

# How can administrative databases help us to understand the funding behaviour of non-financial corporations?

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## 1. Introduction

The contagion effects associated with the adverse international environment, characterised by high uncertainty about the sustainability of public finances in several European countries as well as the upward revision of the estimated general government deficit in Portugal in 2009, have been negatively conditioning the evolution of the yield on Portuguese Treasury bonds. This increase in risk premiums associated with the government debt is already being reflected in other economic agents' funding costs, namely banks, with potential widespread macroeconomic impacts.

This is particularly noteworthy for an economy where indebtedness has become a structural feature as the move in the International Investment Position easily illustrates. In 1999, the year when the country joined the euro, the net debtor position for economic agents resident in Portugal stood at 32 p.c. of GDP. By the end of 2009 it had soared to more than 109 p.c. of GDP, with almost half of this position corresponding to the resident banking sector, while the remainder is essentially public debt in the hands of non-residents. Given its role in financial intermediation with the rest of the world, the indebtedness of the banking sector emerges as the external counterpart of the non-financial private sector domestic debt.

This setting emphasises the critical need for having detailed data on these institutional sectors in order to assess their financial soundness and how they are being affected by the adverse economic situation. Data gaps are, however, an unavoidable consequence of the ongoing development of markets and institutions and are usually highlighted when a lack of timely and accurate information hinders the ability of policy makers and market participants to develop effective responses. The recent worldwide economic events drew attention to many data gaps and have clearly underlined the importance of going beyond traditional statistical production approaches to obtain a set of indicators in more innovative ways.

In this sense, this paper demonstrates how administrative databases can be used to fill in data gaps in the Non-Financial Corporations (NFC) sector. The focus will be twofold: on the one hand, it intends to unveil more detail on the NFC sector balance-sheet; on the other hand, it illustrates how these databases can be used to complement traditional macro statistics on this sector.

The report is centred on Portuguese corporate finance, in particular the amount of external financing, the choice between debt and equity, and the composition and maturity structure of debt as well as its cost. The analysis is performed in a way which allows identification of the peculiarities that depend on the activity sector and the company size. The results are particularly relevant to supporting productivity and economic growth, monetary policy and financial stability.

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The analysis is based on data derived from two databases administered by the Banco de Portugal under the responsibility of the Statistics Department: the Central Balance-Sheet Database (CBSD) – containing economic and financial information based on non-consolidated accounting reports – and the Central Credit Register (CCR) – containing information on every individual credit, above €50, granted by the resident financial system.

The use of these data sources has the great advantage of making available additional and more detailed information that, in the case of the CBSD, comes directly from the companies. This is particularly relevant in a sector where most of the existing data comes indirectly from other sectors' statistics or from surveys which are often based on small samples highly biased to larger companies. Another important feature is that all of this additional information is guaranteed without overburdening reporting agents given that both reports are already set up for other purposes.

The remainder of this paper is organised as follows: section 2 introduces both databases used in this study as well as some methodological issues. Section 3 presents the Portuguese NFC sector using mainly traditional macro statistics. Section 4 uses the micro data to characterise in more detail NFC funding behaviour and its cost while section 5 illustrates how these same databases are used for financial stability purposes, to analyse banks' exposure to NFC. Section 6 concludes.

## **2. Databases and methodology**

This section presents the two databases used in the paper. Firms' size distinction and activity sector aggregations are explained. Finally, the method used to control activity and size effects is presented.

### **2.1 Databases**

All the analysis presented in sections 4 and 5 is based on data gathered from two micro databases administered by the Banco de Portugal under the responsibility of the Statistics Department: the Central Balance-Sheet Database (CBSD) and Central Credit Register (CCR). From these two sources it is possible to obtain an almost complete sample of the Portuguese Non-Financial Corporations (NFC).

An important feature of these data, as a source for statistics, comes from the fact that all the reported information concerns individual firms. This allows for an accurate classification of companies and instruments according to relevant statistical criteria, taking advantage of the knowledge and statistical reference data resources available at the Banco de Portugal, as part of the Portuguese national statistical system.

#### **2.1.1 Central Balance-Sheet Database (CBSD)**

Since 2006, CBSD data has been based on corporate accounts reported in fulfilment of firms' statutory obligations. This database has detailed and carefully harmonised balance-sheet and profit/loss data on nearly all non-financial companies in the country. The information is reported with a delay of about seven months from the reference period.

Table 1  
**Sample coverage, by number of non-financial corporations, number of employees, turnover and total assets**  
 In per cent

	2006	2007	2008
<b>Number</b>	91.9	93.7	91.9
<b>Employees</b>	94.8	96.8	94.9
<b>Turnover</b>	96.8	98.3	97.0
<b>Total assets</b>	98.2	98.2	96.1

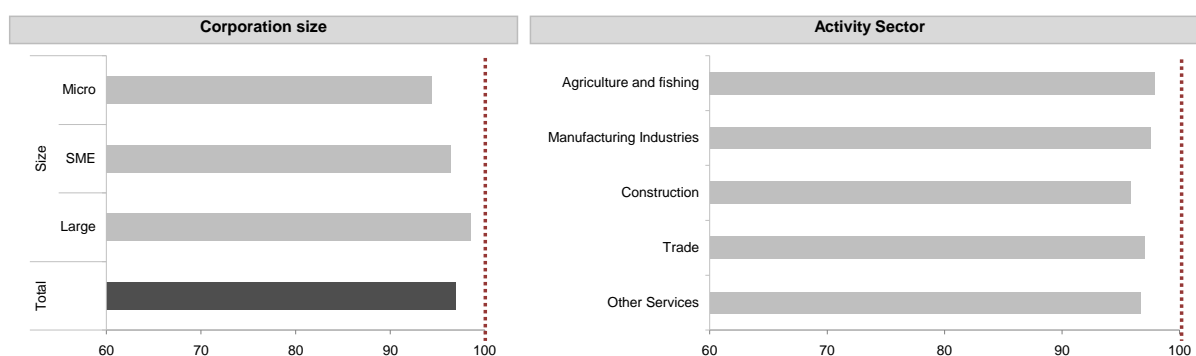
Source: Banco de Portugal

As table 1 demonstrates, the coverage level in any of the indicators (number of companies; number of persons employed; turnover; total assets) is well above 90 p.c. in every year.

Detailing the coverage indicators, at the turnover level it is possible to verify that the Portuguese CBSD has the great advantage of showing almost no bias towards larger companies or to any of the activity sectors. In fact, the CBSD represents equally well smaller and larger firms (95 p.c. for micro; 96 p.c. for SME and 99 p.c. for large) and the same happens for all activity sectors with the one with smaller coverage, “construction”, being covered at more than 95 p.c. (figure 1). This high coverage level implies that the size and sectoral structure of the Portuguese economy is being well replicated in the database.

Data quality control is a crucial step in this process. Each year, the CB receives reports from more than 350 thousand companies with each one reporting up to 1 600 indicators. The massive amount of data increases the chance for reporting errors making quality check procedures a key element in order to allow the good use of this information. The data control starts with automatic consistency tests performed at the reporting level that are later complemented with additional individual quality control at the Banco de Portugal.

Figure 1  
**CBSD turnover coverage by companies' size and activity sector (2008)**  
 In per cent



Sources: CBSD, Banco de Portugal

The large amount of available data provides comprehensive disaggregated information (e.g. by activity, firm size, geographical area), tail/distribution information, and can be crossed with other data sources<sup>2</sup>.

### **2.1.2 Central Credit Register (CCR)**

The CCR contains information on actual and potential<sup>3</sup> credit granted by the resident financial system<sup>4</sup>, both positive (when contractual obligations are being duly fulfilled) and negative (when there are arrears).

Borrowers are resident or non-resident entities, both individuals and organisations, receiving credit from resident financial institutions. Information is reported to the CCR by the lenders on a monthly basis, with reference to the outstanding liabilities at the end of each month. Participants are obliged to supply the CCR with information related to all borrowers whose total debt outstanding (actual or potential) is over €50.

Given the reduced threshold used for reporting operations and the mandatory report, this database has virtually all credit operations granted by the financial system in Portugal. As reference, just for the month of December 2009, the CCR received 1 057 560 registries concerning only NFC.

The main aim of the CCR is to provide the participants with relevant data for their assessment of the risks attached when granting credit. To this end, participants can assess aggregate information on the credit liabilities of each client (borrower) vis-à-vis the financial system as a whole<sup>5</sup>. From a legal point of view, information on credit liabilities can be used for the supervision of financial institutions and for the compilation of statistics<sup>6</sup>.

## **2.2 Aggregation used**

In order to facilitate the analysis and identify common trends, some aggregations were performed at the company level, namely concerning companies' size and activity sector.

### **2.2.1 Size dimensions**

The size classes considered herein are based on the European Commission Recommendation of 6 May 2003 related to the definition of micro, small and medium sized companies.

In many studies these three categories are taken together as SME. Given that in Portugal micro companies account for the large majority of firms it was decided to treat them as an autonomous group in order to enable the identification of their specific characteristics.

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<sup>2</sup> See *Simplified Reporting: Inclusion of the Simplified Corporate Information in the Statistics on Non-Financial Corporations from the Central Balance-Sheet Database* (<http://www.bportugal.pt/en-US/Estatisticas/PublicacoesEstatisticas/Tumbnails%20List%20Template/sup-be-1-2008-en.pdf>) for more details about the CBSD.

<sup>3</sup> Potential liabilities consist chiefly of the situations that constitute irrevocable commitments by participants, such as available credit on credit cards, credit lines, pledges given by participants and other credit facilities which may become actual debt.

<sup>4</sup> Banks, savings banks, mutual agricultural credit banks, credit institutions, specialised consumer finance companies, leasing companies, factoring companies and credit card issuing or managing companies.

<sup>5</sup> In 2009 financial institutions assessed data on more than 7 million borrowers (non-financial corporations and households) in the CCR.

<sup>6</sup> See *A New Source for Monetary and Financial Statistics: the Central Credit Register* (<http://www.bportugal.pt/en-US/Estatisticas/PublicacoesEstatisticas/Tumbnails%20List%20Template/sup-be-1-2005-en.pdf>) for more details about the CCR.

Accordingly, this study has adopted three categories: micro companies, small and medium sized companies (SME), which entails both classes referred to in the EC Recommendation, and large sized companies, which are considered to be those who are above the thresholds mentioned in table 2.

Table 2  
Definition of micro, small and medium sized companies

Enterprise category	Employees	Turnover		Balance-sheet total
Medium sized	<250	≤ €50 million	or	≤ €43 million
Small	<50	≤ €10 million		≤ €10 million
Micro	<10	≤ €2 million		≤ €2 million

Source: European Commission

### 2.2.2 Activity dimensions

The business segments considered throughout this analysis are those foreseen for NFC in the 3rd revision of the Portuguese Economic Activity Classification (CAE rev3) that is equivalent to NACE Rev. 2. Nevertheless, in order to simplify the activity sector analysis, it was made an aggregation which, although based on NACE Rev. 2 Section codes, only comprises five categories, as shown in table 3.

Table 3  
Categories considered in the business segments classification  
NACE Rev. 2

NACE Rev. 2 Section	Description	Additional categories
A	Agriculture, Forestry and Fishing	Agriculture and Fishing
B	Mining and Quarrying	Manufacturing Industries
C	Manufacturing	
D	Electricity, Gas, Steam and Air Conditioning Supply	
E	Water supply, Sewerage, Waste Management and Remediation Activities	
F	Construction	Construction
G	Wholesale and Retail Trade, Repair of Motor Vehicles and Motorcycles	Trade
H	Transportation and Storage	Other Services
I	Accommodation and Food Service Activities	
J	Information and Communication	
L	Real Estate Activities	
M	Professional, Scientific and Technical Activities	
N	Administrative and Support Service Activities	
P	Education	
Q	Human Health and Social Work Activities	
R	Arts, Entertainment and Recreation	
S	Other Service Activities	

Source: NACE Rev.2 – Statistical classification of economic activities in the European Community, Eurostat, 2008

### 2.3 Method of adjusting financial indicators

In order to unveil the respective influence of the firm's size and activity sector on the firm's financial structure, the financial indicators taken from the CBSD and CCR were adjusted.

For the size effect, the adjustment consists in imposing on each size class the same sectoral structure as that observed at aggregate level (taking all size classes together). In analytical terms, that is expressed as:

$$Y(d)_t = \sum_s Y(d)_{st} \cdot W_{st}$$

Where:

$Y(d)$  = aggregate value of the variable at the size class d level

$Y(d)_s$  = individual value of the variable at the size class d – sector s level

$W_s$  = weight of each sector in total value added (taking all size classes together)

$s = 1, \dots, S$  sectors

$d = 1, \dots, D$  size classes

$t = 1, \dots, T$  years

To reveal the sector effect, the adjustment means considering that the class structure within each sector is equivalent to that observed at aggregate level (taking all sectors together), expressed as:

$$Y(s)_t = \sum_d Y(s)_{d,t} \cdot W_{d,t}$$

## 3. The Portuguese non-financial corporations sector – a macro statistics approach

The NFC sector plays a major role in the Portuguese economy. Indeed, in 2009 NFC were responsible for more than two thirds of the employment and more than half of the gross value added of the Portuguese economy.

### 3.1 Companies' structure

This sector is composed essentially by very small firms<sup>7</sup>, as they represent 87 p.c. of the total although in terms of employment and turnover they stand for only 26 p.c. and 15 p.c., respectively. With large companies the opposite situation takes place. With a weight of less than 1 p.c. in number, they stand for 27 p.c. of employment and 42 p.c. of turnover. SME hold, however, the largest share of persons employed (47 p.c.) and turnover (43 p.c.).

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<sup>7</sup> This analysis does not consider self-employed businessmen as they are, for statistical purposes, part of the household sector.

Table 4  
**Non-financial corporations sector structure, by size and by activity sector (2008)**  
 In per cent

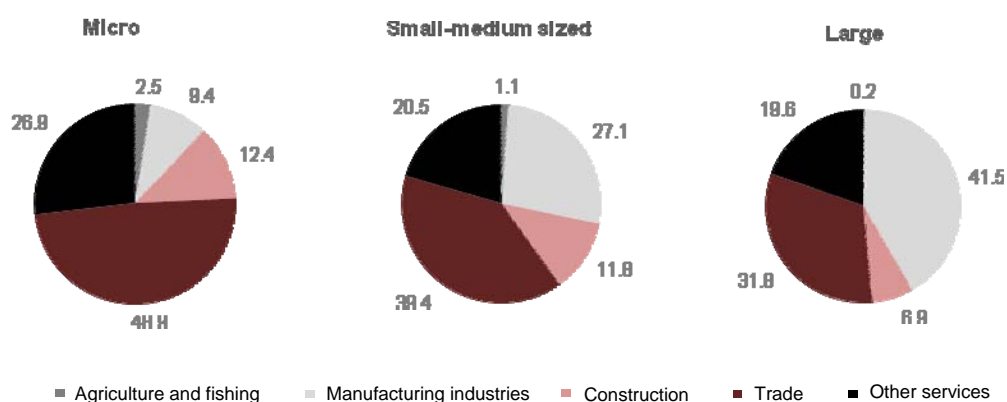
	Nr. of NFC	Employees	Turnover
<b>By size dimension</b>			
Large	0.3	27.4	41.9
Small and medium sized	13.2	46.6	42.8
Micro	86.5	26.0	15.3
<b>By economic activity</b>			
Agriculture and fishing	2.5	1.5	0.9
Manufacturing industries	11.9	25.4	29.4
Construction	13.6	13.7	9.6
Trade	27.3	20.6	36.4
Other services	44.7	38.8	23.7

Source: Banco de Portugal

From an economic activity perspective, the services sectors emerge as the most relevant no matter the indicator being considered. When “trade” and “other services” are merged, they represent 72 p.c. of the companies, 59 p.c. of total employment and 60 p.c. of total turnover. “Construction” and “manufacturing industries” are balanced in terms of number of companies, yet the second clearly dominates in number of persons employed (25 p.c. against 14 p.c.) and turnover (29 p.c. against 10 p.c.). The primary sector is nowadays almost inexistent (table 4).

Combining dimensions – size and activity sector – and focusing on turnover, it is clear the large relevance that “trade” has in all size aggregations although its influence decreases with company size (figure 2). Indeed, for micro companies and SME, “trade” is the most relevant activity with almost half of the total turnover for the former and 39 p.c. for the latter. For large companies it appears only as the second most relevant with 32 p.c.

Figure 2  
**Structure of the non-financial corporations’ turnover by size and by activity sector (2008)**  
 In per cent



Source: Banco de Portugal

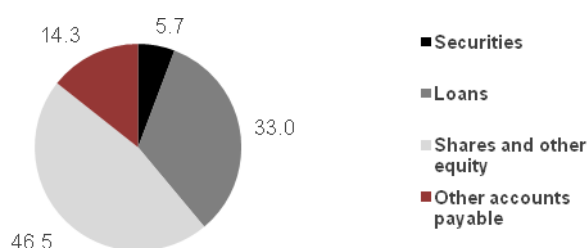
“Manufacturing industries”, being in general a sector involving large investments, shows the opposite trend, increasing its relevance in total turnover with the firm’s size, having the

highest weight for large companies (42 p.c.). “Other services” are balanced across size dimensions with a slight bias towards smaller companies while “construction” is about two times more relevant in micro and SME than in large firms.

### 3.2 Funding structure

Financial Accounts data show that own funds represent almost half of the total value (47 p.c.) followed by loans (33 p.c.) and other accounts payable, which include trade credits and advances (figure 3). The share of debt securities (6 p.c.) demonstrates the small relevance that this instrument has for Portuguese firms.

Figure 3  
Non-financial corporations' liabilities structure (2009)  
In per cent



Sources: Financial Accounts, Banco de Portugal

Comparing the actual structure with the one existing at the beginning of the decade, financial debt (loans and securities other than shares) increased its weight by 7 p.p. while own funds and trade credits reduced by 3 p.p. and 2 p.p., respectively. The boost in debt can be seen by the large increase in the financial debt ratio<sup>8</sup>, which has moved from 65 p.c. in the year 2000 to 83 p.c. in 2009.

This increase in debt also had effects on the maturity structure. In the year 2000, the weight of long term financial debt in total financial debt was 72 p.c. while in 2009 it rose to 78 p.c. However, it is interesting to notice that this is due to the large weight that loans have in total financial debt given that in the case of securities other than shares, in the same period, the short term component increased its relevance from 43 p.c. to 56 p.c. essentially due to higher amounts of issued commercial paper. The increased relevance of this instrument can be explained in part by the problems associated with the issue of debt securities at longer terms in the most recent periods.

Given this liabilities structure, it is important to know which sectors are financing the NFC. Analysing whom-to-whom tables, also derived from Financial Accounts, it is possible to see that more than 62 p.c. of the funding is coming from other institutional sectors with emphasis on the Financial Sector with a share of 42 p.c. of this value while the Rest of the World and Households represent around 29 p.c. and 27 p.c., respectively.

Detailing by instrument, debt securities are mainly in the hands of the Financial Sector (55 p.c.) and Rest of the World (42 p.c.). The largest component of loans is granted by the resident Financial Sector (55 p.c.). Concerning shares and other equity, more than 45 p.c.

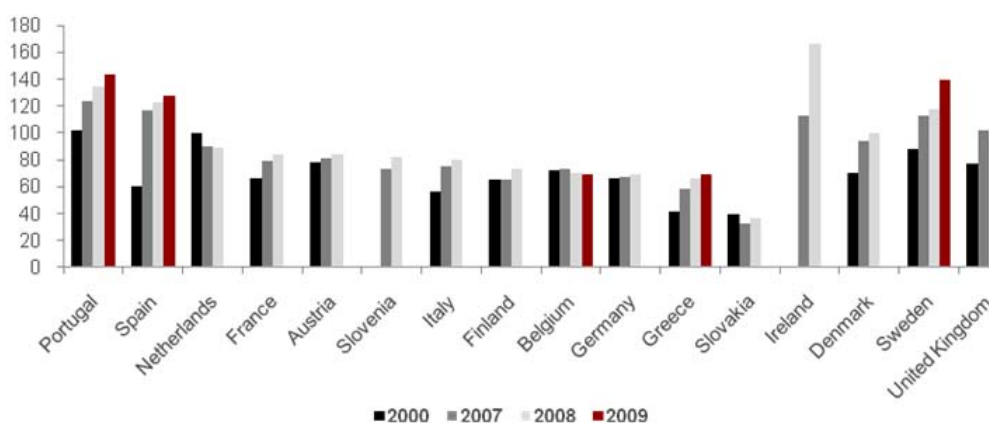
<sup>8</sup> Ratio between financial debt and shares and other equity.



are in the hands of other companies inside the NFC sector (45 p.c.), Households detain 25 p.c. and the Rest of the World 20 p.c.

Focusing only on the magnitude of other sectors' exposure to NFC, through the consolidated financial debt it is possible to verify that, at the end of 2009, the indebtedness of NFC to other institutional sectors in instruments paying interest amounted to 143 p.c. of GDP, one of the highest in the euro area. This comparatively high level of debt is recurrent but, as figure 4 demonstrates, the gap to most of the other countries has widened in these last ten years.

Figure 4  
Non-financial corporations' financial debt  
As a percentage of GDP



Note: Consolidated amounts except for Ireland and the United Kingdom  
Source: EUROSTAT

Within a framework of a meaningful differentiation of sovereign risk at international level, with the Portuguese Republic rating under downward revision, firms will probably face more constraints to accessing debt markets and bank financing, namely by incurring higher costs. The high indebtedness level and the prevalence of credits with rates indexed to money market interest rates makes Portuguese NFC even more vulnerable to this situation. Given that, for Portuguese firms, bank loans represent a significant share of the financial debt, this instrument interest rate can be a key indicator to analyse NFC funding costs.

### 3.3 Funding cost

The ECB, along with the euro area national central banks, publishes, on a monthly basis, data on a set of euro area interest rates on lending business. These Monetary Financial Institutions (MFI) Interest Rate statistics (MIR)<sup>9</sup> provide a comprehensive, detailed and harmonised picture of the level of interest rates applied by the MFI, and their changes over time. They are particularly useful to analyse the monetary policy transmission mechanism, especially the extent of the pass-through of official rates to the lending and deposit rates paid and received by the Households and NFC.

The interest rate on outstanding amounts of loans granted to NFC reflects the weighted average interest rate applied by MFI to the stock of these loans in a certain time reference period. It covers all loans used and not yet repaid by customers in all the periods up to and including the reporting date, although excluding bad loans and loans for debt restructuring at

<sup>9</sup> These statistics are covered by the Regulation (EC) No 290/2009 of the ECB, of 31 March 2009, amending Regulation (EC) No 63/2002.

rates below market conditions. The figures for individual countries reflect loans granted by the resident banking sector to all companies resident in the euro area.

Figure 5 demonstrates that the average interest rate on outstanding amounts of loans granted by MFI to NFC closely follows the market interest rates' behaviour, here represented by the six month EURIBOR. It is also noticeable that the spread between both rates shrank until the first tensions in the financial sector were felt in summer 2007.

Figure 5  
Interest rates  
In per cent

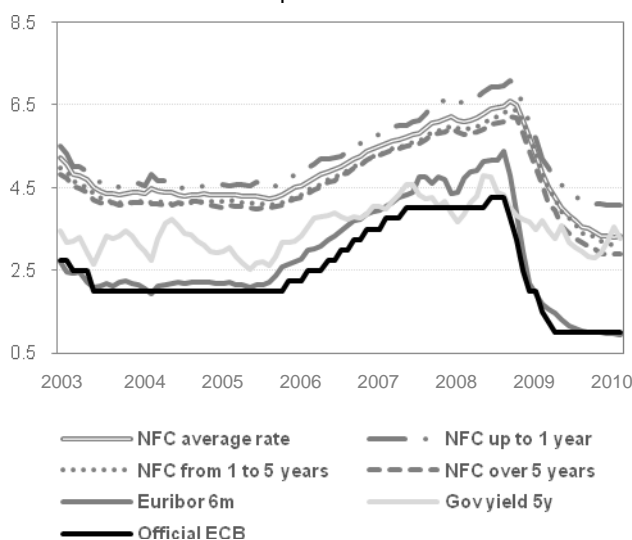
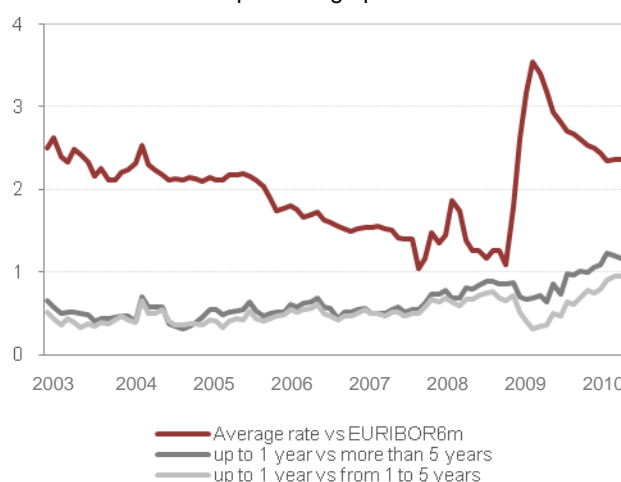


Figure 6  
Non-financial corporations' interest rate spreads  
In percentage points



Sources: Banco de Portugal, author's calculations

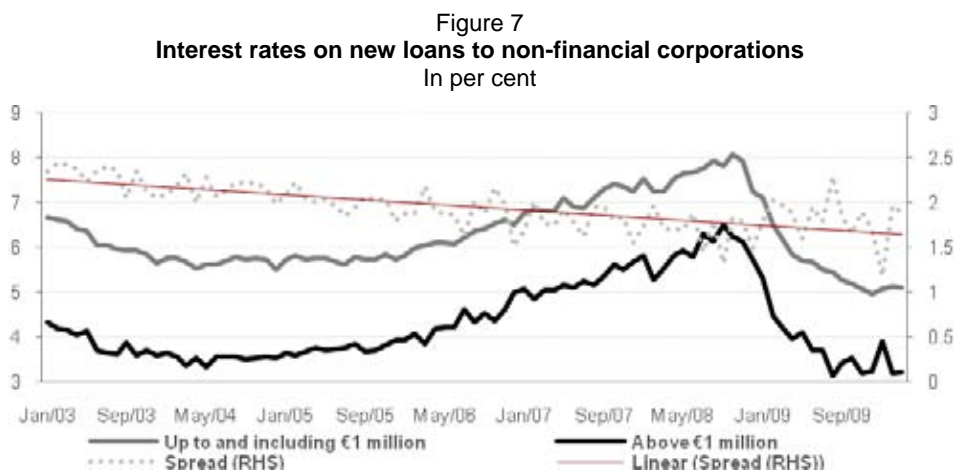
With the Lehman Brothers bankruptcy in September 2008, and all the turbulence that it provoked in financial markets, central banks started a substantial cut in their official interest rates in an effort to pull down market rates, which eventually happened. Nevertheless, although more than 98 p.c. of the new loans granted to NFC are with initial rate fixation up to one year, the fast decline in market rates was not immediately reflected to the total stock of loans. Given this, between September 2008 and January 2009 the spread between these rates increased markedly (figure 6). Since that date, it has started to decrease again although, in the latest months, it has remained flat, probably reflecting more careful behaviour from the banks.

Also from figure 5 it is possible to see that, even with the referred link of NFC loans to short term interbank rates, credits with shorter maturity pay higher rates. That differential in costs between short and medium and long term loans has also increased in the latest periods<sup>10</sup>.

MIR statistics also include figures on new operations from which it is possible to gain a better idea of the interest rate level being currently applied by banks. In these statistics, for NFC, a distinction is drawn between loans above and below €1 million in order to have an approximation to the effect of the company size on the interest rate level. As can be seen from figure 7, larger loans have smaller interest rates along the entire series.

<sup>10</sup> Another remarkable feature that can also be seen in figure 5 relates to the most recent events in sovereign debt markets and how they managed to pull the government bond yields above the average interest rate paid by banks on bank loans.

Rates on larger amounts present significant volatility – due to the impact that some large operations have on the average rate – making the spread highly variable. Nevertheless, adding a linear trend to it, it is possible to detect that this differential has been presenting a slightly downward tendency. In January 2003 it was 2.4 p.p. while in December 2009 it stood at 1.7 p.p.



Sources: Banco de Portugal, author's calculations

This section presented, by means of traditional macro statistics, the NFC sector structure, funding sources and related costs. One of the points highlighted here relates to the high indebtedness level presented by NFC which is a major source of concern in the current difficult economic context, marked by credit restrictions to the Portuguese economy.

This situation will surely have negative impacts on many firms. In order to support economic growth, policy makers are expected to intervene and for that, they need to be aware of which subgroups of companies and instruments must be targeted, a goal which can only be accomplished if more detailed data is available.

The conclusions presented here, being based on macro figures, mask all scope of heterogeneous behaviour than can be found by looking into smaller subsets of companies. The relevant issue then, is to ascertain if these conclusions are in fact valid for all types of companies. Are smaller companies paying similar interest rates to the larger ones? Do all activity sectors use the same funding sources? Which companies are riskier in terms of credit? All these questions are difficult to answer based on aggregate figures and the cost of collecting additional, more detailed, data is high. The next two sections of this paper show how these questions can be addressed in a cost effective way by using existing administrative micro databases.

#### 4. Micro databases – complementing traditional macro statistics

National accounts provide a full picture of the transactions and financial positions of institutional sectors in a country. They enable a comprehensive analysis of the links between financial and non-financial developments in the economy and the relationships between the various institutional sectors.

MIR statistics provide a comprehensive, detailed and harmonised statistical picture of the level of interest rates applied by the MFI, and their changes over time. They facilitate the analysis of the transmission mechanism of monetary policy, especially the extent of the

pass-through of official rates to the lending and deposit rates paid and received by the Households and NFC.

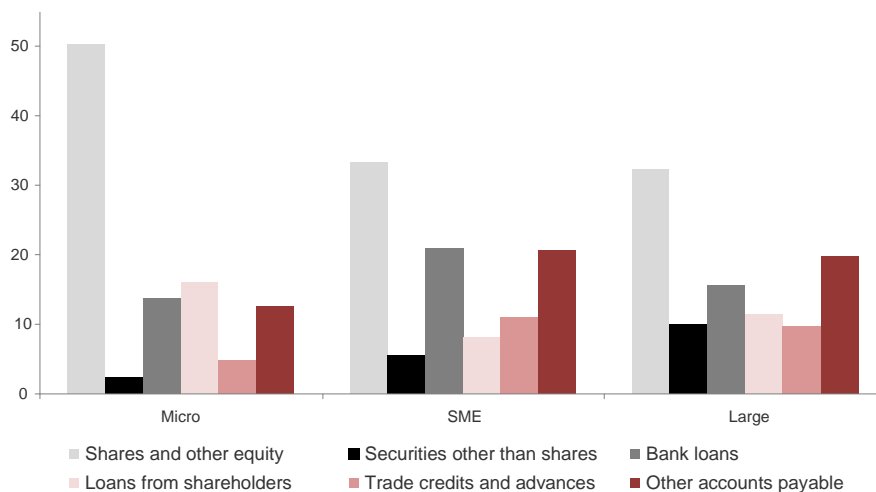
Both statistics, however, only allow analysis at a high aggregation level making it impossible to identify important heterogeneities existing inside institutional sectors. This section, with the help of micro data, deepens the analysis by showing additional details by activity sector and company size. The use of CBSD and CCR data to complement Financial Accounts and MIR statistics reveals the usefulness of administrative databases in overcoming the lack of more detailed data on the NFC balance-sheet position and funding cost. It is worth mentioning that the additional information obtained from these databases does not imply overburdening of reporting agents given that these are administrative tools created mainly for other purposes. Yet, in recent years, that information has started being treated and employed also for statistical purposes. This additional usage has also carried large benefits in terms of the quality of those databases. Indeed, the thorough statistical use demands detailed quality control of the basic registries, often implying crosschecks with other statistical sources. Any inconsistency detected needs to be explained, resulting quite often in error correction.

The conclusions derived from this analysis are notably relevant in a context marked by an economic crisis and among fears that NFC access to credit is being restricted.

#### 4.1 Balance-sheet data

Decomposing the funding structure into three size classes immediately highlights some relevant disparities (figure 8). Larger companies are the ones presenting more diversified funding sources as their dependence on the various instruments is more balanced. Going to the instrument detail, although own funds is the major funding source for all groups its relative weight varies deeply. For micro companies it represents 50 p.c. while for large companies, the same component weight drops to 32 p.c. This shareholder dependence showed by micro companies is also evident in the weight of loans granted by their capital owners (16 p.c.) that compares with 8 p.c. for SME and 11 p.c. for large companies.

Figure 8  
**Non-financial corporations' liabilities structure, by company size (2008)**  
 As a percentage of the total



Sources: CBSD, Banco de Portugal

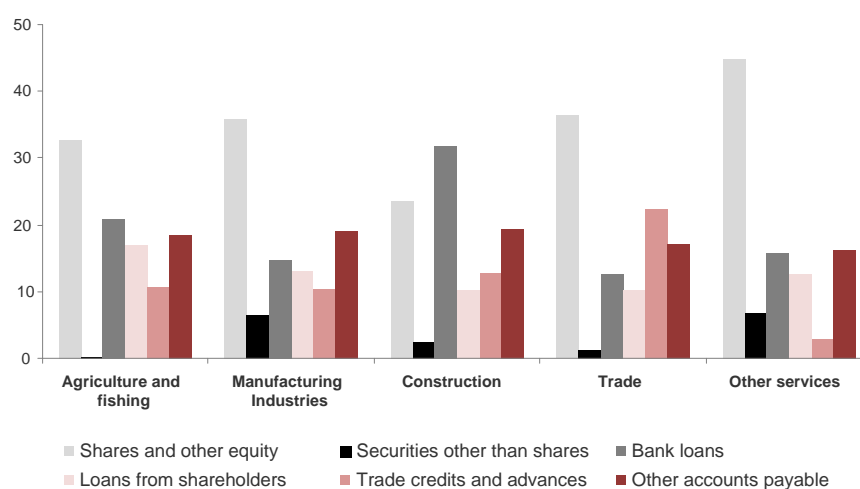
Another important funding source is financial debt (excluding loans granted by shareholders). Breaking down this component, it is clear that bank loans are the most relevant source of funding for all companies, with some emphasis on SME, where it reaches 21 p.c. of total

liabilities. The balance between loans and securities other than shares, as a source of funding, grows with company size. Indeed, for micro companies the difference between the two instruments is 12 p.p. (2 p.c. for securities and 14 p.c. for bank loans) while for large it goes down to 6 p.p. (10 p.c. for securities and 16 p.c. for bank loans).

Trade credit and advances are twice as relevant for SME and larger companies than for micro companies. Remaining debt, including diversified components such as taxes, accruals and deferrals and other debtors, is also less relevant in micro companies.

The same analysis can be made by activity sector. Figure 9 compares the financial structure indicators in the five activity sectors used in this study: agriculture and fishing; manufacturing industries; construction; trade; and other services.

Figure 9  
**Non-financial corporations' liabilities structure, by activity sector (2008)**  
 As a percentage of the total



Sources: CBSD, Banco de Portugal

The first important remark highlighted by the graph is that bank loans are the major source of funding for “construction” while for all the remaining activities it is own funds. Securities other than shares only present some relevance for the “manufacturing industries” sector and “other services”, while for “trade” and especially for “agriculture and fishing” these are almost inexistent. The remaining instruments present some equilibrium between activities with the main highlights being the higher significance of trade credits for the “trade” sector and loans from shareholders in “agriculture and fishing”.

All this analysis directly based on the figures reported by firms can be biased if there is a large concentration of a certain activity in one particular company size group, or vice-versa. A great advantage of using individual balance-sheet data is that it enables one to detect and control specific effects. The remainder of this section takes activity sector and companies' size composition into consideration.

### 4.1.1 Size dimension

Various points suggest that small firms' financing methods differ from those used by larger firms, or may even be subject to financial constraints<sup>11</sup>. Problems of information asymmetry are probably more significant in the case of small firms, which often suffer from a degree of information opacity in the sense that they don't face such an intense scrutiny as listed and larger companies. Therefore, it is usually harder for small companies to build a reputation, ending up, most of the time, being judged by the average behaviour.

Information asymmetry entails costs (screening, contracting, monitoring costs, etc.) for the lender and those often have a large fixed component, making the average cost decline for larger borrowers and encouraging the banks to prefer larger customers. Small firms generally also have relatively fewer assets available to use as collateral, to protect creditors against adverse selection or moral hazard problems and clearly have less bargaining power than larger companies.

The previous analysis, being based on data taken directly from the companies' accounts, may imply that some of the figures are biased by the activity distribution existing in each class. That is, some results may be mainly reflecting the characteristics of an activity that has more weight in that company's size group. To overcome this situation, all indicators presented in this section were adjusted for activity sector effects by using the method described in section 2.3.

Table 5 presents a set of selected financial ratios that, by synthesising information provided by the financial statements, are useful indicators of firms' performance and financial situation.

Table 5  
**Financial ratios, by company size**  
3 year (2006-2008) average adjusted for activity effects; in per cent

	Micro	SME	Large
Debt to equity	188.0	220.6	260.0
Financial debt/Turnover	87.4	56.4	40.0
Weight of long term financial debt on total financial debt	51.5	61.8	59.0
Days in receivables	106.5	99.1	74.4
Days in accounts payable	122.3	90.5	77.3
Cost of debt	11.3	5.1	4.4
EBITDA/Interest and similar charges	124.1	242.8	289.6
Liquidity ratio (current ratio)	121.2	125.9	107.8
Reduced liquidity ratio (quick ratio)	81.3	89.7	88.2
Return on Assets (ROA)	7.0	5.1	5.4

Sources: Banco de Portugal, author's calculations

The first conclusion that can be derived from the indicators presented in table 5 is that Portuguese firms are highly leveraged with that effect growing with the company size. Indeed, adjusting for the activity sector effects, the debt-to-equity ratios are 188 p.c. for micro companies, 221 p.c. for SME and 260 p.c. for large companies.

<sup>11</sup> The Flash Eurobarometer 174/184 – SME access to finance – conducted in 2006 by the European Commission showed that a considerable proportion of small and medium sized enterprises did not have enough financing to enable them to complete their projects.

Higher leverage increases the potential return of the company, but also the risk. Assuming everything else remains constant, if the Return on Assets (ROA) of the company is greater than the rate of its financing, then the Return on Equity (ROE) will be greater than it would if the company was not leveraged. Conversely, if the company's ROA is lower than the interest rate on its financing, then the ROE will be lower than it would if the company was not leveraged.

According to the available data, the leverage effect seems to be particularly positive for larger companies while for micro companies it appears to be negative. Indeed, for large companies the implicit interest rate<sup>12</sup> on financial debt is 4.4 p.c. while ROA stands at 5.4 p.c., whilst for micro the values are 11.3 p.c. and 7 p.c., respectively. The easier access larger companies have to debt markets seems to enable them to benefit from a leverage effect. In any case, the high dependence on debt is also a source of risk particularly in a crisis context where the ROA may well be affected negatively.

Given the high debt level presented by Portuguese NFC it is important to examine their ability to meet their financial obligations. Bearing in mind that financial debt has a higher weight in larger companies' financing structure, it is noteworthy that for this size class it represents only 40 p.c. of total turnover while for micro companies it reaches 87 p.c. Also from table 5, it is possible to verify that for micro companies only 52 p.c. of the debt has a long term maturity, compared to 59 p.c. for large and 62 p.c. for SME. These figures show that a large portion of micro companies' debt has to be paid, or revolved, briefly.

Liquidity ratios can help assess their ability to meet their immediate financial obligations. As table 5 demonstrates, all groups present current ratios above 100 p.c. meaning they have enough liquidity to cover short term liabilities. Comparing across dimensions it is possible to see that larger firms are the ones presenting lower values for that indicator (108 p.c.). However, focusing on the quick ratio<sup>13</sup> the values are more balanced between segments with the micro companies being now the ones appearing with the lowest value (81 p.c.). It is clear then, that the higher liquidity showed by smaller companies through the current ratio is due to inventories which quite often include items that are not that easy to transform into money.

Besides the repayment of the credit, companies also have to be able to pay the associated costs. The interest coverage ratio, obtained by dividing EBITDA by interest costs, indicates how well the firms' operational earnings can cover the interest payments on their debt. There is a clear difference between the capacities shown by different groups of firms, with micro companies showing the lowest coverage (124 p.c.) while SME and especially larger companies present a more comfortable situation (243 p.c. and 290 p.c., respectively).

The CBSD also allows the calculation of days in receivables and in accounts payable. This information clearly demonstrates that the time lag used for payments and receivables has a negative correspondence with the companies' size, with the difference between micro and large companies reaching 32 days for receivables and 45 days for payments. These figures also indicate that micro companies manage to finance themselves by trade credit, in net terms<sup>14</sup>. On average they take 122 days to pay their accounts while they manage to receive in 107 days. By this analysis, it is also possible to see that SME have the opposite situation (99 days to receive and 91 to pay) while for large companies both maturities are balanced.

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<sup>12</sup> The rate is obtained by the ratio of all interest costs and the financial debt taken directly from the CBSD. This rate is merely indicative as its calculation has some methodological drawbacks. Section 4.2 identifies some of these shortcomings and presents another funding cost estimation method.

<sup>13</sup> The quick ratio, often referred to as the acid test, removes inventories from current assets in the liquidity ratio numerator.

<sup>14</sup> This is indeed an important funding source given that in general it bears no interest costs.

In brief, the figures presented in this section indicate that micro companies are the group showing a more fragile financial situation. Indeed, these companies present a high indebtedness level with a large portion having short term maturity, meaning that many of these loans will have to be paid or renegotiated briefly. Given that the debt incurring interest payment covers 87 p.c. of the turnover, paying their loans immediately would imply a big effort for these firms. The option then would have to be renegotiating. However, in a context of restrictions to credit access this option also brings concerns. Indeed, given that currently interest costs already cover a large part of the operational earnings, it will be difficult to support higher interest levels. Commercial credit seems to be the better source of funding for micro companies. In any case, their bargaining power is probably small making it difficult to continue to benefit from this source of finance if larger companies feel serious problems in getting credit through their usual channels.

#### 4.1.2 Sectoral dimension

This section presents figures at the sectoral level in order to detect if the aggregate indebtedness is comparatively high due to a widespread and uniform use of external resources in all activity sectors, or whether, by contrast, it happens in only some of them. To better understand the funding structures it is necessary to disentangle the size effect from them. Table 6 presents a set of selected financial ratios adjusted for this effect using the methodology presented in section 2.3.

Table 6  
**Financial ratios, by activity sector**  
 3 year (2006-2008) average adjusted for activity effects; in per cent

	Agriculture and fishing	Manufacturing industries	Construction	Trade	Other services
Debt to equity	163.1	207.0	324.3	210.6	236.0
Financial debt/Turnover	37.6	28.1	60.9	9.8	97.4
Weight of long term financial debt on total financial debt	53.2	49.8	59.3	34.6	64.5
Days in receivables	100.7	96.0	121.8	66.9	88.6
Days in accounts payable	109.7	90.5	126.5	70.7	88.8
Cost of debt	3.1	3.9	5.4	2.5	9.1
EBITDA/Interest and similar charges	390.5	293.9	179.7	257.6	209.5
Liquidity ratio (current ratio)	140.2	114.3	159.4	130.6	101.5
Reduced liquidity ratio (quick ratio)	84.2	84.4	92.3	93.2	86.5
Return on Assets (ROA)	4.0	4.9	4.0	5.8	6.3

Sources: Banco de Portugal, author's calculations

From the leverage point of view, it is clear that all sectors rely more on debt than on own funds. Here, "agriculture and fishing" and "construction" are noted for being in opposite positions. The former presents a debt-to-equity ratio of 163 p.c., being the activity relying more on own funds, while the latter, with a ratio of 324 p.c., which is by far the highest among all activities, shows that on average these companies' funding structure depends more than three times more on external finance than on own funds.

Comparing "construction" sector ROA (4.0 p.c.) with its implicit cost of debt (5.4 p.c.) it appears that the leverage effect is negatively affecting the sector's profitability. A similar



situation is happening in the “other services” sector<sup>15</sup>, while for all the other activities the leverage effect seems to be positive.

Knowing that the “construction” sector depends heavily on financial debt as a source of finance, it is interesting to notice, however, that this debt has a higher weight in “other services” turnover (97 p.c.) than in “construction” (61 p.c.). The opposite scenario can be found in the “trade” sector, where financial debt represents only 10 p.c. of the turnover, which is probably explained by its more intensive use of trade credit.

The interest coverage ratio, given by the ratio EBITDA to interest and similar charges, also shows that “construction” and “other services” are the sectors presenting the lower coverage of interest expenses by operational earnings (180 p.c. and 210 p.c., respectively).

In terms of liquidity, from the current ratio values it is possible to see that, on average, all activities have enough liquid assets to cover their short term liabilities, with “construction”, “agriculture and fishing” and “trade” presenting higher coverage. Removing inventories, to consider the most liquid assets only, the ratios drop below 100 p.c., showing however more equilibrium between activities.

Concerning commercial credit, a noteworthy feature is the balanced values presented in days in receivables and payables by most of the activities, when the size effect is controlled. This indicates that, on average, most of the sectors cannot finance themselves, in net terms, by trade credit. The results also show that the larger delays in this credit are verified in “construction” (122 days for payments and 127 for receivables) and the lower ones happen in “trade” (67 days for payments and 71 for receivables).

Summing up, “construction” stands out in most indicators by presenting a somewhat more vulnerable financial situation. This is particularly patent in its high indebtedness level, associated with a negative leverage effect, and by the large proportion of its operational revenues being channelled to cover interest costs.

## 4.2 Funding cost

Given the high dependence shown by Portuguese firms on debt it is important to evaluate its cost. In section 3, this institutional sector aggregate funding cost was examined using MIR statistics. Here, using data available from the CBSD and CCR, MIR figures are disaggregated, namely to identify the effect owed to the company size and activity sector.

To perform this study we need, for each individual company, a proxy of the interest rate paid on loans granted by MFI. In the accounting report to the CBSD, NFC are asked to provide the total amount of interest paid to banks for their loans. This is an item from the profit and loss account and so it comes as a flow, i.e., gives the total amount of interest paid during one year to banks, and it will be used in the numerator to calculate the interest rate.

In the denominator, the corresponding amount of loans during the year is needed. From the CBSD it is only possible to obtain the outstanding amount at year end as this data comes as a stock from the accounting balance-sheet. Besides that, it also does not discriminate banks from other credit institutions. These are two major setbacks. First, by having only outstanding amounts at year end, it is likely there will be incoherencies between this value and the total amount of interest paid during the year. An example would be a company that had a significant amount of loans during the year but in December, in order to publicise lower indebtedness, paid back a significant portion of the credit. Using the data from the CBSD, this company would present a high level of interest paid to a low amount of received loans

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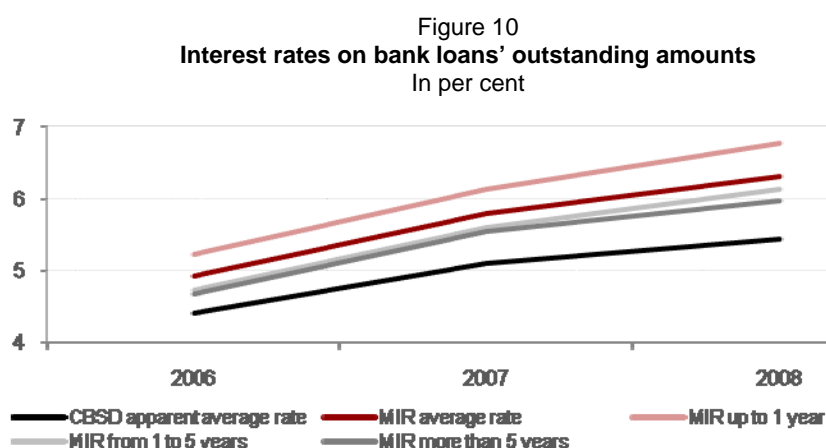
<sup>15</sup> Highly affected by real estate activities.

creating an abnormal estimated interest rate. Second, the fact that the CBSD does not isolate MFI from all other credit institutions would imply a lower estimated interest rate, if those values were used. The size of this effect depends on the weight of loans granted by MFI in the total loans granted by credit institutions.

In order to solve these problems, CCR data on monthly loans granted by banks to NFC is used<sup>16</sup>. Given that this database has individual information on the lending institution, it enables the creation of any needed aggregation. Thus, using this monthly average as the denominator in the interest rate calculation completely unravels the problem of differentiating MFI from other credit institutions and also reduces substantially the problem of loans with very short maturity appearing in the component of interest paid but not in loans received.

There are other methodological differences worth mentioning. First, MIR considers all companies in the euro area, while here only those resident in Portugal are taken into consideration. Also the interest reported in the CBSD includes loans received in other countries while MIR does not. Finally, MIR excludes bad loans and loans for debt restructuring at rates below market conditions, while the CBSD does not.

Figure 10 presents the aggregate values obtained by using CBSD methodology along with the ones published by MIR for the period 2006-2008. All rates show similar increasing behaviour along the period with the difference in levels being mostly explained by the above mentioned methodological differences.



Sources: Banco de Portugal, author's calculations

These rates are broken down in the next two sections. First, by firm size, controlling for activity effects and later for activity sector, controlling for companies' size effects.

#### 4.2.1 Size dimension

Some arguments defending the view that smaller companies tend to face more constraints in order to obtain external finance were already mentioned. The analysis of the figures presented in table 7, where loan interest rates are broken down by company size and adjusted for activity sector effects, helps us to understand that this is indeed the case in Portugal for bank loans.

<sup>16</sup> Data from both data sources can be assembled given that both use companies' fiscal number as a unique identifying code.

For the period under analysis, the interest rate has a negative association with the companies' size. In 2008, for example, the average interest rates were: 6.23 p.c. for micro companies, 5.64 p.c. for SME and 4.79 p.c. for large companies.

Table 7  
**Apparent interest rates on bank loans' outstanding amounts, by company size**  
 Adjusted for activity effects; in per cent

	2006	2007	2008
<b>Micro</b>	5.37	5.78	6.23
<b>SME</b>	4.52	5.10	5.64
<b>Large</b>	4.53	5.00	4.79

Sources: Banco de Portugal, author's calculations

These figures support the idea that the cost of loans is one of the constraints faced by smaller firms which can possibly help explain the lower weight of this type of funding on their balance-sheet when compared to the larger companies.

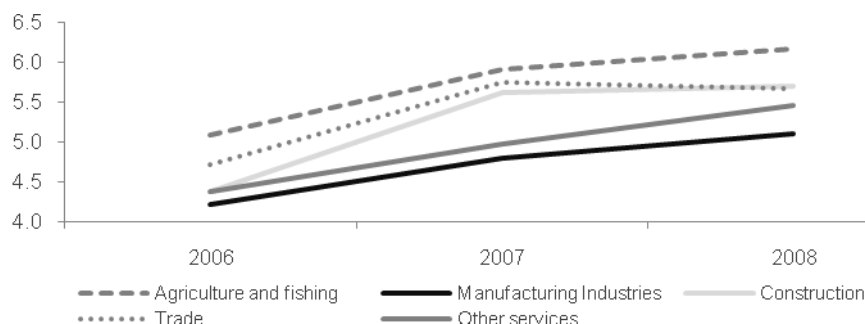
Section 3 showed how MIR statistics on new business use loan size as an approximation to company size. It was clear from the results that higher amount loans pay lower interest rates. The numbers presented here can also be used to support that approximation.

#### 4.2.2 Sectoral dimension

Using the available micro data it is also possible to detail interest rates based on a sectoral perspective. The primary sector is clearly the one facing higher interest rates on its bank loans. This is a sector with very low relevance in the Portuguese economy and it is usually associated with low profitability, being very reliant on government support and extremely risky in the sense that it is highly dependent on unpredictable climatic events. Against this background it is very likely that banks charge higher spreads to these companies in order to deal with the perceived risk.

The "manufacturing industries" sector seems to be the one paying lower rates. The explanation probably lies in the fact that companies in this sector usually need large investments in fixed assets, which makes them more attractive for banks as they possess more assets to use as collateral. In addition, this sector, unlike "agriculture and fishing", is usually associated with higher profitabilities.

Figure 11  
**Apparent interest rates on bank loans' outstanding amounts, by activity sector**  
 Adjusted for activity effects; in per cent



Sources: Banco de Portugal, author's calculations

Concerning other sectors, the numbers are not so clear but they seem to indicate that “trade” and “construction” have faced similar costs in 2008. The evolution is however noticeable as the latter starts from a lower level in 2006 (4.37 p.c. against 4.71 p.c.) and ends up in 2008 with a slightly higher rate (5.70 p.c. against 5.67 p.c.). This is probably a consequence of the negative impact of the economic crisis on construction companies that resulted in a boost in their default levels<sup>17</sup>. Likely, banks started to be more cautious and this was reflected in higher spreads charged to this sector. “Other services” present through the period a somewhat lower rate.

## **5. Financial stability – going deeper**

The figures presented in section 3 highlighted the NFC funding structure and how it is financed by other institutional sectors. For financial stability analysis, the quality of these exposures is a major concern, particularly in a setting characterised by the acceleration of fiscal consolidation and a significant sovereign risk differentiation that are expected to carry higher short term costs to economic activity and greater materialisation of credit risk.

This section, focusing on bank loans, illustrates how the micro databases used in this study can also be used to complement and validate the aggregate figures available through macroeconomic statistics.

### **5.1 Banks’ exposure to the non-financial corporations sector**

Data from money and banking statistics show that, at the end of 2009, the credit portfolio vis-à-vis the non-monetary resident sector accounted for about 72 p.c. of the Portuguese banks’ total assets, on a consolidated basis. Of this, 41 p.c. of the loans and 45 p.c. of the securities had NFC as counterparts.

From the same source, it is possible to see that loans to NFC registered substantial growth rates until 2007, the year where the rate reached 11.2 p.c. Since then, credit has started to grow at decreasing rates, ending 2009 with a value of 1.9 p.c. (table 10). In terms of default, the aggregate figures show that the default ratio, reflecting the economic crisis, more than doubled between 2007 and 2009 (from 1.8 p.c. to 4.2 p.c. – table 8).

Once again, it must be noticed that the analysis based on aggregate statistics hinders relevant details that can only be detected with individual data. The use of CCR information in this context illustrates the relevance of micro data. The first striking feature arising from this more detailed analysis is that, at the end of 2009, 18 p.c. of the NFC had credit in arrears (table 8). This, however, only corresponded to 4 p.c. of the total credit, meaning that most of these defaults involve very small amounts. Nevertheless, the total amount of credit granted to these firms stood for 17 p.c. of the total credit granted to NFC. This is an interesting indicator in the sense that if these companies already defaulted on some of their credits it probably means that they are facing financial problems that may well force them to default on other loans as well.

Also interesting is to see the evolution of these indicators over the last few years. As table 8 demonstrates, all those figures have been growing although presenting higher intensity in the last couple of years. For example, from 2006 to 2007 the percentage of companies in default increased roughly 2 p.p., the credit overdue only rose 6 b.p. and the total amount lent to

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<sup>17</sup> NFC default level will be addressed in section 5.

them rose 1.5 p.p. Doing the same math for 2009, against 2008, those indicators went up by 2.2 p.p., 1.8 p.p. and 3 p.p., showing a clear credit quality deterioration.

In order to derive implications for macroeconomic and financial stability the next two sections detail these indicators by company size and activity sector.

### 5.1.1 Size dimension

Individual data gives the necessary flexibility to analyse the bank exposure by loan size, using CCR data, or by company size, using CBSD information.

Table 8 splits credit indicators by loan size – above (large exposures) and below (retail exposures) €1 million – to see how different was these two groups' behaviour. The first salient feature which can constitute an additional risk to the banking sector is the very high concentration of large loans to a very small percentage of companies. Indeed, 6 p.c. of the firms receive more than 79 p.c. of the total loans, or, seen from another perspective, small exposures have 21 p.c of loans' value although they represent 94 p.c. of the borrowers.

	2006	2007	2008	2009
<b>Total exposure</b>				
Number of defaulters (1)	12.2	14.2	16.0	18.2
Credit overdue (2)	1.8	1.8	2.4	4.2
Total credit to defaulting NFC (2)	8.7	10.2	13.8	16.8
<b>Large exposures (higher than or equal to €1 million)</b>				
Number of borrowers (1)	5.8	5.9	6.1	6.1
Total credit in this portfolio (2)	76.8	77.9	79.3	79.5
Number of defaulters (3)	11.2	11.8	15.9	19.3
Credit overdue (4)	1.2	1.2	1.8	3.6
Total credit to defaulting NFC (4)	7.4	9.4	13.2	16.5
<b>Retail exposures (lower than €1 million)</b>				
Number of borrowers (1)	94.2	94.1	93.9	93.9
Total credit in this portfolio (2)	23.2	22.1	20.7	20.5
Number of defaulters (3)	12.3	14.3	16.0	18.1
Credit overdue (4)	3.7	4.0	4.7	6.7
Total credit to defaulting NFC (4)	12.7	13.2	16.2	18.2

**Note:** (1) As a percentage of the total number of borrowers, (2) As a percentage of total credit, (3) As a percentage of the total number of borrowers in this portfolio, (4) As a percentage of total credit in this portfolio

**Sources:** Banco de Portugal, author's calculations

In historical terms this concentration can be considered relatively benign to the banking sector as large exposures have always posted the lowest default rates and registered the smaller increases. In any case, it is important to notice that in 2009 the credit overdue in this segment doubled its size when compared to its 2008 value (1.8 p.c. to 3.6 p.c.) and also, for the first time in this series, it presents a higher percentage of companies in default than the retail segment (19 p.c. for larger exposures against 18 p.c. for retail).

This split by loan dimension is often taken as a distinction between large and small companies. Using the CBSD it is possible to break down the data by company size and verify the validity of that assumption. From table 9, it is clear that the default rate decreases with the company size both for the number of companies and for credit overdue. Still, it is important to notice that the default indicators are rising in all segments. From 2008 to 2009 the weight of credit overdue almost doubled its size for SME (2.0 p.c. to 3.9 p.c.) and also for large companies (1.2 p.c. to 2.4 p.c.).

The relevance of the exposure of banks to each segment of firms through the years has been stable in a number of companies. Yet, concerning the credit amount it is possible to notice a slight increase in the larger companies' significance as their weight rises from 20.7 p.c. in 2006 to 25.3 p.c. in 2009.

Comparing table 8 and table 9 it seems to be acceptable that the default indicators of large exposures show the behaviour of large companies and a subset of the SME groups, probably the medium size companies, while the retail group gets much closer to the smaller companies' behaviour.

Table 9  
Default indicators of credit granted to NFC broken down by company size  
In per cent

	2006	2007	2008	2009
<b>Large</b>				
Number of borrowers (1)	1.1	1.2	1.2	1.2
Total credit in this portfolio (2)	20.7	23.2	24.2	25.3
Number of defaulters (3)	9.8	10.4	13.2	16.0
Credit overdue (4)	0.8	0.7	1.2	2.4
Total credit to defaulting NFC (4)	5.9	7.3	10.3	13.0
<b>Small-medium</b>				
Number of borrowers (1)	20.8	20.3	20.0	19.7
Total credit in this portfolio (2)	52.4	51.4	50.8	49.8
Number of defaulters (3)	11.3	12.9	14.8	17.8
Credit overdue (4)	1.4	1.6	2.0	3.9
Total credit to defaulting NFC (4)	8.1	10.0	13.2	16.5
<b>Micro</b>				
Number of borrowers (1)	78.1	78.5	78.8	79.1
Total credit in this portfolio (2)	26.9	25.4	25.1	24.9
Number of defaulters (3)	12.5	14.5	16.3	18.3
Credit overdue (4)	3.2	3.4	4.6	6.7
Total credit to defaulting NFC (4)	11.9	13.3	18.5	21.4

**Note:** (1) As a percentage of the total number of borrowers, (2) As a percentage of total credit, (3) As a percentage of the total number of borrowers in this portfolio, (4) As a percentage of total credit in this portfolio

**Sources:** Banco de Portugal, author's calculations

### 5.1.2 Sectoral dimension

Table 10 presents credit growth rates detailed by selected activity branches. Here, it is interesting to see how the deceleration of loans was differentiated by sector, reflecting a gap in the transmission of shocks to different activities. Indeed, lending for activities related to real estate lose pace immediately at an early stage of the crisis. From 2007 to 2008, “construction” moved from a growth rate of 10.7 p.c. to 8.6 p.c. and “real estate activities” changed from a rate of 14.4 p.c. to 8.5 p.c. At this period many other activities were still registering increasing credit growth rates, being only affected in 2009, the period where the overwhelming majority of the activities show decreasing growth rates. This situation is perceptible in “trade, hotels and restaurants” with a slight increase in their credit growth rate in 2008, from 6.3 p.c. to 7.5 p.c., but then experiencing a marked slowdown in 2009 closing the year with a negative growth rate of 0.4 p.c.

The last column in table 10 shows that, in opposition to what happens to loan size, bank loans are not very concentrated in one activity. Although they are more centred on the services sector, when these heterogeneous activities are disaggregated, none of those represents, by itself, more than 20 p.c. of total loans. Yet, it needs to be noticed that 39 p.c. of loans are granted for activities related directly to real estate (19 p.c. for “construction” and 20 p.c. for “real estate activities”).

Table 10  
Loans to non-financial corporations – by sector  
Annual rates of change at end of period, in per cent

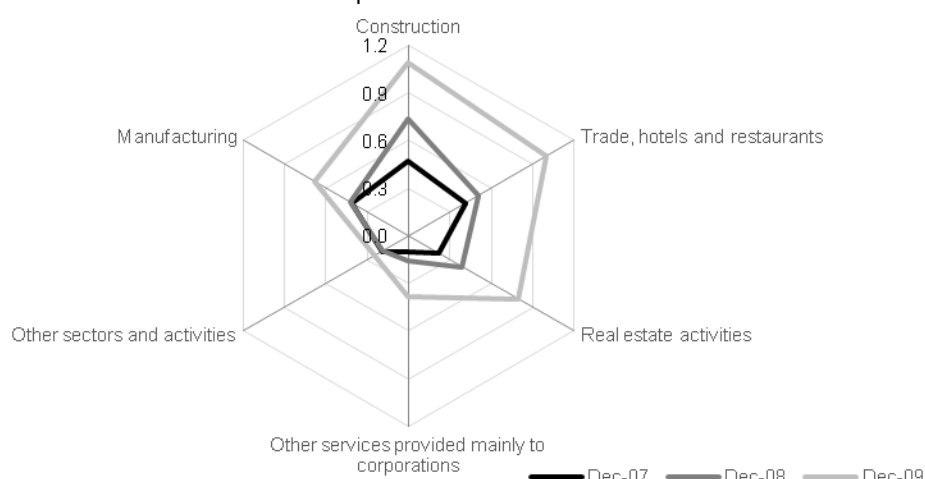
	2004	2005	2006	2007	2008	2009	Proportion in total loans (Dec. 2009)
<b>Total</b>	2.5	5.0	7.1	11.2	10.5	1.9	100.0
<b>By activity sector:</b>							
<b>Agriculture, fishing and mining</b>	1.8	3.6	6.4	13.6	20.3	4.0	2.2
<b>Manufacturing</b>	-3.8	-3.0	0.7	7.9	7.7	3.2	12.9
<b>Electricity, gas and water</b>	-2.0	37.9	-11.3	13.7	47.8	10.7	3.1
<b>Construction</b>	6.0	10.7	5.4	10.7	8.6	2.5	19.3
<b>Trade, hotels and restaurants</b>	2.0	3.0	7.1	6.3	7.5	-0.4	16.9
<b>Transport, post and telecommunications</b>	-4.5	-10.6	0.7	11.0	18.3	3.9	6.0
<b>Real estate activities</b>	14.0	12.0	12.9	14.4	8.5	1.3	19.7
<b>Services provided mainly to corporations</b>	-1.7	6.6	13.8	16.6	14.1	-2.0	14.3
<b>Other services activities</b>	2.9	-3.6	9.6	10.0	6.2	9.1	5.6

**Note:** Rates of change are calculated on the basis of the ratio between outstanding bank loan amounts at the end of the period and transactions calculated on the basis of balances adjusted for reclassifications. They are also adjusted for securitisation operations and write-offs/ write-downs from assets and foreign exchange and price revaluations.

**Source:** Banco de Portugal

Having seen how credit is spread around different sectors, from a financial stability perspective, it is interesting to verify its default rate. Figure 12, prepared with CCR data, enables the detection of the sectors giving higher contributions to the evolution of the aggregate rate.

Figure 12  
Sectoral contribution to the non-financial corporations' default ratio  
In per cent



Source: Banco de Portugal

Companies in the “construction”, “trade, hotels and restaurants” and “real estate activities” sectors and, to a lesser extent, companies in the “manufacturing industries” had higher default ratios at the end of 2009 than those recorded by the non-financial corporations aggregate, having, this way, the largest contributions to the value of the aggregate rate (4.2 p.c).

Also in the default ratio it is possible to spot a time lag in the transmission of shocks to different sectors of activity. While the “construction” sector registers a balanced increase in its contribution to the aggregate default rate through the years, loans to companies in the “trade, hotels and restaurants” and “real estate activities” sectors saw their weight increase heavily only in 2009.

## 6. Conclusion

In a context of a deep financial and economic crisis, policy makers are compelled to intervene and for that it is crucial to have access to detailed information on the relevant subject. The recent worldwide events highlighted many data gaps that need to be addressed going beyond traditional statistical production approaches.

This paper has demonstrated how administrative micro databases can be used to complement traditional macro statistics, like national accounts or money and banking statistics, with the advantage of not overburdening reporting agents.

The main focus of the study was on understanding Portuguese corporate finance and its impact on the banking sector exposure to NFC. This analysis is particularly relevant for a country where the NFC sector presents relatively high indebtedness levels when compared to its euro area counterparts.

The individual data gathered from the two micro databases administered by the Banco de Portugal give the flexibility to perform a thorough analysis according to the firms' characteristics. In the course of the study, a distinction between activity sector and companies' size was presented. These breakdowns enable the detection of company subgroups with specific behaviours and particular problems, providing meaningful information to policy makers.



An assessment of the differences between the financial position of micro, SME and larger firms requires sectoral composition effect to be controlled for. Once this has been done some differences emerge more clearly. The highlight arising from this analysis is the delicate financial situation that micro companies face. Indeed, a large component of their high indebtedness level has short term maturity, meaning that many of these loans will have to be paid or renegotiated briefly. However, the debt incurring interest payment already covers 87 p.c. of these companies' turnover, making the option of paying back the loans immediately very costly. The other option would be to revolve those loans, yet, given the current difficult access to credit markets, that will probably imply higher costs. Bearing in mind that interest costs already cover a large part of the operational earnings, there is not much leeway to support higher interest levels.

Larger companies show more diversified funding sources. It is notorious that all company groups, no matter the size, rely more heavily on debt than on own funds, which can be a risk factor in case their access to this type of funding is restricted. Nevertheless, larger firms present higher leverage, which is probably explained by its positive effect on profitability given that the return they take from assets seems to be bigger than the cost they pay for debt. It is also possible to see that interest payments are better covered by firms' earnings as the company size grows, indicating that larger firms are better prepared to absorb possible interest rate shocks. Another indication in this sense comes from the bank loan interest rates disaggregation, where it is clear that there is a negative relationship between these costs and the companies' size.

From a financial stability perspective, a noteworthy feature is that the high concentration presented by bank loans to large companies and large amounts. Given their better financial position, this concentration can be seen as relatively benign. In any case, it must be noted that, in 2009, this segment's default indicators presented the larger proportional increases.

The funding behaviour also differs across sectors, a phenomenon explained mainly by specific characteristics of firms' activities. Construction related segments are the ones standing out in most indicators. Although all sectors are more dependent on debt than on own funds, "construction" is the only activity where, as an individual instrument, bank loans clearly overcome own funds as the major source of funding. This activity's dependence on debt is confirmed by a clearly higher debt-to-equity ratio than all the remaining groups. This can be a challenging position in the sense that the leverage effect in "construction" seems to be negative, meaning that losses are being amplified by these firms' high indebtedness. This is probably a result of the financial and economic crisis that was reflected very early on in this sector with a significant decline in the credit growth rate and higher default ratios on bank loans.

The approach presented here has its merits but also its own drawbacks. The most important one is clearly the large time span between the reference date and the availability of data that, in the CBSD case, reaches seven months. The amount of data, the vast number of companies and all the necessary quality control involved makes very unlikely any relevant decrease in this time gap. Given this, the CBSD is clearly more suitable to be used for structural analysis and forecast models. The way to overcome urgent information needs is through smaller samples that can work as advanced indicators. In Portugal this is being done by a questionnaire (ITENF) that collects from a minor sample of companies a smaller set of the most relevant indicators. This data is available with a three month lag which allows the authorities to follow the NFC sector more promptly. The results are later confirmed and complemented by the CBSD.

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