portuguese CCR was the provision of relevant information to better understand the risk attached to granting specific credit contracts or to specific borrowers. However, over time, the CCR has also shown a significant potential and usefulness to support other central bank's purposes, such that the current CCR legal framework already foresees that this data can be used in meeting the tasks entrusted to the Bank, such as the compilation of official statistical, micro and macroprudential supervision, economic research and monetary policy making.

Indeed, the use of CCR data for statistical purposes has allowed, *inter alia*, the improvement of the quality of monetary and financial statistics (MFS), namely in balance sheet statistics, since the CCR fosters a greater accuracy in the institutional classification of the counterparties receiving credit form monetary and financial institutions' (MFI). Furthermore, in this statistical domain, the use of CCR data has been facilitated, due to the fact that: (i) both the CCR and the MFS domains share the same reporting institutions; (ii) the content of the reported information is coherent; and that (iii) they both share identical reporting frequencies and timeliness.

Notwithstanding, the CCR has also enabled a better assessment of credit developments, while also increasing the analytical possibilities at the disposal of the Bank by enabling a thorough evaluation through several different breakdowns. New statistical products have also been developed – without imposing further reporting requirements and intensifying the respondents' burdens – and new statistical capabilities are planned within the CCR's reformulation horizon.

In the domain of micro and macroprudential supervision, the CCR has been extensively used in the assessment of the risk of the credit granted by credit institutions to non-financial corporations and of the concentration of such risk exposures, both at micro and macro level. Furthermore, the CCR has also proved to be particularly useful in improving on-site inspection practices and to assess the need for prudential policy making. Concurrently, the CCR has also been a source extensively used by the Bank's economic researchers, as its microdata, often combined with other microdata databases available at the Bank (e.g. the CBSD), have fuelled several research papers and analysis. Concomitantly, within the monetary policy framework, the CCR has been employed in the identification of the loans used as collateral in the Eurosystem's financing operations.

In the future, as today, the CCR will surely continue to be of utmost importance to fulfil the Bank's mandate. Notwithstanding, when taking into account the new data model arising from the CCR's reformulation and the Bank's information model, which fosters the combination of its data with other microdata databases available at the Bank (namely the securities holdings and issues and corporate balance-sheet data), it will be possible to develop and produce new statistics, thus increasing the contribution of the Bank to the official statistics universe.

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Tailoring national financial accounts to the users' needs using administrative and other large granular datasets*[1,2]

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Abstract

Economic and financial reality is increasingly more complex and portraying it in a precise and timely fashion challenges the statistical function of central banks. Furthermore, users have been requesting ever more comprehensive and detailed information. In this context, it is crucial to develop tools that allow users to see the details without losing sight of the big picture. National financial accounts are of particular interest when dealing with these challenges, as they provide an overall view of the financial interlinkages between institutional sectors helping in the identification of sector vulnerabilities, imbalances and potential over-exposures to certain financial instruments. Banco de Portugal places a strong emphasis on the compilation of national financial accounts, namely, by making extensive use of administrative and other large granular databases. In this paper we show how these databases – which include, among other sources, the Central Balance Sheet Database, the Securities Statistics Integrated System and the Central Credit Register –, are being used to tailor the national financial accounts statistics to the specific users' needs. Additional insights brought by the Household Finance and Consumption Survey are also illustrated.

Keywords: sector accounts; micro-data; indebtedness; flow of funds; Household Finance and Consumption Survey

* ISI 2017: World Statistics Congress, Marrakech, Marrocos, July 2017.

1 The views expressed in this paper are those of the authors alone and not of the Banco de Portugal or of the Eurosystem.

2 The authors would like to thank to André Dias and Luís d'Aguiar for their valuable insights and suggestions.

1 Introduction

Recommendation 15 of the G-20 Data Gaps Initiative calls for a strategy to promote the compilation and dissemination of the balance sheet approach, flow of funds, and sectoral data more generally. The use of an integrated approach for the compilation of financial flows and positions on a from-whom-to-whom basis is a key element of this strategy. There is, concomitantly, a growing trend for looking beyond aggregate data. As mentioned by of Lautenschläger (2016), central banking statistics are currently undergoing a paradigm shift: "the move from macro to micro statistics, or from aggregate to granular statistics.", which is justifiable since she believes that , beyond the aggregates lies a whole world of observations that reveal the underlying distribution and "driving forces". The combined use of aggregate and granular data are key to understand the evolution of these developments over time, particularly when economies are hit by crisis: are all economic agents affected similarly? How representative is the mean/median economic agent?

The economic and financial developments in Portugal in the years since the global financial crisis provide, we believe, interesting case-studies in support of the importance of this "paradigm shift". In addition to the effects of the global financial crisis of 2007-08, throughout 2010 and early 2011, Portugal was severely struck by the increase in risk aversion associated with the European sovereign debt crisis. The access to the international financial markets became significantly difficult and costly and in May 2011 the country requested an Economic and Financial Assistance Programme (EFAP) which lasted until June 2014. The agents financing conditions deteriorated in a context where banks faced financing difficulties and the need to restructure their balance sheets, together with increased risk perception. One question that arises is then whether all agents were similarly affected in terms of access to bank loans; by having granular credit data, we are able to assess, for example, the "driving forces" behind any credit aggregate development, and distinguish the agents who continue to be financed from those who have been excluded from the banking loans' market.

The remainder of the paper is organised as follows: in section 2 we describe the approach followed by Banco de Portugal (hereinafter referred as "the Bank") in the compilation of national financial accounts; in section 3 we assess the financial interlinkages between sectors in Portugal, and in section 4 we provide additional insights to some variables for households, namely looking beyond the aggregates by using granular data. We conclude in section 5 with some final remarks.

2 Innovative solutions to compile national financial accounts

The compilation of national financial accounts in the Bank hinges on multiple data sources: monetary and financial institutions balance sheets, balance of payments and international investment position, non-financial corporations' statistics, among others. Since national financial accounts draw on information from other primary statistics, their compilation should, in principle, benefit from the input of experts in other statistical fields. The Bank has been gradually pursuing a move towards micro-data – this approach has been twofold: first, to manage highly detailed and granular databases; and second, to build a fully integrated data infrastructure[3]. Some examples of the micro-databases managed by the Statistics Department are the Securities Statistics Integrated

3 For more information on the strategy based on the integrated management of micro-databases and examples of its successful applications, please see Cadete de Matos (2016a) and Drumond & Lima (2016), respectively.

System – which is a security-by-security and investor-by-investor system of both securities holdings and issues –, the Central Credit Register (CCR)[4] – which contains granular credit information on a debtor-by-debtor basis – and the Central Balance Sheet Database[5] – which holds accounting and financial information covering (almost) exhaustively the population of non-financial corporations. In broad terms, the long-standing aim of this approach is to have a fully-fledged integrated system, encompassing granular data of all institutional sectors and financial instruments, which can then serve the purposes of the different statistical domains. These, in turn, feed the information they produce into the system, while at the same time tapping the system for the information they need. Micro-databases provide an unquestionable valuable input to ascertain counterparts and to construct from-whom-to-whom matrixes and the flow of funds, allowing the Bank to go beyond its statistical reporting obligations.

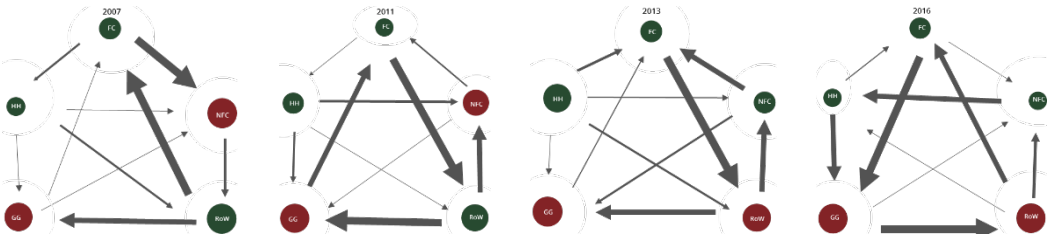
3 Assessing sectoral financial interlinkages

The flow of funds representation gives a picture of the inter-sectorial patterns of an economy. In this type of charts, the diameter of the circle is proportional to the net flow of each sector, usually filled in green when positive and in red if negative. Moreover, the direction of the arrows goes from net creditors to net debtors, their respective widths being proportional to the significance of the inter-sector relations.

Figure 1 shows the flow of funds for the Portuguese economy in four years of the last decade. There one can see important variations in the profile of the financial flows over time, with changes in the direction and magnitude of the transactions observed between the various sectors.

In 2007, the Portuguese economy as a whole was financed by the rest of the world (relatively large green circle), which is compatible with an external deficit in the balance of payments. However, the situation was heterogeneous across sectors. The rest of the world (RoW) financed essentially the general government (GG) and financial corporations (FC), which, in turn, were essentially financing the non-financial corporations (NFC) and households (HH). The financing needs of the general government were financed by households and the rest of the world.

Figure 1 • Flow of funds – Portuguese Economy



With the beginning of the EFAP, in 2011, the financing needs of the Portuguese economy decreased (smaller green circle for the rest of the world), since the reduction of the non-financial corporations funding requirements and the increase of the funding capacity of financial corporations and households more than offset the rise of the financing needs of the general

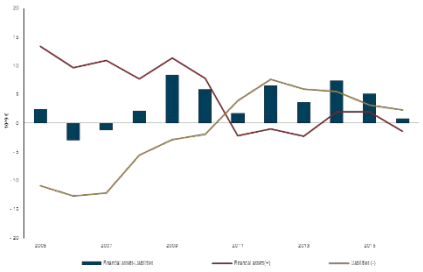
4 See Cadete de Matos (2016b).

5 See Cadete de Matos (2016c).

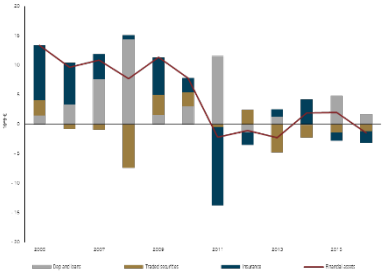
government. In addition to these changes in the net lending/net borrowing balances, it is worth mentioning the differences in terms of direction and width of the arrows, which reveal deep changes in the interlinkages between sectors. The depictions for 2013 and 2015 differ from the one for 2011: Portugal became a net lender (red circle for the rest of the world) – compatible with an external surplus in the balance of payments – and in both years the general government deficit decreased and the non-financial corporations became net lenders. Regarding the financial corporations, in 2013, there is a noticeable deleveraging *vis-à-vis* the rest of the world and in 2016 the financial corporations are largely financing the general government. As for households, they show a more stable pattern, with some fluctuations in their funding capacity, linked to the savings rate, but without deep variations in the inter-sectorial financial relations. When looking at the exposure to the different counterpart sectors[6], the importance of the financial corporations is very clear for both sides of the balance sheet. However, by decomposing the net flows between households and financial corporations into gross flows of assets and liabilities, including financial instrument detail, it becomes clear that the apparent stability hides important changes, since the positive net flow (financial assets - liabilities) for the recent years (since 2011) is achieved by reduction of liabilities (net repayment of debts), that are partly offset, for some of the years, by negative flows in the financial assets (i.e. households disinvesting in assets *vis-à-vis* the financial sector).

Figure 2 • Households transactions *vis-à-vis* financial corporations

Assets and liabilities



Assets – by financial instrument



4 Tailoring national financial accounts to the user's need – the case of households

In this section we explore how the aggregate changes for households vary according to some characteristics of the individuals. We use data from the CCR and the Household Finance and Consumption Survey (HFCS). The results of the 2013 HFCS for Portugal are presented by Costa (2016), which is our main reference in this section. The HFCS data enables the analysis of the distributions of variables that affect the financial situation of households across different groups of households. As the recent financial crisis illustrated, information on the heterogeneity of the financial situation of households and, in particular, on the degree of indebtedness, is essential to assess the extent to which debt accumulation in aggregate terms originates risks to financial stability and ultimately to the growth of economic activity. The comparison of the aggregated HFCS data with the macroeconomic data from National Accounts should be done with caution given the

6 Data by counterpart sector is not publicly available for all the financial instruments.

conceptual differences between the two sources and the measurement errors associated with both sets of information. From a purely statistical point of view, this type of data is useful to infer the distribution of the variables in the population but does not substitute macroeconomic data to obtain the levels for the different economic aggregates.

4.1 Looking beyond households' aggregate liabilities

We start with the evolution of liabilities, namely loans granted by financial corporations, based on CCR data. The annual rate of change of these loans dropped from 1.6% in December 2010, just before the start of the EFAP in 2011, to -4.3% in mid-2013, and is currently at -1.2% (February 2017). One question that naturally arises is "who is behind these movements"? Figure 3 shows the breakdown by credit amount of loans granted to households by financial corporations for 2010, 2013 and 2016 (end of period stocks). From the nearly 30 EUR billions (mM€) reduction in the stock of loans between 2010 and 2016, almost 80% was concentrated in the most indebted classes (above 100 EUR thousands), whose representativeness decreased from 58% in 2010 to 52% in 2016. Interestingly, between 2013 and 2016 we can already observe an increase in the least indebted classes (below 50 EUR thousands). This analysis can be complemented with information on overdue loans. According to Figure 4, the increase in the overdue loans ratio from 3.3% in 2010 to 4.9% in 2016 is mainly explained by the most indebted class (above 250 EUR thousands), where the overdue loans ratio increased from 3.6% in 2010 to 9.1% in 2016. The least indebted class (below 5 EUR thousands) continues to exhibit the highest overdue loans ratio, 15.8% in 2016.

Figure 3 • Households' loans – breakdown by credit amount, 2010, 2013 and 2016

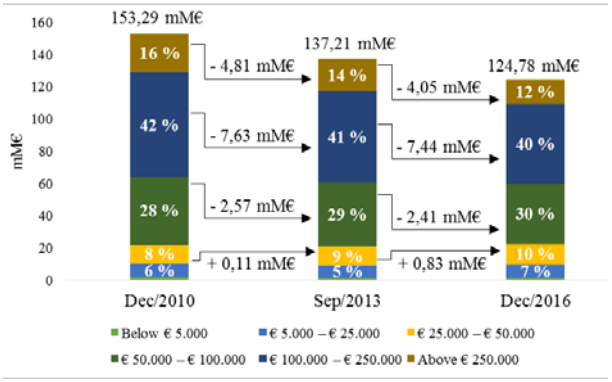
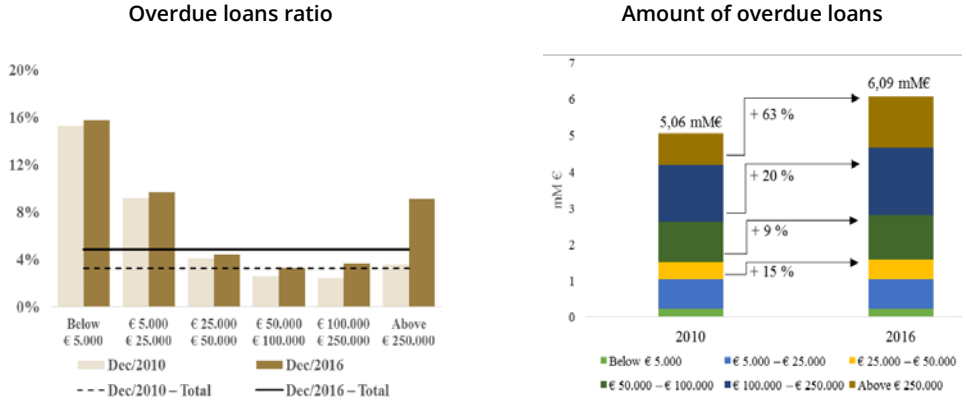
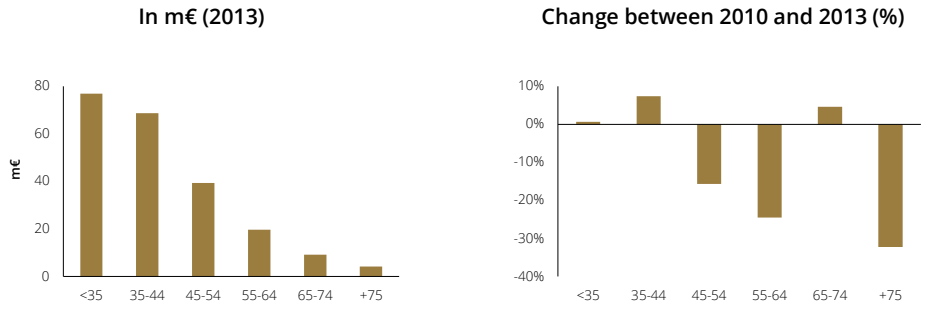


Figure 4 • Household's overdue loans, breakdown by credit amount, 2010 and 2016



The results of the 2013 HFCS for Portugal show that debt has a much skewed distribution, reflecting the fact that around 55 % of households in Portugal have no debt. Households in the upper net wealth classes in 2013 held less debt than households that were in these groups in 2010. The decline in the debt concentration on the wealthiest households might have resulted from a change in the composition of households that are in the top wealth classes in favour of households with lower debt levels or from the fact that households with a better financial situation have made higher total loan repayments than the remaining ones. In Figure 5 we observe that households debt peaks at the youngest ages of adult life (<35), declining steadily thereafter, and reaching its lowest levels at the end of the age distribution. Older people experienced the largest reduction in debt between 2010 and 2013. This empirical evidence is in line with the life-cycle theory, which postulates that, in the absence of credit constraints, households borrow in anticipation of future income growth, to buy housing and other durables. Typically, these events occur at younger ages, which are also characterised by lower stocks of accumulated wealth than those held later on in the life span.

Figure 5 • Conditional median[7] outstanding total debt by age of the reference person

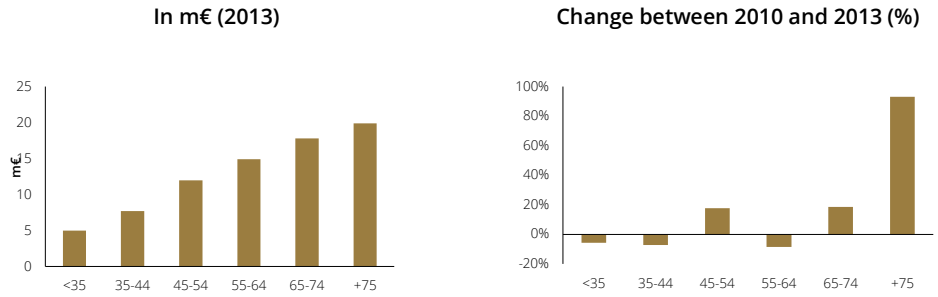


4.2 Looking beyond households' aggregate assets

Saving deposits are the most important asset in the financial wealth for all kinds of households, except those that are in the lowest net wealth class, for which sight deposits have a dominant weight. The share of total deposits is higher for lower income and net wealth classes and for households with older and lower educated reference persons. Saving deposits are the financial asset with the highest median value (about 11 thousand euros). Both participation rates and conditional median values of the financial assets in general increase with the level of net wealth and income. While for deposits the median value increases with age (Figure 6), for tradable assets it reaches the highest level in households with younger reference persons and in the cases of voluntary pensions and other financial assets in the age group prior to retirement. For most assets types, participation rates did not changed much in the period 2010-13. For the main asset types, with the exception of saving deposits, the median values are lower in 2013 than in 2010.

7 Median value of the outstanding debt conditional on participation in debt (i.e., on having a debt).

Figure 6 • Conditional median value for saving deposits by age of the reference person



5 Final remarks

In this paper we illustrate how to tailor national financial accounts to the users' needs by means of administrative and other large granular datasets, with a focus on households, using data from the CCR and the HFCS. Both datasets contribute to a better understanding of the behaviour of macroeconomic aggregates, as they allow the identification of the groups of households where these aggregates are concentrated. As Lautenschläger (2016) puts it, beyond the aggregates lies a whole world of facts and observations that feed into granular data. The "paradigm shift" from aggregate data to granular data poses challenges that central banks must stand ready to address: (i) granular datasets need to be standardised, well integrated and multi-purpose; (ii) rules and definitions must be stable and consistent; (iii) state-of-the-art IT solutions that can process huge data volumes and ensure the necessary data confidentiality are needed.

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Looking into R&D intensity in Portugal in the last years*

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Abstract

This paper presents some results regarding the economic and financial behavior of manufacturing companies based on their technological intensity, using OECD's classification of these activities. Results show that profitability levels are higher among high Research and Development (R&D) intensity sectors of activity, which present a greater link with the export sector. These sectors' performance regarding bank loans and foreign direct investment on these activities are also discussed.

Keywords: Corporations, Indebtedness, Investment, Profitability, R&D.

Evaluating industries' technological intensity has proven to be a challenging task for those who investigate this feature. The OECD has historically proposed a taxonomy where manufacturing activities are labelled according to different technological levels. Galindo-Rueda et. al. (2016) discussed this taxonomy, proposing the use of the expression "R&D intensity" instead of "technological intensity". The authors suggest four levels of R&D intensity (high, medium-high, medium-low and low R&D intensity) based on the International Standard Industrial Classification (ISIC) and provide its correspondence with NACE Rev. 2 codes. This classification was used in this study.

* JOCLAD 2017 – XXIV Jornadas de Classificação e Análise de Dados, Porto, Portugal, April 2017.

Banco de Portugal's Central Balance Sheet Data (CBSD) show that low and medium-low R&D intensity sectors prevail in the Portuguese manufacturing sector concerning a large number of indicators. In 2015, low R&D intensity sectors gathered 59% of the companies, 44% of the turnover and 57% of the number of employees of manufacturing companies as a whole. High and medium-high R&D intensity sectors, which stood for only 10% of the companies, represented around 26% of manufacturing sector's turnover and 17% of its number of employees.

Foreign direct investment (FDI) positions in Portuguese manufacturing represented 8% of total inward equity direct investment in 2016; it was mainly linked to low and medium-low R&D intensity sectors, which had 57% of that investment. Nevertheless, FDI in equity of medium-high R&D intensity sectors was also significant (39%).

Data from Banco de Portugal's Central Credit Register (CCR) reveal that loans granted to the manufacturing sector by the resident financial sector at the end of 2016 were also mostly directed to low R&D intensity sectors (52%), followed by medium-low (29%), medium-high (16%) and high (3%) R&D intensity sectors.

Results also point to differences between levels of R&D intensity through the 2011-15 period, with high and medium-high R&D intensity sectors performing better in several economic and financial indicators. In 2015, the average turnover of a company in the high R&D intensity sectors was 3.6 times higher than the standard for manufacturing companies, while the low R&D intensity sector's average turnover stood for only 75% of the average turnover of manufacturing companies in Portugal.

Export companies were more relevant among high R&D intensity sectors, standing for 27% of these sectors' enterprises and 88% of its turnover.

Profitability, measured according to the return on equity ratio, was generally higher among high and medium-high R&D intensity sectors (13% and 15%, respectively in 2015), although it is worth mentioning profitability developments within low R&D intensity sectors in recent years (7 p.p. increase from 2011 to 2015).

The highest non-performing loans ratios, according to CCR data, were registered among medium-low and low R&D intensity sectors (14.9% and 11.1%, respectively, at the end of 2016) while high and medium-high R&D intensity sectors exhibited significantly lower non-performing loans ratios (1.7% and 6.3%, respectively, at the same period).

In spite of the better economic and financial performance of high and medium-high R&D intensity sectors, it is worth mentioning that the 1% increase in the manufacturing sector's turnover from 2011 to 2015 was sustained by low R&D intensity sectors, while the remaining segments registered turnover decreases. Low R&D intensity sectors were also the major contributors to the 30% increase of manufacturing sector's EBITDA in the same period.

Disclaimer

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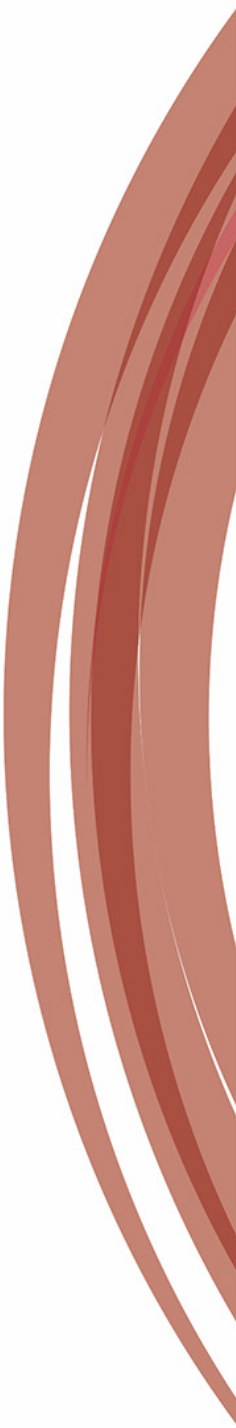

III Indicators of macroeconomic imbalances

Why do external statistics matter?
– A multidimensional approach in a context of macroeconomic imbalances

External statistics and national financial accounts as leading indicators for the assessment of economic vulnerabilities

How to use International Banking Statistics?
Upgrading monetary and financial Statistics?

Why do external statistics matter? – A multidimensional approach in a context of macroeconomic imbalances*

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Abstract

The recent financial crisis highlighted the importance of an early detection and mitigation of macroeconomic vulnerabilities. In this context statistical compilers and analysts were challenged to develop enhanced methodologies and indicators, namely under the scope of external statistics. This paper proposes a multidimensional assessment of the external debt imbalances achieving a comprehensive and consistent approach by analysing not only the decomposition of the current and capital account balances but also how the economy is financed. This is possible through a deep insight of the financial account. Due to the existent interconnections one might analyse the current and capital account and whether a given deficit or surplus is explained by the component of goods and services or by the component of current income generated by the direct or portfolio investment, as an example. Simultaneously it is possible to observe in more detail the type of financial instruments; identifying if the net acquisition or disposal of financial assets is explained by the behaviour of a given institutional sector; detecting risk exposure of investment by country or identifying bilateral asymmetries that might exist with other commercial partners. It is a comprehensive and integrated approach rich of a variety of dimensions.

Keywords: external statistics, balance of payments; imbalances; direct investment; portfolio investment; income

* ISI 2017: World Statistics Congress, Marrakech, Marrocos, July 2017.

1 Introduction

The recent financial crisis highlighted the importance of creating useful mechanisms capable to early detect and mitigate macroeconomic imbalances but that went beyond the criteria of government debt and deficit of the Stability and Growth Pact. Bearing this in mind, since 2011, a complex reform of the European governance framework has being implemented in the European Union (EU) in which is included the creation of the Macroeconomic Imbalance Procedure (MIP). Under the MIP, an alert system based on a macroeconomic scoreboard was developed in order to identify imbalances within and between individual EU countries – the Alert Mechanism Report (AMR). This scoreboard includes both stock and flow indicators which can capture shorter-term deteriorations, as well as the longer-term accumulation of imbalances. Currently it is built by 14 main indicators (along with their indicative thresholds), including some external statistics – the current account balance and the net International Investment Position (IIP). The current account balance is considered one of the most significant indicators in explaining the incidences of crises. Although surveillance under the MIP covers both current account deficits and surpluses, more attention is paid to economies with large current account deficits and competitiveness losses. A persistently high current account deficit leads to a highly negative net IIP. Besides its level, the composition of assets and liabilities in terms of maturities is also an important factor when assessing the overall vulnerability of the external position of a Member State.

This paper aims to develop a multidimensional assessment of the Portuguese external imbalances by analysing not only the decomposition of the current and capital account balances but also how the national economy has been financed during the last years.

2 The Portuguese external imbalances: an historical perspective

Portugal has historically displayed a negative current and capital account balance. Between 1963 and 1973, the current and capital account balance remained at around 1.2 per cent of GDP, declining to a deficit of nearly 5.6 per cent in the following decade (1974-1985), due to the combination of the international oil crises of the 1970s and the social and political upheavals in the aftermath of the Portuguese democratic revolution of 1974. The external imbalances accumulated during this period led to two International Monetary Fund (IMF) interventions in Portugal (1977/78 and 1983/85), which favored a rapid improvement of the goods and services balance. After 1995 and until the subprime crisis, the Portuguese current and capital account experienced substantial deterioration from - 2.5 per cent in 1996 to -11.8 percent in 2008. Since the end of 2009 a strong instability and a sovereign risk differentiation has increased markedly across the euro area, penalizing economies with larger fiscal and external imbalances and more significant structural problems, including Portugal. In the beginning of 2010 a sizeable impact on the Portuguese banks' financing capacity was installed and supplementary fiscal consolidation measures were successively adopted. In April 2011, the Portuguese government decided to give to the European Commission (EC) a request for financial assistance and on May 2011, Portugal has reached an agreement with the Troika of EC, the European Central Bank (ECB) and the IMF for a three-year 78 000 euro million bail-out.

Figure 1 tries to illustrate this reality, by presenting the evolution of Portuguese investment, national savings and the current and capital account balance. A carefully analyses of the referred chart evidences the association between the Portuguese successive current capital account deficits and the need for an intervention. Typically, these persistent deficits are mainly driven by the behaviour of the goods and primary income accounts, while services, secondary income and capital account have been contributing positively to the balance and capital account, as shown in Figure 2.

Figure 1 • Current and capital account, investment and national saving

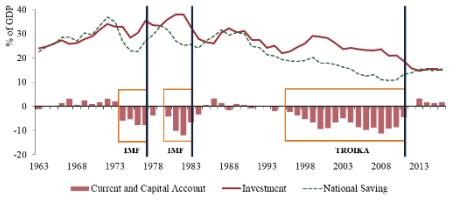


Figure 2 • Portuguese current and capital account by component

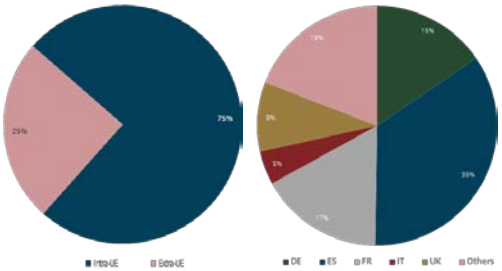
3 Current and capital account in detail

Since 2012, the Portuguese economy has been registering a surplus on the current and capital account. This reversal was attributable to a combined improvement in the goods account deficit and an increase in the services account surplus.

The decrease in the goods account deficit started in 2009, with a significant boost in the performance of consumer, intermediate and investment goods exports. These transactions are mostly directed to other UE countries. Assessing the bilateral trade and dependency to partner countries, in 2016, the main trading partners were Spain, France and Germany, which together represented about 50 per cent of total Portuguese exports of goods.

Figure 3 • Portuguese goods exports (X) and imports (M)

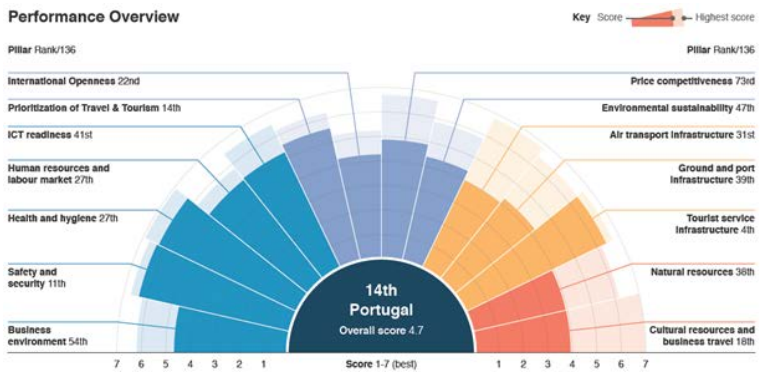
Figure 4 • Portuguese exports of goods, broken down by geographical area, 2016



The travel sector is the most prominent sector of Portuguese exports of services, representing around 45 per cent of total in the 2008-2016 period. In the last years, it has been the major factor

behind the increase of the services account surplus. The main four country visitors are from France, United Kingdom, Spain and Germany. In 2017, Portugal attained the 14th position in the Global Travel & Tourism Competitiveness Index. Besides its appealing weather, tourism services infrastructure, safety and security concerns and cultural resource helped driving tourism toward Portugal, as shown in Figure 5.

Figure 5 • Portuguese tourism performance overview, 2017



Source: World Economic Forum

The second most relevant sector in Portuguese exports of services is the transportation sector, with a share of around 25 per cent of the total of services during the same period.

Figure 6 • Portuguese BoP Services account

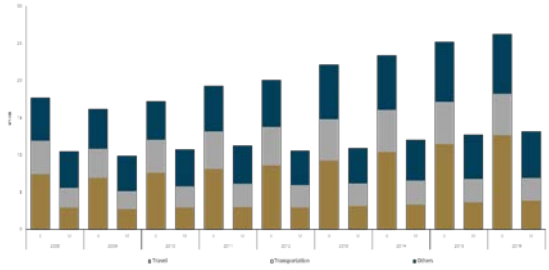
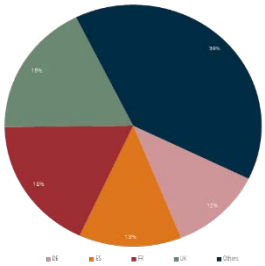


Figure 7 • Portuguese exports of tourism broken down by geographical area, 2016



4 Primary and secondary income balance

In Portugal, primary income is mainly determined by investment income – interests, reinvested earnings and income on equity among other (Figure 8). For the time-series considered, compensation of employees, income on reserve assets and the remaining primary income represent, on average, 40% of the primary income. On the basis of the available data it is also possible to analyse the income associated to each functional category like direct investment, portfolio investment, reserve assets and other investment and making possible to establish a link with the international investment position (IIP) performance.

On the other hand, the evolution of secondary income is largely driven by the migrant's remittances. While in 2010 the emigrants' remittances were mainly from France, Switzerland and Angola; in 2016 the emigrants' remittances continue to be mainly from France and Switzerland but the United Kingdom swapped with Angola. Identifying the main host countries helps in delineating in a more accurate way policies targeted to specific groups (as an example, aiming to increase migrants' savings).

Figure 8 • Investment income

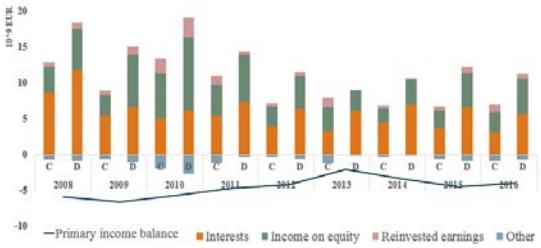
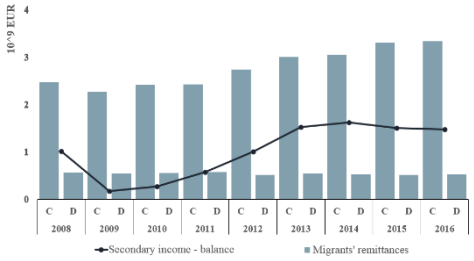


Figure 9 • Secondary income: migrants' remittances



In the case of Portugal, the capital account it is mostly composed by capital transfers and, in particular, by investment grants received from the European Union (EU). It is to be referred that the funds received from the EU are also recorded as subsidies in the primary income and as current transfers in the secondary income. Nonetheless, the evolution of the capital account illustrates an overall decrease of the EU funds in the most recent years. Links could be established with the time-series of gross fixed capital formation of the sector of non-financial corporations noting that the time of recording of these amounts in balance of payments corresponds to the moment amounts are received by the final beneficiaries.

Figure 10 • Capital account

5 International Investment Position

A net lending of the current and capital account corresponds to a rise in net foreign assets (via redemption of liabilities or via an increase of assets). This was what happened in 2016, in Portugal, because the financial account recorded a rise in net foreign assets of € 3142 million (Figure 11). These developments were partially due to the redemption of Treasury bills held by nonresidents (category portfolio investment) and an early repayment of loans granted by the IMF under the Economic and Financial Assistance Programme (category other investment).

Figure 11 • Breakdown of the financial account by functional categories

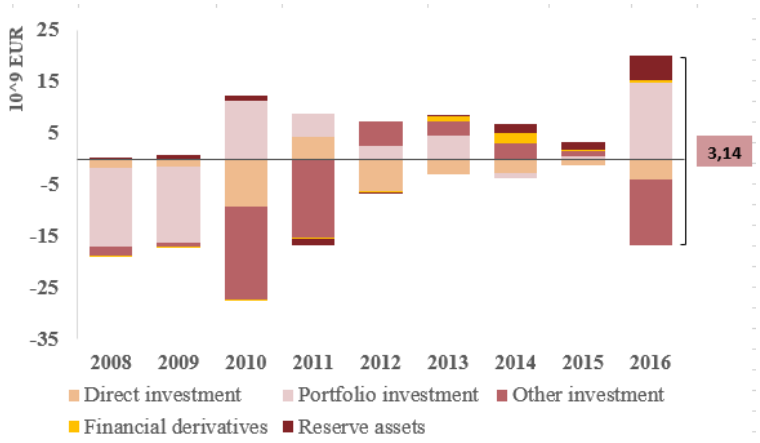
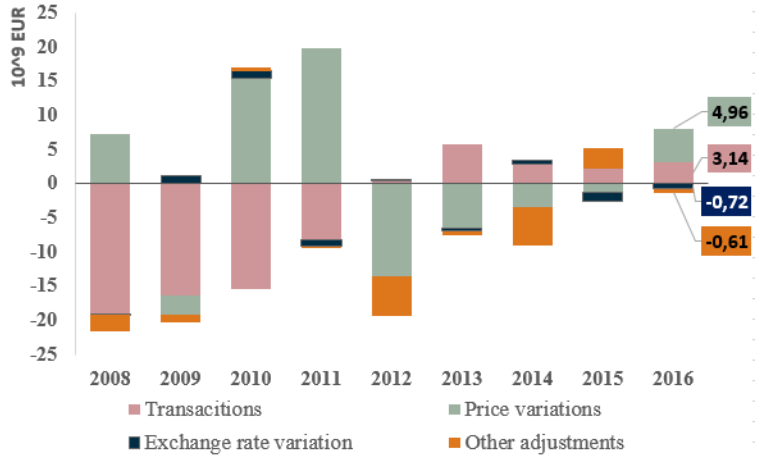


Figure 12 • International investment position by component



Besides analysing the transactions, it is important to have into account the stocks. One of the most meaningful aggregated measure of the external accounts is the IIP. The composition of the IIP illustrates the vulnerability of the economy to changes in external market conditions. The implications for vulnerability differ among functional categories and instruments. The IIP shows how the transactions recorded in the financial account plus the price changes, the exchange rate changes and other adjustments contribute to explain the change of the financial assets or liabilities

of a given country (Figure 12). For example, in 2016, Portugal's IIP stood at €-194.4 billion, corresponding to -105.2 per cent of GDP. The referred rise of € 3142 million in net foreign assets (transactions) explained to some extent the change in the IIP because the change was, however, primarily explained by price changes due to the devaluation of Treasury bonds held by non-residents (category portfolio investment).

In addition, the breakdown of the international investment position by institutional sector illustrates the main contributors to a given evolution of the IIP. Referring to Portugal (Figure 13), it is possible to observe that in most recent years, general government (GG) has had an important role when explaining the change of IIP.

Figure 13 • Breakdown of the International | Investment Position by institutional sector

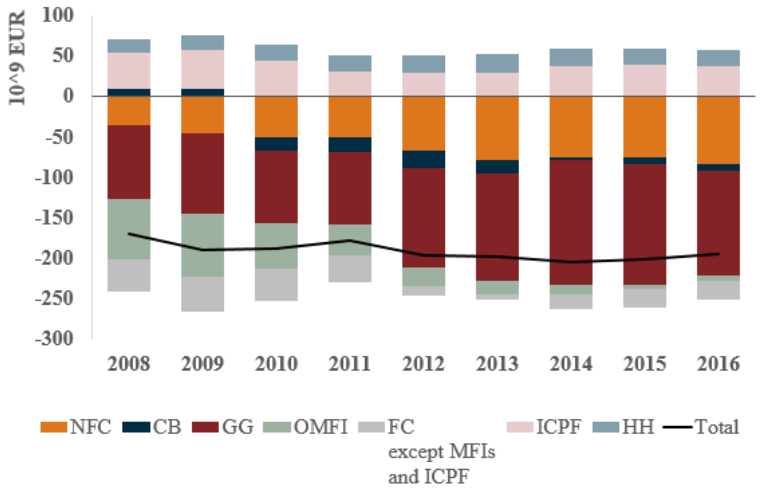
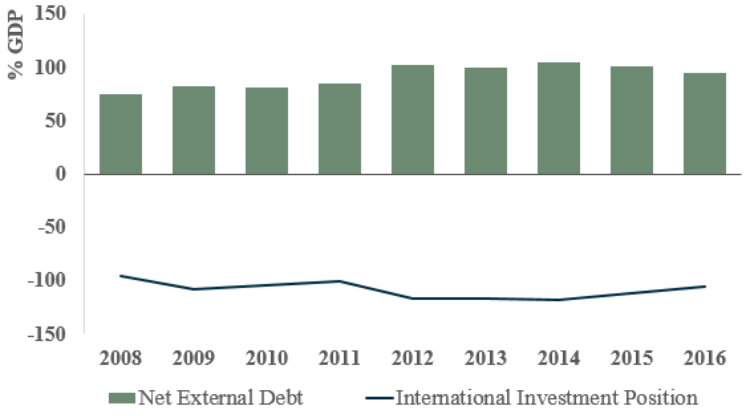


Figure 14 • Net external debt and international investment position



Together with the IIP, external debt statistics is undoubtedly considered an indicator allowing external creditors to assess countries financial vulnerabilities.

Gross external debt corresponds to the sum of the non-equity liabilities components in the IIP statement of the economy, while the net debt is the difference between gross debt and the related financial assets that the country holds *vis-à-vis* the rest of the world (Matos (2013)). The net debt can be seen as an appropriate measure of external indebtedness, if one considers a country with a significant amount of assets which need to be considered when thinking about the solvency of its external accounts.

At the end of 2016, the net external debt of Portugal reached € 174.6 billion, which represented a fall of €7.6 billion from 2015 and corresponded to a decrease from 101.5 to 94.5 per cent of GDP, the lowest value since March 2012 (Figure 14).

6 Final remarks

External sector accounts are a rich data source for analysing risks based on: maturity mismatches that can put in hazard debt payments; currency mismatches; structure problems of a financial nature; solvency problems or dependence from a partner economy.

The level of data desegregation on this statistical domain disseminated by Banco de Portugal allow economists, analysis and policy makers to develop their own tailor made analysis. When correctly managed and understood, external statistics can be considered a powerful tool in the monitoring of economic developments.

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External statistics and national financial accounts as leading indicators for the assessment of economic vulnerabilities*[1,2]

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Abstract

The Global Financial Crisis has reinforced the need and relevance of the development of early warning systems, which enable the detection, and, to the extent possible, the prevention of severe internal and external economic vulnerabilities. In this context, several initiatives at the international level have been pursued. For instance, the European Union has implemented, in December 2011, a surveillance mechanism that attempts to meet this identified need - the Macroeconomic Imbalances Procedure (MIP). Banco de Portugal contributes to this Procedure with the compilation and development of external statistics and national financial accounts, which are used in the MIP scoreboard. Furthermore, in 2015, Banco de Portugal has overhauled its Statistical Bulletin by introducing a Chapter on Main indicators, which now includes information that allows an improved assessment of the current economic conditions, and facilitates international comparisons. In this paper, we discuss the relevance of these statistics as leading indicators for economic assessment and present the results of the recent overhauling process.

Keywords: economic monitoring; balance of payments; sectoral accounts; main economic indicators

* ISI 2017: World Statistics Congress, Marrakech, Marrocos, July 2017.

1 The analysis, opinions and findings of this paper represent the views of the authors, which are not necessarily those of the Banco de Portugal or of the Eurosystem.

2 The authors would like to thank Filipa Lima and Luís d'Aguiar for their valuable insights and suggestions.

1 Introduction

The recent Global Financial Crisis (GFC) has shown the importance of the interconnections between economies but also between the resident sectors of an economy. In fact, an apparently very concrete and specific problem in the United States subprime real-estate market quickly transformed into an international banking crisis, deeply affected trade worldwide, and had a very significant economic cost in terms of GDP loss and unemployment. In Europe, the GFC has been followed by a profound sovereign debt crisis after 2010[3].

Although each economic crisis has historically been associated with somewhat different immediate causes, some authors argue that the main cause for policy inaction before the materialization of a given crisis has not been the lack of warning signals of an approaching crisis, but rather a generalized this time is different syndrome. Reinhart & Rogoff (2009) have compiled a database covering eight centuries of economic crises, of different typologies, and have found several economic developments that were present in most of the times. In fact, in our view, one of the main conclusions of this seminal work is the importance of a systematic and objective analysis of available data – namely through the development and analysis of early warning systems and leading indicators.

Nevertheless, the economic community and policy makers worldwide recognized that the GFC unveiled the existence of some gaps in the availability of key information for policy making and for the timely assessment of risks in and across countries[4]. Particularly, the accumulation of risks and imbalances in some sectors and/or financial instruments did not seem to be easily identified. Clearly, there were some warning signals provided by available statistics, but there was also the need for more harmonization and more transparency in some instruments or economic sectors.

In this paper we will not delve on the typical idea behind "leading indicators" – i.e., the use of indicators or the construction of a composite aggregate index that may anticipate (nowcast or forecast) the behaviour of "real figures"[5]. Rather, we focus on how the Banco de Portugal (hereinafter, referred to as the Bank), and the European Union (EU), are making use of available external and national financial statistics to detect, monitor and assess economic weaknesses. In this *lato sensu*, the mentioned macroeconomic statistics can be seen as powerful leading indicators of economic vulnerabilities and, therefore, deserve increased attention by policy makers and regulators. The bulk of these statistics, and their relevance, are not new per se, although some important improvements have been developed. What is in some ways new is the systematic fashion by which policy makers look at them and the policy consequences that may arise from this more analytical, and in some instances even legal[6] approach.

The paper is organized as follows. Section 2 presents a brief review of the literature on early warning systems and leading indicators of economic crises. Section 3 highlights the results of the creation of a Chapter on Main Indicators in the Banco de Portugal's *Statistical Bulletin*. Section 4 concludes.

3 This European debt crisis had its pinnacle with the financial assistance programs to Greece (May 2010 and February 2012), Ireland (November 2010), Portugal (May 2011) and Spain (June 2012).

4 In this respect the reference is, of course, the G20 Data Gaps Initiative – see: http://ec.europa.eu/eurostat/statistics-explained/index.php/G20_Data_Gaps_Initiative_(DGI)_%E2%80%93_background.

5 For a review on leading and coincident indicators for the Portuguese economy see, for instance, Esteves & Rua (2012) and Rua (2015) where these topics are studied in depth.

6 For instance, as we mention in Section 2 of this paper, the EU's MIP has a corrective arm with legal enforcement power. 56. The analysis, opinions and findings of this paper represent the views of the authors, which are not necessarily those of the Banco de Portugal or of the Eurosystem.

2 Leading indicators for the assessment of economic vulnerabilities: a synthesis

One of the main focus of attention of economists has been, for a long time, not only the explanation of the origins of economic downturns, but also the development of mechanisms that enable the detection of the build-up of imbalances that lead to such downturns. While the former has been the source of controversy between several streams of economic thought, the latter, on which we focus this paper, is still widely debated in economic literature – which consistently underlines the difficulties in identifying broad lessons and stylized facts.

Indeed, there is extensive research on which indicators perform best in suggesting the build-up of imbalances that lead to economic downturns (early warning indicators), but, as Frankel & Saravelos (2012) underline, despite the multitude of different data available today and numerous testing, any such exercise is always "fraught with difficulties". Moreover, each generation of models that attempt to identify such early warning indicators are particularly useful in explaining the preceding crises but have "to be jettisoned when the next crisis comes"[7].

Nevertheless, several studies look at historical data in an attempt to find regularities. In this spirit, Babecky et. al (2013) assessed, for the period between 1970 and 2010, which indicators could prove to be the most useful in explaining the cost of economic crises for EU and OECD countries and concluded that the key early warning signal is the growth of domestic credit to the private sectors, while "an increase in government debt, the current account deficit, and FDI inflow, or a fall in house prices and share prices could be considered late early warning indicators". Jordá et. al (2011) used a set covering 140 years of historical data for a sample of advanced economies and concluded that, in the run-up to normal crises, the current account deteriorates, in line with Reinhart and Reinhart (2009) who also found evidence that the current account deficits are helpful in foreseeing crises in developing countries.

Recently, several studies have focused on the Global Financial Crisis. For instance, Rose & Spiegel (2011) investigated possible determinants of the intensity of the GFC across countries and concluded that the countries with pre-crisis current account surpluses and/or with lower credit growth rates appeared to endure that downturn better. In the same vein, Lane & Milesi-Ferretti (2011) sought to understand if the cross-country incidence and intensity of the GFC was systemically connected to any pre-crisis macroeconomic behaviour and/or financial factor – they found that "countries with a high share of manufacturing in GDP, large increases in private credit relative to GDP, high current account deficits, and net external liabilities – particularly in the form of debt – were among those experiencing higher output and demand declines".

Although several authors have duly identified a few caveats in the identification of the most powerful early warning indicators, it becomes clear that there are a set of variables which are repeatedly identified for this purpose – e.g. the growth rate of domestic credit and the current account deficits.

2.1 The case for the European Union's Macroeconomic Imbalances Procedure

Against this background, having recognized the importance of developing early warning models and the usefulness of incorporating the indicators described in the literature surveyed, the EU has

7 For a good survey on the literature regarding early warning indicators please refer to Frankel and Saravelos (2012), who have conducted a review of over eighty papers from the pre-2008 early warning indicators literature.

embedded those principles in the setting up of its Macroeconomic Imbalances Procedure (MIP), which attempts to alert decision makers on the building up of macroeconomic vulnerabilities in EU countries (European Commission, 2012). This was done through the creation of a scoreboard which comprises a small number of relevant, practical and high quality macroeconomic, financial and social indicators to which an indicative threshold – which serves as an "alert" level – was defined. The MIP scoreboard works as a filter that aims to identify the countries for which a more in-depth analysis – and possible subsequent measures – is deemed necessary. When serious and persistent imbalances are identified, the corrective arm of the MIP requires the Member State to put in place a detailed policy plan to achieve their correction and provides means to effectively enforce it.

The indicators which are currently being used for the MIP[8] are derived from available macroeconomic and financial statistics, such as external statistics and national accounts. The MIP scoreboard includes, among others, (a) three indicators pertaining to the external statistics' domain: the current account balance, the net international investment position (both as a % of GDP) and the percentage change of export market shares; and also (b) three aggregates that are derived from national financial accounts: the consolidated private sector debt, the general government gross debt (both as a % of GDP) and the year-on-year changes in total financial sector liabilities. In Portugal, the Bank is responsible for the compilation of all of the MIP statistics in these domains, apart from the change of export market shares which is a compiled by the National Statistical Institute.

3 Banco de Portugal's Main Economic Indicators – external statistics and national financial accounts

In 2011, the Bank began a new phase in the release of indicators for the Portuguese and international economy, through the creation of a new Chapter in the *Statistical Bulletin* – Chapter A: The Main Indicators. This new chapter reflects the concerns of the Bank in simplifying the access to indicators capable of providing an overview of recent national and international economic developments, with an emphasis on the Portuguese and euro area economies, allowing for a more systematic analysis of such data, and including several indicators useful for the detection of macroeconomic vulnerabilities. Chapter A is organized by statistical domains and uses an up-to-date user-friendly tabular and chart presentation, which covers, *inter alia*, national accounts, general government (GG) finance statistics, labour market statistics, monetary and financial statistics, as well as external statistics indicators.

Chapter A also benefits from the publication by the Bank of several statistics with a shorter timeliness than is usually the case. This aspect further empowers the users with high quality and more timely information that effectively allows to proxy and/or forecast the behaviour of some important areas of the economy.

For example, the Bank compiles and publishes central government and general government financing statistics on a monthly basis, with a timeliness of t+30 and t+50, respectively. These statistics have proved to be high quality and timely proxies for the official deficit of the general government, which is available on a quarterly basis and compiled in the framework of the quarterly

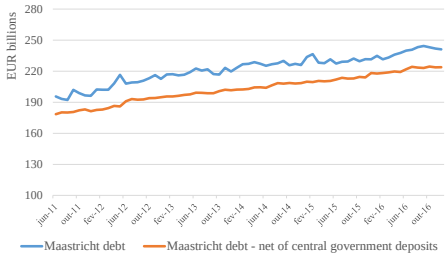
8 The set of indicators that composes the MIP scoreboard is routinely revised. For a complete overview of the indicators currently used please consult: https://ec.europa.eu/info/business-economy-euro/economic-and-fiscal-policy-coordination/eu-economic-governance-monitoring-prevention-correction/macroeconomic-imbalance-procedure/scoreboard_en

national financial accounts, with a t+90 timeliness (Figure 1). Similarly, although the publication of public debt statistics, according to the Maastricht criteria, is only done at the European level in a quarterly basis, which the Bank publishes with a t+90 timeliness, the Bank also publishes monthly public debts statistics, with a t+30 timeliness (Figure 2).

The more frequent and timely publication of public debt statistics, together with the monthly statistics on general government financing, allows for a closer monitoring of the general government sector and thus provide added value for analysts and decision makers. Such more frequent and timely publication of these statistics is only possible given the existence – and comprehensive exploitation – of several micro-data sources at the Bank.

Figure 1 • General Government Financing and Deficit

Figure 2 • General Government Debt |monthly



In the same spirit, it is worth highlighting that the statistics regarding the indebtedness of the non-financial sector[9], which are now available monthly, with t+30 timeliness, and included in Chapter A, can also be seen as leading indicators, in latu senso, for the liabilities of this sector, which are only published in quarterly national financial accounts, with t+90 timeliness. Such comparisons between these two statistics are possible given that the sectors covered are the same and the monthly indicators on the non-financial sector indebtedness include the most relevant financial instruments[10]. However, in this respect, analysts must adequately consider some existing methodological differences between the two statistics, namely distinct valuation methods for some instruments, and also the fact that monthly data is non-consolidated and quarterly financial accounts data is consolidated.

Finally, it is also relevant mentioning that, in April 2017, Chapter A was extended to include a set of statistics on financial stability, which encompass, *inter alia*, a composite index of financial stress in Portugal – which Braga et al (2014) show is a good predictor of financial stress episodes that, after a certain threshold, negatively affect economic activity –, and a selection of specific indicators related with the banking sector. Among others, these specific indicators are used by the Bank for financial stability analysis and enable the assessment of systemic issues, such as the evolution of credit gaps[11].

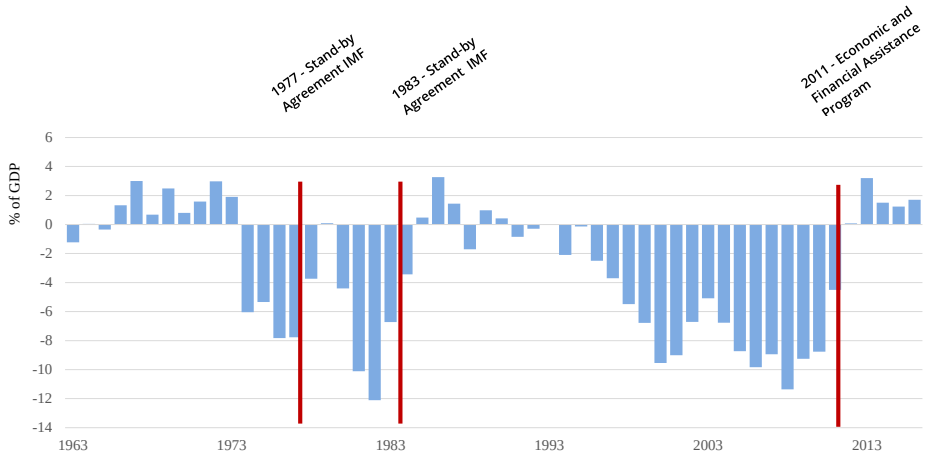
9 For a broader scope on the usefulness and methodological issues underlying these statistics, please consult Lima et. al (2014). http://ec.europa.eu/eurostat/statistics-explained/index.php/G20_Data_Gaps_Initiative_(DGI)_%E2%80%93_background.

10 In this monthly statistics, debt includes: loans, debt securities (nominal value) and trade credits.

11 For an illustration of how these indicators are used, please consult the Banco de Portugal's Financial *Stability Report* at: https://www.bportugal.pt/en/publications/banco-de-portugal/all/120

We present in figures 3, 4 and 5 an additional set of the statistics compiled by the Bank and published in chapter A. As figures 3 and 4 appear to suggest, the GFC exposed the underlying weaknesses and imbalances of the Portuguese economy – for instance, in the run-up to the crisis, the Portuguese economy was characterised by large and persistent current account deficits. In fact, according to the literature surveyed, persistent current account deficits are one of the most important early warning signals that a crisis is imminent. Indeed, considering Figure 3, one can verify that the three foreign financial assistance programmes that have occurred in Portugal – in 1977, 1983 and 2011– have all been preceded by some years of large accumulation of external imbalances – in the 70's, beginning of the 80's, and from the mid-90's to the early 10's[12].

Figure 3 • Current and Capital Account and financial assistance programs



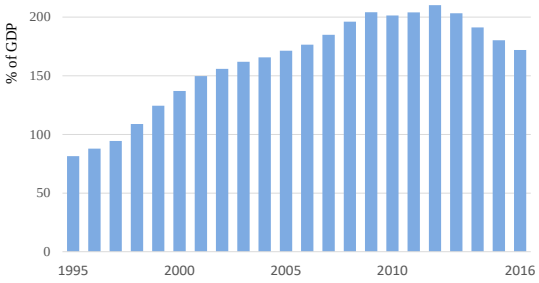
However, since 2010, Portugal has achieved a significant turnaround of its current and capital account deficit: from a deficit of 8.7% of GDP in 2010 to a surplus of 1.7% in 2016 (Figure 3). These results were much supported by the consistent increase in the gross exports of both goods and services. Notwithstanding, the financial external exposure of Portugal is, still, a matter of concern, as indicated both by a large negative International Investment Position and a high gross external debt (Figure 4).

In terms of public finances, although the fiscal deficits have been gradually declining, the current size of public debt is still a significant vulnerability of the Portuguese economy, as at the end of 2016 the public debt stood at €241.1 billion (130.4% of GDP). Likewise, the non-financial private sector also keeps featuring very high levels of indebtedness, although there has been a significant and ongoing deleveraging among households and non-financial corporations over the last few years (Figure 5). Despite this important deleveraging and a seemingly recent stabilization, the (consolidated) private sector debt is still alarmingly high (172% of GDP at the end of 2016) and, in light of the literature surveyed of the early warning importance of this variable, demands a close monitoring by policy makers.

12 For a broader discussion on the sustainability of the Portuguese current account and its implications, please consult Silva & Silveira (2016).

Figure 4 • International Investment Position and Net External Debt

Figure 5 • Private Sector Debt (consolidated)



4 Conclusions

In this paper, we discussed the relevance of external statistics and financial accounts as leading indicators for the assessment of economic vulnerabilities. Having acknowledged that such aggregate statistics provide a good view of the build-up of imbalances and vulnerabilities, Banco de Portugal created a new Chapter in its monthly *Statistical Bulletin* – Chapter A: The Main Indicators –, which aims at simplifying the access of users to indicators capable of providing an overview of recent national and international economic developments, with an emphasis on the Portuguese and euro area economies, and, for some indicators, with higher frequency and shorter timeliness than demanded by international organizations. Furthermore, several of the indicators published can be viewed as interesting proxies to important macroeconomic variables, and, as such, provide a way to a more timely assessment of economic developments.

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How to use International Banking Statistics?*

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Abstract

International Banking Statistics were created to monitor the activity of banking systems, providing internationally comparable measures of their exposure to several risks. In this article we focus on the consolidated banking statistics analysis and show that the Portuguese banking system country risk has changed over the years.

Keywords: International banking statistics, consolidated banking statistics.

1 Introduction

Globalization has deepened financial international interlinkages which have become more and more complex. Financial markets and the economies became more intertwined both domestically and abroad. In this respect, International Banking Statistics play a fundamental role to provide international comparable measures of the banks' cross border activities. These data comprises two different data sets: the locational banking statistics (LBS) and the consolidated banking statistics (CBS). The purpose of this article is to present International Banking Statistics and its main components. In addition, a descriptive analysis of the CBS is presented for Portugal since 2004.

LBS measure banks' international holdings/ liabilities based on the concept of residency. It uses unconsolidated information of financial claims and liabilities in the balance sheet of banks resident in reporting countries. The CBS address national banking exposures to country risk. It is based on the nationality of the reporting bank, i.e., the country where the bank's head office is located (excluding inter-office positions).

* JOCLAD 2017 – XXIV Jornadas de Classificação e Análise de Dados, Porto, Portugal, April 2017.

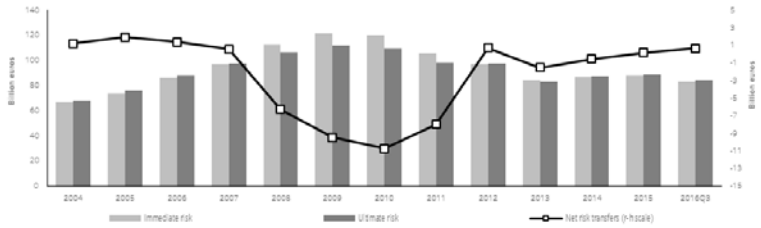
CBS offers two different perspectives: the immediate risk basis and the ultimate risk basis. The immediate risk basis covers claims allocated to the country of residence of the counterpart which signed the agreement with the bank, even when the claim is guaranteed by a third party. On the contrary, the ultimate risk basis corresponds to foreign financial claims against the counterpart that is ultimately responsible for the compliance with the agreement. At a country level, the difference between the ultimate risk basis and the immediate risk basis corresponds to the risk transfers across countries. Under the current statistical methodology, a risk transfer is recorded with a negative sign when the ultimate risk of a foreign claim held by a bank of the reporting country is addressed by an entity resident in the reporting country. On the other hand, when the ultimate risk of a domestic asset held by a bank of the reporting country is addressed by a non-resident entity, the risk transfer is recorded with a positive sign.

1.1 Data Analysis: Immediate risk basis, ultimate risk basis and net risk transfer

Chart 1 shows the international financial assets of Portuguese banks (CBS), split between the immediate risk basis, the ultimate risk basis and the correspondent risk transfers.

Chart 2 shows the net risk transfers broken down by relevant geographic aggregates (European Union – EU; BRICS; Off-shore financial centers and Portuguese Speaking African countries – PALOP).

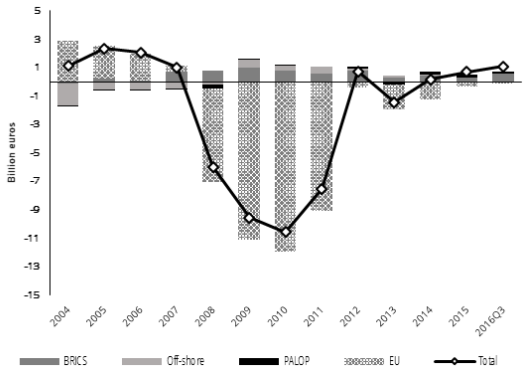
Chart 1 • International financial assets of Portuguese banks | 2004-2016Q3



Between 2004 and 2007 (Chart 1) the net risk transfers were systematically positive, reflecting a period where foreign financial claims of Portuguese banking groups were more exposed to other countries on an ultimate risk than on an immediate risk. This situation was reversed between 2008 and 2011 where exposure to ultimate risk fell below that on an immediate risk basis. This implies that part of international immediate risk was ultimately borne by residents in Portugal. Analysing the same period by geographical counterparty (Chart 2), European Union exhibits a negative net risk transfer. This means that at an ultimate risk basis, a major part of the assets held by Portuguese banks *vis-à-vis* entities resident in the European Union are guaranteed by entities resident in other geographical areas.

For the most recent years, the size of net risk transfers has decreased markedly. This suggests that the value of foreign claims on an immediate risk basis is very similar to that of claims on an ultimate risk basis.

Chart 2 • Net risk transfers, by geographical aggregates



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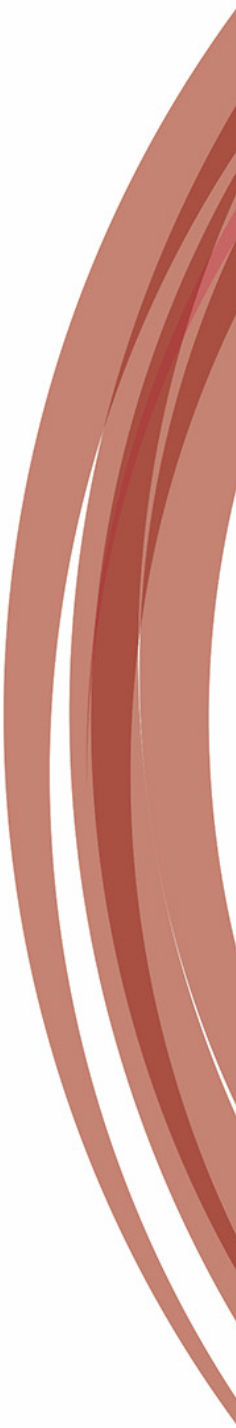

IV Compiling statistics: Special case studies

Money talks – Nowcasting real economic activity with payment systems data

Sentiment surveys in Portugal – description and empirical analysis

Challenges with the delineation of public sector: borderline between the financial corporations and general government sectors

Experience of Banco de Portugal on the compilation and publication of data regarding government finance statistics)

Money talks – Nowcasting real economic activity with payment systems data*

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Abstract

Payment systems play a central role in the functioning of modern market economies, by enabling the transfer of money and financial instruments between economic agents in a safe and efficient way. In this context, researchers have devoted a great deal of attention to the assessment of the spillover effects that the development of payment systems could induce in an economy and on the demand for currency. More recently, the usage given to the data generated by these systems have been considerably broadened, to encompass issues as, *inter alia*, the assessment of financial integration and nowcasting private consumption. In this paper, we explore possible uses of payment systems data in the specification of coincident and/or leading indicators for key macroeconomic aggregates – such as the gross domestic product and private consumption of households. Given the strong connection between the phenomena underlying these data and the above-mentioned macroeconomic variables, we highlight the comparative advantages of this information in relation to competing indicators, which is based on its inherent quality, competitive costs and high frequency. In addition, we present the payment systems data available in Portugal, with particular emphasis on Automated Teller Machine and Point of Sale driven data, and describe how the current institutional environment and the recent enhancements in the reported information have gained further importance and relevance in meeting Banco de Portugal's main goals.

Keywords: GDP forecasting; private consumption forecasting; nowcasting; leading indicators

JEL codes: E42; E27

* International Statistical Institute: Regional Statistics Conference, Bali, Indonesia, March 2017.

1 Introduction

Good evidence-based policy making demands that decision makers are provided with quality and timely inputs that are able to shed light on the relevant realities and fundament the different alternatives under scrutiny. Although this might seem as a simple and rather naïve premise, the problem is even more complex when one thinks of economic policy making, since there is also the challenge to select and analyze timely information that allows a proper understanding on what is going on in the economy and where it is heading to. In such demanding context, researchers have continuously been debating the pertinence of different inputs to meet this purpose, which, in view of the data gaps unveiled by the recent great financial crisis, have become increasingly more important.

In the same vein, the paper seeks to contribute to this discussion by reflecting on the appropriateness of using payment systems data as leading and coincident indicators for key macroeconomic variables, through a meta-analysis of different contributions on this subject. To this extent, we review the nature and the traditional applications given for this type of data and highlight the recent propositions denoting the growing interest for the information generated through these systems. Drawing up on the work of Esteves (2009) and Garcia (2011), we illustrate how the data stemming from the Portuguese retail payment systems have been proving to be particularly useful in nowcasting the Gross Domestic Product (GDP) and the consumption of non-durable goods and services, both of which are key macroeconomic variables to take into account in many economic and financial decisions.

2 The data – what's in it and where can it be found?

Before any investigation or discussion on the uses of payment systems data, it is of utmost importance to firstly clarify what is the nature and content of the referred information and where it can be found.

According to the Bank of International Settlements (BIS) (2012, pp. 8), a payment system "is a set of instruments, procedures, and rules for the transfer of funds between or among participants" which are "[...] generally categorised as either a retail payment system or a large-value payment system". In this sense, a retail payment system is a "funds transfer system" which is operated either by the private or the public sector that deals with large volumes of low-value payments processed through a variety of forms: "cheques, credit transfers, direct debits, and card payment transactions". By contrast, a large-value payment system is also a funds transfer system, but processes "large-value and high-priority payments" and is operated by central banks.

Naturally, the data generated by either types of payment systems is very diverse and, as discussed below, can arguably be used for several different purpose. Therefore, their applications must always be framed in light of the attachment to the reality under study. Notwithstanding, although these definitions and principles are quite clear and provide an overall idea of the phenomena being registered, they do not immediately convey per se an impression on what kind of information a researcher can extract from these systems. Indeed, in order to truly foster a fruitful discussion on the uses of payment systems data in the specification of coincident and/or leading indicators for key macroeconomic aggregates, it is also very important to identify what sources are available and clarify what their content is.

The information on payment systems is publicly available, both from a statistical and descriptive standpoint, from a variety of national and international sources, for either type of the referred

payment systems. From the purely international perspective, the Bank of International Settlements (BIS) is one of the more relevant providers of payment systems statistics. It publishes yearly a report compiled by the Committee on Payments and Market Infrastructures (CPMI), known as the Red Book, which contains a set of very detailed statistics on payment, clearing and settlement systems in the CPMI countries[1]. Among others, this report includes a set of statistics on the institutions offering payment services to non-banks (e.g. number of banks, number of accounts in banks, value of accounts in credit unions), a group of statistics on the functions of the payment cards and their accepting devices (e.g. number of cards with cash, debit, credit or e-money functions, total number of cards, number of Automated Teller Machine (ATM) terminals, number of Point of Sale (POS) terminals) and a very comprehensive set of indicators on the use of different payment instruments and terminals, which include, for example, the number of transactions per type of payment instrument/terminal.

In the same vein, but within the European context, the contributes provided by the European Central Bank (ECB) are also a reference worth highlighting, given their comprehensiveness and detail. Indeed, over the last three decades, the publication of the four editions of the *Blue Book*[2] – a very detailed descriptive report of the progress in the main payment systems in the euro area and non-euro area countries – have supplied a crucial element of analysis of the evolution of the phenomena linked to the payment systems of several countries, namely the developments of their institutional framework, the preference for different payment methods, the growth of the interbank exchange and settlement systems and of the securities settlement systems[3]. Besides this, the ECB is also an important player in the field of the dissemination of statistics on payment systems *per se*, by making available on its Statistical Data Warehouse (SDW) a very complete report containing country tables – for the euro area and non-euro area countries – on issues deeply related to payment systems. These include, *inter alia*, the number of institutions offering payment services, the number of payment and terminal transactions involving non-monetary financial institutions, the value of transactions per type of payment service and the relative importance of different payment services, among several others[4].

That being said, it is clear that the information on payment systems disseminated internationally is very rich and comprehensive, thus fostering an array of different uses which are critical for policy makers and enabling the international comparability of this phenomena. In the case of Portugal, the data available nationally are also of great utility for policy makers and researchers, given its very high degree of detail and timely publication. Indeed, the payments system in Portugal benefits from the stability conferred by its institutional environment, since, as Lima (2013) argues, there is only one large company involved in processing payment cards data and, pursuant to the regulatory and oversight powers conferred by the Banco de Portugal's Organic Law[5], the remaining payments institutions report to the Banco de Portugal (hereinafter referred to as the Bank) information deeply related to the payments system on a monthly basis. Given this very rich input, the Bank publishes, through its statistical dissemination tool,[6] several statistics on payment systems covering its many dimensions: from the aggregate interbank operations processed in Portugal

1 Australia, Belgium, Brazil, Canada, China, Euro area, France, Germany, Hong Kong SAR, India, Italy, Japan, Korea, Mexico, Netherlands, Russia, Saudi Arabia, Singapore, South Africa, Sweden Switzerland, Turkey, United Kingdom and United States.

2 First edition: 1992; Second Edition: 1996; Third edition: 2001; Fourth edition: 2007.

3 For more information on this publication, please consult https://www.ecb.europa.eu/paym/intro/book/html/index.en.html

4 For further information, please consult http://sdw.ecb.europa.eu/reports.do?node=100000760

5 For further clarification, please consult article 14 of Banco de Portugal's Organic Law through https://www.bportugal.pt/sites/default/files/anexos/documentos-relacionados/leiorganica-en.pdf

6 https://www.bportugal.pt/EstatisticasWeb/(S(gmtvwtittgj1lb45g2fumw45))/SeriesCronologicas.aspx

(either via clearing or in gross), to the different number of users and volumes involved in each of the payment instruments available in Portugal – cheques, credit transfers, direct debits, bills of exchange and the Portuguese ATM and POS network. In this domain, the Bank also publishes several indicators of the overall settlement system transactions and presents them by type of system, number of operations and value.

Against this background, through which we have explored thoroughly what is the content of payment systems data and provided key references on where it can be found, it is now important to understand what were the focus of earlier studies on payment systems, in order to evaluate the possibility of incorporating their contributes towards the fulfillment of this paper's purpose.

3 Insights on the earlier uses of payment systems data

Nowadays, payment systems data are used as a tool to monitor the developments in the retail/large-value payment systems of a country, but also as an important input on the study of very different phenomena, spanning from the assessment of financial integration to the nowcasting of key economic variables. However, this was not always the paradigm. Indeed, as Jonker (2005) describes, up until the 1980s, the academics focused primarily on payments behavior and on how these could help in explaining the demand for currency, following up the insights developed by Baumol (1952) and Tobin (1956) on the optimal amount of cash, which later became known as the Baumol-Tobin model.

In this sense, Jonker (2005) provides a valuable literature review, from which the picture emerging is that the use of electronic payment cards (debit and e-purse) is negatively related with age and positively related with the educational level of consumers. Furthermore, women seem to use more different payment instruments than men. Cash is regarded as a universally accepted, but relatively unsafe mean of payment, whereas the debit card is considered to be modern, easy to use and practical. This evidence is consistent with the findings of Banco de Portugal (2007)'s report on the benefits and costs of different retail payment instruments: "The survey focusing on consumers produces findings in line with studies in other countries (the U.S., Belgium and the Netherlands) to the effect that the use of electronic payment instruments (payment cards) is directly related to income and education and inversely to age"[7]

However, as Schreft (2006) describes, it was not until the mid-1990s that important research bodies, such as the Fed, "really started encouraging payments research", in response to a series of innovations in payments methods, as, for example, the introduction of new electronic payment instruments. This has led to a growing interest in payments information and set the foundations for a stream of more recent studies on the choice between different payment instruments, as, for example, Van Hove et al. (2005) and Hyytinen and Takalo (2004)'s input on the relationship between the consumer's characteristics (e.g. age, gender, education) and their preferences for different payment methods.

More recently, the uses given to these data have been considerably broadened. Indeed, by resorting to payments information such as the demographic/geographic ATM penetration across countries, the total number of active cards, ATMs and POSs and the relative uses of the different payment methods, Matos and D'Aguiar (2009) have shown how payments data can be used to

7 Banco de Portugal (2007, pp.18)

assess the dynamics of monetary and financial services. They found that that the recent boom in retail financial services registered in Portugal is deeply connected to the proliferation and development of Multibanco, a network shared by all banks operating in Portugal that fully integrates ATM and POS terminals and that enables a large set of innovative services, such as the inter-bank transfer of money or the payment of utilities.

In the same vein, Lima (2013) has also investigated the possible uses of payments data for the improvement of monetary and financial analysis. The author showed that, apart from the purposes discussed above, data on the number and value of operations done through Portuguese ATMs and POSs (with cards issued abroad) and on the operations performed abroad by cards issued by Portuguese entities, are also used as a very important component of the compilation process of the travel account – an important part of the Portuguese balance of payments.

The contributes put forward by the previous researchers have highlighted not only how relevant payments system data are, but also how different its uses can be. Indeed, as Schreft (2006) describes, the times when payments data were discussed only within restricted specialized groups, with very limited scopes of discussion, are now over. It is now clear that "payment decisions have macroeconomic implications" (Schreft, 2006, pp.2) and must therefore be studied accordingly, in order to meet a handful of different purposes. In this context, one of the main potential uses of payment systems data, which seems to be untapped, consists in using this information as coincident/leading indicators for the economic activity. In the next section, we discuss this possibility and demonstrate how the inherent quality, competitive costs and high frequency make up compelling arguments for the consideration of these data for these purposes.

4 Nowcasting real economic activity with payment systems data

One of the key inputs from Schreft (2006)'s description of the growing interest in payment systems data is the recognition of the macroeconomic implications that payment decisions convey. Under this premise, one might engage in the investigation of how these implications help in better understanding the economic reality and its foreseeable behavior.

To this extent, Esteves (2009) presents one interesting contribution on the use of payments data as input to nowcast a key economic variable: the consumption of non-durable goods and services. The author argues that ATM and POS data fill two key requirements to be used for this purpose: (i) it is "truly associated" with the reality it seeks to portray and (ii) the frequency with which it is available, "typically just a couple of days after the end of the month", is highly beneficial for nowcasting purposes. In this sense, Esteves (2009) elected to use ATM/POS cash withdrawals and payments made by local residents to nowcast the consumption of non-durable goods and service.

In order to evaluate the comparative performance of payments system data, the author selected a set competing indicators, which included the retail trade sales, the consumer confidence indicator level and the consumption of electricity, and compared the co-movement of each of these 4 time-series with the actual consumption of non-durables.

Table 1 • Pearson's correlation coefficient between the consumption of non-durables and payment systems data and its competing indicators in Esteves (2009)

Pearson's Correlation Coefficient

	Consumption of non-durables
Retail trade	0.87
Consumer confidence	0.87
Electricity consumption	0.38
ATM/POS data	0.83

Although there are some methodological differences between the different indicators that are not taken into account[8] the comparison of the correlation coefficient between the consumption of non-durables and each of the four competing indicators, depicted in Table 1, clearly shows the relevance and pertinence of using ATM/POS data in nowcasting the consumption of non-durables, as it is observed a very high degree of association between the ATM/POS and non-durable consumption curves. Despite of the fact that this comparison already provides an early insight on the pertinence of using ATM/POS information for the referred purposes, Esteves (2009) investigated deeper the comparison of these indicators, by defining a general equation[9] to nowcast the consumption of non-durable goods and services, which included the different competing indicators. In this process, the author compared the root mean square error (RMSE) for the one step ahead out-of-sample forecasts of this model, for the specifications including each of these indicators and two additional naïve models – random-walk and auto-regressive of order 4 (AR(4)).

Table 2 • Forecasting performance evaluation: Root mean square error in Esteves (2009)

Out of sample period: 2005q1 to 2009q2

	Single equation forecasts	
	Yoy	Δyoy
Random-walk	0.45	
AR(4)	0.53	0.51
Retail trade	0.36	0.33
Consumer confidence	0.51	0.42
Electricity consumption	0.54	0.57
ATM/POS data	0.35	0.34

Out of sample period: 2007q1 to 2009q2

	Single equation forecasts	
	Yoy	Δyoy
Random-walk	0.50	
AR(4)	0.64	0.54
Retail trade	0.40	0.34
Consumer confidence	0.62	0.50
Electricity consumption	0.62	0.64
ATM/POS data	0.37	0.33

8 Especially the availability of the information.

9 The equation used by Esteves (2009) to nowcast private consumption of non durable goods and services is:

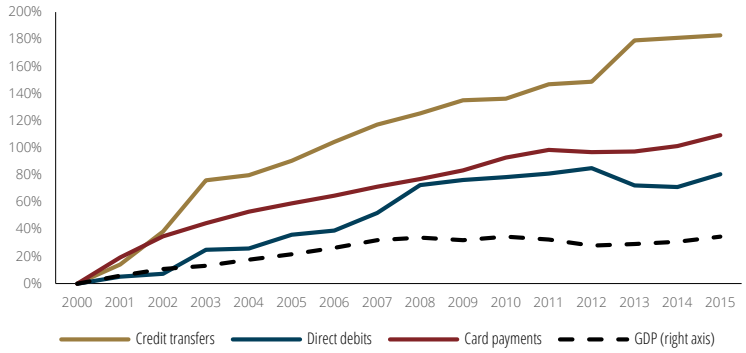
$$\Delta^4 C_t = c_0 + \sum_{i=1}^{4} \alpha_{t-i} \Delta^4 C_{t-i} + \beta_t \Delta^4 I_t$$

Where $\Delta^4 C_t$ is the year-on-year rate of change in the consumption of non durables and $\Delta^4 I_t$ is the "contemporaneous evolution of the chosen indicator, after its transformation from monthly to quarterly frequency." (Esteves, 2009, pp. 6).

The results of this procedure, shown in Table 2, clearly showed that ATM/POS data performs significantly better than its competing indicators in the out-of-sample forecasting of the consumption of non-durables. Indeed, Esteves (2009) reports that "On average, the gains [of using ATM/POS data] – measured by the reduction in the RMSE – are close to 40 per cent" and that these results show that the performance of the retail trade information – the most frequently used source for the envisaged purposes – is very close to the ones obtained by the ATM/POS information. However, it must be also noted that, as the author emphasis, payments information are available much faster than its competing indicators, which further attests the validity of using this information to nowcast economic activity from both the quality and availability of the forecasts point-of-view.

In the same vein as Esteves (2009), but in a broader scope, Garcia (2011) investigated the role of payment system statistics on the evaluation of economic activity. To demonstrate the usefulness of this information for that purpose, the author started by describing the cashless payments landscape in Europe at the time. In Figure 1, one can observe precisely the high co-movement between the GDP growth rate and the credit transfers growth rate – which can be an interesting feature to explore when considering how to nowcast GDP – and the explosive evolution of the use of card payments and direct debits, which were already noted by Matos and D'Aguiar (2009) for the Portuguese economy. Under this background, the author stresses how relatively important cashless payments have become over the past decade, by comparing, for the European Union (EU) countries, the declining trend in ATM withdrawals per card to the rising trend of the number of payments per card, which further builds the case for the increasing importance of the cashless payments instruments in economic transactions and for the need to consider payments data when monitoring the economic activity.

Figure 1 • Number of transactions with cashless payment instruments within the monetary union countries (cumulative growth rates)



In this sense, after carefully describing how the Portuguese institutional environment fosters the reporting and analysis of payments information (as Lima (2013) reports) and the cashless payments dynamics in Portugal, Garcia (2011) shows how Portuguese payment systems data can be used as a first indicator of macroeconomic trends, especially as a crisis performance indicator and as a tool for short term macroeconomic monitoring. To demonstrate the pertinence of using payments data as a crisis performance indicator, Garcia (2011) resorted, *inter alia*, to two key metrics: the value of customer operations settled through TARGET2-PT and the cheques returned for insufficient funds in the account (as a % of presented cheques).

Figure 2 • Value of customer operations settled through TARGET2-PT and GDP in Portugal (growth rates)

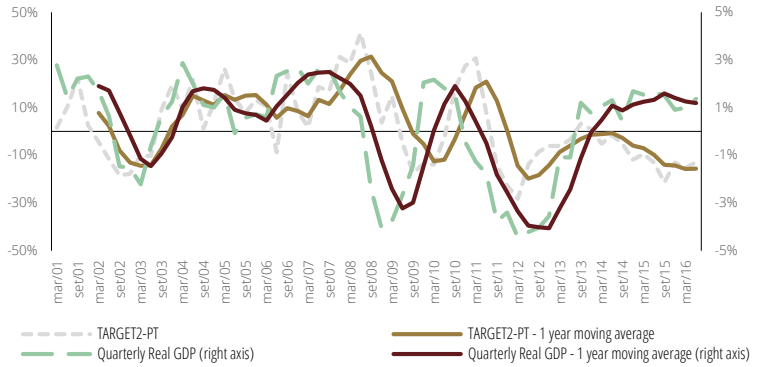
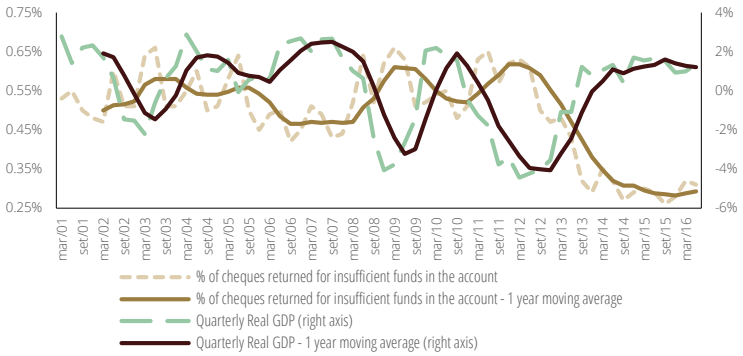


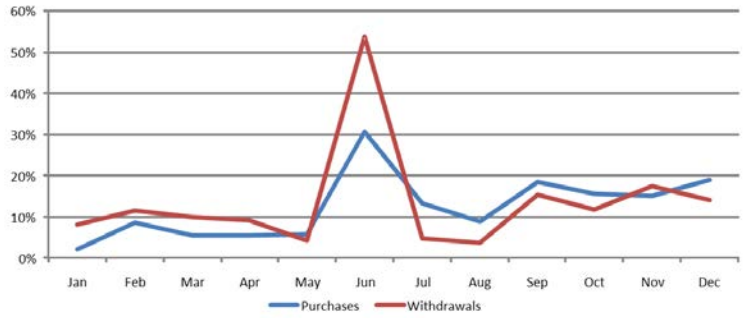
Figure 3 • Cheques returned for insufficient funds (as a % of presented cheques) and GDP growth in Portugal



When analyzing figures 2 and 3, one can validate the exercise ran by Garcia (2011) both from a pro-cyclical and counter-cyclical point-of-view. If one considers figure 2, it is clear that the 1 year-moving average of the operations settled through TARGET2-PT and the same period moving average for the GDP fluctuate in a pro-cyclical fashion, thus evidencing a high degree of positive association between the two phenomena. Conversely, when one considers figures 3, one can verify that the 1 year moving average of the cheques returned and the same period moving average for the GDP move in a clear counter-cyclical fashion. In this sense, Garcia (2011) argues that the benefit of using this data for this purpose is not only the quality of the forecasts obtained, which are evident through the figures analyzed, but also the possibility to assess more timely the performance of the economy– which is invaluable for economic policy makers.

Apart from the demonstration of the usefulness of payments information as a tool for performance evaluation, Garcia (2011) also showed, through a very simple example, how the same information can be used for short term macroeconomic monitoring. Taking as reference the year of 2004 in Portugal, the author resorted to the information on withdrawals and purchases made in Portugal with cards issued abroad to demonstrate the impact that the European football championship (which took place in Portugal in June of 2004) had on the hosting country's economy.

Figure 4 • International withdrawals and purchases in Portugal in 2004 (month-on-month growth rates) in Garcia (2011)



The analysis of the month-on-month growth rates of this data allow to quickly perceive the positive effect that the event induced in the local economy and presents a first quality proxy for the measurement of this phenomena, something which would take considerably more time to do with alternative information (as, for example, the competing indicators used in Esteves (2009)).

Bearing in mind the insights provided on the uses of payment systems data as a first indicator of macroeconomic trends, Garcia (2011) concludes by noting that this information is "almost not used by institutions that evaluate short-term economic fluctuations." and by signaling the need to start using it more often, under the argument of the growing importance of cashless electronic payment instruments, the relative quality of the nowcasts obtained and the timeliness and reliability with which this information is available for policy makers.

5 Conclusions

Payment systems data, i.e. the information stemming from the retail/large-value payment systems which enable the transfer of funds between/among participants, are nowadays being discussed and regarded as a crucial element for good evidence-based policy making. However, this was not always the case, as up until the beginning of the 21st century the academics and researchers focused primarily on what payment systems data could reveal about the degree of financial integration of a country or help in the modelling of the demand for currency.

The growing interest on the phenomena that payments information could unveil was then triggered by a series of innovations in different payments methods, which have significantly broadened not only the content and the research interest on this topic but also the uses of this information. This is crystallized on the fact that data on payments and withdrawals with cards issued by foreign and national entities have recently been given a whole new purpose, as a crucial element in the compilation of the travel account of the Portuguese balance of payments. In this paper, we have not only discussed where one can find the most relevant sources of payments data – both from the international and the national (Portugal) perspectives – but also described their contents and conventional uses.

The insights provided in this research show that payments data are an essential tool to meet one of the most critical aspects of economic decision making: the monitoring and assessment of real economic activity. This is warranted due to three essential features of the data under scrutiny: its comparative quality, high frequency and relative low cost.

Indeed, this paper has shown how payments data can beat indicators conventionally used to forecast key macroeconomic variables, such as the consumption of non-durable goods and services or gross domestic product. Esteves (2009) even reported that, in the case of the out-of-sample forecasting of the consumption of non-durable goods and services, payment systems data produced forecasts that were, on average, 40% better than its competing indicators. In the same vein, Garcia (2011) further validated the quality of this information as an input for the evaluation of economic activity, by demonstrating how large pro-cyclical and/or counter-cyclical relationships with GDP can be drawn with this data, thus providing a tool to better understand and monitor the economic reality.

This research has also clearly depicted how the high frequency and the low cost associated to this data benefits policy making. By being nearly costless and available typically just a few days after the phenomena occur – which effectively enables a much faster evaluation and reaction to economic events – it is clear that this is a combination of features than arguably any indicator can match.

Therefore, in light of the research path undergone, it seems crystal-clear that payment decisions have macroeconomic implications that provide a very inexpensive, fast and quality input onto the economic reality. It is now up to researchers everywhere to listen wisely to what money has to say about the economy.

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Abstract

Sentiment surveys are a powerful tool to capture economic agents' expectations and activities, which makes them particularly useful for policy makers in interpreting and analysing economic conditions, especially since the global financial crisis, often labelled as a "confidence crisis".

This paper empirically assesses the role of confidence in explaining private consumption and analyses to what extent the Portuguese consumer confidence index can bring additional information beyond variables which are usually found to have some power in explaining the real expenditure of households. When relevant, we draw some comparisons of this phenomena in the euro area through similar studies previously conducted.

Keywords: statistical surveys, consumer confidence; economic expectations

1 Introduction

Sentiment indicators can be defined as a representation designed to measure the economic agents' perception about a specific market, business, environment or other factor.

In the European Union (EU) countries, the most known sentiment indicator is the European Commission's Economic Sentiment Indicator (ESI), a composite indicator made up of five sectoral

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1 The views expressed in this paper are those of the authors alone and not of the Banco de Portugal or of the Eurosystem.

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confidence indicators with different weights: the industrial confidence indicator, the services confidence indicator, the consumer confidence indicator (CCI), the construction confidence indicator and the retail trade confidence indicator.

Each of these confidence indicators is calculated as a simple arithmetic average of the seasonally adjusted balances of the answers given to a specific set of questions – the ones that are closely related to the reference variables that they are supposed to track – that are chosen from each full survey[3]. These surveys are defined within the Joint Harmonised EU Programme of Business and Consumer Surveys and are conducted in each participating country, on a monthly basis. The sample sizes vary across countries according to the heterogeneity of each economy and are generally positively related to their respective population size. In Portugal, these surveys are conducted by the National Statistics Institute, which every month inquires about 4200 firms and 1630 consumers (EC, 2017).

The survey results are published by the European Commission (EC) and are then used for economic analysis, surveillance and short-term forecasting, not only by the EC, but also by the European Central Bank (ECB), National Central Banks, researchers and financial institutes, especially since the global financial crisis, "as the large swings in survey-based indices seem to be consistent with the collapse in confidence as an important driver of the subsequent economic recession" (ECB, 2013, p. 45)

The link between confidence and economic decisions has been, so far, widely covered in the literature, namely, in what concerns consumer confidence – an indicator that measures the consumers' feelings about the current and future economic conditions.

The main concerns on this topic are, on the one hand, whether consumer confidence can be explained by current and past values of variables such as income, unemployment or consumption and, on the other hand, whether confidence measures have any statistical significance in predicting economic outcomes once information from the variables cited above is used.

Dées et al (2011) present an interesting literature review on this subject and show that, although the evidence found seems to be mixed, most authors appear to find a significant statistical relationship between confidence measures and economic variables, current and future.

In their work, they tried to empirically assess the role of confidence in explaining households' consumption in the United States (USA) and the euro area and to analyse to what extent confidence indicators could bring additional information beyond the variables which are usually found to have some power in explaining the real expenditure of households (e.g. income, wealth or interest rates). They also tried to identify under which circumstances confidence indicators could be a good predictor of the households' consumption, by measuring the contribution of confidence during periods associated with large movements in household survey indicators. Overall, they concluded that the CCI can be, in certain circumstances, a good predictor of consumption. In particular, out-of-sample evidence showed that the contribution of confidence in explaining consumption increased when the household survey indicators featured large changes, such that confidence indicators can have an increasing predictive power during such episodes. Moreover, they found evidence of a "confidence channel" in the international transmission of shocks, as the USA confidence indices lead consumer sentiment in the euro area.

As future research, the referred authors suggested the extension of this analysis to other countries, since it would be interesting to verify whether the conclusions taken to the euro area could be confirmed at the level of the different countries.

3 For more information regarding each survey see EC (2017).

With this challenge in mind, this paper aims to assess the role of confidence in explaining Portuguese household consumption and analyses to what extent Portuguese CCI can bring additional information beyond the variables which are usually found to have power in explaining the real expenditure of households.

2 Consumer confidence indicator – main components and its developments

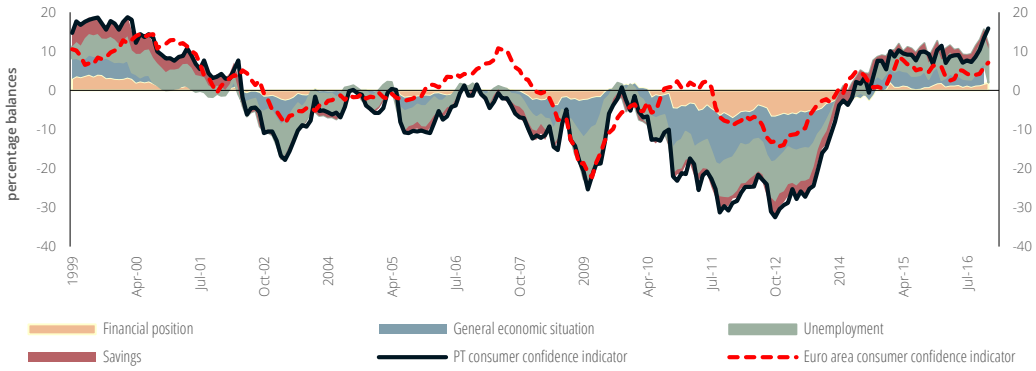
The CCI released by the EC is defined as the arithmetic average of the balances (in percentage points and seasonally adjusted) of the answers to the survey questions on the financial situation of households, the general economic situation, the unemployment expectations (with an inverted sign) and savings, for the next 12 months.

Figure 1 sheds some light on the developments of Portuguese and euro area CCI since 1999. During the period under analysis, consumer confidence experienced large swings and strongly reacted, in a relatively homogeneous way, to the various exceptional events, especially those related to the global economic and financial crisis.

Consumer confidence fell with the international propagation of the US "sub-prime" crisis in mid-2007 and with the Lehman Brothers collapse in September 2008. The Portuguese indicator declined in the beginning of 2010, with the emerging of the banking crisis and the successive supplementary fiscal consolidation measures adopted, namely, under the Financial Assistance Programme (EFAP) agreed between the Portuguese authorities, the EU, the ECB and the International Monetary Fund (IMF) in May 2011.The indicator started recovering since the end of 2012, reaching positive levels, in the mid of 2014, the year that marked the end of the EFAP.

The computation of the contribution of the various components of the CCI is a very useful tool to provide evidence on the driving forces of confidence. In Portugal, between 2007 and 2014, most of the volatility of the CCI was mainly driven by changes in expectations related to unemployment and to the general economic situation. The other two components, savings and financial situation, contributed relatively less to the changes in the overall indicator.

Figure 1 • Contributions of components to Portuguese CCI



Source: EC and authors' calculations

Note: Data shown are calculated as deviations from the average over the period since June 1986

The ECB (2013) further suggested that, in addition to this analysis, it is also interesting to identify a few variables that tend to co-move with the CCI, even without presuming any causal link between them. This exercise was developed to the euro area, for the period between the early 90's and 2013, and it was found that increases in the annual change in the unemployment rate tend to be associated with declines in consumer confidence. The correlation between the CCI and the inverted yearly change in the unemployment rate was strong and positive: 0.84 when calculated contemporaneously and 0.88 with a 3-month lead for the confidence indicator. It was also found a strong correlation between the change in the CCI and the change in equity price in the euro area, especially when computed contemporaneously.

For the purpose of this paper, the same exercise was performed to Portugal for the period between 1999 and 2016. The correlation between the CCI and the inverted yearly change in the unemployment rate is strong and positive (0.65) and only a minor change is observed when we consider a 3-month lead for the CCI. The correlation between changes in the Portuguese CCI and changes in equity prices is lower and more contemporaneous, either considering the PSI 20 index (0.11 contemporaneously and 0.04 with a 3-month lead for the confidence indicator) or the Eurostoxx 50[4] index (0.31 contemporaneously and 0.25 with a 3-month lead for the confidence indicator)[5].

Besides the unemployment rate and the stock indexes, there is also empirical evidence of an association between consumer confidence and real consumption. Dées et al (2011) found that, in the euro area, the correlation between these two variables is the highest when confidence is lagged by one period (0.42), decreasing when higher lags are considered (0.20 for a 2-period lag and 0.21 for a 4-period lag). We found much higher results when performing the same exercise with Portuguese data: the coefficient of correlation achieves 0.8 when computed contemporaneously and remains relatively high (0.74) when CCI is lagged by one-period, which could be a strong suggestion of leading properties for consumer sentiment.

Overall, we can also corroborate that "the association between movements in consumer confidence and those in other economic or financial variables indicate that common causes, possibly related to third factors (e.g. rare events producing financial or uncertainty shocks), might be at the origin of these large swings" as in ECB (2013).

3 Consumer confidence as a predictor of consumption

In this section, we aim at testing if confidence indicators bring additional information beyond economic fundamentals, by following the methodology proposed by Dées et al (2011)[6]. We start our empirical analysis by running a causality test. Thereafter, we estimate a set of consumption equations where the confidence indicator is considered as an explanatory variable for consumption alongside with other standard variables used in the empirical literature. Finally, we estimate a VAR model to derive impulse response functions and historical decomposition[7].

4 The Eurostoxx 50 index was also tested due to the increasing integration of financial markets.

5 Stock markets have a relatively low importance for consumers in terms of their personal financial situation: the investment in quoted shares represents less than 2 per cent of the total financial wealth in the Portuguese households.

6 We also assume that confidence indices derived from surveys are a relatively good proxy of households' perception about their economic environment and could be used as explanatory variables of their consumption expenditures.

7 For all the methodological details, see Dées et al (2011).

3.1 Data

The dataset used in this section covers quarterly information from the first quarter of 1999 to the fourth quarter of 2015. The variables considered in this study were treated as suggested by Dées et al (2011), i.e., whenever applicable they were seasonally adjusted and deflated.

Concerning the confidence indicator, we used the CCI released by the EC. The other explanatory variables, denominated by the Dées et al (2011) as "economic fundamentals", include the real disposable income, the financial and housing wealth, the real stock prices, the short-term interest rates, the unemployment rate and the real oil prices. Due to lack of data on non-financial Portuguese households' total wealth, we considered the households' financial wealth as a proxy of their total wealth. Eurostoxx 50 data were considered to measure stock prices[8] and the six month Euribor as a proxy for short-term interest rates.

3.2 Granger causality test

Given that the strong correlations found in section 2 do not warrant any causal relationship, the existence of Granger causality was tested among the various variables of our dataset. The results show that, for a 95 per cent confidence level, consumption is Granger-caused by interest rates and by oil prices, while consumption and unemployment rate are the only variables that Granger-cause domestic confidence. However, confidence does not seem to Granger-cause changes in consumption, at least at the conventional significance levels.

For the euro area, Dées et al (2011) showed that consumption is Granger-caused only by confidence and interest rates while confidence is Granger-caused by unemployment rate, interest rates and foreign confidence.

These results remain however very limited. The estimation of consumption models together with a dynamic analysis are necessary to better understand the role of the various possible determinants of consumption and their complex dynamic relationship.

3.3 Estimation of a simple model for consumption

We extend our causality analysis with the estimation of a very simple model where changes in consumption only depend on the lagged changes[9] in consumer confidence (Model 1). We then compare Model 1 with a second one (Model 2) where changes in consumption depend on a set of "economic fundamentals" and where the CCI is excluded, as defined in subsection 3.1. Finally, we define Model 3, as the combination of Model 1 with Model 2. We then compare the adjusted coefficient of determination ($\bar{R}^2$) of each tested model.

Although the fit in Model 1 is not particularly high – about 11 per cent of real consumption fluctuations could be explained by changes in consumer confidence, – the analysis of the results shows a positive relationship between both variables, as the parameters estimated for the lags of consumer confidence are positive. In Model 2, the adjusted $\bar{R}^2$ increased to 18.7 per cent. However, once these economic indicators are included in the regression, there is still a benefit to be obtained by including the CCI as an explanatory variable, as the $\bar{R}^2$ that would result from such a regression (Model 3) would be 20.6 per cent – almost 2 percentage points better when compared to Model 2. These results are in line with those obtained by Dées et al (2011) for the euro area,

8 Eurostoxx50 shows a higher correlation with Portuguese CCI when compared to PSI20 (vd section 2).

9 According to the evidence of the information criteria of several auxiliary regressions, we decided to use only one lag of the independent variables of models 1, 2 and 3.).

where Model 3 seems to be the best one (with a $\bar{R}^2$ equal to 18 per cent against a $\bar{R}^2$ of 10 per cent in Model 1 and 16 per cent in Model 2).

Although this analysis remains relatively simple, it helps to tentative conclude that both for the euro area and for Portugal, consumer confidence seems to help explain consumer expenditures when taking fundamentals into account.

3.4 VAR analysis

In this section, we set up a VAR modelling framework to help us analyse the dynamics of the impacts of a shock to confidence on consumption through impulse response functions. In a first step, we estimate a VAR model for Portugal using the same variables as in Model 3. This allows us to infer the response of consumption to a one standard deviation shock to confidence over time. In a second step, we compute historical forecast error decomposition to describe the relative importance of shocks to confidence and shocks to the other fundamental variables.

Figure 2 shows the impulse function of a shock to confidence on real consumption in Portugal and allows to infer that, for the model and data used, a shock to confidence has a short-term significant impact on consumption. Nonetheless, one cannot identify any long-run persistent movement, which is completely in line with the results obtained for the euro area (Dées, et al, 2011).

Figure 2 • Responses to a 1 standard deviation innovation in confidence on consumption growth with 95% confidence

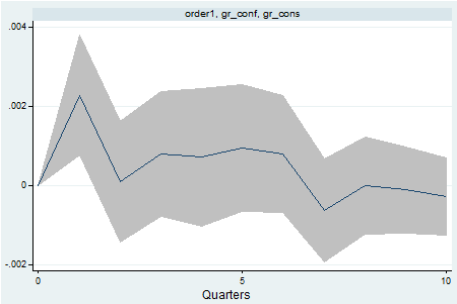


Figure 3 • Historical forecast error decomposition – Portugal

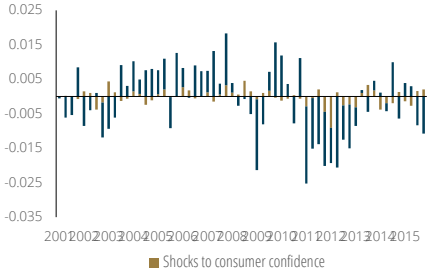


Figure 3 illustrates how the contribution of confidence shocks has changed over time. As expected, these play, on average, a relatively small role when compared to shocks to fundamentals. However, there are some periods when confidence seems to play a relatively more important role. Indeed, we can notice that while the contributions of confidence shocks tend to oscillate around zero, such shocks had larger negative influence on the forecast error decomposition during very specific episodes, such as during the economic and financial assistance programme (2011-2014). Negative confidence shocks contributions are sometimes absorbed by positive contributions of other shocks (2004-2005), while strong positive contributions can also be found, for instance in the last two quarters. Once again, the results obtained are entirely in line with those found by Dées, et al (2011) for the euro area.

Overall, the historical decomposition exercise shows that the confidence seems to matter in some specific episodes, which in most cases corresponds to periods where there are large changes in household survey indicators.

4 Consumer confidence as a driver to bank loans demand

The high levels of households' indebtedness is one of the main concerns regarding the Portuguese economy. Bank loans are traditionally the main liability of Portuguese households' representing, at the end of 2016, about 86% of the total liabilities of the sector. Despite some reductions since the onset of the financial crisis, the indebtedness levels remain still high when compared to other EU countries (Banco de Portugal, 2016).

The Bank Lending Survey (BLS)[10] provides some useful information on the factors influencing loan demand[11]. Figures 4 and 5 show the relevance of consumer confidence in the changes of the demand for housing loans in Portugal and in the euro area. Since the beginning of 2014, this variable is having a positive impact towards the shift observed in the demand for loans.

Figure 4 • Changes in demand for housing loans and contributing factors – Portugal[12]

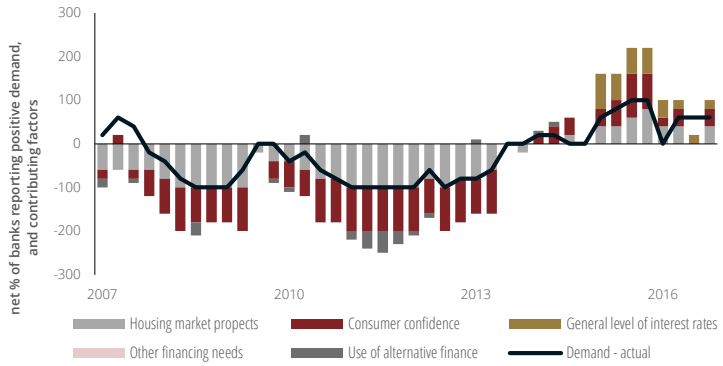
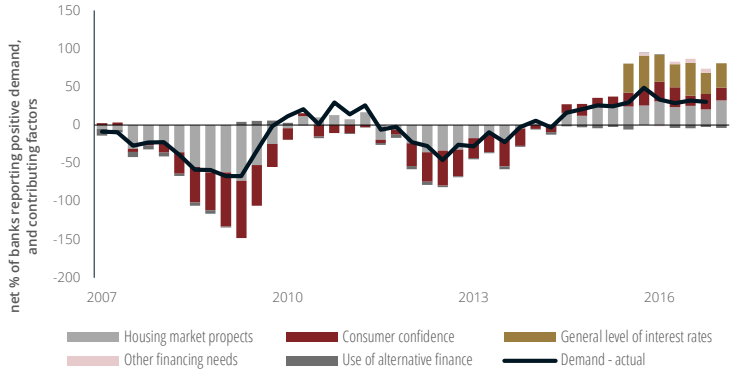


Figure 5 • Changes in demand for housing loans and contributing factors – Euro area



10 For more detailed information on BLS, see: https://www.ecb.europa.eu/stats/ecb_surveys/bank_lending_survey/html/index.en.html

11 Loan demand refers to the need of households for bank loan financing, irrespective of whether or not this need results in a loan being granted.

12 We use the same aggregations as shown in ECB (2016).

5 Conclusions

This paper confirms the usefulness of survey-based confidence data to monitor economic developments in Portugal in a timely manner, as they are available earlier than, for example, national accounts. Our empirical evidence showed that the Portuguese CCI seems to contain some valuable information to explain consumption when taking other economic fundamentals into account. These results were confirmed by the VAR approach, which also showed – through a historical decomposition exercise – that confidence seems to matter in some specific episodes, which, in most cases, correspond to periods where there are large changes in household survey indicators. In this domain, future research, as suggested by Dées et al (2011), could include the development of a third empirical approach that relies on a non-linear estimation of the consumption equation using a threshold model. It would also be interesting to explore if a "confidence channel" can be observed between the euro area and Portugal.

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Challenges with the delineation of public sector: borderline between the financial corporations and general government sectors*[1]

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Abstract

Sector classification issues related with the borderline between financial corporations and general government sectors have been particularly relevant in Europe, in the context of government interventions in financial institutions, since 2008. These interventions led, among other, to nationalizations, bank resolutions and the creation of special purpose entities, creating complex classification issues that have led to different interpretations across the statistical community. This paper aims to discuss, in the light of the international statistical manuals, the different views concerning the sector classification of entities, namely concerning captive financial institutions, defeasance structures and protection funds. In this context, we argue that a review of the rules on

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1 The analyses, opinions and findings of this paper represent the views of the authors, which are not necessarily those of the Banco de Portugal or the Eurosystem. Any errors and omissions are the sole responsibility of the authors. The data used in this paper refers to the data available at the time it was prepared and/or presented and, therefore, may not necessarily correspond to the most recent available data. We thank Filipa Lima for its comments to this paper.

sector classification of entities, so that they can be clearer and more objective, would be a beneficial action for the quality of statistics. Statisticians should also be concerned both with the correct sector classification and with the consistency across different statistical domains, guaranteeing thus a unique classification of entities.

Keywords: sector classification, financial corporations, general government, captive financial institutions, defeasance structures, protection funds

1 Introduction

The classification of entities in the European framework relies on the European system of national and regional accounts in the European Union (ESA2010), established by the Regulation (EU) No 549/2013 of the European Parliament and of the Council of 21 May 2013. This Regulation sets up a closed integrated system of representative economic statistics broken down into institutional sectors, financial instruments, and production and distribution transactions. In addition to the rules defined in ESA2010, clarifications are fostered in the Manual on Government Deficit and Debt – 2016 edition (MGDD), as well as in specific advices issued by Eurostat[2] in particular cases. The Committee on Monetary, Financial and Balance of Payments Statistics (CMFB)[3], has also contributed, as a consultative committee created by EU law, to the establishment of rules concerning the issue of sector classification of entities.

The practical application of the theoretical rules on the classification of entities established in the international statistical manuals could be complex, divergent and not straightforward. Moreover, the existing rules on the delimitation of institutional sectors do not always offer a clear guidance for the classification of entities, especially when they are engaged in financial activities and, at the same time, government units have a strong influence in their activities. In those cases there could be valid arguments for the classification of the units in the financial corporations sector, but also equally strong arguments in favour of classifying in the general government sector, depending on their specificities.

Some complex classification issues arose since 2008, after several government interventions in financial institutions, which led to the creation of special purpose entities and to the nationalization and/or resolution of entities.

2 Borderline cases

The analysis of the rules on the classification of entities presented in the various international statistical manuals can lead to different interpretations by different specialists that can conduct to some incoherence in specific cases and, therefore, to inconsistent statistical results.

This section presents a set of borderline cases that were typified in three groups – captive financial institutions, defeasance structure and protection funds – which may lead to the classification of units in the financial corporations or in general government. Financial corporations are defined as market producers that are mainly involved in providing financial intermediation or financial

2 Eurostat is the statistical office of the European Union.

3 CMFB (www.cmfb.org) was established by a Council Decision in 1991 (91/115/EEC) to assist the European Commission in drawing up and implementing work programmes concerning monetary, financial and balance of payments statistics.

auxiliary services. General government includes non-market producers that are controlled by public sector and units involved in the redistribution of income and wealth.

2.1 Captive financial institutions or government units?

The definition of captive financial institutions is provided in §2.98 of ESA2010: «The captive financial institutions [...] consists of all financial corporations and quasi-corporations which are neither engaged in financial intermediation nor in providing financial auxiliary services, and where most of either their assets or their liabilities are not transacted on open markets.» According to ESA2010, neither the assets nor the liabilities of captive financial institutions are transacted on open markets. Captive financial institutions include entities transacting within only a limited group of units or subsidiaries of the same holding corporation, or entities that extend loans from own funds provided by only one sponsor.

According to §47 of Part I.6.6 of MGDD «a unit engaged in financial activities and controlled by government would have the features of a captive financial institution and thus would be classified in the government sector, and not in the financial corporations sector (S.12), if at the same time the following conditions would be met: 1. the unit would carry out a limited range of activities in narrow conditions set by government (in the framework of public policy objectives), 2. government influence or constraints would be evidenced simultaneously on both: assets side and liabilities side of the unit, and 3. the unit would not behave like a "normal" commercial entity (e.g. no expectation of a market rate of return on equity).» Additionally, §48 of Part I.6.6 of MGDD states that «a unit controlled by government and acting in narrow limits defined by government but financing itself directly on the market without support from government (i.e. without a need for government guarantees or subsidies), would not have (all) the features of a captive financial institution. However, when this influence or constraints would be evidenced on both assets and liabilities, the entity in fact would act mainly on behalf of the controlling unit (government).»

In the case of captive financial institutions the classification controversy arises from the incoherence between ESA2010 and MGDD in relation to the status (or not) of the captive financial institutions as separate institutional units. In fact, ESA §2.20 refers that only the captive financial institutions with no independence of action are to be classified in general government. Concerning this issue, ESA 2010 is aligned with provisions stated in System of National Accounts 2008 (SNA). Notwithstanding, according to §47 and §48 of Part I.6 of MGDD, if certain conditions are met, other than that of independence, a unit «engaged in financial activities and controlled by government would have the features of a captive financial institution and thus would be classified in the government sector, and not in the financial corporations sector», which seems to point, in contradiction with ESA, to classifying all government controlled captives in general government. Indeed, in recent cases, all units which have the features of captive financial institutions controlled by government have been classified inside government.

The case: Hungarian Eximbank

Eximbank is a government controlled Hungarian Export-Import Bank. Eurostat and the Hungarian authorities diverge on the statistical classification of Eximbank. According to Eurostat, Eximbank is a captive financial institution and should, therefore, be classified in General government sector (S.13), since Eximbank is controlled by the government, with a limited autonomy of decision. Eurostat considers that this entity does not fulfil the criteria to be considered as a financial intermediary or as a deposit-taking corporations except the central bank subsector because Eximbank does not place itself at risk by acquiring financial assets and incurring in liabilities neither

collect deposits. The government bears the risks and grant an explicit guarantee on the liabilities of Eximbank. In the opposite side, the Hungarian authorities consider Eximbank as an entity belonging to the financial corporations sector (S.12), as it acts on its own risk. According to the Hungarian authorities, Eximbank acquires financial assets and incurs liabilities on its own account and transform them, producing financial services as its main activity. Due to these different views, the issue is currently being analysed by a CMFB dedicated task force.

2.2 Defeasance structures or financial corporations?

The §20.46 of ESA2010 refers that defeasance structures are restructuring agencies that «deal with impaired assets, and may be set up in a banking or other financial crisis… A restructuring agency shall be classified according to the degree of risk it assumes, considering the degree of financial support of the government.»

According to the MGDD, §9 of Part IV.5.2 «A financial defeasance structure is an institutional unit, which has substantial problematic assets, whose principal activity is the resolution of these assets generally over an extended period. Such an institutional unit is not a financial intermediary.»

In the context of defeasance structures, one of the relevant questions is which body assumes most of the risk. The MGDD rules on the sector classification of defeasance structures, §11of Part IV.5.2, establish that «When there is evidence that government is assuming all or the majority of the risks and rewards associated with the activities of a government-controlled defeasance structure, as described above, this structure is classified in the general government sector, whatever its legal status. For instance, government is committed to cover the majority of the expected losses from the assets, through providing guarantees on the financing of the entity holding the problematic assets and the guarantee fee is not in line with the risks involved, or that the main source of financing is from the public sector. The entity should be classified in the general government sector either from its creation or a point of reclassification.»

The borderline between a defeasance structure and a financial intermediary under resolution can therefore be tenuous. As defined by the §2.57 of ESA2010 «the financial intermediation process channels funds between third parties with a surplus and those with a lack of funds. A financial intermediary does not only act as an agent for other institutional units, but places itself at risk by acquiring financial assets and incurring liabilities on its own account.» The §2.56 of ESA2010 describes intermediation as a "process" where «assets and liabilities … are transformed or repackaged in relation to, for instance, maturity, scale, risk, etc.». However, the features of the entities created under the resolution schemes often raise doubts about their sector classification, because they often have residual activities which can still be considered as financial intermediation.

Additionally, according to ESA the entities classified in national accounts in the deposit-taking corporations subsector coincides with the entities classified by the ECB as Monetary financial institutions (MFIs). As stated in §2.67 of ESA, «MFIs as defined by the ECB consist of all institutional units included in the central bank (S.121), deposit-taking corporations except the central bank (S.122) and MMF (S.123) subsectors». Since institutional sectors are mutually exclusive (ESA 2010 § 1.57), the §2.67 of ESA 2010 confirms thus the need for consistency between national accounts and monetary and financial statistics. However, the MGDD states that the owning of a banking license and/or the inclusion of an entity in the MFI list are not sufficient criteria to classify entities in the financial corporations sector criteria (footnote 70 of §15 of Part I.5 of MGDD «A unit which would not place itself at risk, even if it held a banking license, cannot be considered as a financial

Intermediary» and footnote 89 of §41 of Part I.6 of MGDD «Even in cases they would hold a banking license and would be included in the MFI list held by the ECB»).

Moreover, concerning the statistical classification of entities under resolution, the CMFB issued an opinion, in September 2015, with the aim of achieving consistency across the various statistical domains and across countries, and of ensuring that the economic substance of transactions is duly taken into account.

The case: Portuguese Banif - Banco Internacional do Funchal, S.A.

Banif is a residual entity that arose from the resolution process of the Banif - Banco Internacional do Funchal, S.A.. It is an institutional unit that still produces on a limited scale financial intermediation services and with a low probability of receiving additional government support. The composition of the balance sheet shows a transformation of its liabilities and assets in terms of its maturity, nature, and risk indicating that Banif is still exposed to the risk. Any losses will be borne by creditors (as defined by the Portuguese Law) and not by government. In the light of these arguments, it was expected that Banif should be classified in the financial corporations sector (S.12). However, the understanding of Eurostat is that Banif is controlled by the government and, the government, as shareholder may have to inject funds to cover possible losses at the end of the liquidation process. Therefore, Eurostat considered that Banif should be classified in the general government sector (S.13). This controversial case was analysed by the CMFB, and after a consultation carried out by this Committee, Banif was reclassified from deposit-taking corporations except the central bank sector (S.122) to the general government sector (S.13), considering Banif as a defeasance structure that holds problematic assets, which must be settled in a short period of time. It should be referred that, the opinions expressed during the CMFB consultation were not unanimous, with the option to classify the residual entity in the general government sector totalizing 27 votes, compared with 24 votes for classifying the entity in the financial sector.

2.3 Protection funds or financial corporations?

According to §7 of Part I.5 of MGDD, «financial sector protection funds are entities that manage funds in order to be in a position to face a default of some units towards some categories of their creditors».

In the case of protection funds it is relevant to define the degree of control by the State and the autonomy of decision. According to the §20.309 of ESA2010, «control of a resident public sector unit is defined as the ability to determine the general policy of the unit. This can be through the direct rights of a single public sector unit or the collective rights of many». Regarding the autonomy of decision, the §12 of Part I.5 of MGDD states that «the main criteria should refer to decision-making related to the resources of such protection funds, and, in particular, those related to exceptional resources which may be needed».

As stated in §13 of Part I.5 of MGDD, if the protection fund has a full autonomy of decision, it should be classified as a financial auxiliary (S.126), otherwise the unit should be classified in the general government sector (S.13). However, this rule does not always have a straightforward application.

The case: Hellenic deposit and Investment Guarantee Fund (TEKE)

TEKE is a legal entity created in 2009, by law 3746/2009. It comprises three different activities: a resolution fund, a deposit guarantee fund and an investment fund. The Eurostat and the Bank of

Greece diverge on the statistical classification of TEKE. According to Eurostat, TEKE fulfils the criteria to be classified in the general government sector (S.13) due to the fact that TEKE activity is controlled by the Greek government and that it is financed by compulsory payments from financial corporations. In addition Eurostat considers that it acts much as an auto-pilot, with reduced autonomy of decision. The Bank of Greece considers that TEKE is not controlled by the Greek government and that it has autonomy of decision in important issues. Hence, Bank of Greece considers that TEKE should be included in the financial sector (S.12). A CMFB consultation was also conducted in this case, and a large majority of votes pointed to the classification of TEKE in general government sector (S.13).

3 Challenges in the delineation of the public sector

As demonstrated in the previous section, the theoretical rules and principles on the classification of entities and its implementation could be enhanced and further harmonized in the various statistical manuals. The application of the current framework leads, in some cases, to different interpretations by different specialists. Therefore, inconsistent statistical recordings may arise. The proof of these different interpretations is the very split vote that has occurred in consultations on specific cases. The borderline cases presented also demonstrated that there is no consensus between the statistical entities in the classification of entities, meaning that the existing rules could be considered insufficient.

In order to guarantee further harmonization across countries, statistical domains and systems regarding the statistical classification of units, further development of the existing rules should be sought. This could be achieved by, in the one hand, eliminating existing inconsistencies between different methodological documents, and, in the other hand, clarifying the rules by minimizing the room for subjective interpretations and/or ad-hoc decisions.

In addition, it should be stressed that the classification of entities should depend to a large extent on the economic rationality that led to the creation of the entity, rather than on the mechanic application of rules, based on administrative details and procedures that underlie the entity. This occurs, for instance, with the classification in the general government sector of entities created under the resolution of financial institutions, especially when all the resolution legislation in Europe had the main objective of safeguarding the public funds from the costs of these operations.

To achieve these goals of a broader consistency and clarity of the application of rules, all the whole statistical system should be involved. As a first step, a review of the rules on sector classification of entities should be performed. As a follow-up of this review, an in-depth discussion should be launched so that results could be reached in time for the next update of the international methodological manuals.

4 Conclusion

This paper presents several controversial issues regarding the sector classification of entities in the European framework. The practical application of the theoretical rules on the classification of entities established in the international statistical manuals could be complex, divergent and not straightforward. The analysis of these rules on the classification of entities presented in the various statistical manuals can lead to different interpretations by different specialists that may conduct to some incoherence in specific cases and, therefore, to inconsistent statistical recordings, namely concerning captive financial institutions, defeasance structures and protection funds. Depending

on their specificities, the entities can be classified in the financial corporations sector or in the general government sector, with significantly different impacts in statistical aggregates.

We argue that it is highly relevant to guarantee further harmonization across countries, statistical domains and systems regarding the statistical classification of units, especially of entities in those categories.

Therefore, an involvement of the whole statistical system should be reached in order to perform a review of the sector classification of entities rules, so that, in the future, more consistent and clear rules may be adopted.

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Experience of Banco de Portugal on the compilation and publication of data regarding government finance statistics*

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Abstract

Government debt is one of the most relevant macroeconomic indicators. It is used to evaluate the financial health of governments and, often, of the country as a whole. However, different definitions of government debt can be found in macroeconomic statistics, alternating from the most commonly used concept of debt in Europe – Maastricht debt – and other definitions of government debt depending on the different coverage of entities and instruments considered and the different ways to value them.

This note presents several concepts and definitions of debt measures departing from the Maastricht debt concept (see Figure 1). Additionally, this analysis is supplemented by looking at net debt measures and explores the challenges in the treatment of contingent liabilities in the definition of public debt.

The experience of Banco de Portugal in measuring some of the indicators mentioned above and usefulness of public sector aggregates is also presented in this note. In this respect, it should be emphasized that Banco de Portugal is publishing on a monthly basis the Maastricht debt, including the Maastricht debt net of deposits of the central government, after 30 days of the end of the reference month. Other statistics concerning the non-financial public sector indebtedness are also released on a monthly basis. The demand for these statistics, and the number of headlines they generate, reveal that they are, in fact, widely appreciated by the users.

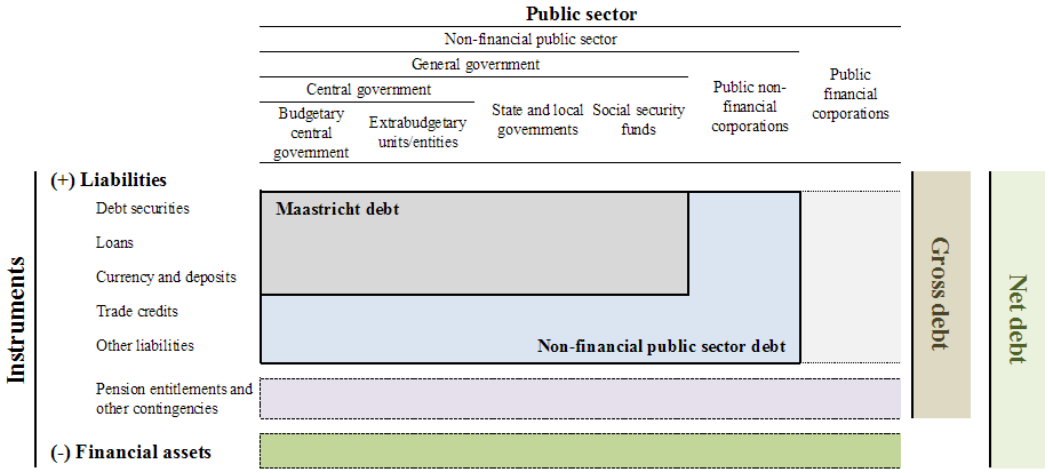
* Meeting of the IMF Government Finance Statistics Advisory Committee (GFSAC), Washington, D.C., USA, March, 2017.

1 Introduction

Government debt is one of the most relevant macroeconomic indicators. It is used to evaluate the financial health of governments and, often, of the country as a whole. However, different definitions of government debt can be found in macroeconomic statistics, alternating from the most commonly used concept of debt in Europe – Maastricht debt – and other definitions of government debt depending on the different coverage of entities and instruments considered and the different ways to value them.

This note presents several concepts and definitions of debt measures departing from the Maastricht debt concept (see Figure 1). Additionally, this analysis is supplemented by looking at net debt measures and explores the challenges in the treatment of contingent liabilities in the definition of public debt.

Figure 1 • Different definitions of government debt



The experience of Banco de Portugal in measuring some of the indicators mentioned above and usefulness of public sector aggregates is also presented in this note. In this respect, it should be emphasized that Banco de Portugal is publishing on a monthly basis the Maastricht debt, including the Maastricht debt net of deposits of the central government, after 30 days of the end of the reference month. Other statistics concerning the non-financial public sector indebtedness are also released on a monthly basis. The demand for these statistics, and the number of headlines they generate, reveal that they are, in fact, widely appreciated by the users.

2 European definition of general government debt

The Treaty on the European Union (signed in Maastricht in 1992) established the process of economic and monetary union and defined the 'convergence criteria' that specified the conditions required for a country to participate in the common currency. With the Stability and Growth Pact then adopted, countries agreed to pursue the joint aims of price stability, sustainable economic growth and employment. It is intended to ensure that Member States maintain budget discipline with medium term balanced budgets. This discipline involves avoiding excessive budgetary deficits.

To this end a regular surveillance should provide early warning if budget deficits diverge from the agreed medium term targets. The Instruments of multilateral surveillance for achieving medium term balanced budgets are defined in the Protocol on the Excessive Deficit Procedure (EDP)[1] that is annexed to the Maastricht Treaty, which specified that the deficit to GDP ratio must not exceed three percent and the debt to GDP must not exceed sixty percent of GDP.

The Protocol defines government deficit and gross debt with reference to European System of Accounts[2] (ESA), which is broadly consistent with the System of National Accounts (SNA) but has been written specifically by and for the European Union. In the Protocol, deficit means net borrowing of general government (as surplus means net lending) and gross debt is constituted by the liabilities of general government at face value in currency and deposits, debt securities and loans according to ESA definitions.

It should be noted that, although the calculation of the debt indicator uses ESA as a reference, it differs in some ways from the stocks accounts of ESA. Therefore, the indicator is not fully integrated in the framework of national accounts. The main differences are: i. Maastricht debt excludes some financial instruments, such as financial derivatives and other accounts payable (which include trade credits); ii. Maastricht debt is an end-of-a-period position at face value, which corresponds to the amount contractually agreed by general government to repay to creditors at maturity, different from the valuation at market prices used in national accounts; iii. Maastricht debt is a gross definition, i.e., it is not netted by the corresponding government assets.

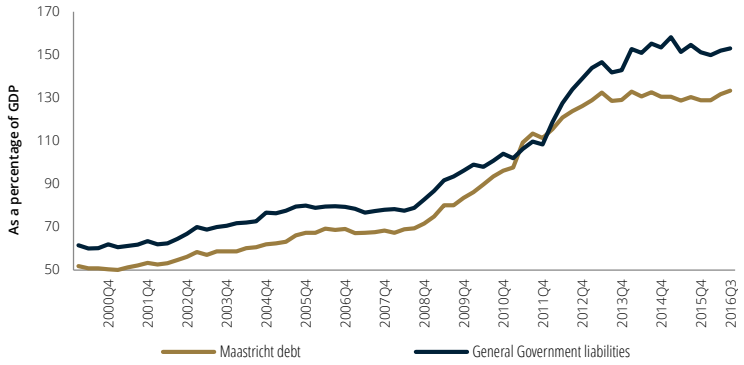
3 Looking forward: net debt and alternative measures

Public debt can also be assessed using other analytical prisms. An aggregated measure of debt may result of the total liabilities derived from the financial accounts (stocks). This measure corresponds to the sum of all liability instruments, in accordance with ESA2010 definition, i.e. liabilities in gold and special drawing rights, currency and deposits, debt securities, loans, equity and investment fund shares or units, insurance, pension and standardised guarantee schemes, financial derivatives and employee stock options and other accounts payable. Figure 2 illustrates the difference between general government liabilities compiled in the context of ESA stocks accounts and the Maastricht debt for Portugal. The total liabilities derived from the financial accounts has the advantage of having the same valuation of the deficit/surplus. However, it is also a gross measure by not considering the financial assets. This could be overcome if a net financial worth concept is considered, which corresponds to the total value of its financial assets minus the total value of its outstanding liabilities.

1 Council Regulation (EC) No 479/2009 of 25 May 2009 on the application of the Protocol on the excessive deficit procedure annexed to the Treaty establishing the European Community, and Commission Regulation (EU) No 220/2014 of 7 March 2014 amending Council Regulation (EC) No 479/2009 as regards references to the European system of national and regional accounts in the European Union.

2 Regulation (EU) No 549/2013 of the European Parliament and of the Council of 21 May 2013 on the European system of national and regional accounts in the European Union.

Figure 2 • Difference between general government liabilities and public debt, for Portugal

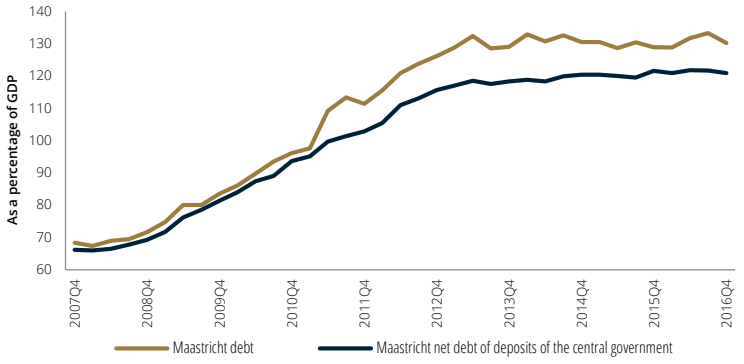


Another definition of gross debt is established by the International Monetary Fund. According to the Guide for Compilers and Users of the Public Sector Debt Statistics[3], «total gross debt, often referred to as "total debt" or "total debt liabilities"— consists of all liabilities that are debt instruments. A debt instrument is defined as a financial claim that requires payment(s) of interest and/or principal by the debtor to the creditor at a date, or dates, in the future.» Thus, all liabilities of the total liabilities derived from the financial accounts are considered debt, except for liabilities in the form of equity and investment fund shares and financial derivatives and employee stock options.

For risk management, it could be useful to focus on a net debt concept. For example, debt may have been incurred to fund assets that will generate income to meet liabilities. A concept of net debt, according to the International Monetary Fund is then calculated as the previous gross debt minus financial assets corresponding to debt instruments. Another concept of net debt is proposed by Eurostat, considering the Maastricht debt net of financial assets corresponding to the instruments also included in Maastricht debt (currency and deposits, debt securities and loans).

Portugal publishes the Maastricht debt net of central government deposits (see Figure 3). The rationale for choosing this definition is the fact that recently the Portuguese government has issued significant amounts of debt in order to create cash reserves.

Figure 3 • Maastricht debt and Maastricht net debt of deposits of central government, for Portugal



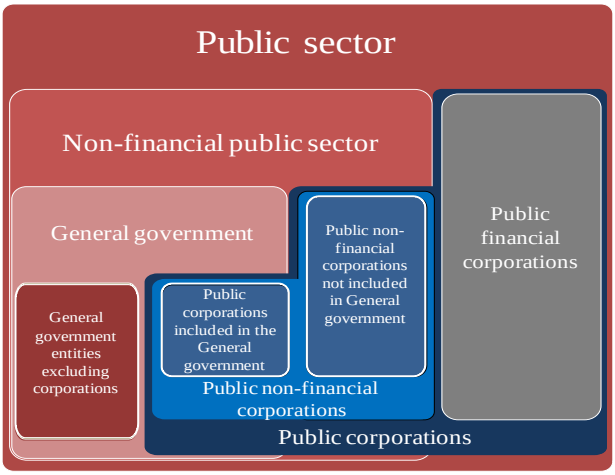
3 Available at http://www.tffs.org/pdf/method/2013/psds2013.pdf

3.1 A more comprehensive measure

Concerning fiscal policy purposes, the debt of the whole public sector rather than just the debt of the general government sector could be an indicator showing a more comprehensive and accurate portrait of the financial position of governments.

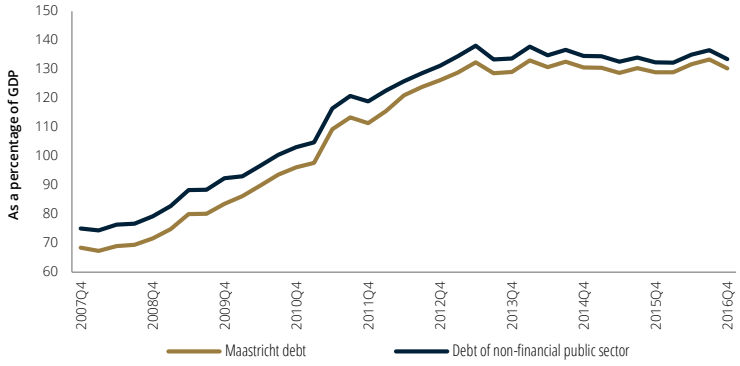
The public sector includes the public institutional units classified in the institutional sectors of general government, non-financial corporations and financial corporations (see Figure 4).

Figure 4 • Delimitation of the public sector



The public sector debt includes, in addition to the debt of general government entities, the debt of other public institutional units. In this respect, Banco de Portugal regularly publishes on the indebtedness of the non-financial public sector which includes general government and non-financial public corporations not included in general government (see Figure 5).

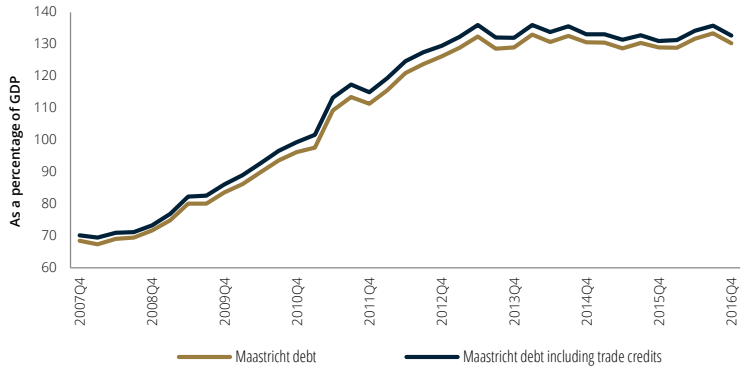
Figure 5 • Maastricht debt and debt of non-financial public sector, for Portugal



Departing from the most commonly used concept of debt in Europe, the Maastricht debt presented above, it is also possible to evaluate the impact of trade credits in the definition of the Maastricht debt. Trade credits are compiled for financial accounts and the expenditure financed

by trade credits is included in the calculation of government deficit. However, they are not part of the definition of the Maastricht debt. Since significant accumulation of trade credits has been identified in many European Union Member States in recent years, the exclusion of trade credits in the current definition of the Maastricht debt appears to be something to be discussed in the future. In fact, trade credits are, in some cases, an alternative to financing through classic debt securities or bank loans. In the case of Portugal, trade credits granted to general government units are compiled in a monthly basis and shown as a component of government debt (see Figure 6).

Figure 6 • Maastricht debt and Maastricht debt including trade credits, for Portugal



3.2 Future liabilities of the general government sector

Another aspect that may be analysed in the future is the fact that governments often incur in contingent liabilities. In particular, during financial crisis governments tend to increase the amount of guarantees granted, which are used to ease the access of certain entities (namely banks) to credit. Guarantees are not a liability of government but they constitute a risk of having additional debt in the future, if those guarantees are called.

Pension entitlements of public social insurance schemes may also be seen as future responsibilities of governments. The SNA provides for the calculation of these entitlements of households *vis-à-vis* the general government. Although the general government may change the amount of pensions that are going to be paid in each moment, the age of retirement, and other conditions, it may be useful to consider that there is an amount of pensions to be paid in the future. If this is the case, however, it should also be considered that contributions are paid by workers and employers to finance social security and, therefore, this liability of the general government.

Other off-balance-sheet liabilities that represent significant risks for the sustainability of government finances may also be considered, such as liabilities due to long-term contracts (e.g. public-private partnerships) and non-performing loans granted by government agencies (student loans, import / export loans, etc.).

These items have different natures and different impacts on public debt. Additionally, they may be difficult to measure reliably. Nevertheless, they give an indication of the potential risk to be supported by the general government which may impact the future level of public debt.

4 Experience of Banco de Portugal

The compilation of general government statistics by Banco de Portugal is included in the functions attributed in its Organic Law (Law No 5/98 of 31 January, and amendments) and by the Law on the National Statistical System (Law No 22/2008 of 13 May). The division of tasks and the cooperation framework for the compilation of national accounts are defined by a protocol signed in 1998 by Banco de Portugal and the Instituto Nacional de Estatística - INE (National Statistical Institute). According to this agreement, INE compiles the national non-financial accounts and Banco de Portugal compiles the national financial accounts. To achieve consistency between the financial and non-financial accounts, the protocol establishes cooperation mechanisms, mutual consultation and methodological discussions for the compilation of national accounts, namely the harmonized implementation of the European System of National and Regional Accounts.

For general government accounts, a specific institutional framework has existed since 2006, when the Institutional Cooperation Agreement in the Field of General Government Statistics was signed between Banco de Portugal, INE and the Ministry of Finance's Directorate-General for the Budget (DGO). The main goal of this agreement is to allow for a better coordination of the statistical activities in the field of general government. This coordination involves several activities, namely, the analysis of methodological issues, the delimitation of general government, the compilation of annual and quarterly accounts and debt and the preparation of the Excessive Deficit Procedure notifications. Under this agreement, Banco de Portugal assumed the responsibility of compiling the financial accounts of general government and Maastricht debt.

Therefore, besides the reporting of statistics to international organisations (Eurostat, European Central Bank, International Monetary Fund, among others), Banco de Portugal was disseminating a set of general government statistics, namely the financial accounts of general government, the public debt on a quarterly basis, the deficit-debt adjustment and the general government financing.

In 2011, Portugal formally requested financial assistance from the International Monetary Fund, European Commission and European Central Bank. With a strategy aimed at restoring the confidence of international financial markets and promoting competitiveness and sustainable economic growth, the Financial Assistance Programme was based on three pillars: fiscal consolidation, stability of the financial system and structural adjustment of the Portuguese economy. During this Programme, a total amount of 78 million euro was disbursed to Portugal by the three institutions.

Between 2011 and 2014, twelve review missions took place in Portugal. During the execution of the Programme, several statistical indicators and reports were identified by the European Commission, the ECB and the IMF, as it was critical to have sound economic data to monitor the evolution of the Programme. The statistical authorities transmitted this information on the agreed periodic basis, developing additional indicators when these additional data was not available.

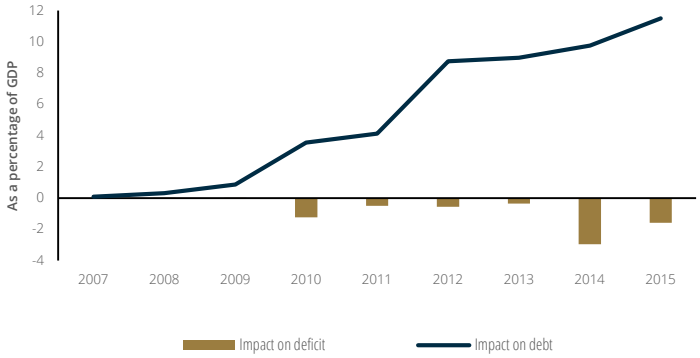
One specific requirement, concerning the detailed breakdown of lending to the non-financial sector of the economy by category of borrower originated the creation of a new chapter in the *Statistical Bulletin* of Banco de Portugal in 2012, so that the general public could benefit from the more comprehensive data available. In this chapter, the indebtedness of the non-financial sector was published in detail, combining different dimensions of analysis, namely: debtor and creditor sectors, type of financial instruments, original maturity and economic activity and size of the company.

Concerning the general government sector, additional debt measures are currently published in this chapter, particularly the indebtedness of the public sector, which includes not only the general government sector but also all public corporations. Moreover, trade credits are also included in addition to Maastricht debt liabilities.

Having in mind the relevance of general government debt statistics, Banco de Portugal also started to publish the Maastricht debt of general government on a monthly basis, including the Maastricht debt net of deposits of the central government. These data are released on the first working day of the second month after the reference period. The main developments are summarized by a monthly statistical press release.

Additionally, Banco de Portugal also disseminates information on the impact in the government deficit and debt of the measures to support financial institutions. This information includes transactions with impact on the revenue and expenditure and thus, on general government deficit, namely, capital injections, calls on guarantees and interest payable imputed to the debt incurred to support such interventions. Similarly, it comprises the liabilities incurred by general government, included in public debt, to finance these measures, namely through the issuance of debt securities or loans borrowed. The interventions in the financial sector also involve the acquisition of assets by general government. These assets include, among others, loans granted under those measures, debt securities acquired, including contingent capital instruments issued by banks and investments in shares and other equity, particularly through the subscription of capital increases not recorded as government deficit. The potential risks associated with contingent liabilities, such as guarantees granted to the financial sector, are also included in the information transmitted. Figure 7 illustrates the impact on deficit and debt of the measures to support financial institutions in Portugal.

Figure 7 • Impact on the general government deficit and debt of the measures to support financial institutions in Portugal | 2007 – 2015



5 Conclusion

The definition of public debt is not a closed concept. Different possibilities for alternative measures of government debt may be discussed. The Maastricht debt definition is clearly defined and includes all core liabilities instruments which have consistent data sources and can be reliably compiled. It allows comparability between European countries and is the concept used to monitor the 'convergence criteria' established in the Treaty on the European Union. However, this definition

is one of the most restrictive concepts that can be used in terms of sector delimitation, valuation, instrument coverage and netting.

The concept might be enlarged by including all of the public sector and not only the general government. Other financial instruments may also be included, such as trade credits. Debt could also be considered net by taking into account the investment of government in financial assets. The valuation of debt could follow the concepts defined in ESA 2010, e.g. nominal value or market value.

An important challenge also to take into account in the definition of public debt is the treatment of future liabilities of governments, namely pension entitlements of public social insurance schemes, guarantees granted, and other off-balance-sheet liabilities.

In what concerns the experience of Banco de Portugal on the compilation and publication of data, it should be referred that Banco de Portugal is already publishing in a monthly basis the Maastricht debt, including the Maastricht debt net of deposits of the central government, after 30 days of the end of the reference month. Additionally, the approach followed by Banco de Portugal has been to complement the Maastricht debt with other public debt measures. Therefore, other relevant statistics concerning the non-financial public sector indebtedness and other debt instruments not included in Maastricht debt, are also released on a monthly basis.

The demand for these statistics, and the number of headlines they generate, reveal that they are, in fact, widely appreciated by the users.

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