SUPPLEMENT TO THE STATISTICAL BULLETIN

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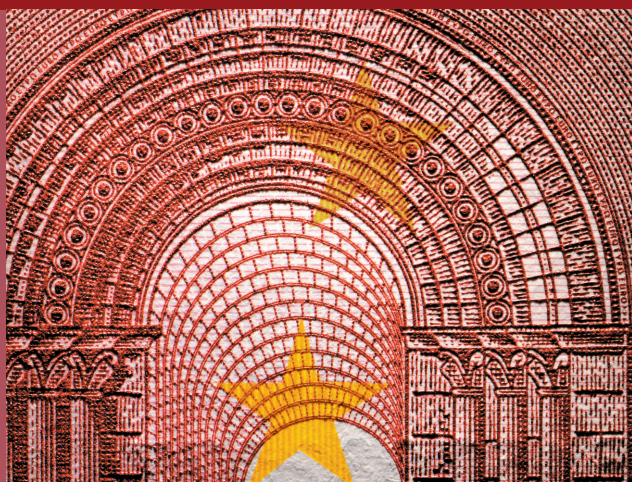

Papers presented by Banco de Portugal representatives at the 58th World Statistics Congress of the International Statistical Institute, held in Dublin, Ireland

October 2011

Banco de Portugal
EUROSYSTEM

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FOREWORD

1. This publication covers the papers presented at the **58th World Statistics Congress of the International Statistical Institute** (henceforward referred as the "ISI 2011") by *Banco de Portugal* representatives.[1] The ISI 2011 was held in Dublin, Ireland, from 21st to 26th August 2011. The papers presented by *Banco de Portugal* representatives at the ISI2007 and the ISI2009 are available in the supplements to the Statistical Bulletin **1/2007** and **1/2009**, respectively.

2. Established in 1885, the **International Statistical Institute** (ISI) is one of the oldest scientific associations operating in the modern world. Its principal objective consists of promoting the understanding, development, and good practice of statistics worldwide. For this purpose, the ISI encourages excellence in statistical research, statistical education, and the practice of Statistics; supports the international statistical community in assisting the establishment and maintenance of sound statistical institutions; fosters the appreciation in governments and the public at large of the true value of statistics and statistical methods; facilitates the collaboration among diverse groups of ISI members, and among statistical societies and other national and international organisations having statistical interests; provides diverse coordinating services; and continually develops new initiatives to maintain leadership in the field of Statistics. The ISI has held biennial Congresses since 1853 and recent sessions have attracted over 2,500 delegates, bringing together statisticians from across the disciplinary spectrum – official statistics; business, financial, environmental and industrial statistics; surveying and sampling, computational and mathematical statistics; probability and stochastic modelling and statistical education. Moreover, the ISI brings together statisticians from both developing and developed nations to share experiences, expertise and challenges.

Currently, the ISI has more than 2,000 individual elected members, internationally recognised as definitive leaders in the field of statistics. The membership crosses all borders, and is drawn from over 130 countries. The Institute has 7 specialised Sections consisting of approximately 3,000 additional individual members, including, *inter alia*, the International Association for Official Statistics (IAOS), the International Association of Survey Statisticians (IASS), and the International Society for Business and Industrial Statistics (ISBIS).

The Irving Fisher Committee on Central Bank Statistics is also associated to the ISI, as a transitional section.

3. The **Irving Fisher Committee on Central Bank Statistics** (IFC) was established on the initiative of a number of central bank statisticians who were attending the ISI Corporate Members Meeting at the 1995 ISI Session in Beijing, People's Republic of China. It is a forum of central bank economists and statisticians, as well as others who wish to participate in discussing statistical issues of interest to central banks. The institute is governed by the international central banking community and operates under the auspices of the Bank for International Settlements (BIS). The *Banco de Portugal*

[1] The delegation comprised the Director of the Statistics Department (João Cadete de Matos), two of his Deputy-Directors (Ana Margarida de Almeida and Filipa Lima) and ten members of the Department's staff (Carla Marques, José Faustino, Lígia Nunes, Luís D'Aguiar, Olga Monteiro, Paula Casimiro, Paula Menezes, Paulo David, Sérgio Branco and Sílvia Fonte Santa).

has been an active member of the IFC since its establishment.

The IFC has adopted the name of Irving Fisher, an internationally renowned economist and statistician, for his work on economic measurement and many other topics related to monetary and financial stability of interest to central banks. His wide-ranging contributions to economics and statistics and his multi-disciplinary approach serve as an example for the IFC's objectives and activities.

At the ISI 2011, the IFC sponsored 8 different sessions. The *Banco de Portugal*'s delegation contributed to 6 of them.

4. The ISI has charged the Irish *Central Statistics Office* (CSO) with the primary responsibility for organising, managing and promoting the 58th World Statistics Congress, which was subordinated to the theme *"Water – Quality and Quantity"*. To further emphasise the significance of this choice, the CSO decided to devote a whole day to the discussion of the topic, an initiative that constitutes a first time in the Congresses' long history. The ***Water Theme Day*** was held on the 24th of August with the objectives of:

- Highlighting the important contributions statistics can make to the solution of water quality problems and quantity challenges facing the world; and
- Identifying statistical research challenges that arise.

On this day, the Congress addressed the statistical challenges in sampling methods, new measurement technologies, modelling, forecasting, inference, risk-assessment and decision-making, created by the following issues:

- Water quality and human health;
- Climate change, ecosystem health and environmental accounting;
- Socio-economic issues, water security and water management; and
- Droughts, floods and the modelling of extremes.

The Congress lasted for 5 days, with 22 sessions running in parallel. There were almost 1,300 papers presented over the week, requiring the involvement of some 1,800 unique persons (*e.g.* authors, organisers, chairs and discussants) with the Congress being attended in total by almost 2,300 delegates. These were generally from a wide range of backgrounds, *inter alia*: academic institutions, researchers, demographers, economists, environmental, medical, pharmaceutical, theoretical, computational, quality control and financial statistics. In particular, a great number of national central banks and all the most relevant international organisations – *e.g.*, the European Central Bank (ECB), the Bank for International Settlements (BIS), the International Monetary Fund (IMF), the Eurostat, the Organisation for Economic Co-operation and Development (OECD) and the World Bank – attended the conference.

5. The **delegation of the *Banco de Portugal* to the ISI 2011** was responsible for the full organisation of one Special Topics Session (STS),[2] participated as discussant in one Invited Paper Session (IPS),[3] and made 7 presentations in 5 different sessions (both IPSs and STSs). A brief reference to these activities is given in the next paragraphs. All the documents presented at the ISI 2011 by the *Banco de Portugal*'s representatives are shown in the remainder of this Supplement.

5.1 *Banco de Portugal* organised the IFC-sponsored "**STS 060 – *Establishing 'agile' statistical tools such as micro-databases to facilitate responses to changing user demands"***. The session, chaired by **João Cadete de Matos** (*Banco de Portugal*, Statistics Department, Director), was divided into 3 segments: a vision, and then two other parts, each with its own discussant, and at the end of each part the opportunity to hear the audience's views.

In the first part (called 'The Vision') Francis Gross (European Central Bank, Directorate General Statistics, Head of the External Statistics Division) presented the paper *"Macro from Micro: new horizons for financial statistics"*. Starting from the story of the European System of Central Banks' (ESCB) Centralised Securities Database (CSDB), the author reviews lessons learned from the development of the CSDB and some of the developments it enables in the ESCB's production of statistics on financial markets. He provides an outlook on potential further developments in financial statistics and their infrastructure, especially the initiative to standardise reference data on financial instruments and legal entities by the means of an international Reference Data Utility backed by legislation. Also, the author sets a specific focus on the likely longer term implications of the recent creation in the USA by the Dodd Frank Act of the Office of Financial Research and its potential role as a catalyst of international data standardisation.

In the second part (called 'Micro-databases') there were 4 papers, covering the following topics:

- **Securities holdings statistics in Germany**

  Matthias Schrape (*Deutsche Bundesbank*, Statistics Department) presented the paper *"Securities holdings statistics in Germany: a flexible multi-dimensional approach for user-targeted data provision"* in which he argues that data alone do not necessarily give insights as every statistician well knows – in order to turn a numerical ocean into valuable information streams for users it is essential to have 'agile' statistical tools such as micro-databases and software for performing advanced analytics. The author then describes the features and the uses of the securities holdings statistics database for Germany that the *Deutsche Bundesbank* set up in 2005: on the one hand, the system serves as a hub providing standardised statistical products for *e.g.* financial accounts, government finance statistics, Balance of Payments and International Investment Position (b.o.p./i.i.p.) statistics and statistics for investment funds and insurance corporations; on the other hand, the granular data are stored in a multi-dimensional system to enable high service level for *ad hoc* user requests for *e.g.* information on financial risks. The paper also illustrates how user-tailored data are provided for a number of research projects in the area of financial stability, international economics and for studies on investor behaviour.

[2] STSs are sessions on topics proposed by members of the ISI and its Sections and selected by the Programme Coordinating Committee. They typically consist of 5 papers (or 4 papers and a discussant) invited by the organiser of the Session.

[3] IPSs are central to each ISI biennial Conference. Typically, an IPS consists of 3 papers plus discussion. An aim of each IPS is to attract a diverse group of statisticians and to promote communication among them. Ideally, each IPS will be of interest to members of more than one Section and will link developers and users of statistical methodology.

- **The statistical potential of micro-databases at the *Banco de Portugal***

  Ana Margarida de Almeida (*Banco de Portugal*, Statistics Department, Deputy-Director) presented the document ***"Promoting enhanced responsiveness to statistical users' demands. The experience of Banco de Portugal in exploring micro databases"*** that she co-authored with **Luís D'Aguiar** (*Banco de Portugal*, Statistics Department, Senior Adviser) and **Paula Casimiro** (*Banco de Portugal*, Statistics Department, Head of the Monetary and Financial Statistics and Central Credit Register Division). This paper reviews the work of the *Banco de Portugal* in reusing and sharing micro-data for statistical purposes – namely the Securities Statistics Integrated System, the Central Credit Register and the Central Balance Sheet Database – and addresses key operational issues related to the implementation of this approach. According to the authors, the extended usability of these databases, with proven results in reducing or eliminating information gaps and monitoring and assessing developments in the Portuguese financial system, improves the overall efficiency of the statistical framework. In fact, linking micro-data to macro-risks helps to confirm (or to disprove) the trends and developments conveyed by macroeconomic statistics and to explore possible implications for, *inter alia*, financial stability analysis and systemic risk assessment.

- **Loan registers in Lithuania**

  Rimantas Vaicenavicius (Bank of Lithuania, Statistics Department, Director) presented the paper *"Use of credit registers for financial and external statistics in Lithuania"* in which he describes how two separate loan registers have been progressively used for statistical purposes in Lithuania: (i) the Foreign Loans Register (FLR), which records both granted and received loans of all residents, except households, *vis-à-vis* all non-residents, and is used primarily in external statistics; and (ii) the Central Credit Register (CCR), which records loans extended by credit institutions and their subsidiaries and is used in financial stability statistics.

  The wide statistical use of the FLR became possible after the reporting forms were aligned with statistical needs in 2008. The FLR is used to update annually the enterprise population in the statistical register for external statistics quarterly surveys, compile external debt statistics and generate breakdowns both for quarterly and monthly b.o.p./i.i.p. statistics. Moreover, the FLR is used in validating the external statistics survey information.

  The distinct feature of the Lithuanian CCR is its online character: information on loans and borrowers is updated continuously. The CCR includes a lot of attributes on both borrowers and their loans together with the information on all transactions, which makes it relatively rich, compared to CCRs in other countries. Statistics based on the CCR data are increasingly used for financial stability analysis, including breakdowns of loans by NACE (Statistical Classification of Economic Activites in the European Community, Rev. 2) categories, or *ad hoc* exercises.

- **The architecture of the new Portuguese bop/iip system**

  Carla Marques (*Banco de Portugal*, Statistics Department, Head of the Balance of Payments and International Investment Position Statistics Division) presented the paper ***"Guidelines for a flexible and resilient statistical system: the architecture of the new Portuguese b.o.p./i.i.p. system"*** where she describes the Portuguese experience in designing a new system for the collection and compilation of b.o.p./i.i.p. statistics, which will replace the current settlement-based system established in 1993. That system will be based on a business intelligence general

architecture and will stand on three pillars: a statistical data warehouse; centralised reference tables; and a common IT platform. The paper describes the new system along four stages – acquisition, processing, exploration and disclosure –, and discusses key issues that arise in each of them. A special emphasis is given to the acquisition of data from direct reporters, one of the main (and most challenging) of available data sources.

Antonio Casado (*Banco de España*, Statistics Department, Head of the Statistical Information Management Division) discussed these 4 papers.

In the third part (called 'Surveys'), the following documents were presented:

- *"Collecting micro data from MFIs for frequent user demands"*, by Kimmo Koskinen (Bank of Finland, Financial Stability and Statistics Department). The paper describes how the Bank of Finland started to collect data from Monetary Financial Institutions (MFIs), for different purposes, with a single data collection survey, covering requirements for the following: ECB's and national MFIs' balance sheet and interest rate statistics, Statistics Finland's outstanding credit statistics, balance of payments and financial accounts statistics, and the BIS banking statistics (Locational data). According to the paper, because the information is collected at much disaggregated level (including security-by-security data collection) it can be used extremely well for *ad hoc* data needs. The format also enables the possibility to add in new attributes/data requirements quite flexibly, if necessary.

- *"Measuring the access to finance of small and medium-sized enterprises across the euro area through a flexible survey"*, by Sébastien Pérez-Duarte and Malgorzata Osiewicz (European Central Bank, Directorate General Statistics, Statistical Development and Coordination Division). The paper describes the ECB survey on access to finance of Small and Medium-Sized Enterprises (SMEs) across European countries, in cooperation with the European Commission, and explains how the format chosen allows flexibility of sample design and questionnaire, with short implementation times and timely results. In particular, the survey combines a six-month frequency over euro area countries with a biennial component over all European Union countries. The micro-data allow results to be broken down in many different dimensions, and have contributed to the growth of a rich source of information to monitor euro area economic developments.

- *"Can we employ time-use survey data to forecast fluctuations in macroeconomic aggregates?"*, by Adrián de la Garza (Bank of Mexico, Research Department, Macroeconomic Analysis Division). This paper investigates the links between time allocation decisions by individuals and fluctuations in macroeconomic aggregates. How people distribute the 24 hours that are available to them each day has important repercussions on several dimensions, including their financial security, physical health, emotional well-being, and general level of happiness. It is thus possible that these decisions also have significant effects on macroeconomic aggregates. However, in spite of their potential benefits, widespread implementation of time use surveys has been limited. Continuous data would allow researchers and policy-makers to analyse how shocks that differentially affect the market and non-market sectors result in substitution between market and non-market work. Also, data at such high frequency would enable the investigation of the activities of various sectors of the population (*e.g.*, the unemployed) and would help assessing how different types of household

production activities vary over the business cycle. The paper argues that such advantages, among many others, justify the need to collect high-frequency information on individuals' time allocation decisions.

Petr Vojtíšek (Czech National Bank, Monetary and Statistics Department, Deputy Executive Director) discussed these last 3 papers.

5.2 The *Banco de Portugal*'s delegation participated directly in 3 of the 4 IPSs that were sponsored by the IFC:

- **IPS 111 – *Challenges in improving the measurement of the government financial position and in the classification of units as public or private***

  In this session, chaired by Peter van de Ven (OECD, Head of National Accounts), four presentations were made. **Sérgio Branco** (*Banco de Portugal*, Statistics Department, Head of the General Government Statistics Unit) discussed the following papers:

  - *"Treatment of special bank interventions in Irish government statistics"*, by Mary Cussen and Mick Lucey (Central Bank of Ireland, Statistics Division);

  - *"Differences in the design of rescue units and its impact on government finance data"*, by Albert Braakmann and Thomas Forster (German Federal Statistical Office).

  Following a brief introduction, meant to provide a conceptual framework for the impact on public debt caused by the government's interventions in the financial sector and the associated complexities of the statistical recording of these actions, the discussant provided concise descriptions of the main aspects of each of the papers under scrutiny. Along the way, the discussant raised a number of questions to the authors that, together with his account of their papers, fuelled a generalised and vivid discussion by the audience.

- **IPM 112 – Integration of financial and balance sheet accounts (including flow of funds integrated with the real economy)**

  In this session, chaired by Chihiro Sakuraba (Chief Statistician of the Bank of Japan and Vice-Chair of the Irving Fisher Committee on Central Bank Statistics), **Olga Monteiro** (*Banco de Portugal*, Statistics Department, Head of the Financial Accounts Unit) presented the document ***"An integrated analysis of the Portuguese economy: the financial and the real economy"***, that she co-authored with **Filipa Lima** (*Banco de Portugal*, Statistics Department, Deputy-Director). The main focus of this paper is to illustrate the importance of compiling financial accounts on a from-whom-to-whom basis and to contribute to a better understanding of the interaction between real and financial activities in the Portuguese economy. An analysis of the main economic and financial developments in Portugal over the last decade is also provided.

- **IPM 113 – *Revision of financial accounts in conformity with the SNA2008***

  In this session, also chaired by Chihiro Sakuraba, **Paula Menezes** (*Banco de Portugal*, Statistics Department, Head of the Methodological Development Unit) presented the document ***"Issues in implementing SNA2008: looking for the data"***, that she co-authored

with **Sílvia Fonte Santa** (*Banco de Portugal*, Statistics Department) and **Filipa Lima** (*Banco de Portugal*, Statistics Department, Deputy-Director). The paper focuses on the main methodological changes in the field of financial accounts and on the initiatives to address them in the case of Portugal. Firstly, the impact of the redefinition institutional sectors' boundaries is assessed. Focus is also given to specific methodological changes, like those regarding the Financial Intermediary Services Indirectly Measured (FISIM) or the treatment of financial derivatives as an autonomous category. Another important issue concerns pension liabilities in the context of the supplementary table to be included in the ESA2010 (European System of National and Regional Accounts 2010) transmission programme. Moreover, the implementation of the 6th Edition of the IMF's Balance of Payments and International Investment Position Manual (BPM6) also poses important challenges in the field of direct investment relationships (definition of ultimate control/influence).

5.3 Finally, the *Banco de Portugal* delegation contributed with 3 more presentations at the following IFC-sponsored STSs:

- STS 061 – Tracking financial behaviour of investors (households, financial investors) and measurement of risk behaviour and aversion.

  In this session, chaired by Rimantas Vaicenavicius (Bank of Lithuania, Statistics Department, Director), **Filipa Lima** (*Banco de Portugal*, Statistics Department, Deputy-Director) presented the document ***"Insurance companies and pension funds: assessing the dynamics of their assets and liabilities"***, that she co-authored with **Paulo David** (*Banco de Portugal*, Statistics Department). In their paper, the authors argue that Insurance Companies and Pension Funds (ICPFs) have become increasingly more important within the financial sector in the advanced economies. In such economies, ageing populations coexisting with inadequate social security schemes have driven families to look for alternatives to complement their income after retirement. At the same time, insurance companies are highly innovative, having developed a range of products that compete with banks' deposits for households' savings. As such, ICPFs have assumed a pivotal role for the assets they hold and manage, which makes them major players as institutional investors, not only on public debt but also as a source of funds to enterprises. Therefore a careful analysis of the dynamics of their assets' portfolio and their liabilities counterparts is important not only for monetary policy but also for macro prudential analysis. *Banco de Portugal* has devoted a special attention to this financial subsector, developing a statistical framework that meets the European System of Central Banks' statistical standards for ICPFs, using available supervisory data. The paper illustrates the methodologies developed to fill the gap between supervisory and statistical data and to assess the main trends of the behaviour of this sector in Portugal.

  Also in this session, **Lígia Nunes** (*Banco de Portugal*, Statistics Department) presented the document ***"Investors' attitude towards risk in periods of high market volatility"***. In this paper, the author argues that, in the wake of the recent global financial crisis, the investors' perception of risk and uncertainty has increased, leading to the adoption of a more cautious attitude when making investment decisions – an assessment that is even more conclusive if one takes into consideration that households are increasingly taking the responsibility for the assets' allocation of their portfolios and that periods of financial instability are linked with

investors' risk aversion. The paper aims at developing an empirical analysis with a view to have a better understanding on how the Portuguese investors' perception of the financial events that led to the recent turmoil has been incorporated in their exposure to risk and, consequently, in their investment decisions.

- STS 068 – State of the art in communicating statistics

  In this session, chaired by Aurel Schubert (European Central Bank, Statistics Department, Director General), **José Faustino** (*Banco de Portugal*, Statistics Department, Head of the Statistics Dissemination Unit) presented the paper ***"Banco de Portugal's experience in communicating statistics"***, in which he describes the various initiatives in the recent years to promote the knowledge and use of statistics, moving from a reactive model based in statistical dissemination to a proactive model targeting statistical communication. The state-of-play in the statistics communication function of the *Banco de* Portugal is outlined as well as the plans ahead aimed at overcoming the identified obstacles to implement a dynamic and mutually beneficial use of statistics. The paper clearly acknowledges the existence of different users' needs, covering both the actions intended for the general public and those that target specific types of users. The quantitative and qualitative indicators that are being developed to monitor the use of statistics, the presentations and dedicated meetings in specific statistical fields, and the tools and policies defined in this area are also outlined with a view to develop a closer and intensive relationship with statistical users and to implement a comprehensive, integrated and flexible statistical communication system.

From left to right: Olga Monteiro, Paulo David, Paula Menezes, Sérgio Branco, Ana Margarida de Almeida, Nuno Silva (ECB), Sílvia Fonte Santa, João Cadete de Matos, Carla Marques, José Faustino, Paula Casimiro, Rodrigo Soares (ECB), Filipa Lima, Luís D' Aguiar, Lígia Nunes.

Promoting enhanced responsiveness to users' data needs: the experience of the *Banco de Portugal* in exploring the statistical potential of micro-databases

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1. Coping with the "data gaps" issue

The issue of "data gaps" has been attracting an increasing amount of attention in the wake of the financial crisis of 2007-09. Policy-makers, financial supervisors and regulators around the world have been striving to find out which particular indicators were missing that would have helped them, if not to prevent the crisis, at least to mitigate its intensity and to contain its more serious implications within manageable boundaries. Such interest, which typically follows any financial crisis, brought additional pressure on the statistical systems worldwide to expand their reach with a view to covering areas where those data gaps have been more prominent – *e.g.*, information for the purpose of financial stability analysis and systemic risk assessment.

Gathering more and improved information in reaction to data needs revealed by a past crisis is expected to provide superior financial statistics, as well as a better analytical toolkit to the authorities responsible for safeguarding the stability of the financial systems, increasing their levels of preparedness to assess current financial developments, and helping them to avoid the repetition of the same mistakes that had prompted previous crises. A word of caution though: even in the event that, somewhere along the process, we end up having at our disposal what looks like a set of analytical tools of exceptional quality, this does not necessarily imply, of course, that financial crises will be

forever avoided. In fact, it is not unusual that indicators designed to describe past or contemporary events fail as early warning indicators of a future crisis. This may happen simply because crises are not all the same; the determinants of the *next* crises do not have to be replicas of the factors that prompted former ones. What's more, this may lead the unwary into a false sense of security, impairing their ability to identify potential sources of problems right at the earlier stages of the crisis development. Johnston *et al.* (2009) provide evidence about the hidden dangers related to gaps in information content: *"The standard financial soundness indicators that were emphasised as part of the IMF's surveillance generally performed poorly as early warning indicators of the financial turmoil. Some of the core indicators continued to signal soundness and sufficient liquidity of financial institutions even as underlying balance sheet and market conditions deteriorated."*

Clearly, information gaps do not come up only as a result of a financial crisis. To a certain extent, they are an intrinsic, ever-present, feature of conventional data collecting systems. By their very nature, these systems are essentially static, in contrast to the dynamic behaviour of the phenomena they are meant to capture and measure, implying that financial statistics engendered by them tend to lag behind the developments in the financial system, particularly as regards financial innovation. In fact, conventional data collection schemes *"may simply not be consistent with the dynamism of the financial system, particularly in light of the tendency of innovation to continually shift to outside of the areas to which analysis and scrutiny are most directed"* (Palumbo *et al*., 2010).

Also, conventional data collecting systems cannot simply keep on expanding indefinitely just to cope with the need to fill the data gaps perceived by the users. Amongst the many motives for not pursuing recurrently this approach one could point out, *inter alia*, the following:

- The resulting overburdening of respondents goes against established best practices and is "politically" ill-advised.
- The related initial and maintenance costs are far from being negligible, both to the agency that collects the data and to the respondents.
- New reporting schemes (or significant enhancements to existing ones) take a long time (years, rather than months) to develop and implement and, once launched, are supposed to remain in operation for a lengthened period of time (typically some years, as seems to be the case with Eurosystem statistics). This long time-lag could even be further extended, should the revision result from a major change in the principal methodological manuals, as it is often the case.

In a nutshell, the response given by conventional data collecting systems to new data requirements – stemming from, *e.g.*, the need to conduct macro-prudential analyses – is problematic, costly and could possibly turn out to be counterproductive. This calls for a paradigm shift *(see Figure 1).*

Possibly, the answer *"requires changing the way we use existing data"* (Cecchetti *et al*., 2010); we should *"use data in a different way – in a way that can deliver more flexibility in targeting than static data collection can allow"* (Palumbo *et al*., 2010). Central banks already collect and process huge amounts of data. These data, typically aggregate data, if used appropriately, could provide signals of where to look. Referring to broad-based increases in financial leverage and the growth in

off-balance sheet items, Constâncio (2010) pointed out that *"it should be recognised that during the crisis signals of imbalances did emerge from aggregated macro-financial data"* – even though *"they failed to attract sufficient attention"*, as he added next.

To illustrate trends and potential anomalies visible in the aggregate data, Costa (2010) suggested that the latter *"must be complemented with a second stage of more-targeted analysis relying on less traditional sources of information"*. *Ad hoc* surveys and the provision of micro-data[1] are good candidates to be considered within this category. However, given that the designing, conducting and processing of *ad hoc* surveys is in general too time-consuming and expensive, not to mention reliant upon the willingness to participate on the part of the target population, centring our attention in the micro-data instead seems to be a more promising approach to the problem.

In fact, statistically edited micro-data, including data from administrative sources not originally intended for statistical purposes or even data related to the prudential supervision function, offer an unusual array of interesting features, *inter alia*:

- Very good coverage of the population (in most cases).
- Relatively low reporting costs.
- Increased flexibility as regards the compilation of new statistics.
- More rapid response to specific (*ad hoc*) data requirements from the users.

Moreover, the evolution in network and communication protocols, database systems and multidimensional analytical systems has somewhat removed the potential disadvantages of having to deal with the huge amounts of data normally associated with the handling of micro-databases.

The *Banco de Portugal* has been using micro-databases and item-by-item reporting for several years now, with a very significant positive impact on the overall quality of its statistical output. Besides complementing and/or cross-checking the information gathered through more conventional channels, these data have proved to be of great importance in monitoring and assessing developments in the Portuguese financial system, especially in the wake of the recent financial crisis.

[1] Throughout the paper the term "micro-data" will be used to refer data about an individual person, household, business or other entity. It may be data directly collected by the central bank or obtained from other sources, such as administrative sources.

Figure 1 *– Data gaps challenge and micro-data response*

In the remainder of the paper we will:

- Describe the micro-databases that *Banco de Portugal* uses for statistical purposes, and discuss their effectiveness as a means to mitigate data gaps stemming from the recent financial crisis.

- Examine the work ongoing at *Banco de Portugal* with a view to (i) enhancing the consistency of the information coming from different micro-data sources and (ii) integrating micro- and macroeconomic data in an attempt to get a more complete picture of the performance of the Portuguese economy and of its financial system.

2. Looking at the available micro-data

Over the last decade, the *Banco de Portugal* has been focussing an increasing interest on the field of micro-data (including those from administrative databases and from prudential supervision), both for statistical compilation and for analytical purposes.

The Statistics Department of the *Banco de Portugal* currently manages three main repositories of micro-data, namely:

a. the Securities Statistics Integrated System (SSIS) database;

b. the Central Credit Register (CCR) database; and

c. the Central Balance Sheet Database (CBSD).

In order to allow for an efficient integration of the information stored in the different databases, the Banco de Portugal also maintains a business register of resident financial and non-financial corporations.

The three above-mentioned databases are briefly described next.

a. Securities Statistics Integrated System database

The Securities Statistics Integrated System (SSIS) database is a security-by-security and an investor-by-investor database, which was set up in early 1999 with a view to providing, in a single repository, data on the securities issues and holdings required by the different statistical domains (*e.g.*, monetary and financial statistics, external statistics, securities statistics and financial accounts), thus replacing the separate and distinctive data storing systems in place until then.

The concept of "securities" used in this database is fully in line with the definitions of the European System of National and Regional Accounts (ESA 1995), covering both short- and long-term "Securities other than shares" (excluding financial derivatives) and "Shares and other equity".

Individual securities are identified by their respective International Securities Identification Number (ISIN) code. Whenever the ISIN code is not available, reporting institutions should identify the individual security, referring to its main characteristics relevant for statistical purposes: type of security, country and sector of the issuer, currency of issuance and original maturity. Resident investors are identified by means of a company registration number (*e.g.*, the fiscal number in the case of companies). For non-resident investors, the reporting institutions use their own codes but also provide information on the name, country of residence and institutional sector of the investor. In both cases, data on households are reported in aggregated terms, by investor country.

The main data sources as regards securities issues are:

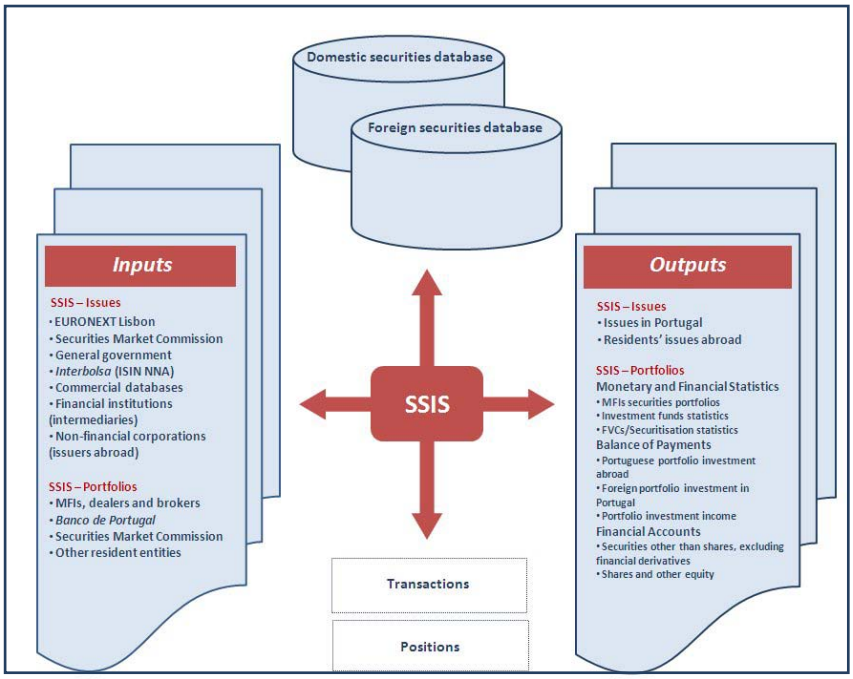
- Euronext Lisbon
- The Securities Market Commission (acting as the national supervisory authority for securities markets)
- The general Government
- Interbolsa (the ISIN national numbering agency in Portugal)
- Commercial data providers
- Resident financial institutions acting as intermediaries in issues of commercial paper by corporations
- The corporations themselves (when issuing abroad).

As for securities holdings, the reporting institutions are, primarily, resident monetary financial institutions (MFIs) and securities brokers and dealers – acting as custodians for the securities portfolios *(see Figure 2).*

MFIs, investment funds and other residents with securities held in custody outside the resident financial sector report directly. The information reported, on a monthly basis, with a lag of 12 working days after the end of the reference month, refers both to flows (purchases and sales) and to end-of-

period positions. Flows are valued according to the respective transaction value and stocks may be valued according to market, acquisition or nominal value of the securities (by this order of preference).

Figure 2 *– The SSIS*



Apart from reducing the reporting institutions' response burden (as they do not have to aggregate individual basic data), the system enhances the data validation procedures, promotes consistency across the various statistical domains, and offers a timelier and more efficient response to *ad hoc* data requests from the users. In addition, the system allows for the compilation of more elaborated statistical outputs, such as the so-called "from-whom-to-whom" tables for securities. SSIS data are also used in the assessment of exposures on the balance sheets of resident financial institutions.

The volumes of data processed and stored in the domestic and in the foreign securities databases, covering both transactions and positions, give a hint on their current size:

- More than 90 thousand shares, 170 thousand debt securities and 10 thousand mutual funds shares/units stored.
- About 250 thousand entities (issuers and/or investors) registered.
- Over 300 thousand registers relating to portfolio data (flows and stocks) processed monthly.

The main statistical outputs extracted from the SSIS comprise:

- Securities issues in Portugal (either by residents or non-residents) and residents' issues abroad.
- Securities portfolios – to be used in the compilation of monetary and financial statistics (e.g., investment funds statistics and securitisation statistics), balance of payments and

international investment position statistics (e.g., portfolio investment) and financial accounts (e.g., securities other than shares excluding financial derivatives and shares and other equity).

The SSIS has also been used to liaise with the Centralised Securities Database (CSDB) developed within the European System of Central Banks (ESCB).

b. Central Credit Register database

The *Banco de Portugal* is responsible for the Central Credit Register (CCR), an administrative database that stores credit-related information supplied by the participants (basically all resident credit-granting financial institutions). The Portuguese CCR was established in late 1978 and has been managed by the Statistics Department since 1999. In 2009 the system supporting the CCR went through a significant overhaul. Along with several technical improvements, additional details to the data collected and a more robust identification of private individuals were implemented, based on the personal tax identification number.

The primary objective of the CCR is to assist the participating institutions in their assessment of the risks attached to granting credit. However, according to the CCR legal framework, data from this repository can also be used for other purposes, *inter alia*: compilation of statistics, financial stability analysis, supervision and regulation of credit institutions and other financial corporations, economic research and the conduct of monetary policy. Confidentiality of individual information is guaranteed by law. In addition, the CCR is fully compliant with all the requirements for individual data protection as laid down by the Portuguese Data Protection Authority.

Information (on a borrower-by-borrower basis) about each of their clients' credit liabilities is submitted by the participants within a deadline of 6 working days following the end of the reference month, provided that its total value exceeds EUR 50. Approximately after two weeks, the *Banco de Portugal* aggregates the data for each borrower and returns to the participating institutions information on their own clients, with no identification of the individual institutions that granted the loans. Additionally, a participant may have access to information concerning individuals or entities other than its clients, whenever there is a credit request or an explicit authorisation to consult the database.

The information stored in the CCR database essentially refers to outstanding amounts of credit granted to individuals and entities (including non-performing loans and loans that were written-off but for which repayment is still seen as possible), as well as potential credit liabilities representing irrevocable commitments, broken down by:

- Purpose of the loan (*e.g.*, credit on current account, financial leasing, mortgages, consumer loans, credit cards' credit, unused lines of credit).
- Categories of credit (*i.e.*, individual loans, joint loans, personal guarantees).
- Loan status (*i.e.*, on-time, non-performing, written-off).
- Type and value of collateral.
- Original and residual maturity.
- The number of days a loan is past due (in case of default).

- Specific characteristics of the loan (*e.g.*, securitised loans, syndicated loans, loans used to back mortgage bonds, loans used as collateral in Eurosystem credit operations).
- Currency denomination of the loan.
- Country where the loan was granted (to cover loans granted to residents by foreign branches of Portuguese credit institutions).

The sheer size of this database provides a good indication of its informational potential as well as of its capability to meet the different foreseeable uses:

- 5.9 million private individuals and over 285 thousand corporations registered.
- 200 participants, covering all the credit-granting financial institutions.
- 15 types of financial products.
- 22.5 million records per month, on average.

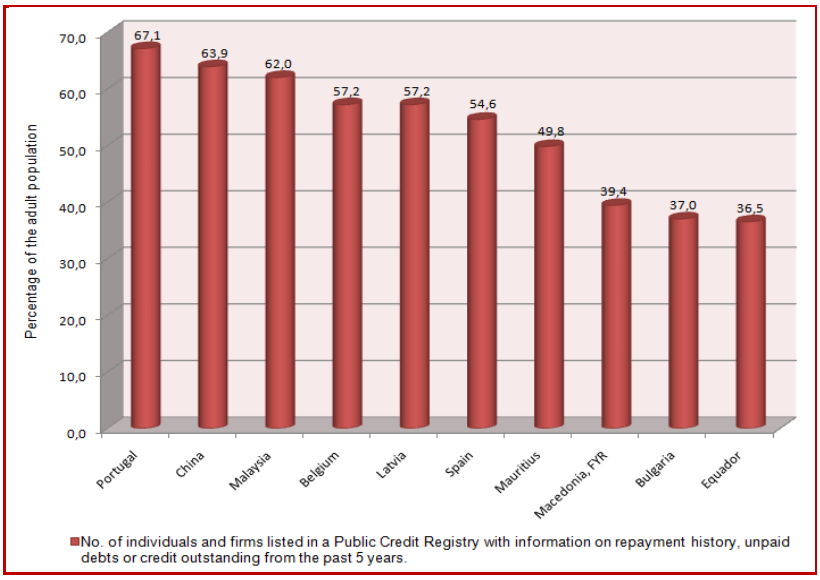
The CCR database also takes in information on the credit liabilities of the Portuguese corporations *vis-à-vis* financial entities in other Euro area countries (currently, Austria, Belgium, France, Germany, Italy and Spain), which is available through the interchange of information among the European CCRs signatories of the 2003 "Memorandum of Understanding (MoU) on the exchange of information among national central credit registers for the purpose of passing it on to reporting institutions". The regular exchange of information among European CCRs is made on a monthly basis (with the exception of Belgium and Germany, which participate on a quarterly basis) and covers borrowers with credit liabilities higher than EUR 25 thousand.

One of the most positive developments as regards the Portuguese CCR has been the steady improvement in its coverage, which has also been instrumental in making it possible the regular publication of statistical information based on this data repository. Currently, the CCR covers about 99 per cent of the overall credit balances reported within the scope of the monetary and financial statistics of the *Banco de Portugal*, with the possible methodological differences between the two systems appropriately factored in.

Moreover, the Portuguese CCR ranks first place in the World Bank's public credit registry coverage indicator *(see Figure 3)*, which reports the number of individuals and firms listed in a public credit registry[2] with information on repayment history, unpaid debts or credit outstanding from the past 5 years. The number is expressed as a percentage of the adult population (*i.e.*, the population aged 15 and above).

[2] In this context, *"a public credit registry is defined as a database managed by the public sector, usually by the central bank or the superintendent of banks that collects information on the creditworthiness of borrowers (persons or businesses) in the financial system and makes it available to financial institutions"* (The World Bank, 2011).

Figure 3 *– Public credit registry coverage*



Source: World Bank, "World Development Indicators 2011"

The use of CCR data for statistical purposes has resulted in a significant improvement in the quality of *e.g.* monetary and financial statistics and national financial accounts, as it has enabled greater accuracy in the classification by institutional sector of the counterparties and additional breakdowns to the existing statistics (*e.g.*, by type, purpose, institutional sector, branch of economic activity, region and corporation size).

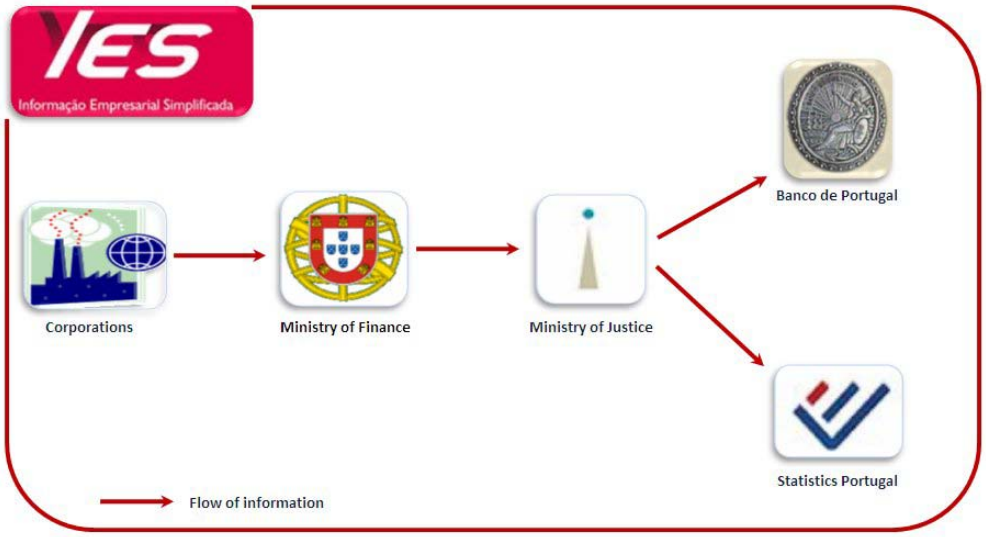
CCR data was also particularly useful in meeting the new European Central Bank (ECB) requirements on securitisation without having to increase the reporting burden on Financial Vehicle Corporations (FVCs). Furthermore, these data have been used in the assessment of exposures on the balance sheet of resident financial institutions, allowing for a timely and efficient response to ad hoc data requests from users.

c. Central Balance-Sheet Database

The Central Balance-Sheet Database (CBSD) of the *Banco de Portugal* was established in 1983, even though it only started operating effectively in 1987 (with data relating to 1986), when the coverage of its annual survey was enlarged to encompass the entire manufacturing sector. Over the ensuing years many improvements were made to the database. However, only in 2000 the CBSD started covering all sectors of economic activity. In the meantime, sampling methods were introduced aiming at getting the best possible coverage of the activities undertaken by the selected non-financial corporations, both in terms of activity and enterprise dimension – a move that was followed by more robust statistical results. Given its experience in the field of the CBSD, the *Banco de Portuga*l actively promoted the implementation of a reporting system for annual corporate accounts, which was completed in 2007, when the *IES* (a Portuguese acronym for *Informação Empresarial Simplificada*, meaning literally "simplified corporate information") was launched. The *IES* is the result of the joint efforts of four distinct public entities – the Ministry of Finance, the Ministry of Justice, Statistics Portugal (the Portuguese national statistical office) and the *Banco de Portugal* – and consists of a

yearly submission of information by corporations, in a single, paper-free, electronic form, to fulfil reporting obligations of accounting, fiscal and statistical nature *(see Figure 4)*.

Figure 4 – *The IES*



The *IES* arrangement allowed the *Banco de Portugal* to discontinue the former, non-mandatory, CBSD annual survey; moreover, given that some of the information needed for external statistics purposes became available within this framework, it made it possible for the *Banco de Portugal* to lighten its foreign direct investment surveys. As a result, the response burden for corporations was significantly reduced while, at the same time, the quality of statistics increased.

The coverage of the CBSD moved from 5 per cent of the total number of non-financial corporations up to 100 per cent (more than 350 thousand companies), whereas the number of variables collected rose from around 600 to more than 1,600. In general, corporations provide information with a 6 months' lag after the end of the reference year, which also represents an improvement from the previous situation (a time-lag of 10 to 12 months).

Data, submitted on a mandatory basis, refer to: (i) basic identification information; and (ii) comprehensive accounting data (balance sheets and income statements) on an unconsolidated basis.

Currently, the CBSD information is widely used for a variety of purposes, *inter alia*:

- Compilation of aggregate statistics on non-financial corporations.
- Submission of internationally comparable statistical aggregates to the BACH (Bank for the Accounts of Companies Harmonised) and the ESD (European Sectoral References Database) databases.
- Dissemination of the so-called enterprise and sector tables, which comprise a number of annual indicators for sector of economic activity / size classes of non-financial

corporations. Among other uses, these data allow every company participating in the aggregates of sector tables to gauge its relative position within each aggregate.

Several other statistical domains use CBSD information as an input. For instance: data on trade credits, own funds for non-listed companies, inter-company loans, non-financial corporation's contributions to pension funds and loans granted by private shareholders are used in the compilation of the national financial accounts; external trade (services), trade credits, foreign direct investment and loans granted by foreign credit institutions supplement the production of external statistics. Also, the CBSD contributes to the regular updating of the earlier-mentioned business register.

3. Going one step farther by using the available data more efficiently

In an ongoing effort to reduce respondent burden and to improve the overall quality of its statistics, the *Banco de Portugal* has been working to increase the use of micro-databases and item-by-item reporting. Notably, this approach has permitted, *inter alia*:

- To improve the responsiveness to users' requirements, particularly those arising from *ad hoc* information requests, with proven results in reducing or eliminating data gaps and in monitoring and assessing developments in the Portuguese financial system, *e.g.* in connection with the recent global financial crisis.

- To curtail the (very demanding, in terms of use of resources and time) follow-up procedures as regards data collecting schemes, whereby respondents are re-contacted after the initial submission of data, to obtain missing information and/or to verify and, if necessary, to correct questionable data.

- To enhance the quality control procedures (*e.g.* by cross-checking elementary/raw data from different statistical domains), thus increasing the efficiency of the production process and improving the quality of end products.

- To avoid data redundancy, while at the same time expanding significantly on the range of statistics available.

Furthermore, the use of the available micro-databases for the compilation of the Portuguese flow-of-funds within the national financial accounts has proved to be extremely helpful, as it allows for a much better understanding of the interlinks within the economy and *vis-à-vis* the rest-of-the-world. Actually, if need be, micro-data have the potential to support the drilling down of the most summarised levels of data to the most detailed ones, which, in turn, may help to confirm (or to disprove) the trends and developments conveyed by macroeconomic statistics and, concomitantly, to explore and/or to elucidate their possible implications for *e.g.* financial stability analysis and systemic risk assessment.

Developing a business intelligence[3] architecture *(see Figure 5)* capable of enabling efficient data analysis could significantly contribute to meeting this objective.

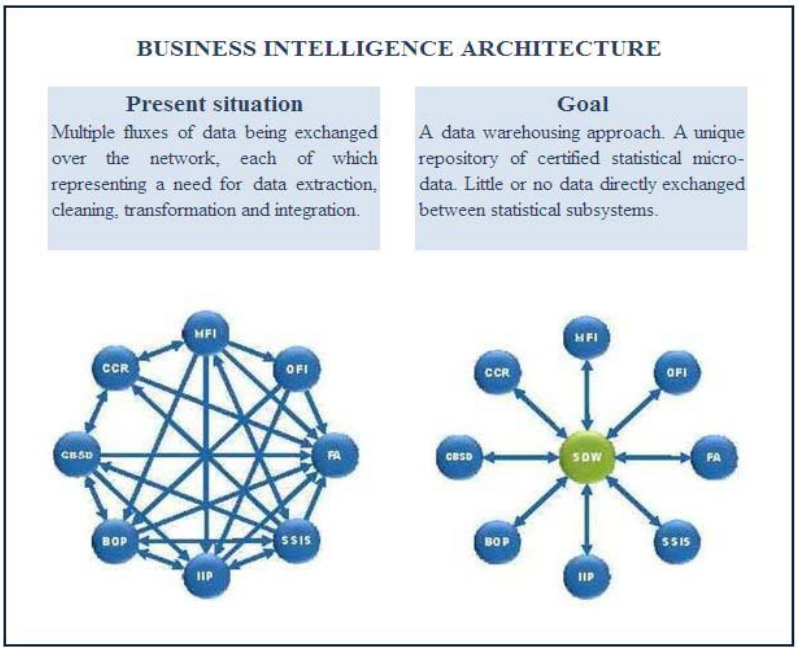
[3] Nelson (2007) describes "business intelligence" (BI) as *"a broad category of applications and technologies for gathering, storing, analysing, and providing access to data to help enterprise users make better business decisions. BI applications include the activities of decision support systems, query and reporting, online analytical processing (OLAP), statistical analysis, forecasting, and data mining."*

With this in mind, the *Banco de Portugal* set off a study in 2008 aiming at defining a business intelligence framework to be used as a reference in all future information technology developments in the statistical domain.

This framework will be built upon three pillars:

- A data warehouse, to guarantee a central access point to all statistical data, independently of the input source or the production process.
- A centralised reference database, to provide common reference data and to enable the linkage of information across different sources and systems.
- A common technological infrastructure, across the various information systems, to facilitate the integration and re-usage of components and to promote data access efficiency and transparency to final users.

Figure 5 *– Business intelligence architecture for statistics*



Such possibility paves the way to a workable strategy to deal more effectively with the data issues arising from financial crises, such as the ones we are facing now. Indeed, rather than relying only on gathering new information on financial innovation-related activities and/or restraining these activities through heavier regulation, it seems more promising to improve the overall efficiency of the statistical framework by further exploring the largely unused statistical potential of already existing data sources, in particular linking micro-data to macro-risks.

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Guidelines for a flexible and resilient statistical system: the architecture of the new Portuguese b.o.p/i.i.p system

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Currently statistical compilers face a challenge of implementing efficient statistical systems that can adapt to constantly changing reality, not only in terms of data requirements and outputs but also in terms of data sources. In this context it is of upmost importance to build flexible and resilient systems. One other matter of concern is the adequate balance between costs (for the compilers and most importantly for the reporting entities) and quality measured as the relevance and accuracy of the data provided to users.

This paper presents the Portuguese experience in designing a new system for the collection and compilation of balance of payments (b.o.p.) and international investment position (i.i.p.) statistics which will replace the current settlement-based system established in 1993. It is based on a business intelligence general architecture designed as a benchmark to be followed by new statistical systems in *Banco de Portugal* which is built upon three pillars: a data warehouse; a centralised reference tables and; a common IT platform.

The new b.o.p./i.i.p. system is described along four major phases (acquisition, processing, exploration and disclosure) highlighting in each phase its guiding principles: centralisation; harmonisation; flexibility; consistency end efficiency.

1. The challenges and the drive behind the change

The current collection and compilation system for balance of payments (b.o.p.) statistics was set up in 1993 upon the liberalisation of the capital movements in Portugal. This system was mostly based upon settlements' data reported by resident banks, which reported transactions with non-residents on their own behalf and on behalf of customers, with all the necessary statistical classification. Furthermore, all entities were obliged to report transactions with non-residents settled without the intermediation of the resident banking sector. This would be the case of transactions settled through an account abroad. The system was completed with other specific data sources such as *Banco de Portugal* own transactions and portfolio investment surveys.

As of late nineties the system developed to incorporate new data sources and to meet new statistical requirements. Statistics Portugal (the Portuguese national statistical office; INE) information on external trade in goods, direct investment annual surveys, securities statistics integrated

system and money and banking statistics are some of the additional data sources incorporated during this period. On the other hand, new statistical requirements include the compilation of international investment position (i.i.p.) statistics (as of 1999 with back data as of 1996) and other requirements, namely those associated with the Portuguese participation in the European Community.

The first motivation for changing the current collection and compilation system is thus to move from a multiple heterogeneous system that resulted from the various developments described previously, to an integrated and coordinated system that takes on board the current complexity in compiling b.o.p. and i.i.p. statistics. Namely the existence of distinct and heterogeneous data sources, with different periodicities and granularity, and new and more demanding statistical requirements. The challenge is to it without overburdening the reporters or the compilers, while insuring a coherent final data set with good quality.

The need for change is emphasised by the current limitations in the use of banks' settlement data. Firstly, globalisation of international markets and integration of payments systems, together with increasing significance of multinational groups that resort to cash pooling, clearing practices or treasury centers, amplified the volume of b.o.p. transactions performed outside the banks' payments system. Secondly, the European banking community pressured for the introduction of restrictions in the statistical reporting. The new Regulation (EC) nº 924/2009 on cross-border payments in the Community establishes a €50,000 threshold for settlement-based national reporting obligations on banks and other payment service providers, for balance of payments statistics, for transactions on behalf of their clients. Additionally it is under review the possibility of establishing a total exemption of such obligations for transactions in euro within the Community. The challenge is to comply with these limitations while maintaining the same level of quality statistics.

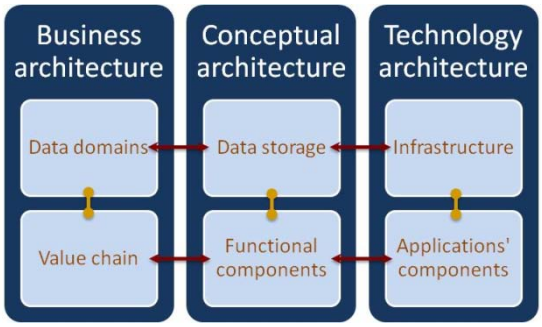
Finally *Banco de Portugal* statistics comprise heterogeneous but interdependent statistical systems, including macro and micro databases. Currently *Banco de Portugal* manages three item-by-item databases: the Securities Statistics Integrated System (SSIS), the Central Credit Register (CCR) and the Central Balance-Sheet Database (CBSD). The ability to provide an efficient and reliable response to statistical requirements and analysis relies not only upon data availability but also in the ability to perform quick multidimensional analysis correlating different data sources and statistical domains. Within this framework *Banco de Portugal* established a goal of building an integrated and coordinated information system for all statistics produced by the Statistics Department. This long term goal is to be achieved by the definition of a Business intelligence (BI) architecture benchmark to be followed by new statistical systems in *Banco de Portugal*. Within this framework the last reason to change the system is to adopt de BI architecture and to benefit from the latest IT tools.

2. Guidelines for the new statistical system

2.1 Business intelligence (BI) architecture

The BI architecture was developed following a three layered approach to the problem: the business layer; the conceptual layer; and, the information technology layer. For each one the structural and functional features of the problem were tackled and analysed, combined to produce an articulated ad coherent perspective of the BI architecture.

Figure 1 *– Business intelligence architecture*

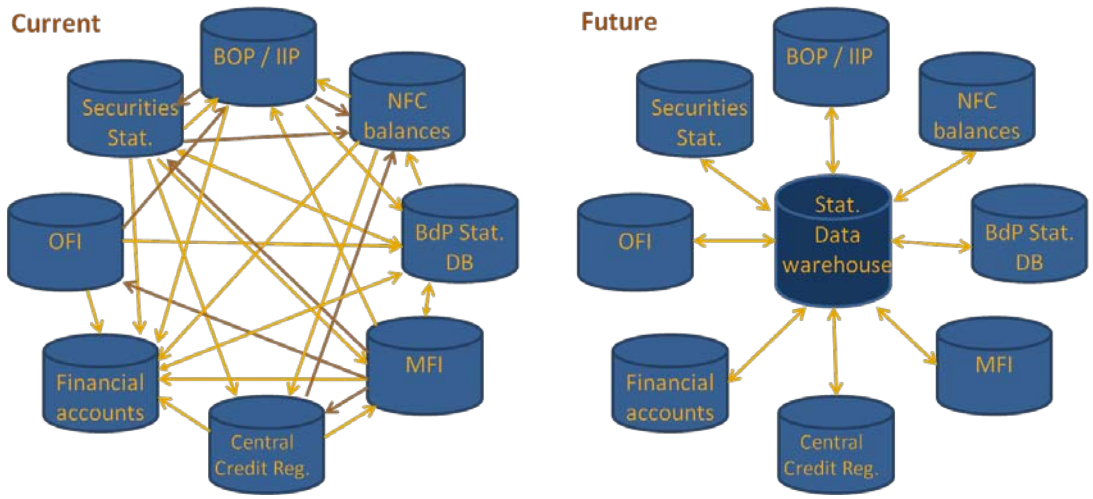


The Statistical Department BI architecture benchmark is built upon three pillars: a data warehouse; centralised reference tables and; a common IT platform.

A statistical data warehouse (SDW). The various statistical systems within *Banco de Portugal* are interconnected, not only at the compilation level as the data produced by a system is used as input data for another system, but also at quality control level in the sense that cross checking data of different statistical domains is essential to ensure a suitable articulation between different statistical outputs and enhance the overall quality of statistics. Each relation implies the development and maintenance of a flow of data that, so far, were ensured in an individual case-by-case basis, following specific approaches. This solution proved to be inefficient and heavier to maintain in the long run, and clearly justifies the development of a data warehouse, which would provide a unique and harmonised repository of data (as detailed as needed).

Each new or revised system will feed its data into the data warehouse and use the data already available in it. This is a gradual process to reach a situation where virtually every data exchange between different statistical systems is established through the single centrally managed database. This will insure a central access point to every statistical data, regardless of the input statistical process, with clear productivity gains in the developing and maintaining of the various data flows. The following figure illustrates the current and future situations.

Figure 2 *– Data warehouse structure: current vs. new*



Centralised reference tables. The second pillar of the BI architecture benchmark is the existence of centralised reference tables, which provide a common ground in terms of reference data and facilitate the interlinking between different statistical systems.

This scheme is already in place within *Banco de Portugal* for several years. A technical team identifies reference data of interest for several domains (statistical, supervision, accounting or other); defines the owner of the data and provides the tools for updating and managing it; ensures the storing and maintenance of the data; and, supplies the data to all the users throughout the *Banco de Portugal*. Some of the reference tables already considered within this scheme refer to countries, currencies, institutional sectors, maturity breakdowns and financial entities. Currently efforts are being made to establish a common reference table for non-financial entities, covering structural and quantitative features (the former include information like name, fiscal number, residency, economic activity classification and institutional sector classification whereas the latter refers to other variable features like capital and number of employed people).

A common IT platform. The consistent usage of a common technological infrastructure across the statistical systems facilitates the integration and re-usage of components, promotes data access efficiency and communication between statistical systems. The IT Department carried out a preliminary analysis and sanctioned a solution based on Microsoft (SQL Server 2008) for the structural components and SAS for functionalities in the domain of statistical analysis and analytical workflow. Microsoft has also been indicated for other utilities such as multidimensional models, ad hoc analysis and dashboards.

2.2 Other guiding principles

The maximisation approach. One other guideline valued in the development of the new system is the maximisation approach. Regardless of the statistical reporting requirements in terms of output, and the currently available source data, the entire b.o.p. and i.i.p. statistics will be compiled with the maximum detail and on a monthly basis. The database that supports the compilation of these statistics will have a common structure that comprises all the relevant dimensions. This approach better guarantees the coherence between different breakdowns and across periodicities (monthly, quarterly and annual outputs), it also allows to respond to new requirements without the need to change the basic databases structures, or to include new data sources. Obviously the quality of the statistics will depend on the available data sources, but the decision in terms of what to disseminate, and with what detail and periodicity, will be made when crossing to the dissemination phase, and not in the processing phase.

Additionally, whenever possible, the data will be obtained on a micro level, operation by operation, item by item. Although this option requires dealing and managing a large volume of data, it also grants higher compilation flexibility with lower reporting costs.

The powered user approach. It is an essential condition for a resilient system that the user has the ability to adapt the various processes according to different methodologies or *ad hoc* requests, without the need for IT development. This guideline reflects in various stages of the system, namely: the tests and processes are associated to reference tables that can be edited by qualified users; the core

data structure is implemented in MS SQL Server, but whenever possible or necessary, the processes are built in SAS; virtually every analysis can be developed or modified by the user.

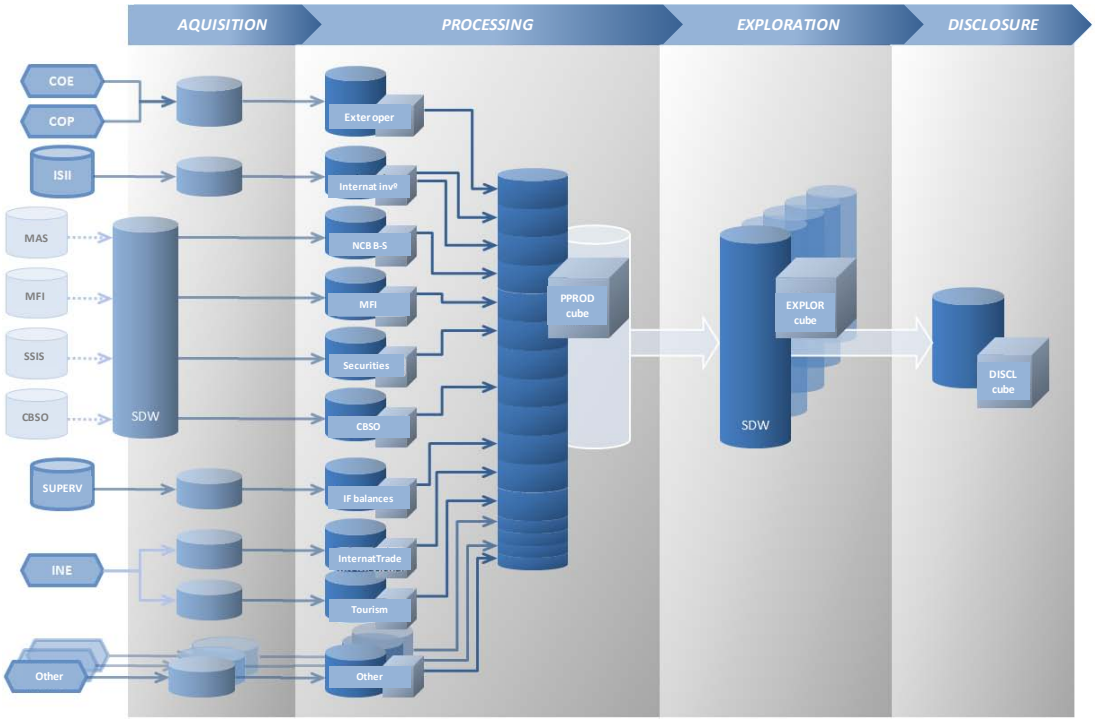
Filling the gaps. Each item was scrutinised individually, considering the available data sources, its strengths and weaknesses. There was an effort to avoid redundancies and to exploit already available databases: if a given information was already reported to *Banco de Portugal* or otherwise available within an accessible and reliable data source, then that information was not considered in terms of the obligation to be imposed on the reporting entities. There was also a concern to identify the entities in the best position to provide the necessary information. This exercise was of particular importance to avoid imposing an unnecessary burden to the reporters and to ensure the quality of the statistics.

3. The new system

The b.o.p. / i.i.p. statistics system is quite complex and challenging. On one hand, there is not a one-to-one relationship with the data sources: each item will be compiled on the basis of a different set of data sources that may, in some cases, differ according the institutional sector. On the other hand, it is essential that the output is coherent and articulated. The b.o.p. is a double entry system but in the actual compilation process each 'leg' of the operation might be reported by different data sources. It is thus a challenge to guarantee that the hole operation in recorded in a coherent fashion and in the correct items.

The new system will be briefly presented following the value chain perspective within the business architecture: Acquisition; Processing; Exploration; and Disclosure. Each phase has a set of different tasks associated, different data storages, and different users, but was developed following some common guiding principles: centralisation, harmonisation, flexibility, consistency and efficiency.

Figure 3 *– Proposed value chain perspective within the business architecture*



3.1. Acquisition

The acquisition constitutes the first phase of collecting input data from external and internal sources. Other tasks performed in this phase are the validation of the file format and the respective source, data loading and a first automatic data quality check.

There are several external data sources, with different features and complexity, with different periodicities and different natures (statistical, accounting, settlements, …) so it is essential that the acquiring process is flexible enough to adapt to each specific source: there is no one-format-fit-all.

The internal sources comprise data from the statistical department but also data provided by the accounting department (essential for the compilation of the Monetary Authority and Reserves assets statistics) and other departments within *Banco de Portugal*. The data from the statistical departments comprises not only statistical data (monetary, financial non-monetary and securities) but also data from administrative databases managed by the department (central balance sheet database and central credit register). Regardless of its nature, the process is very straightforward when the data is stored in the SDW, as data is already validated and stored with the correct (common) codes.

The b.o.p. external source can be organised in the following categories:

- Direct report of external operations
- Settlements data, immediately available within resident banks
- External data from other statistical entities and organisations (including the National Statistical Institute data on external trade of goods)
- Specific surveys targeted to fill in particular and limited gaps

Direct report of external operations is one of the main data source, and one of the most challenging. The shift from a settlement based system to direct reporting by the entities that perform the operations implies an increased burden for these entities, especially for non-financial corporations that were not as familiarised or aware of the statistical requirements The challenge is to handle an extraordinary increase of the number of reporter and to obtain their cooperation in providing good quality data within the established deadlines and according to the required format. This challenge was tackled in a three action plan: first, to define statistical requirements according to the perspective of the reporting entities. This requires an additional effort from the compilers that, within the acquisition phase, have to convert and standardise the data according to the b.o.p. and i.i.p. perspective. Secondly, to develop several auxiliary tools to support the reporting, namely by using the banks' settlement data. A reporting entity has three ways to submit the data: to upload a xml file generated internally by its IT system; to access the online application available in *Banco de Portugal* website and manually introduce the required data; or, through this same application, to access the payments data provided by banks referring to operations preformed to their own entity, and to complement it with the required statistical information (like for example the purpose of the transaction). Thirdly, to feedback useful maps and reports to the reporter, calculated on the basis of available data within the *Banco de Portugal*. This third action is essential to change the viewpoint of the non-financial corporations, that consider the statistical obligations as just a cost and neglect to consider the knowledge and information one can obtain through the statistical data.

All the interaction with the direct non-monetary reporters is facilitated and enhanced by the creation of a web page within *Banco de Portugal* external site dedicated to these entities. Within this web page non-financial corporations can submit the data (regardless of which of the three methods was chosen), have on-line access to some applications but also receive feedback on the quality of the file submitted and on the data itself, as well as an easy access to useful information (like guidelines and Instructions). This is intended to be a restricted area, with user id and password validation, where the reporting entity will have easy access not only to statistical applications and tools but also confidential information concerning the entity itself.

This restricted web page represents a first step in establishing a new relationship between *Banco de Portugal* and non-financial providers of information, and confirms not only a repositioning of *Banco de Portugal* but also the growing importance of these institutions.

3.2. Processing

The processing phase is where b.o.p., i.i.p. and other statistics are compiled, and is the core of the system It comprises two sub-phases: a pre-production phase where data quality control, analysis, editing and managing is performed taken in consideration the characteristics and specificities of each data source; and the production phase where all the data is transformed to fit an unique common format, considered suitable for the compilation of statistics.

The pre-production phase is specially focused on quality control: internal coherence of each data source; cross validation between different data sources; outlier detection. Data editing resulting from value correction, data estimation and annotation is equally important within this phase. In the last stage, it is decided which data is kept on to the production phase. These data is transformed and standardised to a common statistical format.

In the production phase the quality control is performed on a more aggregated level, a common database comprises not only the actually reported data but also calculated and derived measures and estimated data. The core data structure is implemented in MS SQL Server, but most processes are built in SAS, making use of its specialisation towards statistical operations, and also allowing for these processes to be adjusted by power users, whenever a different methodology must be implemented.

The production database stores all data relating to the current processing cycle, and although presenting a common structure, it maintains memory of the origin of the data. In fact, for the same item there might be various data sources that are complementary or concurrent, so, for each specific item, data sources they are classified as primary data, supplementary data and cross check data. The actual item will be calculated by applying a predefined combination of the available data.

It is important to stress that both b.o.p. and i.i.p. are compiled within the same database, guaranteeing an articulation between them. For the same reason, although i.i.p. is only disseminated quarterly, there will be a monthly simulation of this statistics.

The final stage of this phase will be the decision in terms of the data to release, internally to other statistical systems and externally, based on the quality and relevance of the data.

3.3. Exploration

The exploration phase is centered in using the data previously compiled and checked by b.o.p./i.i.p. compilers. It mainly comprises exploration management tasks such as data delivery and reporting, dimensional analysis and time series analysis. The exploration database of the b.o.p./i.i.p. statistics are included in the SDW and have to comply with the rules and conventions that have been determined. The data will be accessed by different type of users within *Banco de Portugal*, from other statistical units to economists of the research department. Each user will have different levels of access to the data but, as a minimum, the data exported to this database will have to have the detail necessary for the most demanding user.

3.4. Disclosure

The disclosure processes are focused on the statistical data dissemination obligations to external entities and also for the general public, it comprises tasks related to statistical publications, statistical reports distribution and output to external databases, namely BDIE (statistical time series database of *Banco de Portugal)* and BP*stat* (a multidimensional statistical dissemination system). The disclosure database presents a lower level of detail and is analysed according to confidentiality and disclosure practices of the *Banco de Portugal*.

4. Conclusion

The b.o.p. and i.i.p. statistical system is a very complex one, dealing with multiple data sources and different reporting requirements and obligations. Currently, due to several factors, this system has to be revised giving the opportunity to embrace a new business intelligence architecture and follow other guidelines to ensure a coherent, integrated, flexible and resilient systems. It was also considered the adequate balance between costs (for the compilers and most importantly for the reporting entities) and quality measured as the relevance and accuracy of the data provided to users was also considered.

The new system is briefly described along four phases: Acquisition; Processing; Exploration; and, Disclosure, presenting the main points in each phase. A special emphasis is given in terms of the acquisition of data from direct reporters, one of the main data sources and one of the most challenging, with the development of supporting tools and a restricted web page within *Banco de Portugal* external site dedicated to non-financial institutions.

Discussant comments on session IPS 111: Challenges in improving the measurement of the government financial position and in the classification of units as public or private

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The session covered issues relating to the classification of institutional units as public or private, in the framework of compilation of statistics. In particular, two papers about the consequences, in general government accounts, of the financial crisis that is ongoing since 2007, were analysed: «Treatment of Special Bank Interventions in Irish Government Statistics», by Mary Cussen & Mick Lucey, from the Central Bank of Ireland and the Irish Central Statistics Office, respectively, and «Differences in the Design of Rescue Units and its Impact on Government Finance Data» by Albert Braakmann & Thomas Forster, from the German Federal Statistical Office.

A short description of the impact in government debt of the financial crisis in several European countries was provided. A comprehensive characterisation of the existing rules on the delimitation of the general government sector was also presented, in particular focusing on the borderline between entities involved in financial intermediation and general government.

The paper from the Irish colleagues described the interventions made by the Irish government in the financial sector in the context of the financial crisis, and showed that the impact of these interventions in the accounts of general government was very significant. The paper discussed the classification, in national accounts, of a company created by the government to acquire impaired assets from banks. This entity was classified as a financial corporation, in accordance to the existing rules adopted by Eurostat for interventions during the current financial crisis. The classification of nationalised banks was also raised by the Irish paper. In fact, a significant part of the banking sector in Ireland is now under government management and some of these banks have lost part of the features of financial intermediation. The paper discussed the conditions in which these public entities should be classified in the financial corporations' sector or, conversely, in the general government. Finally, the authors argued that, as a result of the financial crisis, the attention on government data increased and led to the enhancement of the methodological treatment of operations, of transparency in transmitting information on government interventions, including contingent liabilities, and of timeliness and frequency of data. The discussion focused on the monitoring of the developments of government operations after they occur, namely, the effective losses of corporations *vis-a-vis* the expected losses, and the impact of a possible reassessment of the methodological treatment adopted when the interventions are designed.

The paper from the German Federal Statistical Office, gave an overview of the guidance on the classification of entities available in the European System of Regional and National Accounts and in

the Manual on Government Deficit and Debt. A special attention was given to the guidance adopted by Eurostat on the classification of units created in the context of the current financial crisis. Subsequently, the paper compared the treatment adopted for the classification of entities engaged in interventions in the financial sector, in three countries: Germany (winding-up agencies), Ireland (loan acquisition vehicle) and France (refinancing scheme for banks). The three cases represent different responses to the financial turmoil. In some cases, government control over the companies was explicit (like in Germany) while in other cases the control was implicit. The three cases showed a very little involvement of shareholders in the risk born by the corporations. The three options of intervention led to different impacts on deficit and debt of the three countries. While in some cases there was a clear frontloading of the impact (Ireland), in other cases this impact is spread over a series of years (as in Germany). The discussion of this paper was centred on the harmonisation of treatment of similar interventions, while the issue of using alternative ways of measuring the level of public ownership was also analysed.

There was also a discussion about the existence of special rules that are used only in the context of the financial crisis. It was argued that these "special" rules may be a consequence of the use of national accounts aggregates (namely net lending / net borrowing) to fulfil legal requirements in Europe (Excessive Deficit Procedure). Finally, the definition of financial intermediation was analysed, in particular the fact that this concept relies mainly on subjective assessments like the amount of risk taken by the entities, the number of institutions served by the intermediary, or verifying if the units are acting on behalf of government.

An integrated analysis of the Portuguese economy: the financial and the real economy

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1. Introduction

Recommendation 15 of the G20 data gap initiative[2] 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.

As Mink and Shrestha (2011) put it, several financial and economic crises, which were characterised by disruptions in the capital flows of key sectors of the economy, made academics, analysts, and policy makers increasingly focus their attention on sectoral balance sheets' underlying vulnerabilities. The current global crisis has highlighted the need to understand financial interconnectedness among the various sectors of an economy and between them and their counterparties in the rest of the world.

The accurate assessment of these interlinkages requires detailed from-whom-to-whom data. In this regard, the availability of micro data seems to be of high importance. D'Aguiar and Lima (2009) and Lavrador (2010) elaborate on the experience of *Banco de Portugal* in managing such databases. In the words of Lavrador (2010), "the analyses that can be build up with data extracted from micro-databases, including the from-whom-to-whom tables and the flow of funds, have valuable contributions to explore how the risk exposures and dependencies across sectors are influenced by

[1] The authors are grateful to André Guerreiro, Bruno Pires, Carla Ferreira, Filipe Morais, João Falcão, Lígia Nunes, Luís Garcia, Paulo David, Pedro Silva, Pedro Tomás, Sérgio Branco and Sílvia Fonte Santa for their valuable comments.

[2] Recommendation 15 states that - The IAG, which includes all agencies represented in the *Inter-Secretariat Working Group on National Accounts*, to develop a strategy to promote the compilation and dissemination of the balance sheet approach (BSA), flow of funds, and sectoral data more generally, starting with the G-20 economies. Data on nonbank financial institutions should be a particular priority. The experience of the ECB and Eurostat within Europe and the OECD should be drawn upon. In the medium term, including more sectoral balance-sheet data in the data categories of the Special Data Dissemination Standard could be considered. — See: ***The Financial Crisis and Information Gaps—Report to the G-20 Finance Ministers and Central Bank Governors***, pp. 8. The IAG comprises the Bank for International Settlements, European Central Bank, Eurostat, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, and World Bank.

developments on assets and liabilities of other sectors. These analyses have revealed that micro-databases can be a future improvement to deal with data gaps, both at national and international level, namely concerning counterpart information. (…) First and foremost, micro-databases allow for the understanding of the different relations established across the different economic agents. Extended to a global scale, with the sharing of similar data across national data producers, the benefits could be spread out worldwide."

The main focus of this paper is to illustrate the importance of compiling financial accounts in a from-whom-to-whom basis and to contribute to a better understanding of the interaction between real and financial activities in the Portuguese economy, particularly for households and non-financial corporations. The remainder of the paper is structured as follows: section 2 describes the main sources and estimation procedures for the compilation of financial accounts in Portugal. In section 3 we analyse the main developments in the Portuguese economy over the last decade, with a focus on the corporate sector and households and the effects of the financial crisis. The interdependencies between the real and the financial side of the economy are also addressed. We conclude in section 4 with some final remarks.

2. Data sources and compilation procedures

The main underlying concept both for the definitions and breakdowns of units, transactions and financial instruments is the European System of National and Regional Accounts (ESA1995).

Following an agreement established in 1998, the responsibility for the compilation of national accounts is split between Statistics Portugal (the Portuguese national statistical office; INE) for the non-financial accounts and *Banco de Portugal* for the financial accounts. The reasoning is that *Banco de Portugal* already produces a cluster of statistics necessary for the financial accounts. The two institutions have set up mechanisms for co-operation and consultation, necessary to ensure a high degree of consistency between the financial and the non-financial accounts. The situation is similar to other euro area countries, where the national central bank often has responsibility for compiling the country's financial accounts. The close collaboration between *Banco de Portugal* and INE leads to better quality in the two types of accounts. This stems, for instance, from the cross-checking of primary information and statistical criteria in a way that reduces the possibility of statistical discrepancies.

Moreover, in the case of the general Government (GG), in January 2006 a protocol of institutional cooperation between INE, *Banco de Portugal* and the Ministry of Finance and Public Administration was put into place in order to coordinate the compilation of the several statistics in the field of that institutional sector. In particular this protocol covers the following objectives: i) definition and update of the list of institutional units of the GG sector; ii) preparation of the (financial and non-financial) annual and quarterly accounts for the GG sector; iii) preparation of government debt statistics; and, iv) monitoring of excessive deficit procedure notification and respective methodological analysis.

The coordination of statistical work and, in particular, of national accounts, is performed in the framework of the Statistical Council (*Conselho Superior de Estatística*).

Supplement 2/2005 to the Statistical Bulletin of *Banco de Portugal* describes the methodological aspects used for compiling the financial accounts, covering the methodological framework, the breakdown by institutional sectors and by financial instruments, information on flows and stocks, sequence of accounts and balances, consolidation, valuation, time of recording, data sources, compilation procedures and dissemination.

Most of the information for the financial accounts comes from *Banco de Portugal* primary statistics: (a) monetary and financial statistics that provide data on monetary financial institutions and other financial intermediaries and financial auxiliaries; (b) balance of payments statistics and international investment position statistics, which provide information on operations with non-residents; (c) the central balance-sheet database, which provides annual[3] and quarterly information on non-financial corporations; and (d) the securities statistics, which provide information on issuances and holdings of debt securities and/or shares. Sources outside *Banco de Portugal* include a number of related organisations listed below in two groups: (a) those that provide information on insurance corporations and pension funds (the *Instituto de Seguros de Portugal*, the *Associação Portuguesa de Fundos de Investimentos, Pensões e Patrimónios* and the *Associação Portuguesa de Seguradoras*); and (b) those that provide information for compiling general Government accounts (*Caixa Geral de Aposentações*, *Instituto de Gestão da Tesouraria e do Crédito Público*, *Instituto de Gestão de Fundos de Capitalização da Segurança Social*, *Instituto de Gestão Financeira da Segurança Social*, and the Ministry of Finance and Public Administration). The compilation of the financial accounts is an iterative process. Specific data is fine-tuned in the light of other data from different sources, with mutual enhancement during the period when the statistics are being compiled.

INE partners the *Banco de Portugal* in the process of harmonising methodologies and putting together the national accounts and it provides additional information on various topics, in particular regarding the GG.

Financial accounts are compiled under the quadruple-entry principle in the sense that most transactions involve two distinct institutional sectors and each operation must be entered twice, once as use (or change in assets) and the other as resource (or change in liabilities). For that purpose the data are organised so as to form a matrix where we have information for the following: creditor sector, debtor sector, financial instrument, and classification of asset/liability side of the matrix allowing the compilation of financial accounts on a "from-whom-to-whom" basis with a very detailed structure[4]. Starting with the primary data, the matrix is built taking into account, wherever possible, the perimeter of institutional sectors along with aggregation by type of instrument and the accounting rules of ESA1995. The sectoral counterpart of each transaction is always recorded. Two points are relevant here: (i) use is made of the information available in each sector; and (ii) information obtained from the counterpart. This situation happens most frequently in non-financial corporations and households. In these two institutional sectors, some transactions are obtained residually, as to balance total assets and liabilities across the different institutional sectors, given that, in general, one side is taken as known (the liabilities side, in general).

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[3] Information compiled using IES - Informação Empresarial Simplificada (Simplified Corporate Information). The IES, formally established by Decree-Law No 8/2007 of 17 January, is compulsory as of 2007 (reporting of data for 2006), allowing enterprises to fulfill four obligations with four public entities via a single yearly electronic submission. The IES consists of an integrated electronic reporting of accounting, tax and statistical data, which enterprises must submit to the Ministry of Justice, the Ministry of Finance and Public Administration, INE and *Banco de Portugal*. The IES comprises annual data on enterprises in significant detail. Annex A requests unconsolidated data on non-financial corporations, namely the legal information laid down in the Official Chart of Accounts, as well as additional information for statistical and fiscal purposes. For example, *Banco de Portugal* has requested the inclusion of a set of additional variables of relevance to the balance of payments, the international investment position and national financial accounts.

[4] A full from-whom-to-whom detail (for all financial instruments) is only available from 2006Q4 onwards and it is not yet published by *Banco de Portugal*.

The sources are set down in hierarchical order, because of the vast array of information and the fact that in many cases there is more than one source for a particular item. Certain resident sectors have good quality data compiled internally (among these are the monetary financial institutions, other financial intermediaries and financial auxiliaries, insurance corporations and pension funds, and general government). It was decided to give priority to these internal sources over other information relating to transactions where they are involved. In addition, where transactions with the rest of the world are concerned, priority is given to information from the balance of payments and the international investment position. Finally, there is a hierarchy established within each sector. For example, in the financial corporations' sector, priority goes to *Banco de Portugal*, followed by the other monetary financial institutions and then the remaining financial institutions.

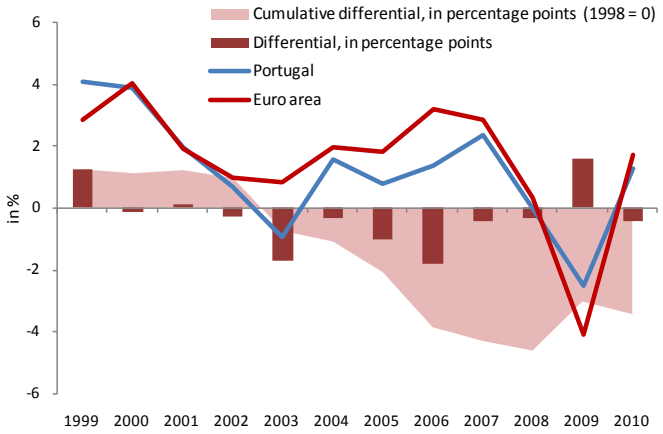
Two of the most challenging aspects regarding the compilation of the financial accounts concern ensuring horizontal and vertical consistency. Regarding horizontal consistency, i.e., the sum of assets equals the sum of liabilities across sectors – for each financial instrument, both stocks and flows, in every period - it is achieved by distributing the residuals by those sectors for which both counterpart and (quarterly) direct data is not complete, typically the non-financial corporations and households. In what concerns vertical balancing, i.e., reconciliation between the financial and the non-financial account, INE and *Banco de Portugal* have been cooperating over the years in order to improve integration of the accounts. In the case of the general Government there is full consistency which is achieved under the framework mentioned above. As for households, *Banco de Portugal* considers that information from the real side is more complete, given the lack of direct sources for financial data, and therefore the financial account adjusts to the non-financial account. Regarding the financial sector, over the past two years there has been an even more intense work between the two institutions in terms of sharing data and harmonising methodologies in order to further improve coherence, although full convergence has not been achieved yet. The same can be said for the rest of the world and non-financial corporations' accounts.

Banco de Portugal disseminates data on financial accounts in the **Statistical Bulletin** and **BPstat | Statistics online**. In particular, in **BPstat | Statistics online**, it is possible to explore the data following a multidimensional approach where the different dimensions, e.g. consolidated/non-consolidated data, financial instrument, transactions/stocks, institutional sector, can be combined. The data are also used for other publications by *Banco de Portugal*, such as the **Annual Report** and the **Financial Stability Report**, and for reporting to International Organisations (e.g., European Central Bank, Eurostat, Organisation for Economic Co-operation and Development, International Monetary Fund, Bank for International Settlements).

3. Recent developments in the Portuguese economy

Over the past decade, Portugal has deepened its divergence in terms of economic growth with respect to the euro area as illustrated in Figure 1, mainly driven by the accumulation of external deficits.

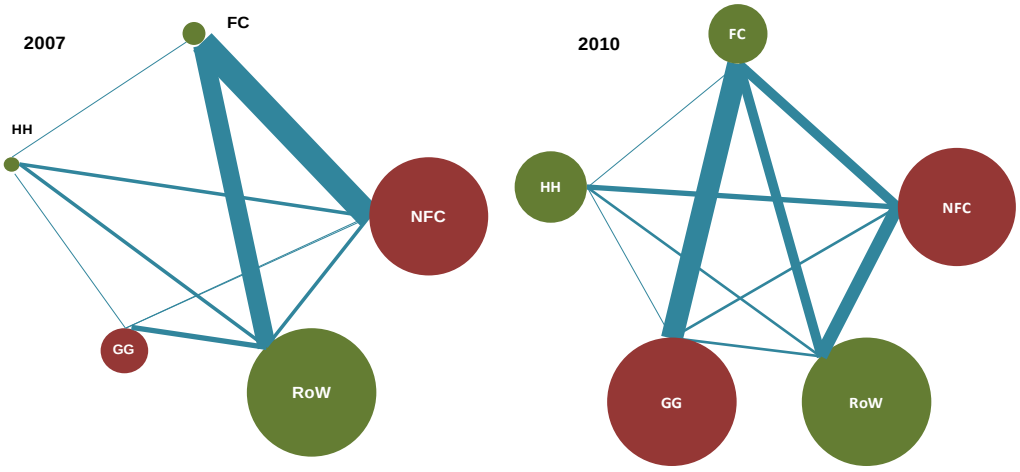
Figure 1 *– Growth differential with the euro area, real growth rates of gross domestic product (GDP)*



This is well explained, in the words of Mr. Carlos Costa on the occasion of his taking office as Governor of *Banco de Portugal* (7th June 2010): "The current account balance deteriorated as a result of a specific combination: on the one hand, easier access to financing and greater exposure to debt among economic agents; and on the other, faltering competitiveness. The result was an economy with higher external public and private indebtedness. On top of this, there was another factor: the structural shortfall in domestic savings, where the situation has in fact worsened, as a result of the fact that the public accounts have leeched with the impact of the international financial crisis and of the budgetary measures introduced to stem the crisis and shore up economic recovery."

Indeed, the Portuguese economy experienced several changes in the last decade. After the credit boom in the late 1990's and early 2000's associated with historically low interest rates, towards the end of the decade, and particularly after the 2008 crisis, the inter-linkages between the different institutional sectors changed dramatically as we can see in Figure 2 which highlights the degree of financial inter-linkages of all sectors in the Portuguese financial accounts. The chart displayed below aims at illustrating the flow of funds (net) observed between the various institutional sectors, comparing the year 2007 with 2010. The diameter of the circle is proportional to the financial saving of each sector (filled in green if positive and red if negative). The dashes' width is proportional to the inter-sector relations.

Figure 2 *– Flow of funds, 2007 and 2010*



Legend: NFC – non-financial corporations; FC – financial corporations[5]; GG – general Government; HH – households; RoW – rest of the world.

[5] The financial corporations include: the central bank (CB); the other monetary financial institutions (OMFI); the other financial intermediaries and financial auxiliaries (OFIFA); and, the insurance companies and pension funds (ICPF).

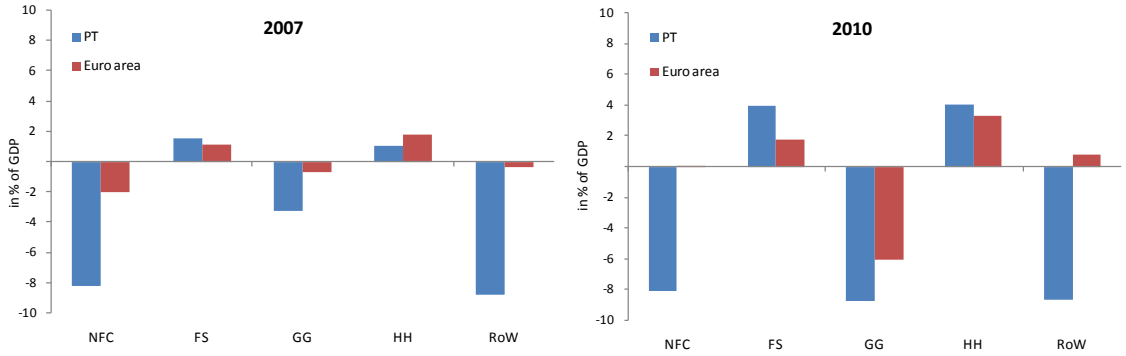
In 2007, the large inter-sector flows were registered in the financing provided by the RoW to the FC, which channelled those funds to the NFC. In 2010, contrarily to what had happened in 2007, the inter-sector flows revealed a strong involvement of the FC, in particular the banking sector, in financing the GG. In this period, the RoW financing was mainly directed to the NFC and the FC.

The borrowing needs of the Portuguese economy, i.e., the inflow of external financial saving amounted, in 2010, to 8.6% of GDP. Those needs of external financing resulted from the fact that the positive financial saving of the HH and the FC (respectively 4.1% and 4.0% of GDP) was insufficient to satisfy the borrowing needs of the GG and the NFC (respectively –8.7% and –8.0% of GDP).[6]

From 2007 to 2010 what is most striking is the large increase of the financing needs of the GG, from 3.2% to 8.7% of GDP, mainly explained by net issuance of debt to finance both increases in expenditure and decreases in the revenue, particularly in 2008 and 2009. Moreover, in 2010, the GG recorded losses amounting to 1.3% of GDP as a consequence of public interventions to support financial institutions; this was partially outweighed by the transfer of three pension funds of a large telecommunications' company to the State amounting to 1.6% of GDP. These capital transfers that occurred in 2010 are important to understand the net lending/borrowing of FC and NFC in that year. Indeed, the FC exhibited an unusual 4.0% of GDP net lending which compares to the average 0.6% of the GDP in the previous 10 years more consistent with their natural intermediation role. Likewise, the NFC net borrowing needs of 8.0% of GDP were negatively affected by the transfer of the pension funds.

In Figure 3 below, we can observe the differences between Portugal and the euro area in terms of the net lending/borrowing for each sector, before and after the financial crisis. The euro area external balance was not significant in both 2007 and 2010, moving from a slight net borrowing in 2007 (–0.3% of GDP) to a net lending in 2010 (0.8% of GDP); on the contrary, the financing needs of the Portuguese economy remained in a very high values in the period (approximately –9% of GDP). The financing needs of Portugal are significantly higher than those of the euro area, explained by above average funding requirements by NFC and GG. For the NFC, euro area figures record a surprising net lending position for the first time in 2010 (0.08% of GDP). Portuguese families reversed its position against the euro area value from 2007 to 2010 after the increase in the savings rate that followed the financial crisis.

Figure 3 – *Net lending (+) / borrowing (–) by sector, in % of GDP: Portugal and Euro Area*



[6] This document was prepared on the basis of the information available as of 13 April 2011. GG net borrowing was revised to –9.1% of GDP on 23 September 2011.

At the current juncture, the Portuguese economy is facing many challenges, and the decisions of economic agents such as HH and NFC are determinant in overcoming some of them, namely the increase in savings and the improvement in the rationality in resource allocation and investment decisions. The need for strengthening the fiscal adjustment and the reduction of the external deficit has inevitable implications for consumption and investment decisions of NFC and HH. Again, as Mr. Carlos Costa puts it, "For Member States which, like Portugal, adopted the euro after a long period of much higher inflation, integration within a monetary area enjoying price stability has been instrumental in improving financing conditions for corporations and households, in terms of both price and volume. This has brought in its wake the capacity to take on more debt. The economic and social players, however, were in general quicker to take up the benefits of participation in the euro than they were to respect the rules on wage and price formation consistent with price stability. On the back of this has come an economy slacker on competitiveness and with an added drawback – the emergence of new players with wage cost advantages. A start has indeed been made on addressing this problem, but a solution for the Portuguese economy has yet to be found. Restoring competitiveness in the tradable goods sector is indispensable for ensuring sustainable economic growth and job creation. This means that price stability, which is a prerequisite for deconstructing the uncertainty of savers and investors, also requires economic agents (corporations and households) to come more quickly to an understanding of the need for curbs on the wage and price formation process; in parallel, it requires greater reliance on the increase in value added per unit of output, either by raising productivity or by rapidly transforming the tradable goods productive sectors and racking up efficiency in non-tradable sectors."

3.1 The non-financial corporations

The high level of indebtedness of Portuguese NFC, as shown in Figures 4 and 5, makes them extremely vulnerable to business cycle fluctuations, which is exacerbated when facing credit constrains by the financial sector as in the current situation. In the case of economies like Portugal where the funding is made mostly through credit granted by the banking system, it is imperative to create mechanisms to promote proper collection and channeling of savings, which has particular relevance for agents who do not have access to capital markets or international financing, as it is the case of micro, small and medium-sized enterprises[7]. In 2010, loans granted to NFC by the FC represented 59% of the outstanding amounts while NFC plus HH – mainly subordinated loans granted by NFC of the same economic group and shareholders – contributed with 29%.

Figure 4 *– Debt-to-GDP ratio*[8]

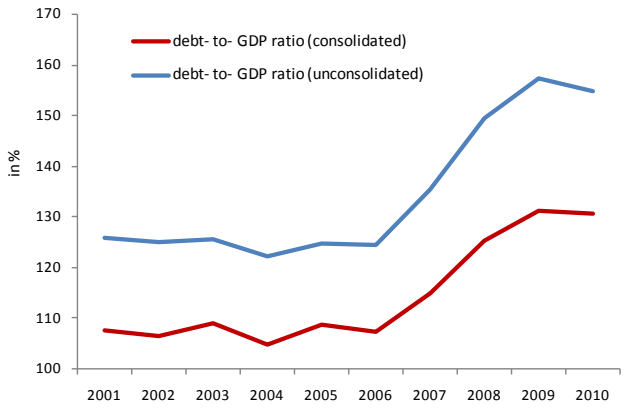


Figure 5 *– Leverage ratio*[9]

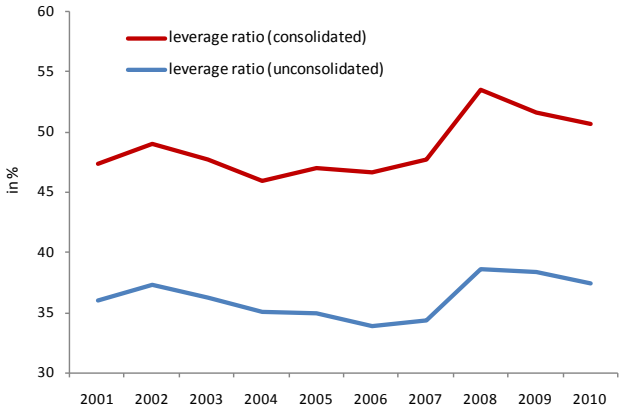


***Figure 6** – Loans' growth rate and interest rate*

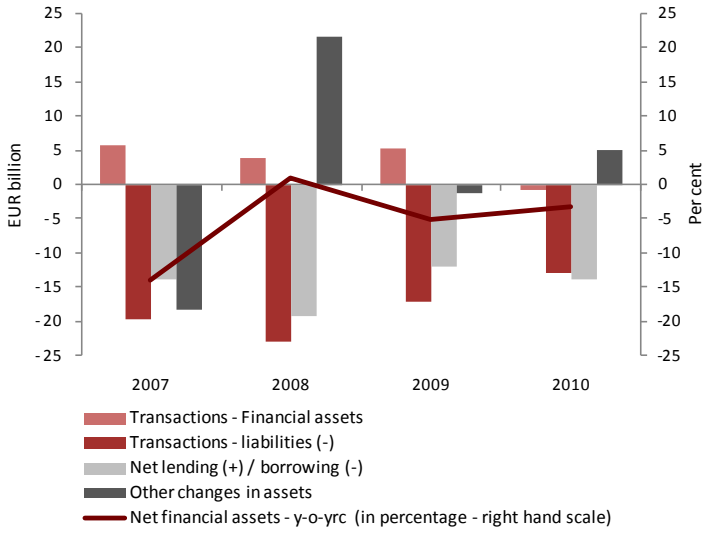
Both leverage and debt-to-GDP ratios reflect the indebtedness increase of NFC after 2006 (Figures 4 and 5). Nevertheless, the growth rate declined in both cases in 2010.

The indebtedness increase was encouraged by historically low interest rates (Figure 6).

The net financial assets of NFC remained barely unchanged between the end of 2009 and the end of 2010, at –163% of GDP and –164.4%, respectively. The revaluation of financial assets above liabilities allowed for a partial compensation of the negative effect of the borrowing needs on the financial wealth of the NFC (Figure 7).

In 2010, on the assets side it was recorded a disinvestment in shares with the sale of the participation of Portugal Telecom in Vivo[10], compensated by the increase in deposits coming mostly from the results of that operation. On the liabilities side, the transfer of pension funds of group Portugal Telecom to the State was preceded by their incorporation in the NFC sector, affecting negatively the borrowing needs of this sector in 2010 (Figure 7).

***Figure 7** – NFC: net financial assets*



The net borrowing of NFC was, in 2010, 8% of GDP (7.1 % in the previous year and 8.2% in 2007). The year of 2008 puts an end to a cycle of consecutive increases in the funding needs of NFC observed since 2003.

After 2008, the reduction in the funding requirements of NFC results largely from a combined effect of lower investment and (slight) gross savings' increase (Figure 8 and 9).

[10] In September, *Portugal Telecom*, via *PT Móveis*, sold its participation in Brasicel, a Dutch company that owned 60 per cent of the Brazilian telecommunications company *Vivo*, to *Telefónica*, a Spanish telecommunications company, which resulted in significant capital gains.

***Figure 8** – Investment and saving*

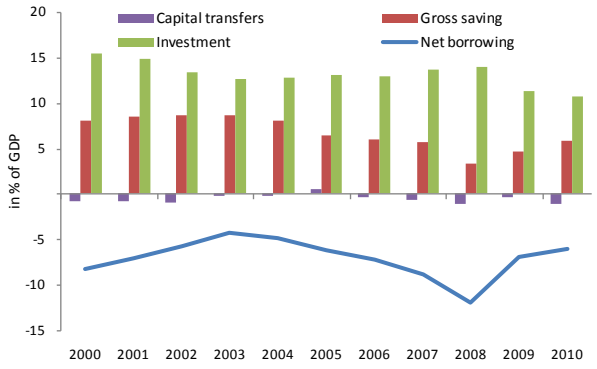
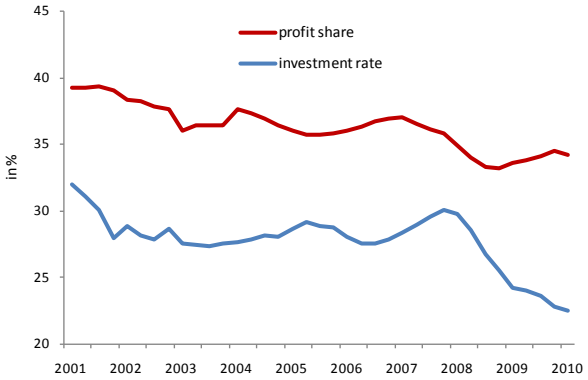


***Figure 9** – Profit share and investment rate*[11]



The structure of financing of NFC in 2009 and 2010 contrasts significantly with that of the two previous years, particularly in terms of the sharp reduction both in loans obtained and issuance of securities other than shares (Figure 10). By counterpart sector, in the past 4 years, a clear declining in the funding by FC was recorded (Figure 11).

***Figure 10** – Liabilities by financial instrument (transactions)*

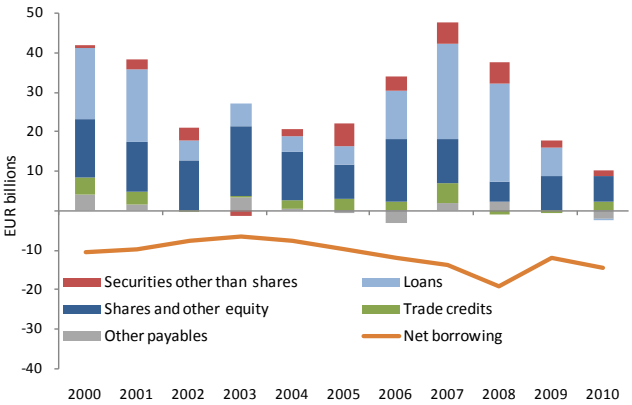
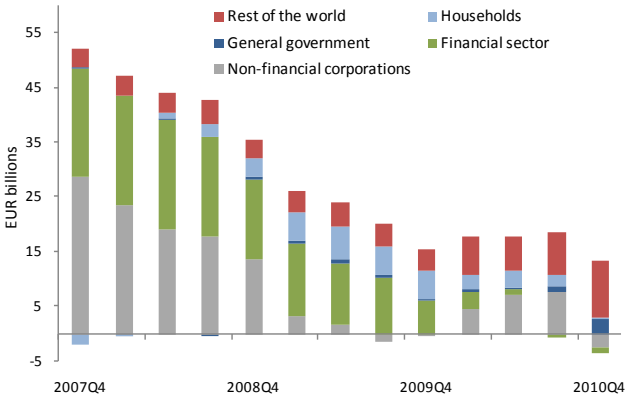


***Figure 11** – Liabilities by counterpart sector (transactions, cumulative four-quarters)*



Liquidity constraints of the Portuguese financial system, in the context of the financial and sovereign debt crises, pose great difficulties to the highly indebted Portuguese NFC.

3.2 The households' sector[12]

For HH, a strong expansion of indebtedness was also observed, following attractive financing conditions, both in terms of volume and price, induced by the integration of the Portuguese economy in the euro area, which enabled the generalised access by families to mortgage and consumption loans.

[11] Profit share equals gross operating surplus and mixed income as a percentage of gross value added. Investment rate corresponds to gross fixed capital formation as a percentage of gross value added.

[12] It includes also non-profit institutions serving households.

Figure 12 *– Loans' growth rate and interest rate*

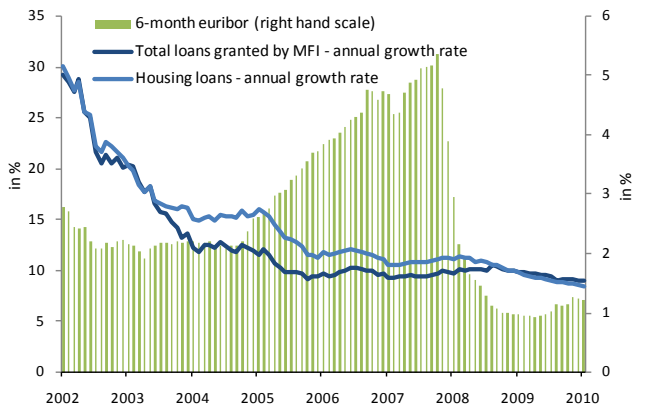
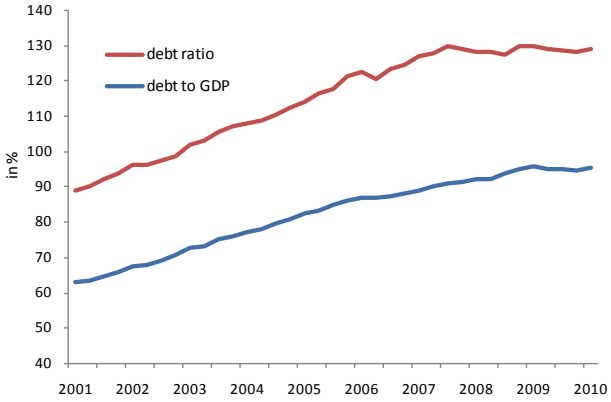
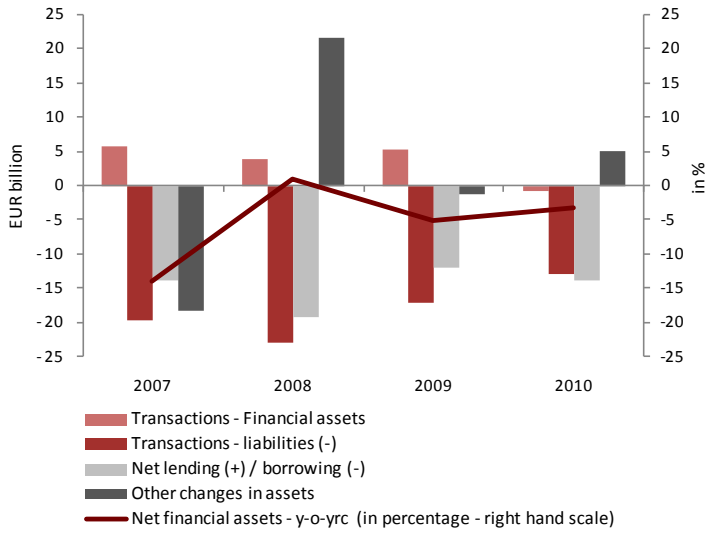


Figure 13 *– Debt ratios*[13]



In recent years there has been a slowdown in the growth of lending by monetary financial institutions to individuals. That slowdown reflected the rise in interest rates observed from the end of 2005 until the end of 2007, and the adjustment made by these institutions regarding conditions for loan supply (Figure 12). This adjustment continued after the financial market crisis, with progressively more restrictive conditions for granting loans to individuals. The upward trend of HH debt ratios was interrupted in 2010 when a (slight) decrease was recorded (Figure 13).

Figure 14 *– HH: net financial assets*



The HH' sector presented, in 2010, a net lending of 4.1% of GDP, which compares to 4.6 % in 2009 (Figure 14) and results from the reduction in the savings' rate (from 10.9% to 9.8%). This change results, essentially, from a slowdown in the financial assets' transactions. On the liabilities side, the level of loans taken remained close to last year's.

At the end of 2010 the net financial assets of HH amounted to 122.9 % of GDP (123.9 % at the end of 2009). However, in nominal terms, it was recorded an increase from 209.0 EUR billion to 212.1 EUR billion.

From 2007 onwards, gross disposable income (GDI) increased and consumption showed an irregular behaviour. The 2010 decline in gross savings is justified by an increase in consumption together with a minor increase of GDI (Figure 15). After 2007, the evolution of saving and investment rates differs substantially. While investment rate record a systematic decrease, savings rate have an irregular pattern (Figure 16), with a recovery path over 2008 and 2009 which was reversed through 2010.

[13] Debt ratio equals household's debt as a percentage of household's Gross Disposable Income, adjusted.

Figure 15 *– Disposable income, consumption and saving*

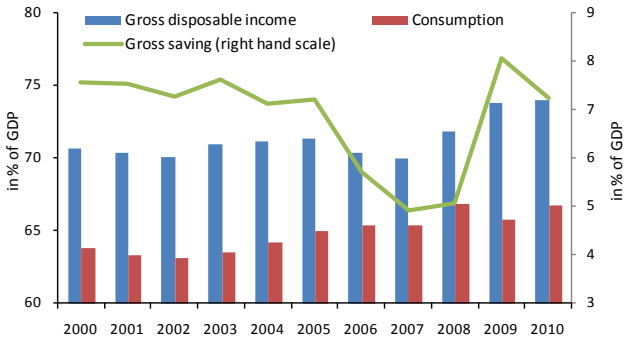
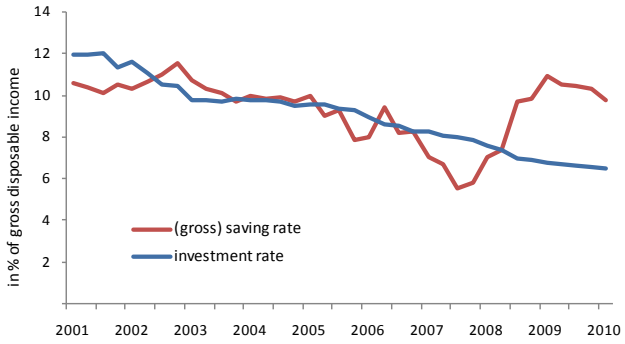


Figure 16 *– Investment and saving rates*[14]



In the financial assets' transactions of HH, in 2010, it is noted a recovery of deposits (Figures 17 and 18). Additionally, there was a substitution of investments in shares and other equity, especially investment funds' shares/units, by bonds and deposits. Similarly to what has been registered since the third quarter of 2009, insurance technical reserves (ITR) constitute a significant part of the financial investment of these economic agents.

Figure 17 *– Financial assets by instrument (transactions)*

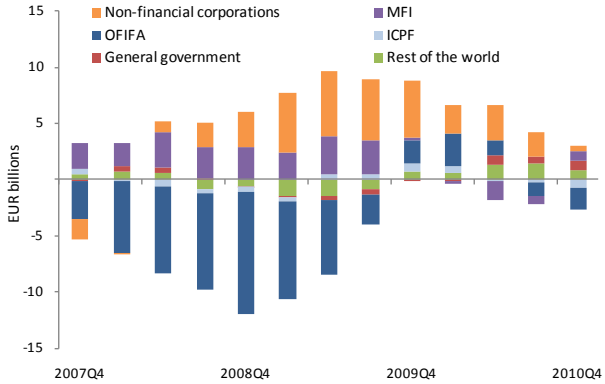
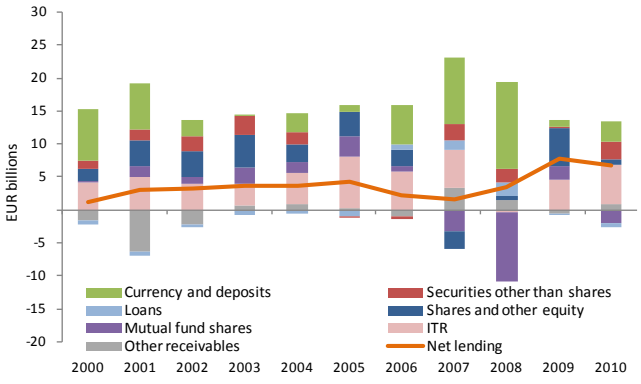


Figure 18 *– Financial assets by counterpart sector (transactions, cumulative four-quarters)*



To recover the stability of the Portuguese economy it is necessary that domestic savings are strengthened, particularly regarding families. However, in the short term, this adjustment will have negative consequences for the domestic demand (consumption and investment).

4. Final remarks

The methodological framework of national accounts is currently under revision and the new European System of National and Regional Accounts is expected to be approved by the European Commission in the course of 2011 for implementation in 2014. This poses major challenges to statisticians in general and national accounts compilers in particular. The compilation systems will

[14] Investment rate equals HH's gross fixed capital formation as a percentage of HH's dross disposable income, adjusted (net adjustment for HH's equity in pension funds reserves). Savings rate equals HH's gross savings as a percentage of HH adjusted gross disposable income.

have to be adapted and new data sources will have to be used to cope with the additional details. This is also a great opportunity to improve the quality and the breakdowns of the data. In the case of *Banco de Portugal*, we aim at having financial accounts for the different sub-sectors within the financial sector, in particular for insurance companies and pension funds separately, distinguishing between households and non-profit institutions serving households, separation by type of flow, i.e., transactions, other changes in volume and price valuations. To the extent possible we also intend to publish from-whom-to-whom data.

As pointed out by Castrén and Kavonius (2009), the financial crisis that erupted in August 2007 has highlighted the need for tools that can analyse risks and vulnerabilities in financial systems in a holistic way. While regular and detailed analysis of the main sectors of the financial system is necessary for identification of developments that may threaten financial stability, it is clearly not sufficient. Modelling the interlinkages between the sectors is equally important as this aims at revealing the channels through which local shocks can propagate wider in financial systems. Integrated accounts and from-whom-to-whom analysis are thus a necessary pre-condition.

The main events that hit the Portuguese economy in the past decade (historically low interest rates, increase in the leverage ratios, declining savings' rate, low economic growth, etc.) and more recently in 2010 regarding the liquidity crisis and the sovereign debt problem that intensified in the course of 2011, are better understood in a setup where the interlinkages between the different players can be measured. For policy makers this constitutes a powerful tool to assess the impact of their policies. Indeed, this will be of particular interest for the quarterly reviews of the specific economic policy conditions set out in the Memorandum of Understanding concerning the financial assistance to Portugal. In particular, the corporate and household indebtedness will be monitored (§2.22) and the authorities will prepare quarterly reports on these two sectors including an assessment of their funding pressures and debt refinancing activities.

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Issues in implementing SNA2008: looking for the data

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Action plan

This paper will focus on the implementation of the European System of Accounts (ESA2010) which is aligned with the SNA2008. In Portugal, the implementation of the ESA2010 requires the coordination of actions between the *Banco de Portugal* and Statistics Portugal (the Portuguese national statistical office; INE). The proposed action plan is staggered in four phases: coordinating methodologies and procedures; adjusting sources and methods; starting data compilation and regular production. Our aim is to have a "shadow" exercise before starting the official reporting, although knowing that some of the required data will only be available in 2011 (FDI Benchmark and Population Census). This study focuses on the main methodological changes in the field of financial accounts and on the initiatives to address them in the case of Portugal.

1. Coordinating methodologies and procedures between the Banco de Portugal and the NSI

1.1 Redefining the boundaries of the institutional sectors

The redefinition of the boundaries of the institutional sectors entails a clear definition of the statistical authorities' main responsibilities, specifically between the *Banco de Portugal* and INE. Moreover, the call for consistency between financial and non-financial accounts requires using the

[1] The authors are grateful to Daniela Miranda, João Falcão and Maria do Carmo Aguiar for their most relevant contributions to this paper.

same delimitation of institutional units and entities (financial and non-financial sectors). The definition of the universe takes a major role in the compilation of statistics; therefore it will entail a significant part of the work regarding the implementation of the ESA2010.

1.1.1 Financial sector

The delimitation of the financial sector is much more detailed according to ESA2010 when compared to ESA1995. At the Central Bank, the accounts are compiled using internal data sources such as money and banking statistics, accounting data from the Banking Prudential Supervision Department and data regularly obtained through institutional agreements in more specific areas, as it is the case of insurance corporations and pension funds. In all this process revising the European Central Bank (ECB) Regulations and Guidelines in the light of ESA2010 is fundamental.

Regarding our internal timetable, we intend to address the issue of the delimitation of the Financial Sector according to the timetable foreseen by the *ECB Working Group on Monetary and Financial Statistics* concerning the impact on monetary and financial statistics. Taking this timetable as a reference, we will start by identifying the reporting units and sectors, in particular the entities comprised in the new sub-sector "Captive financial institutions and money lenders" in the second half of 2011.

1.1.1.1 Holdings Corporations

On the basis of ESA2010, a holding corporation has the assets of subsidiary corporations but does not undertake any management activities. Therefore, the reclassification between head offices and holding corporations requires the evaluation of the activities performed by the entities that belong to the classes 6420 and 7010 of NACE-Rev.2[2].

The gateway involves identifying those entities that could potentially belong to this sub-category by taking the Statistical Units Register as the main data source. Following the identification of this sub-group, we assessed the significance of both the financial and the operational activities of each entity by taking use of the information available at IES[3] and at CBSD[4].

At this stage, we came across some problems regarding the significance of the operational activity of these corporations. ESA2010 leaves room for discretion by stating that holding corporations "do not provide any other service to the businesses in which the equity is held". Following this, we have a number of possible actions and therefore we could: i) exclude those entities which have net operational income and reclassify it as head offices; ii) define a threshold for the net operational income, above which they are considered to have a significant operational activity and should be excluded; iii) implement multi-period analysis of the net operational income figures to assess the regularity of those operations; iv) maintain the classification as holdings of those corporations which have operational income when measuring their output by the sum of costs. As these entities could have large cross-

[2] Specifically classes 64201, 64202 and 70100 of CAE-Rev.3. CAE-Rev.3 is the Portuguese equivalent of NACE-Rev.2. The latter refers to the statistical classification of economic activities in the European Community, established by Regulation (EC) No. 1893/2006 of the European Parliament and of the Council of 20 December 2006.

[3] IES is the Portuguese acronym for the new simplified reporting system for corporate information. IES is the electronic submission of information of accounting, fiscal and statistical natures that companies have usually to remit to the Ministry of Justice, the Ministry of Finance, Statistics Portugal and *Banco de Portugal*.

[4] The CBSD is a database containing economic and financial information managed by the *Banco de Portugal*. The information is based on non-consolidated annual and quarterly data from a relevant sample of non-financial corporations in Portugal.

border financial operations, clear guidance on this subject is needed in order to have a harmonised treatment across countries.

Taking as reference the figures for 2009 in Portugal, our first assessment leads to the reclassification of 3498 entities from the non-financial sector to the financial sector, representing 167,205 million euro in terms of total assets. Nevertheless, excluding all entities which have operational activity leads to a total of 3,292 entities, corresponding in 2009 to 100,511 million euro in terms of total assets. According to the current standards, at the end of 2009, taking supervisory data as the main data source, the financial holdings sector represented only 24,892 million euro in terms of total assets.

Moreover, according to the definition of Special Purpose Entities (SPE), holding corporations which are controlled by a non-resident institutional unit should be classified as SPE within the captive financial sector (please see the next section). Simultaneously, SPE whose principal activity is the provision of goods or non-financial services are classified in the non-financial sector. Therefore, it should be stated clearly that those holding corporations which have operational activity and which are controlled by non-resident entities are classified in the non-financial sector.

In order to have balance-sheet data for holdings corporations, the main data sources that are going to be used are: the Statistical Units Register for the identification of the entities, IES for business data and SSIS[5] for statistics on securities holdings.

1.1.1.2 Special Purpose Entities

The effect of globalisation on statistics is one of the issues that the new manuals aim to tackle. In this context, identifying Special Purpose Entities (SPEs) flows assumes an important role, not in terms of the impact on Gross Domestic Product, but because SPEs are responsible for the intermediation of large amounts of financial flows.

ESA2010 provides more guidance on SPEs. SPEs can be created for different purposes: securitisation, risk sharing, competitive reasons, financial engineering, fiscal reasons or property investing. Those SPEs that "qualify as institutional units and raise funds in open markets to be used by their parent corporation" should be classified as captive financial institutions and money lenders (S.127). Although, sometimes SPEs could be owned by other entity than the one for which it was settled. For example, if a SPE was created for regulatory purposes the consolidation of the accounts within the group could eliminate the analytical interest on these entities.

Intensive research has revealed that a variety of (overlapping) definitions of SPEs exist. As there is no single definition of SPEs, it is left to countries to identify such entities according to their own experience. Therefore, the exchange of country practices in this field is recommended to avoid adding asymmetries to balance of payments statistics.

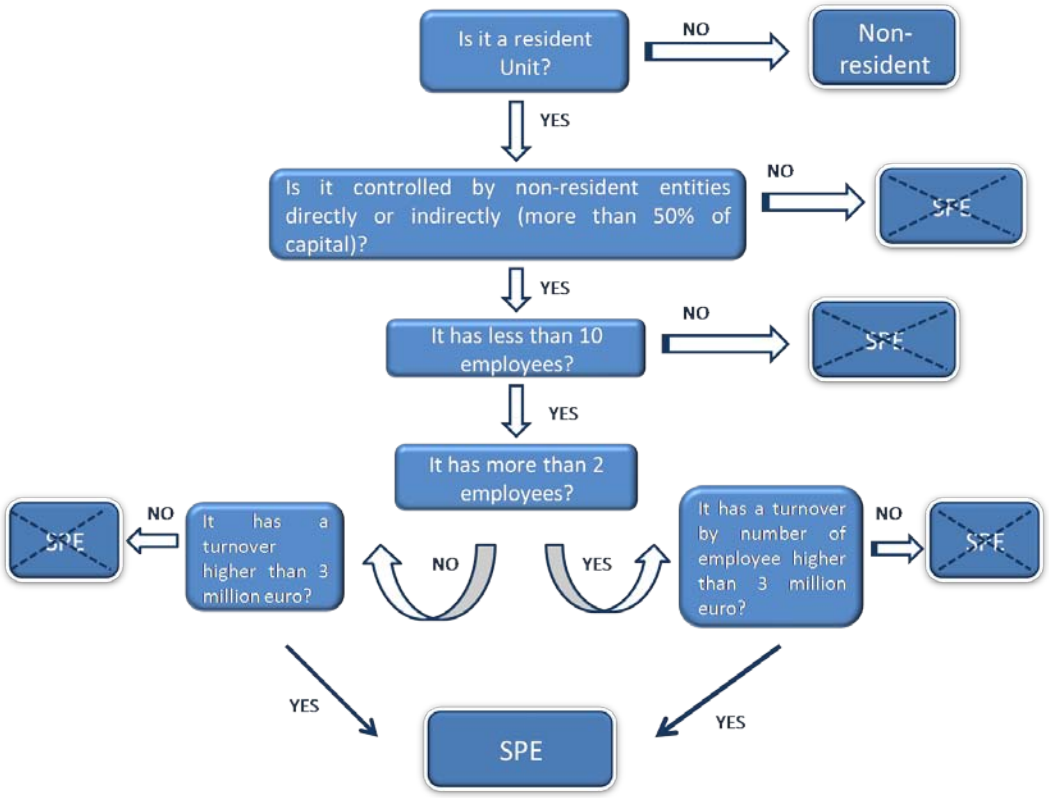
The manuals do not provide a universal definition of SPE, but they give some guidance to help compilers identifying this type of entities. According to the BD4[6], the main characteristics of SPEs

[5] SSIS is the Securities Statistics Integrated System managed by the *Banco de Portugal*.
[6] Fourth edition of the OECD Benchmark Definition of Foreign Direct Investment.

are: few employees; no nonfinancial assets; little physical presence; relation with other corporations (often resident in a territory other than the territory of residence of related corporations); ultimately controlled by a non-resident parent, direct or indirectly; little or no production; group financing or holding activities as the core business.

At national level, by crossing data available from both IES and the International Investment Questionnaire, for the period between 1996 and 2006, it was possible to infer the profile of SPEs and to build a decision tree. This decision tree only applies for cases where we have data available. Nevertheless, qualitative criterions have primacy over the decision tree.

Figure 1 – *Decision tree for SPEs*



ESA 2010 also states that entities with no independence of action should be allocated to the sector of their controlling body. Therefore, clear guidance on the definition of "independence of action" and, in particular, in what is meant by risk and rewards, should be given.

It should be mentioned that one of the clarifications introduced by the ESA2010 is related with the treatment of Government controlled SPEs abroad. ESA2010 states that when a SPE is set up by a non-resident Government unit, their activities shall be shown in the Government accounts. The European Financial Stability Facility (EFSF) is an example of a SPE controlled by the euro area member states. According to the Eurostat decision on the statistical recording of operations undertaken by the EFSF, the "EFSF is an accounting and treasury tool to enable the same conditions for access to

borrowing for members of the euro area, acting exclusively on behalf of them and under their total control". Therefore, this decision states that "the debt issued by the EFSF for each support operation for a member of the euro area must be reallocated to the public accounts of States providing guarantees, in proportion to their share of the guarantees for each debt issuing operation."

1.1.3 Non-profit institutions serving households

The new ESA transmission programme establishes as mandatory the split between households and non-profit institutions serving households (NPISHs). In order to compile the financial account of these sectors, the two major databases of micro data managed in the Statistics Department, the Central Credit Register (CCR) and the Securities Statistics Integrated System (SSIS).

The CCR[7] is an administrative database created in 1978 by *Banco de Portugal* to provide credit-related information to the participants (financial institutions) and to help them in their assessment on the risks attached to extending credit. According to the latest information available in CCR we can see that, in 2010 the amount of loans granted to NPISHs represented 2% of the loans granted to Households, amounting to 2.1 EUR billions. In terms of deposits, according to the monetary statistics data sources, NPISH accounted for 3% of the total of NPISH and households in 2010, amounting to 2.9 EUR billions. This relative share has remained quite stable over time (1% in 1997, the first period for which data are available from monetary and financial statistics). As for external deposits, data is not currently available in the balance of payments and international investment position statistics.

The SSIS database[8] is an information system created in 1999 and managed by the Statistics Department that stores data on securities issues and holdings on a security-by-security and investor-by-investor basis[9].

There are more than 58,000 entities classified as NPISHs, of which around 3,000 entities have information stored in the SSIS database regarding securities portfolio. Out of these 3,000 institutions, 25 account for 90% of total securities holdings of NPISHs. NPISHs are responsible for around 10% of total holdings of households and NPISHs; this distribution has remained quite stable over the last decade.

Total NPISH holdings are not significant and exhibited a dynamic similar to that of households. Nevertheless, a closer look leads to some interesting conclusions. For instance, in 2008, following the financial crisis, there was a significant decrease on shares holdings. However, this decrease was more significant in the case of NPISH, mainly due to the devaluations of quoted shares in which this sector invested.

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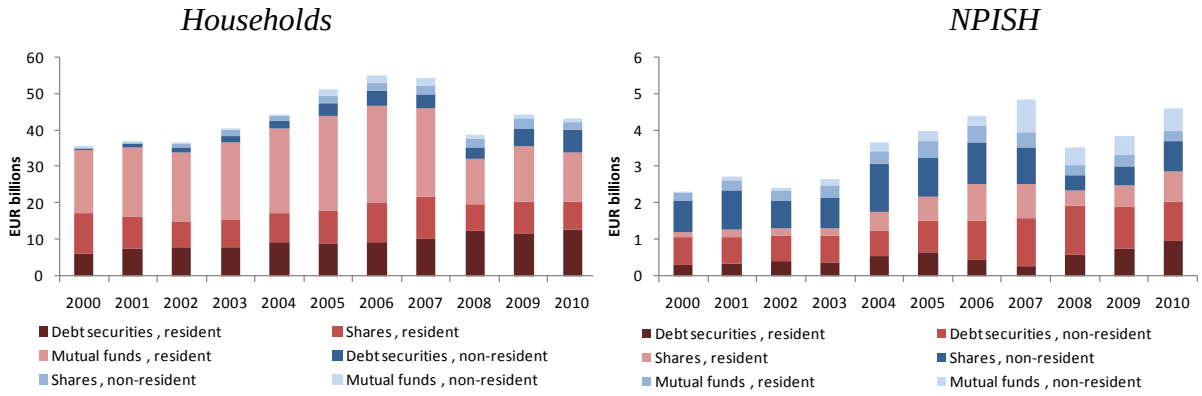
[7] The data reported to this database include, inter alia, amounts outstanding of loans granted to individuals and organisations, by type and purpose, potential liabilities, type and value of collateral or guarantee securing the loan, securitised loans, syndicated loans, loans used to back mortgage bonds and other, and credit defaults. The participants are both suppliers and users of CCR data.

[8] It gathers in a single database detailed data on issues and securities holdings, and includes stocks and transactions of securities other than shares (short- and long-term) and shares and other equity. Information is acquired by ISIN code and afterwards is classified according to the European System of National and Regional Accounts (ESA1995) classification of financial instrument.

[9] See Aguiar (2008), Aguiar *et al*. (2009) and Lavrador (2010) for more details.

Figure 2 – *Holdings of households and NPISH by instrument and residence of the issuer*



The analysis of the holdings by instrument and residence of the issuer (Figure 2) shows that households invest mainly on domestic instruments (80% of total) whereas NPISH holdings on securities issued by non-residents are above 50% at the end of 2010 and were even larger at the beginning of the decade.

1.1.4 General Government

ESA1995 quantitative rules for delimitating general Government will continue to be applied in the context of ESA2010. These rules aim to translate the principle of economically significant prices which is the main criteria used to classify output and producers, as market or non-market. Similarly to SNA2008, there was the intention to apply predominantly a qualitative criterion in ESA2010 for deciding whether an entity should be classified inside the general Government sector. However, the discussions among European experts lead to no changes regarding the option of applying the so-called "50% rule". A non-market producer included in the general Government sector is a public unit where its sales do not cover the majority of its costs over a sustained multi-year period. This analysis is made on the basis of the accounting statements of each institutional unit.

However, some differences were introduced in the new manual. One of the existing differences between ESA1995 and ESA2010 is related with the composition of costs. Besides intermediate consumption, compensation of employees, consumption of fixed capital and other taxes on production, the costs will include the "net interest charge". There is the need to clarify in ESA2010 what is meant by "net interest charge". The term "net" indicates that this figure results from deducting the interest received to the interest paid which is similar to a Financial Intermediation Services Indirectly Measured (FISIM) approach whilst the Government is not a FISIM producer. Specifically, merely flows regarding loans and deposits vis-a-vis financial intermediaries should be considered as consumption of FISIM by the General Government. Therefore, considering the role played by securities on Government operations, a discussion on the composition of costs should be promoted.

Another of the existing differences is related to one of the requirements of ESA2010 (and of SNA2008) which is to include inside general Government all the entities, which sell their output only to Government not competing with private producers (ESA2010, §20.25). Whenever there are several suppliers, a public producer is a market producer if it competes with the other producers through

tendering for a contract with Government (§20.28). These references might imply reclassifying some entities from the non-financial sector to general Government. This impact will differ across countries.

1.2 Encompassing all pension liabilities

ESA2010 foresees a new supplementary table on liabilities with pension schemes in social security covering an information gap in national accounts. It encompasses specific pension schemes such as Government unfunded defined benefit schemes with Government as the pension manager and social security pension schemes. Considerable work has already been done in this respect within the framework of the *Eurostat/ECB Task Force* on the statistical measurement of the assets and liabilities of pension schemes in general Government. One of the main objectives of the *Task Force* is modelling and estimating pension scheme data, and investigating possible methodological issues that may arise. Within this context, benchmark calculations have been carried out by the Research Centre for Generational Contracts of Freiburg University (RCG) for 19 EU member states.

On the basis of this experience the RCG developed a model to calculate pension entitlements for the social security and the Government employee pension scheme in Portugal that will be used as a benchmark to the results of other Portuguese pension models that might be developed in the future. The Freiburg model was accommodated for the Portuguese case. Namely, labour productivity, employment rate and GDP growth were applied for the specific country case taken from the *Ageing Working group* assumptions. Moreover, a three annual per cent real discounted rate was used, which reflects the ten-year average of Euro area ten-year Government bond yield. The estimation accounted also for the existence of two pension schemes. In fact, until 2005 two parallel pension schemes existed: the so called "*Regime Geral*" scheme that included the private sector and the "*Caixa Geral de Aposentações*" (CGA) for civil servants. However, since the beginning of 2006, new employees in the public sector are incorporated in the social security system and consequently, CGA is now a closed system. In this respect, pension entitlements for these two different pension schemes are calculated separately. In addition, with the challenges of an ageing society which put substantial pressure on the Portuguese system, some changes in the calculation formula for pension benefits and payments were introduced. This had also an impact on the model assumptions and final figures.

The implementation of the proposed supplementary table on pension entitlements is a complex task. It involves the collection of several data (both financial and demographic information) from various institutions (Ministry of Finance, Social Security schemes, etc.) and also the development and computation of numeric models. Institutional cooperation at national level is of utmost importance.

1.3 Extending the directional principle to fellow enterprises

Bearing in mind the new requirements of BPM6[10] and BD4 in the field of Direct Investment Statistics, we would have two presentations for these statistics: the standard presentation of balance of payments and international investment position on an asset/liability basis and the breakdown by both economic activity and country according to the directional principle.

[10] Sixth edition of the Balance of Payments Manual.

The presentation on an asset/liability basis is a step forward for the consistency between statistics since it follows the monetary and financial statistics data, as well as other balance-sheets statistics. Additionally, this kind of presentation helps monitoring flows and stocks through information of counterpart sectors.

The directional principle[11] is built on the concept of influence and control, as this would capture the motivation behind a direct investment relation. This type of presentation is particularly helpful in a pass-through economy. Beyond the concept of direct and indirect relations, the new manuals also encompass the relations among fellow enterprises as direct investment operations. In particular, a direct investment relation comprises the investment of a direct investor in his direct investment enterprise, the reverse investment and the investment among fellow enterprises. Therefore, the embracement of the last category in the directional principal requires the identification of fellow enterprises, as well as their ultimate controlling parent.

In light of this, the Portuguese balance of payments Investment Questionnaire was restructured so as to incorporate the new Direct Investment requirements. In particular, the Questionnaire started inquiring the following data: a) designation, ITIN[12] and country of the ultimate owner; b) percentage of voting rights of the holdings of the UO (direct and indirect); c) number of horizontal subsidiaries; d) organisational charts of financial relations; e) additional information of the Direct Investor and horizontal subsidiaries; f) net income paid or to be paid by the resident entity; and g) net income received or to be received by the resident entity.

After the dissemination of the updated questionnaire, a quality control of the information under analyses has to be done, namely through the consultation of both the commercial data sources and the *Eurogroups Register*. In all this process, embracing more entities in the *Eurogroups Register* would be crucial. Moreover, in order to have some quality checks, conferring financial statements and annual reports publically available and obtaining data from financial supervisory sources would be fundamental.

1.4 Financial Intermediation Services Indirectly Measured

Regarding the FISIM methodology, ESA2010 already encompasses the following changes: (i) discontinuation of the FISIM computation for Central Bank (CB) and the restructuring of the Central Bank non-financial account; (ii) setting of the internal and external reference rates by considering namely the maturity and currency breakdowns in the computation; and, (iii) excluding FISIM between financial institutions. Moreover, in the context of the *European FISIM Task Force*, there was some progress regarding implementation issues. The possibility of reflecting credit risk in the FISIM computation was also discussed but there is still work to be done.

The work developed in the context of the *European FISIM TF* advocates the use of different interbank reference rates conferring the maturity and currency of the operations under evaluation. Even in periods of financial markets turbulence the method foreseen lead to economical explainable results.

[11] Under the directional principle, direct investment abroad and direct investment in the reporting economy include both assets and liabilities, and thus, negative values may arise.
[12] ITIN is the individual tax payer identification number.

The interbank reference rates proposed in this approach are the Euribor/Libor for short term maturities and ISDAFIX rates for long term maturities. Alternatively, in the absence of income date by maturity and currency a weighted average of these interbank rates could be applied.

Regarding the Portuguese economy, the adoption of this methodology, as an alternative to the one based solely on Euribor, leads to the decrease of the FISIM produced internally (except for 2008), but to an increase of the impact on the GDP (from 1.13% to 1.37%) justified by the FISIM allocated to the final consumption of households. Moreover, the alternative approach confer some stability to the shares allocated to final demand and to imports allocated to intermediate consumption which causes more stable figures of FISIM allocation measured by the volatility index (from 30.5% to 23.1%).

1.5 Derivatives (excluding employee stock options)

According to ESA2010 financial derivatives represent an autonomous category. Moreover, according to the new manual it is clear that all financial derivatives should be covered by national accounts (e.g. credit default swaps and employee stock options) and that they should be registered in a harmonised way across statistics.

In light of this, an internal work is being carried out at the *Banco de Portugal* in order to assess the consistency among different statistics and between statistics and accounting data. Although there is not a total harmonisation between accounting standards and statistical regulations the discrepancies that were already identified do not have a significant impact. Therefore, by combining accounting data from supervisory data sources with statistical data from the monetary and financial statistics we are able to meet the new data requirements regarding the financial sector. For transactions of financial derivatives by non-financial entities, our data sources are the Financial Derivatives Questionnaire, which encompasses all the transactions between resident and non-resident entities, and information from counterpart sectors. The Financial Derivatives Questionnaire does not include derivative settled outside the resident banking sector and neither information about employee stock options. A possibility is adjusting data sources if business data or information from counterpart sectors reveals to be insufficient.

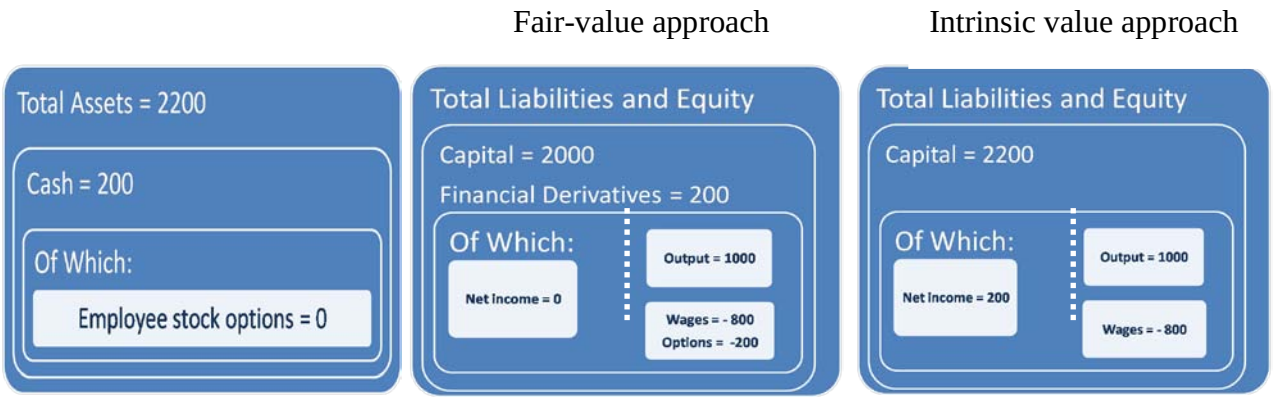
1.6 Employee stock options

At the time of the update of the SNA1993 it was acknowledged that employee stock options (ESO) are a common tool used by companies to motivate their employees and that the SNA1993 did not provide explicit guidance on their treatment, though they were implicitly encompassed in the section on “wages and salaries in kind” (§7.37 – §7.42 of SNA1993).

The revised manuals clarify the treatment that should be followed by stating among others that employee stock option should be considered as compensation of employees, as counterpart to the transaction in the financial account, they should be estimated using fair-value pricing model, given the lack of observable market prices; they be valued at time of grant and accounted over the vesting period.

The implementation of the new manuals allows a further harmonisation with international accounting standards, since from 2004 companies are required to use the fair-value-based method at the granting date and to record this amount over the vesting period. Before that, companies had the possibility to use the intrinsic value approach (stock market price less strike price) which leads to the underestimation of compensation expenses and to an overstatement of company profits as according to this approach the option value would have no value at the time of grant. Even so, in the intrinsic approach the amount corresponding to the employee stock option was implicitly recognised at the balance-sheet through the net income, incorporating the own funds of the company. The setback comes from using, for the period between 2004 and 2016, both accounting and statistical data in the compilation of national accounts given that the mismatch between accounting and statistical standards could increase the discrepancies between non-financial and financial accounts.

Figure 3 – *Fair-value approach vs. intrinsic value approach*



Regarding the Portuguese economy, our proposal would be to include a memo item in the employer-employee data set – *Quadros de Pessoal* (QP) in order to know which part of employee benefits are employee stock options. QP is a mandatory annual employment survey collected by the Portuguese Ministry of Labor and Social Solidarity, which covers nearly all establishments with wage earners. Indeed, each year all institutions with wage earners are legally obliged to fill in a standardised questionnaire. The periodicity of this survey constitutes a drawback that needs to be surmounted through additional data sources.

1.7 Breakdown of insurances technical reserves

In the new ESA, the instrument insurance technical reserves was reshaped to give rise to insurance, pension and standardised guarantee schemes, which are divided into six subcategories:

a) non-life insurance technical reserves (F.61); b) life insurance and annuity entitlements; (F.62) c) pension entitlements (F.63); d) claims of pension funds on pension managers (F64); e) entitlements to non-pension benefits (F65); and f) provisions for calls under standardised guarantees (F.66).

Insurance, pension and standardised guarantees schemes operate as a form of income redistribution mediated by financial institutions. While holding the funds, insurance corporations invest them on behalf of the participants. The part of the investment income that is distributed to the participants as property income is returned as extra contributions. In all cases, net contributions or

premiums are defined as actual contributions or premiums plus distributed property income less the service charge retained by the financial institution concerned. Entries in the financial account, therefore, reflect the difference between net contributions or net premiums paid to the schemes less benefits and claims paid out. Significant other additions to the reserves of the schemes come via other changes in the volume of assets and especially holding gains. The novelty in comparison to ESA1995 lies with the last three sub-instruments referred above.

Claims of pension funds on pension managers (F.64) refer to the situations where an employer contracts with a third party to look after the pension funds for his employees. The pension manager and the administrator is the party who retains the risks (rights) in case of deficit (excess) funding. When the pension manager is a unit different from the administrator and the amount accruing to the pension funds falls below (exceeds) the increase in entitlements a claim (liability) of the pension fund on the pension manager is recorded. It is not clear whether the supervisory reporting templates for pension funds under Solvency II Directive will cover this data requirement.

Entitlements to non-pension benefits (F.65) are intended to capture the fact that the excess of net contributions over benefits represents an increase in the liability of the insurance scheme towards the beneficiaries. As it is written in the new ESA this item is likely to occur only rarely and SNA2008 does not even separate this item from pension entitlements. As such, this should not cause much concern to the compilers.

Provisions for calls under standardised guarantees (F.66) are financial claims that holders of standardised guarantees have against institutional units providing them. Provisions relating to calls under standardised guarantees are prepayments of net fees and provisions to meet outstanding calls under standardised guarantees. Like provisions for prepaid insurance premiums and reserves, provisions for calls under standardised guarantees include unearned fees (premiums) and calls (claims) not yet settled. The rationale for having this sub-instrument in this category is that much like a non-life insurer, a guarantor working on, e.g. commercial lines will expect all the fees paid, plus the property income earned on the fees and any reserves, to cover the expected defaults and associated costs and leave a profit. Accordingly, a similar treatment to that of non-life insurance is adopted for these guarantees, described as standardised guarantees. Standardised guarantees cover guarantees on various financial instruments like deposits, debt securities, loans and trade credit. They may usually be provided by a financial corporation, including but not confined to insurance corporations, but also by general Government.

Information on these guarantees should be found in balance-sheet data; in the case of financial entities supervisory data should be used in order to avoid double reporting from the reporting agents.

Interestingly, the new manuals did not consider the breakdown of insurance reserves and pension entitlements according to the risk profile (unit-linked, non-unit linked) and type of plan (defined benefit, defined contribution, hybrid schemes), which is already contemplated in the case of insurance corporations and pension funds data reporting to the ECB and the Organisation for economic co-operation and development (OECD).

2. Conclusion

In the aftermath of the financial crises, the importance of having a set of harmonised and reliable guidelines for measuring economic activity across countries became more evident. In light of this, tackling the effect of globalisation on statistics is one of the challenges of the revised manuals. In particular, consideration is given to the Direct Investment relations, namely through the extension of the directional principle to fellow enterprises, and to the prominent role that SPE are acquiring in the economies over time.

This article aims to assess the envisaged action plan for implementing ESA2010 in the Portuguese accounts. The foreseen plan is staggered into four phases: coordinating methodologies and procedures; adjusting sources and methods; starting data compilation and regular production. The coordination between statistical authorities, particularly regarding sharing data and settling a common universe for all institutional units is fundamental for the success of this plan.

Taking into account the differences between ESA1995 and ESA2010 special attention will be devoted to definition of the sectors, in particular for the following sub-sectors: holding corporations and SPEs, non-profit institutions serving households and general Government. At *Banco de Portugal*, steps have been taken regarding both the split of the non-profit institutions serving households from the households sector and the assessment of the composition of costs of entities for the delimitation of the general Government sector. Concerning the new sub-sector "captive financial institutions", some clarifications are still needed in particular, regarding the operational activities of holding corporations and the identification of SPEs. Moreover, as much as possible a consistent treatment across countries should be ensured.

The new ESA also aims to measure other realities not elsewhere covered. For instance, it introduces a supplementary table with all pension liabilities, including Government unfunded defined benefit schemes, with Government as the pension manager, and social security pension schemes. In light of this, statisticians will tend to me more involved in modelling and estimating pension schemes figures.

Encompassing other instruments like employee stock options and credit default swaps is another goal of the new manuals. For the first time provisions for calls under standardised guarantees are recognised in the system. The insurance technical reserves also present a new breakdown identifying new categories for pension entitlements.

Regarding the Portuguese economy, the adoption of a new methodology for the computation of FISIM, as an alternative to the one based solely on Euribor, tends to recommend the use of different interbank reference rates conferring the maturity and currency of the operations under evaluation. An impact assessment of the foreseen methods for other countries is of utmost importance.

The evidence developed here suggests fostering cooperation and exchanging information among national producers of statistics in order to promote a harmonised treatment across countries and to avoid introducing international asymmetries.

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Insurance companies and pension funds: assessing the dynamics of their assets and liabilities

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1. Introduction

Insurance companies and pension funds (ICPF) have become increasingly important within the financial sector, accounting for 14% (EUR 6.9 trillion) of the financial assets of the euro area financial sector (2010Q3 data), while in Portugal, at the end of 2010, they represented about the same share (75 EUR billion)[2].

In these economies, an ageing population coexisting with inadequate social security schemes has driven families to look for alternatives to complement their income after retirement. Life expectancy increased 5 years in the last 20 years up to 79.6 in 2009 in Portugal; in the euro area, it rose from 77.3 in 1995 to 80.7 in 2008. As a consequence, the weight of the population over 65 years increased from 13% in 1990 to 17.9% in 2010, in Portugal, and from 14.1% in 1990 to 18.3% in 2010, in the euro area. Moreover, associated with lower fertility ratios, the aged dependency ratios[3] have been increasing. In Portugal, over that period, it went up from 20% to 26.7%, and in the euro area from 20.9% to 27.5%. In other words, considering that the inverse dependency ratio can be interpreted as how many independent workers have to provide for one dependent person (pension), this indicator decreased from around 5.0 to 3.7 in the past 20 years, which clearly jeopardises the sustainability of pay-as-you-go systems.

Families are therefore faced with the need for complementary schemes when they retire. At the same time, ICPF are highly innovative, having developed a range of products that compete with banks' deposits for households' savings. In fact, insurance technical reserves (ITR) represented 19% of the households' financial assets in Portugal at the end of 2010, comparing to 10% in 1997. In terms

[1] The authors are grateful to Olga Monteiro and Luís D'Aguiar for their most relevant contributions to this paper.
[2] This document was prepared on the basis of the information available as of 18 March 2011.
[3] Number of people aged over 65 years divided by the number of people aged between 15 and 64 years.

of households' financial wealth, these shares go up to 13% in 1997 and 35% in 2010. In the euro area ICPF liabilities accounted for 30% of the total households' financial wealth (2010Q3 data). These numbers clearly illustrate how much these financial instruments have been competing with deposits for the households' investments.

As a consequence, ICPF have assumed a pivotal role for the assets they hold and manage, which makes them major players as institutional investors. In the euro area, ICPF financial assets amounted to 74.3% of gross domestic product (GDP) and they held 20% of the total debt securities issued by euro area governments and 57% of the mutual fund shares issued by euro area investment funds (2010Q3 data). In Portugal, at the end of 2010, their financial assets represented 51% of GDP, of which 18% were vis-à-vis non-residents; they held 6.4% of domestic public debt securities (4.0% in 2006) and 18.8% of domestic mutual fund shares/units (6.8% in 2006).

The remainder of this study is structured as follows. In section 2 we describe the data sources used and the compilation procedures implemented by *Banco de Portugal* regarding ICPF statistics. The composition and evolution of financial assets and liabilities of ICPF in Portugal, complemented with the trend observed at euro area level, is examined in section 3. We conclude with some final remarks and considerations for the future.

2. *Data sources and compilation procedures*

The main data source for the compilation of ICPF statistics by *Banco de Portugal* is the Portuguese Insurance and Pension Funds Supervisory Authority (*Instituto de Seguros de Portugal* or ISP, in its Portuguese acronym). Although prior to March 2007 data were already being delivered to *Banco de Portugal*, with the ongoing developments for these statistics at the level of the European System of Central Banks (ESCB), a new informal agreement between *Banco de Portugal* and ISP was established in order to meet in the forthcoming data requirements. For that purpose *Banco de Portugal* provided bridging tables with an indicative correspondence between accounting items and ESA1995[4] instruments. The terms under which ISP provides *Banco de Portugal* with data are the following:

Table 1 *– Stock data reported by ISP to Banco de Portugal (since March 2007)*

Sector	Frequency	Timeliness[5]	Detail
IC	Quarterly	T+50d	Assets – ITR-related assets (with counterpart information) Liabilities – ITR
	Annually	T+50d	Assets – other than ITR-related assets (with counterpart information) Liabilities – liabilities other than ITR (with counterpart information)
		T+9M	Assets – other than ITR-related assets + final balance sheet data (with counterpart information)
PF	Quarterly	T+50d	Assets – ITR-related assets (with counterpart information)
	Annually	T+9M	Liabilities – pension funds' technical reserves

[4] European System of National and Regional Accounts 1995 (ESA 95).
[5] d = days; M = months.

These data are accounting-based and therefore they present some methodological deviations from the ESA1995 concepts and European Central Bank (ECB) requirements which have to be overcome through statistical estimations.

The estimation procedures carried out by *Banco de Portugal* in the compilation of ICPF statistics and the ICPF financial accounts refer to the following:

a) IC representative assets vs. complete balance sheet on the assets' side

Non-representative assets are available on an annual basis and they account for around 10% of total assets. In the estimation procedure, the weight of representative assets within each instrument is assumed to remain constant throughout the year. The estimation is of good quality since the weight of non-representative assets remains fairly stable over the years.

b) IC ITR-liabilities vs. full balance sheet on the liabilities' side

The liabilities data provided quarterly (ITR) encompass the great majority of total liabilities. Quarterly data for shares, loans and other accounts are assumed to be equal to the last year available (in terms of structure). The estimation is of good quality since the estimated instruments account for a relatively small part of total liabilities (around 10%).

c) Counterpart information for ITR

There is no counterpart detail for non-life ITR. The structure of premiums by counterpart sector (made available by the National Statistical Institute, or NSI) is applied to stocks. There is no available information to confirm the estimate but the premiums' structure seems a reasonable assumption.

d) Home approach vs. host approach

The IC reference population used by the supervisory authority follows the home approach, while the industry association (*Associação Portuguesa de Seguradores* or APS, in its Portuguese acronym) provides annual data for IC according to the host approach. The latter liabilities are compared to the former and their ratio is applied to the balance sheet data. This estimation is thought to give reasonable results since, contrary to the activity of foreign companies in Portugal, the activity of Portuguese companies outside Portugal is not significant.

e) Quarterly PF liabilities

Information of ITR is only available on an annual basis. The estimation procedure is the following: the last information available is replicated each quarter until a new year becomes available; the quarterly stocks are then revised through a linear interpolation of the annual stocks.

f) Derivation of "transactions" and "revaluations and other volume changes"

The compilation of ICPF statistics by *Banco de Portugal* occurs in the framework of the financial accounts thus ensuring consistency with different statistical domains, namely monetary and financial statistics, b.o.p.-i.i.p. and securities statistics, through the so-called hierarchy of sources. Transactions are obtained from counterpart data or derived from the stocks variation deducted of revaluations and other changes. Reclassifications are obtained through changes in the population or counterpart data. Revaluations are computed both from counterpart data and from the use of reference indexes for each main instrument.

g) Breakdown of ICPF between IC and PF

In the current financial accounts' compilation framework we follow a process of hierarchy of sources where initial data sources are replaced with others that we consider more accurate and reliable in order to achieve internal consistency within the accounts. In this process, counterpart data for ICPF is only available for the sector as a whole and therefore the distinction between IC and PF is not carried over until the final stage of the compilation cycle. In order to cope with ECB requirements on ICPF statistical data, we developed a system based on the relative share of each subsector on the whole sector in the raw data. Once the stocks are calculated, the transactions have to be derived. We first isolate specific reclassifications and/or other changes that we know. Then, we take the revaluations from the financial account of ICPF and we derive the implicit (de)valuation rate, which we then apply to the stock of the previous period for IC and PF separately. The transactions are then obtained by residual. This procedure assumes that the de/revaluations in the financial instruments affect IC and PF equally; its major advantage is the consistency with the financial accounts.

Data for the ICPF sector as a whole are available since 1997Q4, and since 2006Q1 for IC and PF separately, both in terms of stocks and transactions. This is in line with the requirements set by the ECB under the short-term approach for ICPF statistics.

3. *Key indicators for ICPF in Portugal*

ITR represented 45% of GDP in 2010, as compared to 22% in 1997. They accounted for almost 90% of ICPF total liabilities. The evolution by type of activity is displayed in Figure 1, where we can observe that the outstanding amounts of ITR have increased at a relatively high pace from 1997 to 2007, and since then the growth rate has been much smaller, even slightly negative in 2008. The relative weight of insurance life reserves increased from 38% in 1997 to 66% in 2010, while non-life insurance decreased from 17% to 9%, and pension fund reserves from 45% to 25%. The evolution in the PF sector has also been determined by administrative transfers of certain autonomous funds to the State, namely in 2004 regarding the banks' pension funds and in 2010 concerning three pension funds of a large telecommunications' company. Nonetheless, these numbers reveal the impressive growth of ICs activity over the past years. When we analyse this evolution in terms of transactions, in Figure 2, it is very clear the 2008-crisis effect; this year was preceded of three consecutive years of large increases, with a peak in 2005, which still occurred until mid-2008 but were eventually cancelled out by massive withdrawals towards the end of the year as a consequence of the final near collapse that hit the financial markets throughout the world. Signs of recovery are already present in 2009 and 2010. Again, it should be noted that in December 2010, three pension funds were integrated in the State, thus originating a withdrawal from the PF sector amounting to 2.8 EUR billion.

***Figure 1** – ITR by type activity*

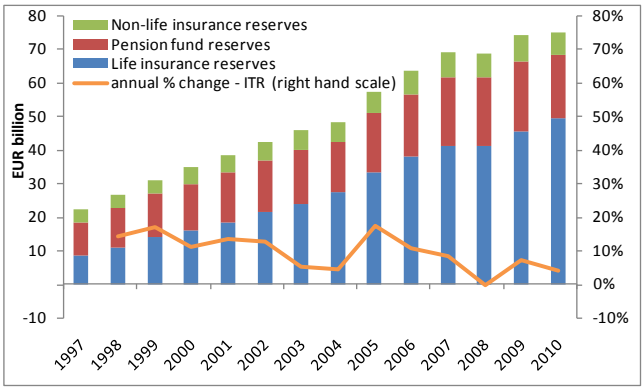


***Figure 2** – ITR by type activity, transactions*

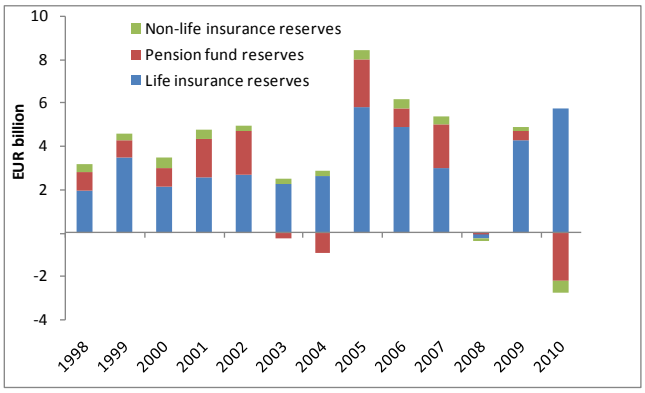


***Figure 3** – ITR by type – 2010*

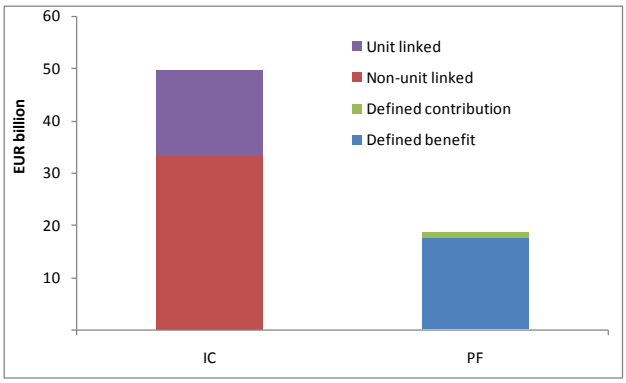


Figure 3 illustrates the distribution of ITR by type. In the case of IC, at the end of 2010 unit-linked plans represented around 1/3 of the reserves, a share that has remained relatively stable for the past five years. In the case of PF, the overwhelming majority (94%) of pension plans were defined benefit schemes as it has been the case since 2006. This provides evidence of a risk-aversion profile in the ICPF activity in Portugal.

By and large, households are the main counterpart for ITR (around 95% for the whole sector at the end of 2010). Taking IC alone, there is also some activity *vis-à-vis* non-financial corporations related to non-life insurance (4%). The activities with non-residents are marginal, linked to reinsurance in most cases.

It is thus not surprising that the relative weight of ITR in the households' financial assets has been increasing over the past 13 years: from 10% in 1997 to 19% at the end of 2010, amounting to 75.7 EUR billion (Figure 4). Of these, 71.7 EUR billion is *vis-à-vis* resident ICPF and the remainder *vis-à-vis* non-residents or non-financial corporations in the case of non-autonomous pension funds. In terms of households' financial wealth, these shares go up to 13% in 1997 and 35% in 2010. ITR are the third most important financial investment of households, next to 'currency and deposits' and 'shares and other equity', while mutual fund shares (MFs) play a major role. Again, looking at Figure 5, the 2008-crisis effect is striking in terms of withdrawals of 'shares and other equity' (MFs in particular) and increases in more liquid and low-risk instruments, such as 'currency and deposits'.

***Figure 4** – Households' financial assets*

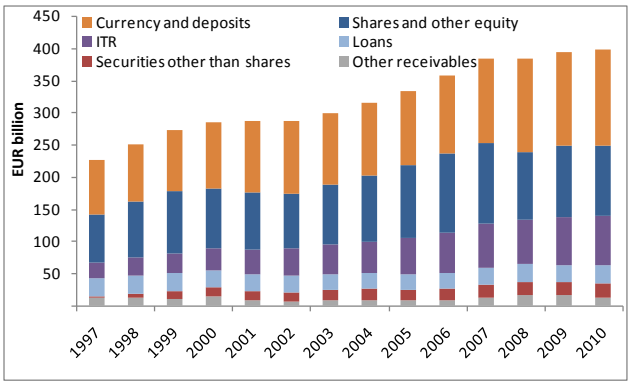
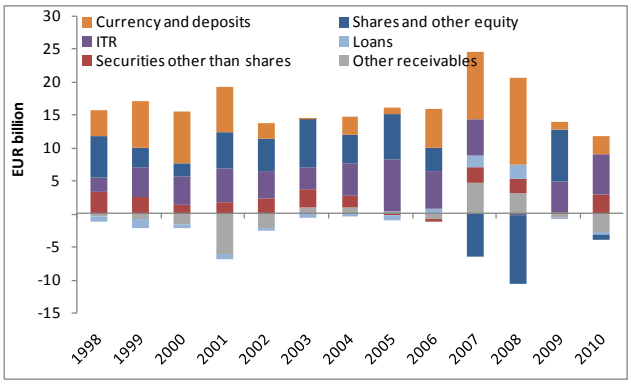
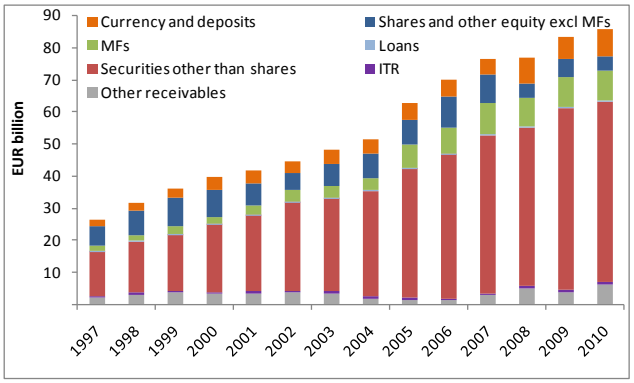


***Figure 5** – Households' financial assets, transactions*



We turn now to the financial assets of ICPF, in Figure 6. 'Securities other than shares' amounted to 55.9 EUR billion, representing circa 2/3 of total assets at the end of 2010 (53% in 1997). 'Shares and other equity' reduced their relative weight from 24% to 6% throughout this period, which was mainly caused by devaluations in 2008. Since then, in turn, ICPF seem to have been investing more in mutual fund shares, with its share reaching nearly 10% at the end of 2010 which compares to 1.4% in 1997.

***Figure 6** – ICPF financial assets*



Looking at the portfolios of IC and PF separately, the structure is somehow different, as we can see in Figures 7 and 8. Clearly, the major weight of 'securities other than shares' comes from IC investments where they represent around 70% (47.3 EUR billion at end-2010). As for PF, although securities have also the largest share (47% at end-2010, with 8.7 EUR billion), MFs represent circa ¼ of the portfolio, with 4.4 EUR billion at end-2010. Non-financial assets represent 2% (1.1 EUR billion at end-2010) for IC and 10% (1.9 EUR billion at end-2010) for PF.

***Figure 7** – IC financial assets*

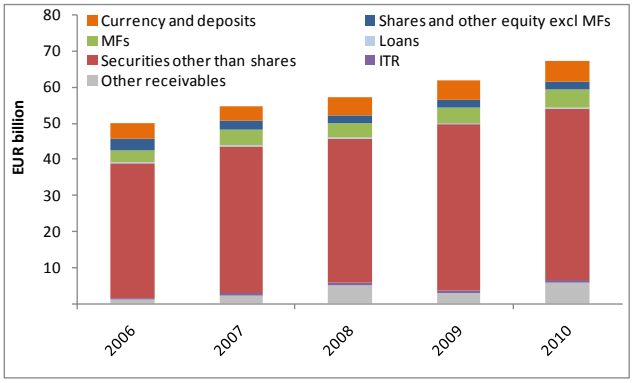


***Figure 8** – PF financial assets*

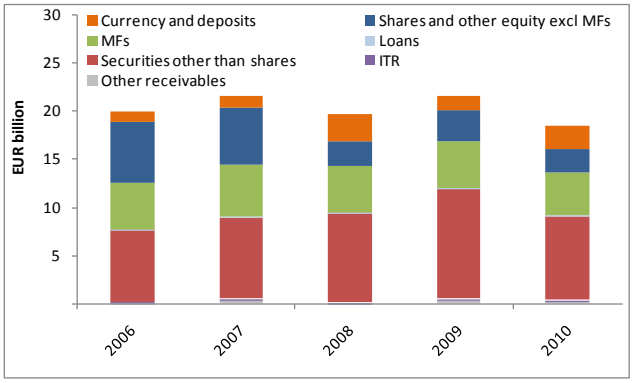
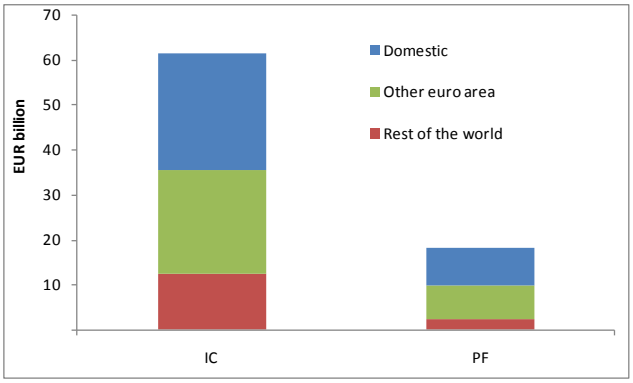


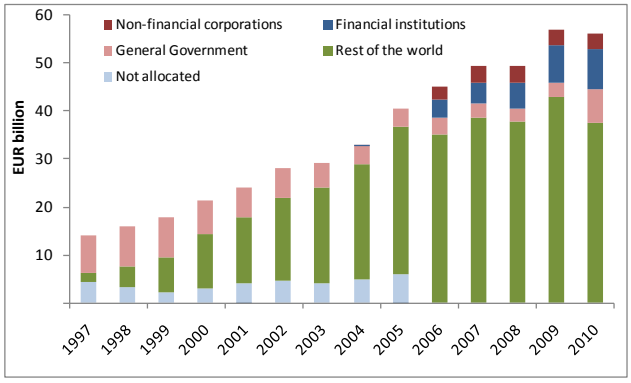
***Figure 9** – IC and PF financial assets, by area – 2010*



As for the geographical breakdown of financial assets, both for IC and PF, domestic and residents in other euro area countries are the main counterparties, each having weights averaging 40% over time. The relative share of other countries is higher for IC than for PF (20% *vs.* 13% at end-2010).

This distribution for total assets varies across financial instruments as we will see.

***Figure 10** – ICPF securities' holdings, by counterpart*



Starting with securities other than shares, observing Figure 10 we conclude that the increase over time resulted in an increase in the exposure to the non-resident sector (including in this case both euro area and other countries). When we analyse IC and PF separately (Figures 11 and 12), based on information from 2006 onwards, we conclude that for both sub-sectors most of this exposure is *vis-à-vis* the financial and the public sector. Interestingly, throughout 2010 IC invested significantly in domestic public debt, possibly attracted by the high return rates. On the other hand, after a significant increase in 2009, PF reduced their investments in debt securities in 2010, mainly regarding public debt from other euro area countries and securities issued by residents in other countries. This was largely due to the transfer of pension funds mentioned above. For both IC and PF, the exposure to debt issued by the corporate sector is not as significant.

***Figure 11** – IC securities' holdings, by counterpart*

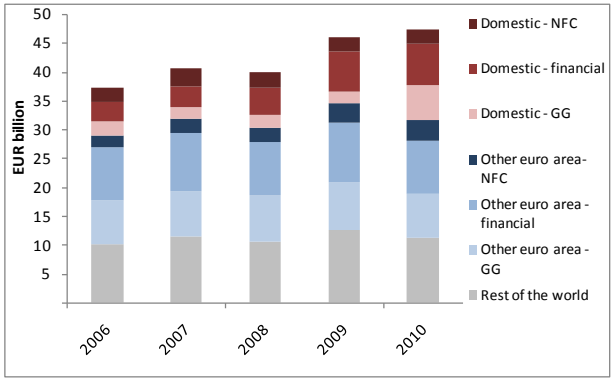
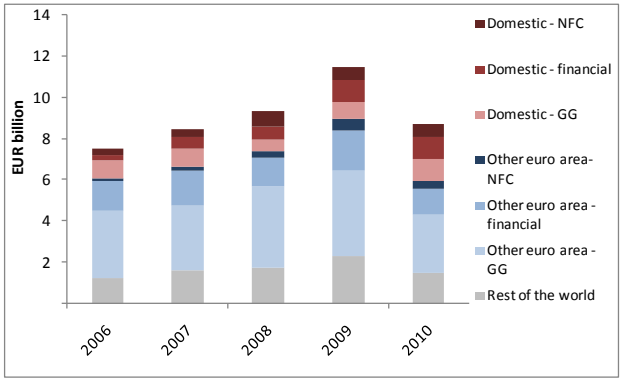


***Figure 12** – PF securities' holdings, by counterpart*



Turning now the attention to shares and other equity excluding MFs, the situation is quite different as we can see from Figures 13 and 14. In the first place, it is not surprising that the relative share of the corporate sector increases significantly as opposed to the financial sector; secondly, the exposure to the domestic sector is much higher in comparison to the securities market. The effects of the 2007-2009 financial crises are quite evident for both sub-sectors, as the decrease in outstanding amounts was mainly due to strong devaluations of quoted shares. However, while for IC there was some partial recovery in the subsequent years, justified both by new investments and revaluations, for PF the 2008 levels remained barely unchanged (even taking into account the 2010 effect related to the transfer of three funds), which could be an indication of more risk-aversion stance in the management of pension funds, shifting their investments towards less risky assets, namely debt securities, as we saw above.

Figure 13 *– IC shares' holdings, by counterpart*

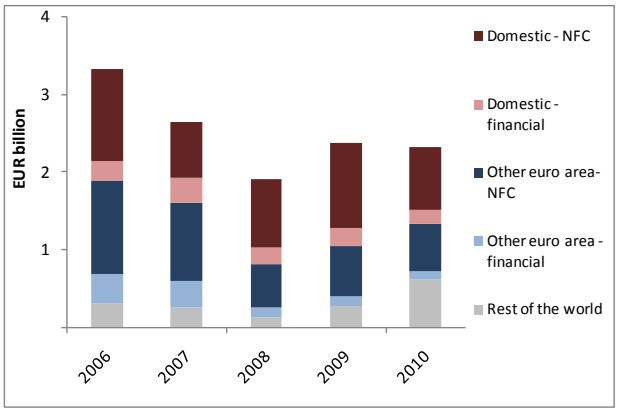


Figure 14 *– PF shares' holdings, by counterpart*

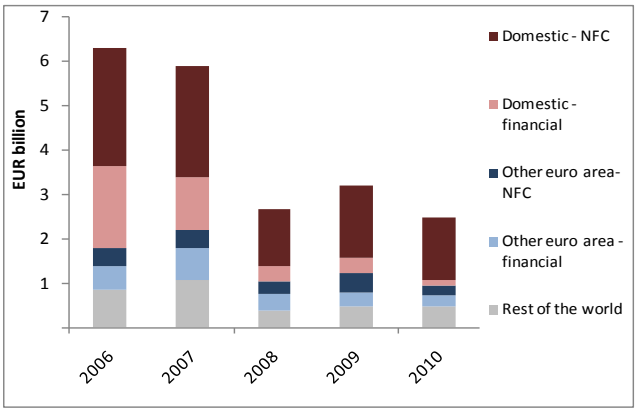
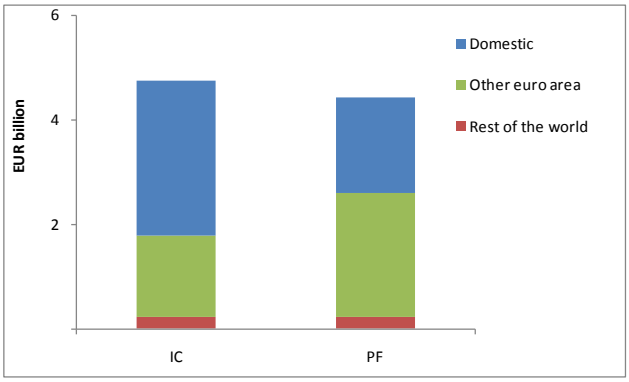


Figure 15 *– IC and PF MFs, by area – 2010*



Finally, regarding MFs, which represent circa ¼ of the PF portfolio, we can see in Figure 15 that the main counterparts are mostly residents in other euro area countries amounting to 2.4 EUR billion at end-2010 which corresponds to 54%. This results nonetheless from a shift between other euro area and domestic MFs, since that the relative weight of the latter increased from 24% in 2006 to 41% at end-2010. The same trend was registered in the case of IC: at the end of 2010, domestic MF represented 63% (42% in 2006) and euro area MF 33% (53% in 2006).

From the perspective of the MF domestic sector, holdings of ICPF increased from 6.8% in 2006 to 18.8% in 2010 in terms of total issues, thus illustrating further the relevance of this sector as a key player in the financial markets.

4. *Future challenges*

In this section we elaborate on the main challenges statisticians are faced with concerning ICPF statistics. Gouveia and Quevedo (2010) and the ECB report on Financial Integration in Europe (2011) provide a good overview. These issues deserve a careful assessment and, although intertwining, they are of a different nature. On the one hand, we have changes in the activities and regulatory regimes of IC and PF, and, on the other hand, we have policy-makers and analysts demanding for more complete, detailed and timely data. It is up to the statistical community to find the right balance.

We start with the **current developments in the industry and the forthcoming regulatory changes**. Included here we have, e.g., higher cross-border activities, pension reforms and new solvency requirements for insurance corporations and pension funds. According to the ECB report on Financial Integration in Europe (2011), it has been observed some movements towards a higher centralised pan-European management concerning IC, driven by efficiency gains and competitive advantages. Moreover, the fact that a company can be registered in any member state of the European Union,[6] and that the registration can be easily transferred to another Member-State, poses additional challenges for data collection. An important recent development which may affect the pension funds sector is that many European countries have introduced or started to introduce reforms aimed at safeguarding the sustainability of their retirement income systems. These reforms include steps to strengthen the link between pension benefits and contributions; to extend the contribution period to qualify for a final pension; and to diversify sources of retirement provision so that private pension funds play a larger role in securing adequate retirement income. With regard to the envisaged review of the insurance corporation's requirements in compliance with Solvency II Directive, one of the primary aims of the Directive is to produce more consistent solvency standards that will protect consumers across all markets. For this purpose, the Solvency II regime is intended to achieve a high degree of convergence in regulatory standards across Europe. For this purpose, harmonised reporting templates[7] are being developed at the European economic area level.[8] Finally, with regard to solvency of pension funds, the IORP[9] Directive's minimum prudential requirements include solvency rules for defined benefit schemes. These solvency rules are currently the same as those that apply to life insurance undertakings. The suitability of Solvency II for pension funds needs to be considered in a rigorous impact assessment, examining notably the influence on price and availability of pension products.

All the aspects described above have necessarily to be taken into account by compilers when changing their compilation systems in order to meet **users' requirements**, such as, i) balance sheets by type of business (non-life; life – unit-linked and non-unit-linked; reinsurance; defined benefit pensions and defined contribution pensions); ii) further improvement of timeliness; iii) ESA2010. The new ESA will entry into force in 2014 and it will include two specific chapters dedicated to the issue of insurance, social insurance and pensions, reflecting its increasing importance for the society. In terms of financial instruments, a more detailed breakdown is introduced, namely in terms of a) non-life insurance technical reserves (F.61); b) life insurance and annuity entitlements; (F.62) c) pension

[6] Council Regulation (EC) No 2157/2001 of 8 October 2001 on the Statute for a European company (SE).
[7] *The Committee of European Insurance and Occupational Pensions Supervisors (CEIOPS)* is in the process of developing harmonised reporting templates for supervisory purposes in the case of insurance corporations, for that purpose the ECB is co-operating closely with the aim to reduce reporting burden to reporting agents.
[8] At present, the contracting parties to the EEA Agreement are the European Union and its 27 members plus Iceland, Liechtenstein and Norway.
[9] IROP – Institutions for Occupational Retirement Provisions.

entitlements (F.63); d) claims of pension funds on pension managers (F64); e) entitlements to non-pension benefits (F65); and f) provisions for calls under standardised guarantees (F.66). More importantly, there will be a new supplementary table on liabilities with pension schemes in social security that tackles the information gap in national accounts for specific pension schemes such as government unfunded defined benefit schemes with government as the pension manager and social security pension schemes. Considerable work has already been done in this respect within the framework of the *Eurostat/ECB Task Force* on the statistical measurement of the assets and liabilities of pension schemes in general government. One of the main objectives of the Task Force relates to modelling and estimating pension scheme data, and investigating possible methodological issues that may arise. Within this context, benchmark calculations have been carried out by the Research Centre for Generational Contracts of Freiburg University (RCG) for 19 EU member states. On the basis of this experience the RCG developed a model to calculate pension entitlements for the social security and the government employee pension scheme in Portugal upon request of *Banco de Portugal* that will be used as a benchmark to the results of other Portuguese pension models that may eventually be developed in the future.

To conclude, despite the significant improvements achieved so far concerning ICPF data, there is still a long way to run. In this respect the alignment of statistical and supervisory reporting is of utmost importance. *Banco de Portugal* has devoted a special attention to this financial subsector, developing a statistical framework that meets the European System of Central Banks' statistical standards for ICPF, using available supervisory data.

Assessing the dynamics of ICPF assets and liabilities, in a timely and integrated way, will become more and more relevant in a context where an ageing population coexists with inadequate social security schemes driving families to look for alternatives to complement their income after retirement. ICPF will keep a pivotal role for the assets they hold and manage, which makes them major players as institutional investors in the financial markets, and, therefore, their behaviour should be monitored both for financial stability and macro-prudential analysis' purposes. Our job as statisticians is to provide the best quality data for this endeavour.

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Investors' attitude towards risk in periods of high market volatility

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1. *Introduction*

Over the last decades and, particularly since the introduction of the single currency in 1999, financial markets experienced high level standards of integration and development, especially among the members of the euro zone.

In this new context of free movement of capital and global stock markets, financial institutions need to understand how investors' behaviour is affected, namely in terms of their exposure to the binomial risk-potential return, in order to offer financial instruments that meet investors' preferences towards uncertainty.

In the economic and financial literature, investors' portfolio allocations are commonly used as a reliable indicator of attitude towards risk. Portfolios' theory started out as a tool of understanding only financial portfolio allocation, which according to McCarthy (2004) is an incomplete perspective of the reality since financial assets are a relatively small proportion of households' portfolios except for very young households.

Some of these models, driven by an interest in asset pricing, in particular in the equity risk premium puzzle, have been used as a foundation for later models of portfolio development. In particular, they have reduced the importance of many of these issues by increasing the number of assets that an household may invest in, have included restrictions on households' portfolios and have incorporated many other aspects – such as the existence of the presence of labour income and cost to investing – that influence the portfolio that households choose to hold.

However, even for these newer models, there still exists a gap between the theory and empirical results. According to the same author, households' portfolios differ by wealth, by country in which the household lives in and by various households' characteristics such as age, education and birth years. Schooley (1996) concludes additionally that, at the time of purchase, investors' behaviour and their perception of risk are formed by factors that include: expert advice from management consultants, past investment experiences (investors who have experienced losses make new investment decisions bearing such in mind), financial and economic news and other sources of information.

Since 2008, more particularly following the advent of the worldwide financial crisis, investors' perception of risk and uncertainty has increased, leading to the adoption of a more cautious attitude when making investment decisions. This is even more acute if we consider that each time more

households are taking the responsibility of the assets' allocation of their portfolios and that periods of financial instability are linked with investors' risk aversion (Papadamou, 2008).

The aim of this paper is to develop an empirical analysis in order to understand how the perception of financial events that led to the current turmoil, by Portuguese investors, was incorporated in their exposure to risk and, consequently, in their investment decisions.

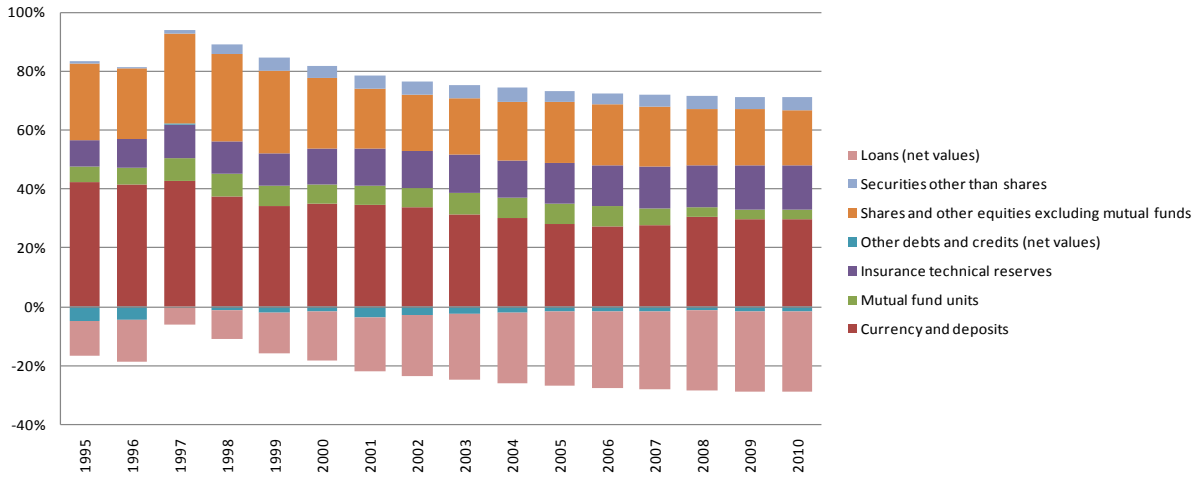
This paper is organised as follows. In Section 2 a brief characterisation of the Portuguese economic environment is presented. In Section 3 the impact on households' portfolios is described and general conclusions of this work are summarised in Section 4.

2. *The crisis and the Portuguese market characterisation*

During the last 30 years a set of changes have occurred in the Portuguese economy. Before the participation in the European Union (EU), in 1986, the Portuguese financial sector was not fully developed. The process of financial liberalisation that culminated in 1992, implemented a set of reforms in the Portuguese banking sector: privatisation of state-owned financial institutions; interest rates and credit were no longer administratively controlled; increased the diversity of banking products and improved the competition across financial institutions.

Economic and Monetary Union (EMU) brought about low interest-rates, low inflation and a sustained economic growth. The combination of these factors strengthened investors' risk appetite and contributed to the underestimation and under-pricing of the risk, to which financial institutions answered with innovative financial instruments.

Figure 1 – *Households' portfolio composition (annual stocks)*



Source: Banco de Portugal

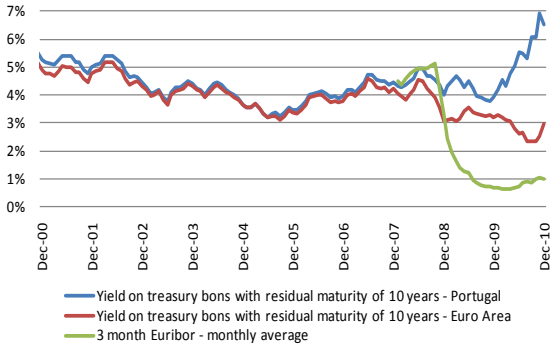
Figure 1 confirms that, despite the relative stability of some instruments (for instance, during all the period under analysis, assets were predominantly "currency and deposits"), the financial portfolio of a typical household suffered significant changes during the last two decades. These changes were

essentially the increased investment in risky assets during the late 90's and the credit *boom* at the beginnings of the 2000's, which can be the result of the falling transaction costs and new financial investment instruments or may reflect the internalisation of expectations of future rates of return derived from the global economic environment.

After years of robust economic performance[1], the same global economic environment began to pose difficulties for several countries in the wake of the intensification of the global financial turmoil and the subsequent global economic recession. This global financial turmoil erupted in August 2007 in the United States (US), with the sub-prime mortgage market at is epicentre and was intensified by the collapse of Lehman Brothers, in September 2008. The turmoil was characterised by immediate and substantial spill over from financial developments in the US to financial markets and banking sectors in other advanced economies by a loss of confidence and by negative feedback loops between the financial sector and the real economy resulting in a global recession.

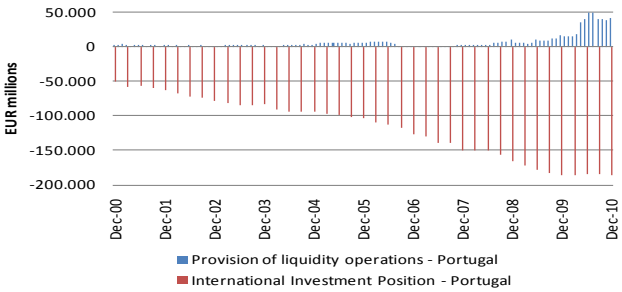
In particular, the Portuguese economy faced a particularly demanding set of challenges which conditioned the decisions of the national agents.

Figure 2 - *Interest rates*



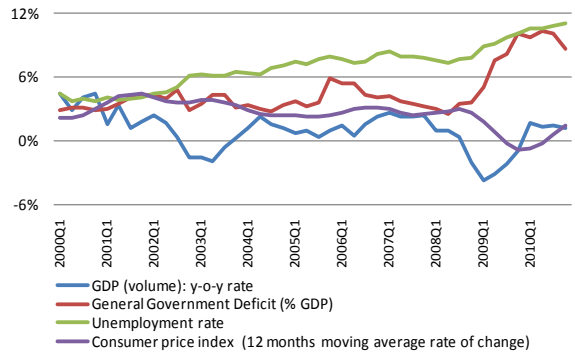
Source: Reuters

Figure 3– *Provisions of liquidity and International Investment Position*



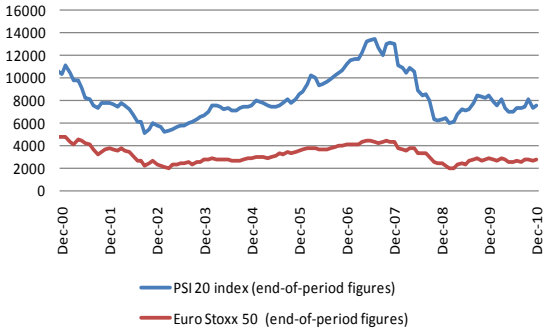
Source: Banco de Portugal

Figure 4 – *Portuguese activity and labour market indicators*



Source: Statistics Portugal

Figure 5 – *Stock Market Indices*



Source: Reuters

[1] Between 1999 and 2007, GDP growth in real terms, in average, 1,5 percent in Japan, 2,8 percent in USA and 2,3 percent in the Euro Area.

Since the end of 2009 a strong instability and a sovereign risk differentiation has increased markedly across the euro area, penalising economies with larger fiscal and external imbalances and more significant structural problems, including Portugal. This situation was reflected in very sharp increases in the yields on Treasury bonds with residual maturity of 10 years (Figure 2). By the end of April 2010, a sizeable impact on the Portuguese banks' financing capacity was installed, which was already weakened since the collapse of Lehman Brothers. These circumstances led to very tight quantitative constraints in the access to international wholesale debt markets: the Portuguese ongoing expansion of the banking system activity started to depend on a large-scale to the access to European Central Bank (ECB) liquidity providing operations, particularly since May 2010 (Figure 3).

This situation led, additionally, to the adoption of supplementary fiscal consolidation measures, beyond those announced in January in the State Budget for 2010 and in the successive updates of the Stability and Growth Programmes (SGP). Eventually, on 6th April 2011, the Portuguese government decided to give the European Commission a request for financial assistance in order to ensure financing conditions to Portugal, and on 4th May 2011 Portugal has reached an agreement with the Troika of the European Commission (EC), the ECB and the International Monetary Fund (IMF) for a three-year 78 000 euro million bail-out, granted at a 5,7 percent average interest rate.

The main features of the Portuguese economy in 2010 result from the combination of several inter-connected factors, namely the GDP growth of 1,3 percent in 2010, after a sharp drop in 2009 (-2,5 percent), as shown in Figure 4. According to the Eurostat's data, GDP growth will be lower in Portugal than in the Euro Area. Thus the Portuguese economy will again diverge in real terms, in line with the evidence of the past decades (the GDP growth forecast is of -1 percent in Portugal against 1,5 percent in the Euro Area and 1,7 percent in the EU). Unemployment is expected to remain at high level standards. The unemployment rate reached another historical peak: 11,1 percent at the end of 2010, maintaining the trend observed in the two last decades (Figure 4).

The interest rate decrease was justified by real interest rate developments, resulting from weak economic growth prospects, and very low inflation expectations, both of which are now at low levels by historical standards.

After a significant valuation (of 30 percent) in 2009, between the end of the referred year and late May 2010, the PSI-20 index declined by 16,4 percent. This is in line with developments in the Euro Stoxx-50 index, which fell by 12 percent over the same period. However, as of the end of June both stock indices started to recover and, in December 2010, the PSI-20 index was only 10,3 percent below the level seen at the end of 2009, while the euro area index declined by 6 percent over the same period (Figure 5). In this context, in the first half of 2010 the issuance of quoted shares by either financial corporations or non-financial corporations was not significant.

In the first half of 2010, developments in financial markets were mainly determined by concerns on sovereign credit risk. The situation intensified in January 2010, in the wake of downward revisions of the credit rating of Greek public debt and contagion to other European countries with high fiscal deficits and structural fragilities, particularly Portugal, Ireland and Spain, which have also undergone some downward credit rating revisions. In this context, international financial market volatility has risen significantly and investors' confidence has deteriorated markedly, also on account on the uncertainty surrounding economic recovery. The spreads between government debt interest rates of Portugal and Euro Area have widened to reach a peak since the start of the Stage Three of the EMU,

with Portugal facing the most significant increase in ten-year government yield vis-à-vis Euro Area. In December 2010 ten-years spread stood at 357 basis points (b.p.).

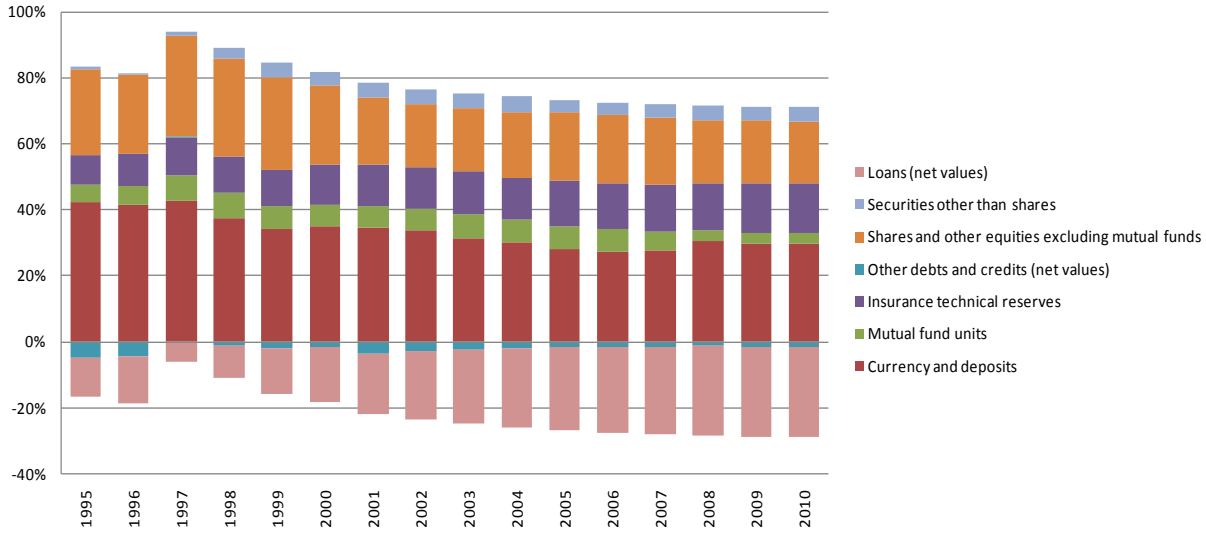
3. *Changes in Households' Portfolios*

All the features described above, once incorporated in households' expectations, could determine their perception of risk and uncertainty and be transmitted to their portfolios, for instance through the adoption of a more cautious attitude when investment decisions are made.

In the literature, there is the debate whether an individual shows a higher or lower propensity to risk, or, alternatively, whether risk-tolerance / risk-avoidance is a specific situation with little consistency across task and domains. Additionally, some authors argue that, while "risk" denotes situations in which the probabilities of outcome are known or at least made explicit, "uncertainty" denotes situations in which the probabilities of outcome are unknown and, hence, uncertainty could be one such potential source of risk aversion on investment decisions, with most investment decisions involving uncertainty rather than risk.

Figure 6 evidences the adjustments done by households to their balance sheets under this context of uncertainty.

Figure 6 - *Changes in households' portfolio composition (transactions, cumulative four-quarters)*

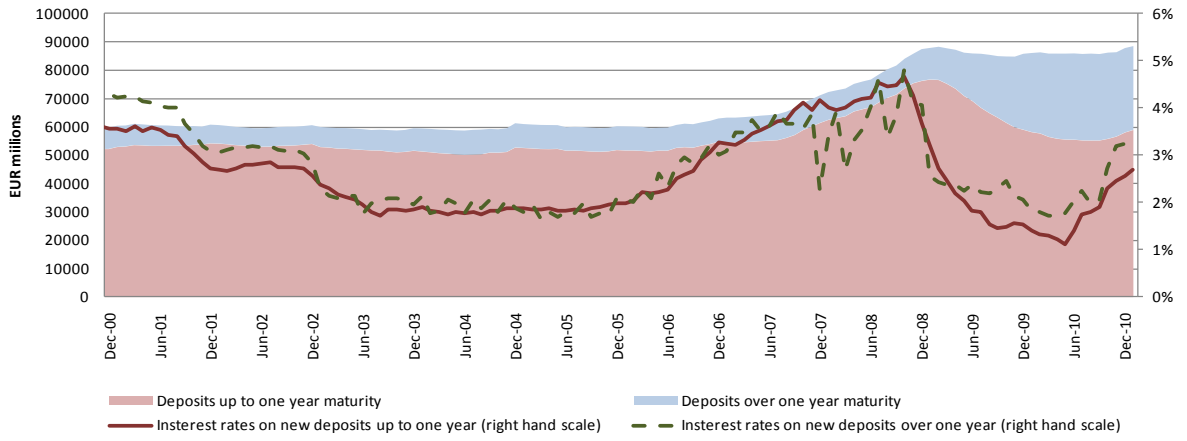


Sources: Banco de Portugal, Statistics Portugal

Moreover it is also worth mentioning that households' net lending has increased significantly only from 2009 onwards, reflecting a higher gross savings rate and a continued downward trend of the investment rate, which currently stands at a low historical level.

3.1 *Deposits*

Figure 7- *Households' deposits*



Source: Banco de Portugal

As shown in Figure 7, in nominal terms, the stock of deposits held by households remained quite stable until 2007 when it started an upward trend until the beginning of 2009. Since the second half of 2009, the stock of households' deposits recovered its stability, although a change of preferences, in terms of maturity, has occurred.

Developments in deposits should be analysed in light of two arguments, already mentioned: the adoption of a more cautious attitude by the households and the developments in banks' financing strategy in a context of liquidity scarcity and constraints in the access to international wholesale debt markets.

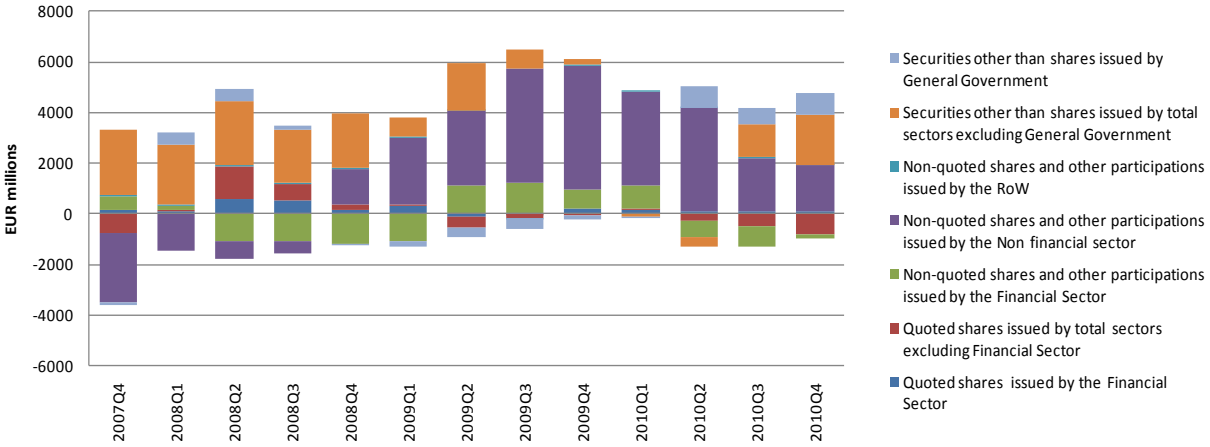
In what concerns the first argument, the upward trend verified in the beginning of 2007 is justified, essentially by the deterioration in the financial markets. This situation made riskier investments less attractive, despite the start of downward trend interest rates, with shorter maturities remunerations falling sharply during 2009. In the second half of 2009, with interest rates still at historical levels and with a slight rebound of the main stock indices, households turned, again, to invest in riskier products until the mid of 2010.

The historical preference by deposits up to 1 year maturity (excluding overnight deposits) over deposits with longer maturities reversed from June 2009 onwards, with an increasing demand for longer maturities, which represent nowadays about 31 percent of the total, 18 percentage points (p.p.) more than until March 2009. This reallocation may also have been influenced by the banks themselves concerned with funding problems and high loan-to-deposit ratios. In this context, banks have looked for more secure financing sources, offering more attractive conditions to their clients. Interest rates on new deposits started grew above 3 percent in higher maturities, with a differential between the shorter and longer maturities, at the end of 2010, of about 70 b.p.

Despite the stability of the stock, the new business volume of deposits started to increase in the second half of 2010, which seems to indicate that investors are transferring savings from lower interest rates to these new products offered by banks.

3.2 *Shares, Other equities excluding mutual funds and Other securities*

Figure 8 – *Shares, other equities excluding mutual funds and other securities (transactions, cumulative four-quarters)*



Source: *Banco de Portugal*

Figure 6 shows households' movements in shares and other securities. The year of 2007 was markedly characterised by a clear disinvestment in shares, much in line with the strong drop observed in the stock market indices, namely PSI 20 index, as shown in Figure 5.

Quoted-shares showed a slightly recovery during 2008, following again a close relationship with the national stock Index trajectory.

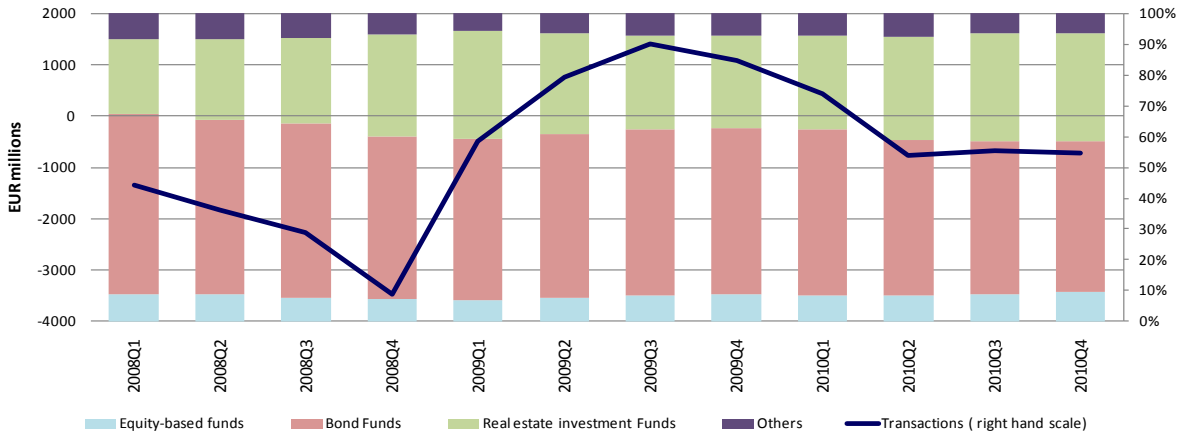
The investment in non-quoted shares increased significantly since 2009 with Non-financial corporations as the main issuer sector.

The amount of securities other than shares reached a certain expression during 2007 and 2008, having declined after the second quarter of 2009. Over the second half of 2010 this type of investment started a recovery path reaching, in terms of cumulative transactions, an amount of about 2 900 Eur millions. Until the beginning of 2009, households' investment was concentrated in long-term securities issued by the Monetary and Financial Institutions (MFI). The rebound in the second half of 2010 was justified not only by bonds issued by MFI but also by the general Government. This change could be related to the very sharp increase in the yield on Treasury bonds with residual maturity of 10 years, as shown in Figure 2.

The investment in short-term securities is relatively stable over the period under analysis. Non-financial corporations were the more relevant counterpart sector (Figure 8).

3.3 Mutual funds

Figure 9 *– Mutual fund units (transactions, cumulative four-quarters)*



Source: Banco de Portugal

The households' portfolios in mutual funds are comprised, essentially, by Bond Funds and by Real estate investment Funds. Between them it is possible to find a substitution effect essentially since the beginning of 2009. In fact, in March 2008 the relative weigh of Bond Funds was about 60% against 24% of Real estate investment Funds while in December 2010 the relative weight was of 49% against 35%. Equity-Based Funds remained quite stable all over the period under analysis (about 9%).

The amount of units held by households fell down in a systematic and strong way since January 2008 until the end of the first quarter of 2009, with the cumulative value of rescues and value changes (devaluations) amounting to -12 194 Eur millions. Since this date a reversal in the downward trend could be observed but only until the end of the first quarter of 2010. From then onwards, a new disinvestment in mutual funds by households took place, much in line with the course of the Portuguese stock index, PSI-20, as shown in Figure 5.

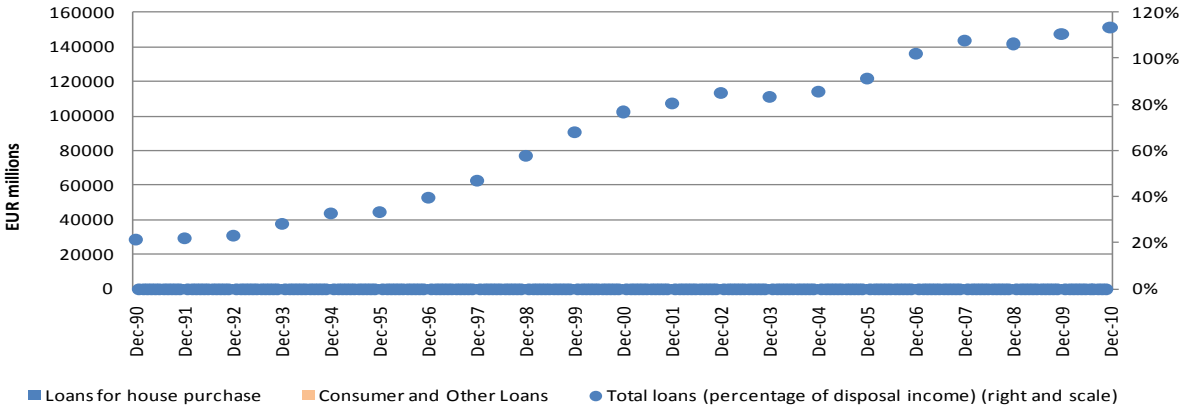
3.4 Insurance technical reserves

As shown in Figure 6, investments in "insurance technical reserves", gained increased importance since the end of 2008. In addition to the perception of the necessity of having a complement to the public social security schemes, households start to see products offered by Insurance Companies as an alternative source of investment, mainly due to the diversifications of products offered by this type of companies.

The evolution of life insurance also reflects the fact that this type of insurance is required by credit institutions for house purchase loans.

3.5 Real estate investment

Figure 10 – *Households' Loans*



Sources: *Banco de Portugal, Statistics Portugal*

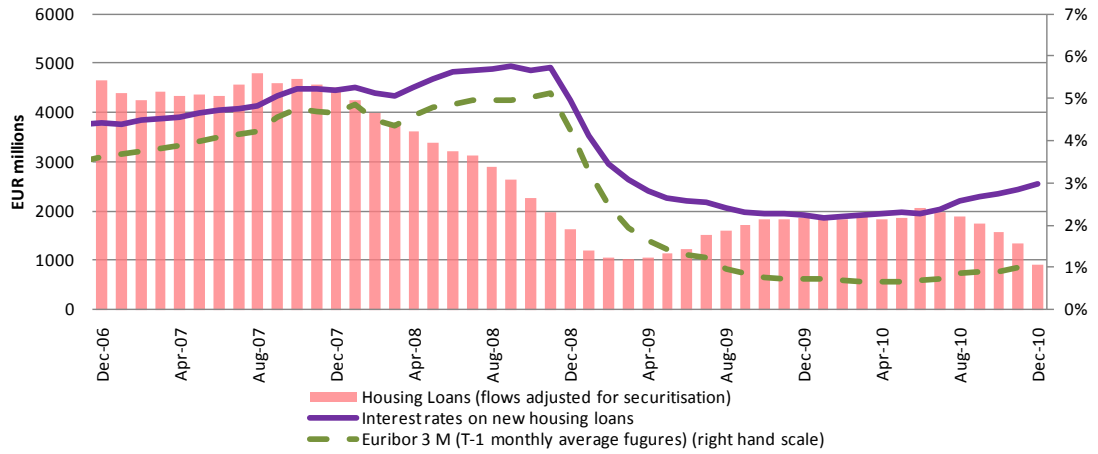
As mentioned above, limiting households' investments to financial assets will not provide us the full picture. Firstly, households use their savings and borrowings to purchase both financial and non-financial assets; secondly, financial assets are a relatively small proportion of households' wealth except for the youngest ones (McCarthy (2004)). Details on the distribution of non-financial assets are scarce, mainly due to the lack of appropriate data (Farinha (2008)). However, a study carried out by Ynesta (2008) shows that, for a set of countries[2], non-financial assets are split between dwellings[3] and land[4]. Although Portugal is not included in the referred study, Farinha (2008) states, in her study that real estate has a significant weight on Portuguese wealth. Thus, not considering this type of investment would be, not only to ignore a significant share of households' wealth, but also to assume that changes in real estate valuations do not have any impact on households spending decisions.

Considering that, over the last decades, loans granted to house purchase[5] represent almost 80 percent of the total loans granted to households, Figure 10 can be useful to infer the increase in real estate investment since the beginning of 2000, in line with Eurostat statement: in Portugal, in 2007, more than 75 percent of households owned their own property.

[2] Australia, Canada, Czech Republic, France, Germany, Italy, Japan, Netherlands, United Kingdom and United States.
[3] According to OECD, dwellings are defined as buildings that are used entirely or primarily as residence, including any associated structures, such as garages.
[4] According to OECD, land is defined as the ground itself, including the covering soild and any associated surface waters over which ownership rights are enforced.

[5] It includes credit extended for the purpose of investing in housing, including building and home improvements (ECB/2008/32)

***Figure 11**-Real estate investment*



***Sources:** Banco de Portugal, Statistics Portugal*

Although growing in nominal terms, loans granted to households for house purchase started to decline, as shown in Figure 11. This downward trend reflects not only the increase in interest rates observed until the end of 2008, but it may also be linked to a higher volatility in housing prices. Given that real estate assets are used as collateral in loans, real estate valuations are thus likely to affect credit market developments.

Despite the drop in interest rates on new loans for house purchase[6], this segment of credit market maintained its downward trend until the beginning of 2009 when, in a context of lower interest rates, started a slight recovery although remaining at a relatively low level.

Since the second half of 2010, with interest rates starting to increase, housing loans started, again, a slow down trajectory, reaching at the end of 2010, a historical minimum.

These results are consistent with those published in the Bank Lending Surveys[7], which sustained that this credit adjustment is being done by banks which have, gradually, set tighter credit standards since the summer of 2007. In line with growing sovereign risk differentiation in euro area debt markets, some factors explain this tightening in credit standards applied to loans, namely: i) higher financing costs due to increasing difficulties in accessing the financial markets; ii) tighter constraints in banks' balance sheet; and, iii) risks associated with expectations regarding developments in general economic activity. Turning to households' demand for loans, although surveyed banks have reported an improvement between late 2009 and early 2010, more recently demand was reportedly lower, particularly in terms of loans for house purchase. This seems to have been mainly due to the deteriorating housing market prospects.

These higher boundaries to the credit granted are also reflected in the larger spread between bank loans and reference market rates. In spite of this, Portuguese household indebtedness, in percentage of

[6] After the historical high reached in the second half of 2008, interest rates fall almost 360 b.p. until June 2010.
[7] The Bank Lending Survey is done by *Banco de Portugal* to a sample of five banking Portuguese groups.

disposable income, remains high reaching, in 2010, values above 120 percent which contrasts with levels of 20 percent in the early 90's.

4. *Conclusion*

Since 2008, more particularly following the advent of the worldwide crisis, investors' perception of risk and uncertainty has increased, worsened by the set of challenges being faced by the Portuguese economy, as a consequence of the economic and fiscal instability.

In this context, and taking into account that periods of uncertainty are usually linked with low investors' risk appetite, a set of adjustments are being done by households in their investments, which consequently affects their portfolio's composition.

Therefore, deposits have been increasing since the beginning of 2007 essentially due to the deterioration in the financial markets situation, which made riskier investments, such as shares and mutual fund units, less attractive, even despite interest rates have become to fall.

Following the PSI-20 trajectory, the investment in these riskier financial instruments slightly recovered in 2009, falling again in the last semester of 2010. Indeed, the end of the last year was characterised by a new growth in deposits, this time with longer maturities. This was a consequence of higher interest rates offered by banks in a context of liquidity scarcity, as well as an increase in investment in securities issued by MFI and general Government in line with the rise observed in the yields. Riskier investments, such as shares and mutual funds units suffered, again, a disinvestment.

Despite the maintenance of high indebtedness levels, as a percentage of disposable income, loans started a downward trend, especially those for house purchase (used as a *proxy* of real estate investment), reaching, at the end of 2010, a historical minimum. This situation is explained by a demand contraction and, on the supply side, by the tightening of credit standards.

The concerns, not only of households but of investors in general, regarding the sustainability of public finances against the background of continued structural fragilities of the Portuguese economy in the international financing market, together with the impact of fiscal consolidation package of measures defined to Portugal, will continue to determine investment decisions, during the following years.

The evolution in 2011 will result from declines in both the domestic saving rate and in the investment rate. However, the current situation is not sustainable, in particular given the persistence of constraints on the external financing of the economy. Thus, the process of fiscal consolidation, which cannot be postponed, must coexist with a deleveraging process in the private sector, desirably associated with a rise in domestic savings, which currently stand at historical low levels.

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Banco de Portugal's experience in communicating statistics

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1. Introduction

The past several months have been an eventful period for the Portuguese economy. All the economic sectors have been suffering severe consequences, particularly income reduction and strong credit restrictions. Most households and firms, taken by surprise and in a troubled situation, could not help asking themselves: "What happened? Why there was no information that would help us to understand what was coming? Can we still trust statistics?"

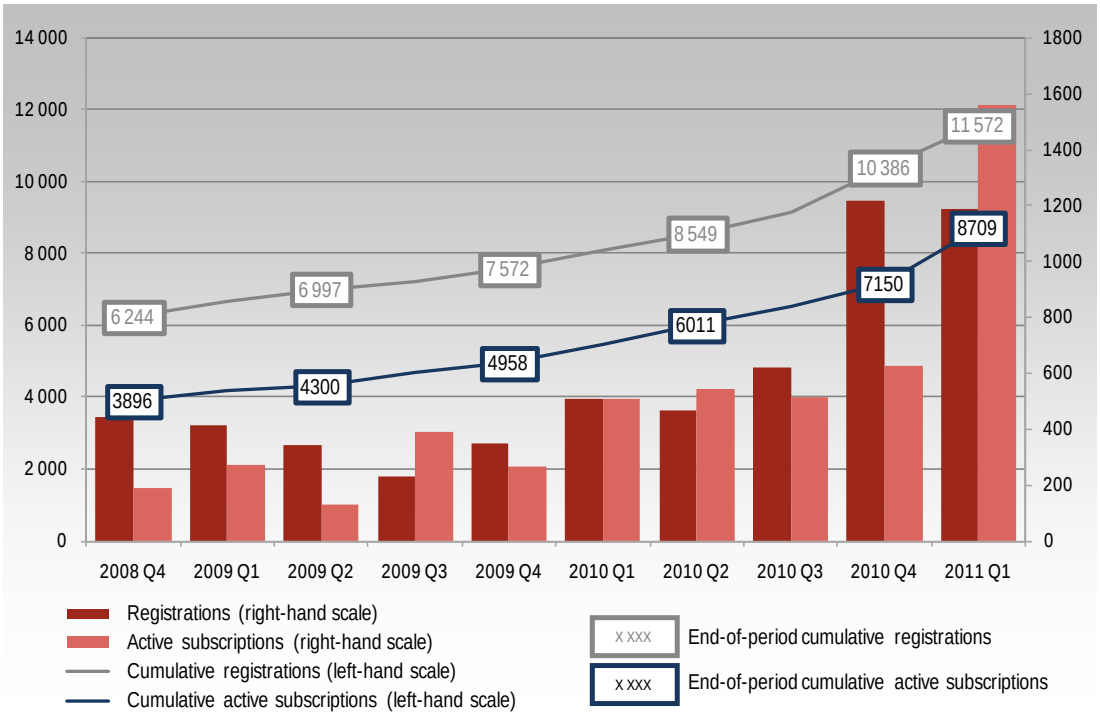
In the case of Portugal, the users' interest for the statistics published by *Banco de Portugal* (hereinafter referred as "the Bank") increased significantly as a result of the financial turmoil. All the internal quantitative indicators show that the demand for statistical data and metadata, as well as for statistical services made available by the Bank, have been growing at a fast pace. For instance:

- The Bank's structure in charge of statistical dissemination[1] recorded 774 direct contacts in the first quarter of 2011 – 440 phone calls (comparing with 307 and 393 in the third and fourth quarters of 2010, respectively[2]) and 334 e-mails (comparing with 242 in the homologous period and 362 and 364 in the third and fourth quarters of 2010, respectively) - which amounts to a daily average of more than 12 contacts; and
- Both the number of active subscriptions and of registered users of BP*stat* | Statistics online[3] (hereinafter referred simply as "BP*stat*") are increasing at a rate higher than before – e.g., in the last two quarters the number of new registered users almost tripled (around 1.2 thousand) compared with the average number in the previous quarters (see Figure 1).

Other indicators, e.g. the number of "clicks" in BP*stat* and in the static pages of the Bank's institutional website, point out in that same direction, thus supporting the idea that trust in central banking statistics has been reinforced in the wake of the last events. However, the most interesting feature is not the increasing use of statistics but rather the contacts that the Bank has been receiving on a daily basis, clearly revealing an effort on the part of the users in having a better understanding of statistics.

[1] *Banco de Portugal*, Statistics Department, Statistical Dissemination Unit (SDU).
[2] Data for the first quarter of 2010 is not available as the SDU become responsible for this task in June 2010.
[3] The internet online service to access to the Statistical Interactive Database of the *Banco de Portugal*.

Figure 1 – BP*stat: developments in the number of users registered and subscriptions (as at 31 March 2011)*



This paper tries to explain how we have conquered the trust of the users in the Bank's statistics and how we have increased the number of our "clients", in line with the Bank's strategy for the dissemination and communication of statistics. Firstly, it describes the state-of-play in 2004 and the first decisions taken for improving statistical communication; then, it describes the main phases of the Statistics Department's strategy in communicating statistics, including the plan for 2010-2012; finally, the challenges for the short- and long-term will be addressed as well as the key goals that the Bank aims to achieve, namely the ambition of a dedicated and cooperative communication specialised per type of user.

2. The infrastructure - the first layer

The strategic plan of the Statistics Department for the period **2004-2006** clearly stated that efforts should be directed to improving the statistics' disseminating function, with a view to increasing the use and the recognition of the Bank's statistics.

Until 2004, the regular diffusion of statistical data to national and, particularly, international organisations was the central task of the Bank's statistical dissemination. Beside a few tables and files, mostly dedicated to exchange rates, and the reference interest rates in the Bank's website, it was published a monthly statistical bulletin with 3,382 statistical time-series. The dialogue with the users was minimum and almost restricted to e-mails asking for data not available in the Bank's monthly bulletin. Typically, the data would be extracted, by simple procedures, from the internal time-series database and, following an assessment of its confidentiality and statistical quality, a decision would be taken as to its possible release.

This system, a conservative and cautious model designed to keep the Bank away from the spotlight, thus avoiding possible controversies, was very inefficient for both the user of statistics and the Statistics Department. It was time to move from a "reactive model" to a "proactive model", i.e., one oriented to develop closer relationships with all the statistical users, thus actively seeking out opportunities for the statistics to be widely used and, to a certain extent, transforming statistical data into knowledge[4].

A plan with three main steps was then defined and implemented:

- Firstly, a decision was taken as to substantially improve the monthly statistical bulletin by January 2005 and to publish it in three different formats: (i) printed; (ii) accessible from the Bank's official website (including long time-series and metadata); and (iii) in a CD-ROM (including metadata, a search engine and all the statistical bulletins issued in the running year, thus offering the different versions of the data);
- Secondly, to initiate the publication of statistical press-releases closed linked to the new statistical domains and sub-domains that were identified in the strategic plan of the Statistics Department, having the first one been released on 21 March 2005; and
- Thirdly, it was decided to make a considerable investment in the provision to the public at large of a new internet online access to the Bank's Statistical Interactive Database by January 2006. The resulting BP*stat* would allow for a quick and user-friendly access to all the statistics compiled by the Bank, as well as to statistics and economic indicators published by other institutions.

These three actions, and in particular the launching of BP*stat*, demanded a huge effort from all the Bank's departments involved in the production and use of statistics. The participants in the project worked together in a cooperative way, defining common structures and formats and developing and adjusting the data to the defined structure that had been designed with the users' needs in mind. All the details were defined for the new presentation of the data and the metadata (e.g. the name and designation of the series had to be amended to fulfil the defined rules and to be understandable by the general public). The data and metadata were considerably enlarged, improving the usability and accessibility of the statistical information shown in the Bank's website. This new system, fully bilingual and free of charge, also helped to define new standards – e.g., the release of all non-daily data at 11 o'clock according to an annual calendar disclosed *ex ante*[5].

During the definition of the users' requirements and the feasibility phases of the BP*stat* project it was possible to benefit from the contributions of relevant users of statistics in Portugal – including a number of the Bank's officers and several representatives from e.g. the domestic financial sector, the research community and the media, which had the opportunity to offer their views and comments on the prototypes that were being developed. Due to technical and budget restrictions not all the suggestions received were accommodated. Nonetheless, the final outcome was very much appreciated by all the participants in the project.

[4] This new attitude is not yet fully assimilated by all that participate in the statistical production. There is still controversy and some people are afraid that the Bank may be misunderstood or, which is worst, blamed of trying to set its own political agenda. This is a clear risk that has to be minimized but cannot be completely avoided. Transparency, openness, visibility and clear communication are a key path to greater trust in statistics and have to be, at least, on the same level of other statistical dimensions – e.g. relevance, accuracy, timeliness and punctuality, accessibility and clarity, comparability and coherence.

[5] Daily data is released in three blocks at 10 a.m.; 12 a.m. and 2:30 p.m..

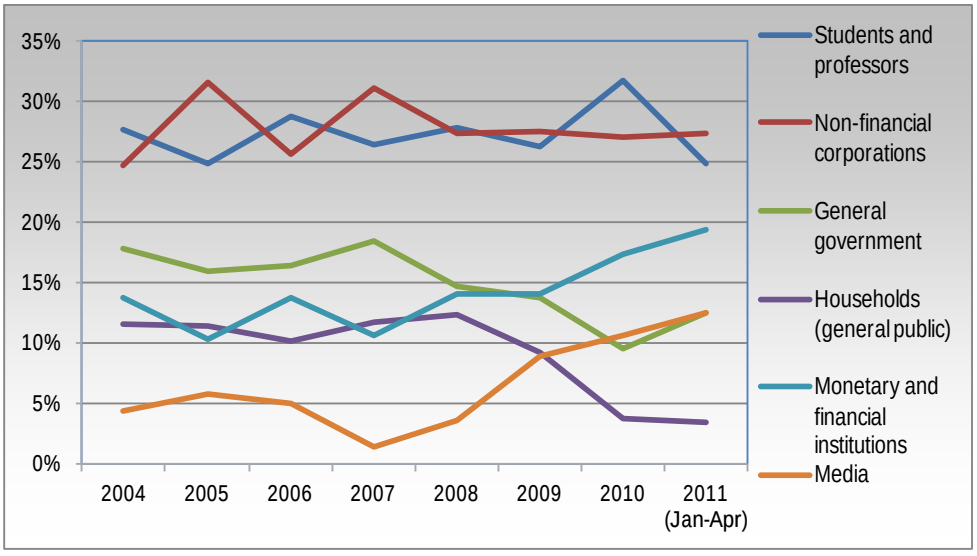
The feedback received from BP*stat* users was also very good, supporting the idea that the new infrastructure was more than appropriate as a mean to disclose statistical data and metadata to the public at large. With BP*stat* the users no longer have to submit their data requests and wait for the Bank to send back the requested data[6]; instead, the information was now freely available in the internet and the users were automatically informed by e-mail whenever new data were released. In addition, they could design and save their own views in their "personal area".

The expansion of data and metadata was, on the one hand, very welcome by the users; but on the other hand some of them were showing signs of being a bit lost in this new data environment. To cope with this problem, the Bank created a hotline (by e-mail or telephone) that, in addition to providing assistance to BP*stat* users, allowed the Bank to assess more accurately and in more detail the needs and difficulties of the users.

From these contacts it became apparent that the users' profiles were very heterogeneous. Following a split up of the users by several different types, on the basis of their needs and the characteristics and volume of their requests, it was decided to implement specific action plans, starting with the research community and the media.

In the case of the former, the number of contacts received by e-mail from students and professors was very high (25% of the total – see Figure 2) pointing out to a clear need for high quality data, long-time series (covering as many details as possible), easy to access databases, comprehensive metadata and micro-data and cross-country tables. In view of the Bank's commitment to fostering the use of central bank statistics, these data requirements were given effective consideration, even though their complexity and/or comprehensiveness prevented, in some cases, a prompt response.

Figure 2 – *Statistical data requests per type of user - (% of total)*



[6] The number of data requests decreased as the users become familiar with BP*stat* but a new type of e-mails, more technical and intended for non-published data, mainly for research purposes, started to be received on an increasing pace.

Having in mind these particular needs, in 2006 the Bank initiated a set of visits to Universities to illustrate the importance of central bank statistics, with a special focus in the presentation of the data and functionalities available in the BP*stat*.

As regards the public media, the focus had to be assumedly more cautious, given that they are the *de facto* main distribution channel for central bank statistics, particularly as regards the public at large, which implied assigning top priority to their statistical needs. Moreover, the Bank had to take into account the specific nature of the data requirements associated to this type of users, which could be described by two, often conflicting, characteristics:

- Firstly, the need for "fast" and "easy-to-read" information. Mainstream media reporters constantly press the Bank to get a fast explanation on a certain development or some additional data details that allows them to publish while the subject is still on the news. As soon as the data are disclosed by the Bank the reporter has to write a concise and as accurate as possible news release or article to be swiftly broadcasted by radio or television, and/or posted on the internet – including social networking websites like Facebook, and Twitter – and to accommodate the need for mobile and smartphone users to have constantly updated and easy-to-read information; and
- Secondly, the need to have more comprehensive data to substantiate a more in-depth analysis, particularly on the part of the specialised media.

3. Going beyond data and metadata

On the basis of the success of BP*stat* and of the identification of specific users' needs, the Statistics Department Strategic Plan for the period **2007-2009** defined as one of its main goals: the "Expansion and dissemination of BP*stat* as a structural and main component of the statistical dissemination system in *Banco de Portugal*".

These goals were implemented along three main lines of action:

- Expanding the data and the metadata in the existing statistical domains and adding new ones in BPstat;
- Promoting seminars directed to the media, with dedicated sessions on specific statistics, using the data available in the monthly statistical bulletin and in BP*stat*; and
- Enlarging the visits to the most relevant Portuguese universities and to receive students and professors to present the statistics compiled by the Bank together with BP*stat*, and to discuss the analytical use for the research community of the available statistical data.

These dedicated actions addressed to specific types of "clients" were led by the Head of the Statistics Department and included presentations by Members of the Board. These initiatives had a huge success and are now hold on a regular basis.

In 2007 the seminars for the media took place during all year, with special sessions dedicated to specific statistics, covering all aspects, from methodologies to the analytics. These type of investment proved to be profitable as it allows to have a better understanding of the needs and the statistical

literacy of the journalists and to increase the knowledge and the appetite of the media for the central bank statistics.

The importance of the media as a major statistical dissemination vehicle,[7] led to the idea that one should not only contribute to improve the media's statistical and financial literacy but also to monitor their activity, focusing in understanding which of the statistics produced by the Bank journalist are more interested in and why. With this in mind, the Bank promoted, in **2009**, and for the very first time, an analysis of the "statistical information of *Banco de Portugal* in the Media". It focused on the following dimensions:

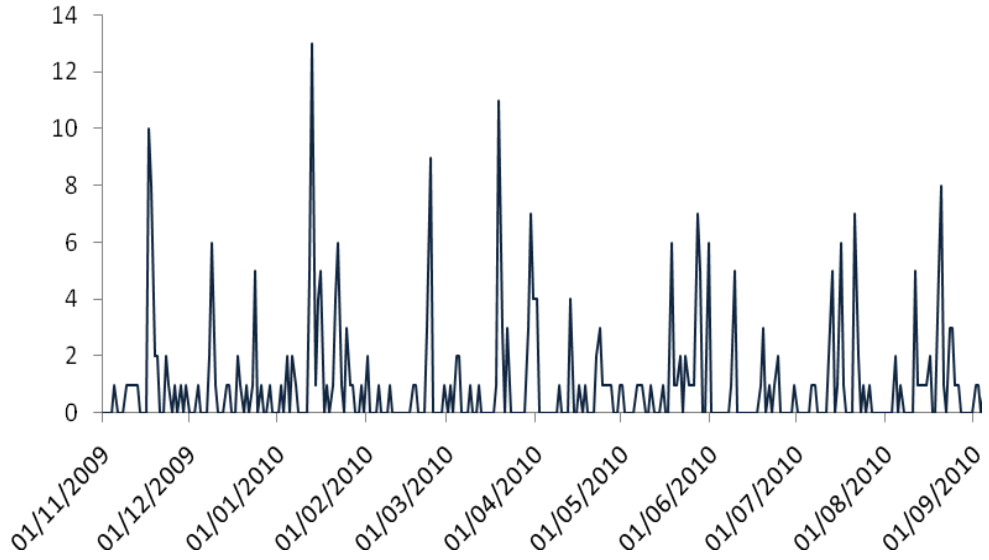
- Type of media;
- Format (news, article, etc.);
- Subject;
- Statistical domain; and
- Reference to the source/publication

An analysis of the distribution of the news along the year was also included (see Figure 3). This work is now to be conducted on a yearly basis and, in **2010**, an index of visibility was added to assess the impact of the statistics published by the Bank. There are a number of interesting conclusions that can be extracted from the 2010 report, *inter alia*:

- The press makes more reference to central bank statistics than all the other media together; more than 50% of the references to the Bank's statistics are in articles in the press;
- Monetary and financial statistics are the ones most used by the specialised press (54% of the references to Bank's statistics), followed by balance of payments statistics (29%); and
- The name of the publication, the statistical domain, etc. are usually not cited – in 66% of the cases only the source (*Banco de Portugal*) is mentioned.

[7] The large majority of people only have access to statistics via the media – the number of people that access directly the statistical sources is almost insignificant.

Figure 3 - *Number of news incorporating Bank statistics*



During this period, not only new statistical data and metadata continued to be release in BP*stat*, on a daily basis,– adding new data segments and new series as well as improving the available metadata –, but also other components of the statistical dissemination system were finalised, namely an application to manage the metadata – allowing to create, share and identify the use of the metadata, in particular statistical notes and "free text" associated to statistical domains, time-series and dimensions of analysis or some of its components that are particularly important in the multidimensional analysis.

4. Getting closer to the users – implementing a client service strategy

The third strategic goal of the Statistics Department Strategic Plan for **2010-2012** explicitly highlights the importance of providing a good service to all users "to improve the ways of communicating statistical information, enhancing its use and promoting statistical literacy".

In **2010** an "Action Plan for Communicating Statistics" was defined. According to it, in the first Monday of every month a one-hour meeting is dedicated to the discussion of strategic points or the approval of specific action lines. This plan is focused on the implementation of a client service strategy that aims at satisfying the statistical users, taking in consideration their specific needs. It includes thirteen objectives, to be achieved throughout the period 2010 -2012, which are grouped into four clusters: (i) statistical dissemination policy; (ii) statistical publications; (iii) statistical users; and (iv) statistical dissemination channels.

In line with the belief that different types of users have different types of information needs, the Bank decided that it was time to move towards accommodating the data requirements of the non-financial corporations, which are the most frequent users of the Bank's statistics, together with the research community.

The improvements included in the statistics on non-financial corporations from the Central Balance-Sheet Database – e.g. the availability of economic and financial indicators, ratios of profitability and financial debt, etc. – was a good opportunity for the Bank to reveal its willingness to understand the needs of thousands of companies operating in Portugal (most of them micro and small-sized enterprises) and to assist them in making more informed business decisions[8].

In line with this concern, the Bank decided in **2010** to carry out a seminar aiming at:

- Fostering the use of statistics, in particular those acquired from the Central Balance-Sheet Database;
- Disclosing the main outcomes of the analyses produced in the Statistics Department on the basis of such information; and
- Showing receptiveness to establish closer relationships with the non-financial corporations.

In same vein, the Bank decided in **2010** to transfer to the Statistics Dissemination Unit the phone calls received centrally that pertained to statistical issues. The growing responsibilities in the communication field led the Statistics Department to promote special training dedicated to improve the staff's communicating skills. Significantly, the reaction by all type of users to the improvements in the quality of the service was very favourable,[9] as attested by the feedback received by phone or e-mail.[10]

In 2011 and 2012 the general public will be one of the priorities! In this context, the responsibility for dealing directly with phone calls from the public helped us to have a better understanding of their difficulties and reinforced the idea of developing specific actions for this type of users. As this is a very heterogeneous and large group, the way to deal with the general public has to be addressed in a different way, mostly by producing or reusing educational material, publishing specific user guides (as it was done for BP*stat*), showing short movies on the statistics produced by the Bank, making good use of the new communication channels (e.g., social networking), etc. Some of the main action lines were finalised in 2010, e.g., the definition of the release dates and subjects for all the statistical press releases to carry out in 2011 and the production of a film on the Bank statistics dissemination system, with a particular focus on the BP*stat*. In June 2011 the Bank started publishing a new version of the "Main Indicators", which will be complemented with the production of a guide[11] to assist the statistical users in getting the most from this publication.

[8] The financial institutions and non-financial corporations that have reporting obligations, already, receive back some statistical data from the statistical production areas.

[9] The principle adopted is*: listen and understand the user's needs and expectations, replying to e-mails and phone calls quickly, friendly and in a positive way, helping and encouraging them to contact us whenever they need to understand and to find the most appropriate statistics.*

[10] One particular investment bank recently said: "Thank you for your immediate response and your explicitly valuable help. Your service is really unique and, honestly, one of the most client-friendly services of central banks around the world"

[11] It is still to be named. The title could be "Statistics for dummies" or similar but the final option may be for something more "institutional" and more connected to the publication of "Main indicators".

5. The future is now – the way forward

The present crisis is an opportunity to challenge the priorities and to understand that producing high quality statistic is at least as important as having people understanding and making good use of those statistics.

In Portugal the problem of productivity is of paramount importance and the public institutions should actively cooperate with all economic agents in promoting innovation and an efficient use of the available resources. The ambition is to develop a cooperative structure in communicating statistics that would permit to play relevant services with dedicated and personalised solutions to the users. In the short-term the objective is to implement an integrated and global statistical system that incorporates all the statistical production subsystems and the statistical dissemination activities. The idea is to keep on expanding the statistical function in the coming years, increasing the number of statistical domains, products and services, while retaining the ability to deliver high-quality statistics in a complex but more cooperative environment with data providers and statistical users.

For this aim, it is indispensable: (i) to create the technical and organisational conditions to succeed; and (ii) to evolve the scope of the statistical production to a statistical service oriented process. To develop a new and dynamic statistical system both hard and soft components will have to be considered. They are equally important: without a robust infrastructure it is very difficult to support an efficient processing and communication system and to quickly incorporate new developments in the technologies and in the people´s habits. In parallel, the system needs to be based in knowledge and in the ability to constantly joint aspects that may seem dissonant but will have to live together, particularly when all the users' needs and characteristics are to be taken on board. In a world that is changing quickly and continuously with ever-increasing competition, the number of deliverables and services the Bank have been providing will continue to grow, in parallel with forecast reductions in staff members in the coming years.

The investment in the information infrastructure, that in the last years have been oriented to the statistical production subsystems, will support the plans of having a completely new way to deal with the data collection for 2012, based in the internet and other mobile communication mechanisms changing the relationship with the data reporters and providing the conditions to increase the coverage, the quality and the informed use of statistics. This solution will start with the balance of payments and international investment position statistics and, subsequently, will be expanded to cover other statistics and to include personalised services for all the members.

In 2012 a new "revolution" in the Bank's statistical system is also expected to be launched. Under the umbrella of a portal for statistics all the dynamics mentioned before will have to be incorporated. Starting from the users' needs, the new system is expected to aggregate all the statistical components and to answer to the growing demand for statistical information. The present economic crisis brings a need for a closer follow-up of the economy and there is a clear need to go to higher levels of detail and to increase the analytics – more detailed data are being required and the statisticians have to be more open to work together with public and private entities. The decision taken by the Bank a few years ago to strongly invest in micro-databases and item-by-item reporting proved to be the most adequate, as it allows for additional flexibility to incorporate new requirements, to anticipate new data needs, to hasten statistical production and dissemination, to disclose data in different formats, to release micro-data, to extract more information from the statistical data, etc.

The Bank statistical communication developments have been driven by the belief that different types of users need different type of solutions. The ongoing or planned improvements in this area will allow for a deepening of this approach – the currently identified types of users will be further split to have a more precise dialogue and a better understanding of their needs. Also, to keep on delivering tailored solutions in a (likely) more demanding environment requires a comprehensive, integrated and very flexible statistical system, which, in turn, calls for the concept of a statistical portal.

With all the mentioned components in mind, our vision for the Bank's statistics in the coming years will consist in implementing a two-way, symmetrical, communication with the users of statistics – i.e., based on an honest and open communication that flows in both directions (rather than one-way direction), focusing on mutual benefits and efforts, attempting to achieve win-win solutions, emphasising dialogue and understanding both needs and expectations. The following elements will guide the Bank actions in implementing this goal:

- time and willingness to negotiate, adapt and make compromises;
- readiness to make adjustments in the way the Bank operates to accommodate different and sometimes conflicting user needs; and
- adoption of a close relationship aiming at reducing respondent burden and improving the overall quality and usefulness of statistics, while increasing its value and benefiting both the statistical producers and the users.

Supplements to the Statistical Bulletin

1/98 Informação estatística sobre Instituições Financeiras Não Monetárias, Dezembro de 1998 /
Statistical information on non-monetary financial institutions, December 1998

2/98 Investimento directo do exterior em Portugal: estatísticas de fluxos e *stocks* para o ano de 1996 e estimativas de stocks para 1997, Dezembro de 1998 /
Foreign direct investment in Portugal: flows and stocks statistics for 1996 and stocks estimates for 1997, December 1998

1/99 Nova apresentação das estatísticas da balança de pagamentos, Fevereiro/Março de 1999 /
New presentation of the Balance of Payments Statistics, February/March 1999

2/99 Informação estatística sobre fundos de investimento mobiliário (FIM), Dezembro de 1999 /
Statistical information on mutual funds, December 1999

1/00 Investimento directo de Portugal no exterior, Dezembro de 2000 /
Portuguese direct investment abroad, December 2000 (available only in Portuguese)

1/01 "Balanço estatístico" e "Balanço contabilístico" das Outras Instituições Financeiras Monetárias, Agosto de 2001 /
"Statistical balance sheet" and "Accounting balance sheet" of other monetary financial institutions, August 2001

1/05 Utilização da Central de Responsabilidades de Crédito no Âmbito das Estatísticas Monetárias e Financeiras, Abril de 2005 /
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