BANK LENDING TO SPANISH CORPORATIONS IN TERMS OF THEIR SIZE. AN ANALYSIS BASED ON THE JOINT EXPLOITATION OF INFORMATION FROM THE CCR AND THE CBI

The authors of this article are Carmen Martínez Carrascal and Maristela Mulino Ríos of the Directorate General Economics, Statistics and Research

Introduction

Bank lending is the main source of finance for Spanish non-financial corporations (especially smaller ones). Following their strong growth in the pre-crisis upturn, loans extended to this sector have shrunk markedly since mid-2009, against an unfavourable cyclical background marked by the need to correct excessive company indebtedness. The latest developments show the rate of decline has eased, from 9.7% in May 2013 to somewhat below 8.5% in November 2013.

When assessing lending extended to non-financial corporations, it is important to analyse its breakdown by sector of activity and by company size. The breakdown by productive sector can be tracked using the information corporations periodically report to the Banco de España. Conversely, the analysis of bank lending on the basis of company size is hampered by the lack of specific statistics enabling loans and firm size to be linked, without major delays. Such analysis has taken on particular relevance in recent years, in a setting in which the crisis may be affecting the access of small and medium-sized enterprises (SMEs) to finance more markedly than is the case for large businesses. This trend may be inferred, for example, from the ECB's regular survey on the access to finance of SMEs in the euro area.[1]

While current monetary statistics do not include a breakdown of lending based on firm size, two microeconomic databases are available at the Banco de España that enable an approximation to the behaviour of lending to SMEs: the Central Credit Register (CCR) and the Integrated Central Balance Sheet Data Office survey (CBI by its Spanish name), which combines the information from the Central Balance Sheet Data Office annual survey and from the mercantile registers. However, the CCR and the CBI both have limitations that hamper the regular monitoring of bank lending to Spanish SMEs. The CCR contains firm-by-firm information on the outstanding balances of bank loans (from resident credit institutions), with a lag of a little more than one month, but size is not included among the characteristics of the companies. The CBI, by contrast, has variables that allow both the size of the firm and its outstanding loans to be known, but the data are available with a time lag of at least one year, and the sample of firms covered is inferior to that of the CCR, which has information on virtually all companies with loans outstanding with resident institutions.[2] Under these conditions, the usual approach pursued to date in analyses conducted by the Banco de España has been to use the volume of loans (in particular, the outstanding balance of debt recorded in the CCR) as an indicator of company size. As from spring 2015, the introduction of changes at the CCR and the new M14[3] supervisory return will enable year-on-year growth rates of corporate loans to be obtained directly, distinguishing between firms on the basis of their size.

---

1 For more details on this half-yearly survey, see https://www.ecb.europa.eu/stats/money/survey/sme/html/index.en.html. For a description of its results regarding Spanish non-financial corporations, see Menéndez and Mulino (2012), Box 5 of the "Informe trimestral de la economía española" in the July-August 2013 *Boletín Económico* of the Banco de España and Box 6 of the "Informe trimestral de la economía española" in the January 2014 edition of the *Boletín Económico*.

2 For those firms with loans outstanding for an amount of over €6,000.

3 The first data from this new return will be available in spring 2014 but, as the information refers to outstanding balances, the year-on-year rate of change may only begin to be calculated one year later.

In the meantime, this article presents a new methodology, combining information from the CCR and the CBI, for the separate monthly monitoring of bank loans extended by resident institutions to Spanish SMEs and to bigger corporations. The article is in three sections. The first describes the methodology proposed for the breakdown of lending on the basis of firm size. The second discusses the results obtained on applying this methodology, with information to November this year. Finally, the third section draws the main conclusions.

Methodology

The analysis conducted distinguishes between two groups of companies on the basis of size: SMEs and large corporations. The classification adheres to the European Commission's (EC) 2003 recommendation, included in the new Banco de España solvency circular, and which will also be used in the M14 return from April 2014 and in the CCR in spring 2015. Owing to the limitations of the information available, the definition of SME used in this article differs slightly from that of the recommendation. Specifically, the latter classifies SMEs as those firms that employ fewer than 250 staff and whose annual turnover does not exceed €50 million or whose annual balance sheet does not exceed €43 million. However, with a view to determining the size of companies with cross-shareholdings, it is established that the classification should be made not only on the basis of individual characteristics, but also of those corresponding to related undertakings. As information on the shareholdings is not available, in the analysis presented here the classification has been made exclusively based on the firm's characteristics. In the particular case of holding companies, for which this aspect may be particularly relevant, only those firms that do not exceed any of the three thresholds (i.e. employment, sales and size of balance sheet) stipulated in the recommendation are included in the group of SMEs. It is sought hereby to minimise the risk that, owing to the lack of information on links with other firms, certain holding companies may be classified as SMEs whereas, under the EC recommendation, they would feature under the group of large corporations.[4]

In the analysis, the CCR information has been complemented with that of the CBI. This latter database is used to identify the size of the companies present in the CCR or, when that is not possible, to estimate it. Specifically, the firms that are simultaneously in both databases are assigned the size that can be inferred from the CBI information. That enables the size of a high proportion of CCR companies to be identified. Thus, for example, size can be assigned in December 2012 to 70% of them[5], which amass 72% of the aggregate loans of this sector in that period (see Table 1).

Companies that are in the CCR but not in the CBI are assigned a size that is estimated on the basis of the relationship between size and outstanding balance of bank loans for companies that are present in the CBI. Specifically, this sample is used to estimate a (probit-type) model that predicts the size of the company (SME or large corporation) on the basis of the amount of its credit (available and drawn down) and of the sector in which it operates, these variables being available in the CCR. Those companies where, according to the specified model, the probability of them belonging to this group exceeds 90% are classified as SMEs. And where the probability is less than 40%, they are classified as large corporations. There is, therefore, an indeterminate area. Hence, where the model assigns

---

4   Classification has, moreover, been made exclusively on the basis of employment, activity and balance sheet size in the current year, without also taking into account their status in the preceding year, as set out in the EC recommendation. Strict application of the recommendation would substantially reduce the number of firms that can be classified using the CBI data.

5   15.6% of the firms are classified according to their size in 2012, 49.4% according to that in 2011, 11.5% on the basis of that of 2010 and 22.8% on the basis of one of the six previous years.

CLASSIFICATION OF CCR COMPANIES BY SIZE ON THE BASIS OF THE CBI AND OF THE PROBIT MODEL TABLE 1
December 2012

	CCR companies with identified size with the CBI				CCR companies with identified size with the CBI and the probit			
	No. of companies	%	Volume of debt (€ bn)	%	No. of companies	%	Volume of debt (€ bn)	%
Total sample	796,912	100	744	100	796,912	100	744	100
Companies with identified size	561,104	70.4	539	72.4	794,347	99.7	690	92.7
SMEs	*557,758*	*70.0*	*362*	*48.6*	*790,954*	*99.3*	*504*	*67.7*
Large corporations	*3,346*	*0.4*	*177*	*23.8*	*3,393*	*0.4*	*186*	*25.0*
Companies without classification	235,808	29.6	205	27.6	2,565	0.3	54	7.3

SOURCE: Banco de España.

PROBIT MODEL RESULTS. IMPACT OF A CHANGE OF €10,000 IN THE OUTSTANDING CREDIT BALANCE ON THE PROBABILITY OF A FIRM BEING AN SME (a) TABLE 2

	Average marginal impact by sector (%)	Standard deviation (%)
Industry	-3.7	4.4
Mining and quarrying	-2.7	2.0
Manufacturing	-4.0	4.9
Electricity, gas and water supply	-3.2	0.1
Construction and real estate services	-0.5	0.3
Construction	-0.7	0.3
Real estate services	-0.3	0.3
Other sectors	-2.7	5.8
Agriculture	-0.7	0.5
Wholesale and retail trade and accommodation and food service activities	-0.8	0.4
Information and communication	-1.7	1.0
Other	-3.4	6.9

SOURCE: Banco de España.

a Marginal impact on the probability of a firm being an SME of a change of €10,000 in the outstanding credit balance. The probit model is estimated allowing the link between bank debt and firm size to be different for 99 sectoral groupings (defined according to the NACE). The table shows the averages, for more aggregated sectors of activity, of the marginal impacts obtained with this model. These are evaluated in the median value of bank loans in each of the 99 sectors considered.

to companies a probability of between 40% or 90% of being an SME, these companies are not classified in any of the two groups.[6]

Table 2 summarises the results of the probit model. It shows, for different sectors of activity, the marginal impact which, on average, an increase of €10,000 in the outstanding balance of a company's loans has on the likelihood of this company being an SME according to the model estimated.[7] As can be seen, this impact shows notable sectoral heterogeneity; it is comparatively high in industry (especially in the manufacturing segment,

---

6 Alternative threshold combinations have been considered, but this is the most satisfactory in terms of the fit of the model.

7 The probit model is estimated allowing the link between bank debt and corporate size to differ for 99 sectoral groupings defined in accordance with the CNAE (Spanish National Classification of Economic Activities). The table shows the averages, for more aggregated sectors of activity, of the marginal impacts obtained with the model. These are evaluated in the median value of the bank loans in each of the 99 sectors considered.

	Goodness of fit of the probit model		
	Volume of debt (€ bn)	Volume of debt classified by the model (€ bn)	Volume of unclassified debt (€ bn)
SMEs	362	282 (77.8 %)	80 (22.2 %)
		Correctly classified / Misclassified	
		274 (97.2 %) / 8 (2.8 %)	
Large corporations	177	87 (49.3%)	90 (50.7 %)
		Correctly classified / Misclassified	
		75 (85.6 %) / 13 (14.4 %)	

	Error in companies with size identified according to the model				
	Volume of debt (€ bn)	Misclassified debt (%)	Volume of the error committed (€ bn)	Volume of debt of total companies with size assigned (CBI+model) (€ bn)	Weight of error (b) (%)
SMEs	142	4.4	6.2	504	1.2
Large corporations	10	9.5	0.9	186	0.5

	Error in companies with no size identified		
	Volume of debt (€ bn)	Volume of debt of companies present in the CCR (€ bn)	Weight in total debt (%)
Size not identified	54	744	7.3

SOURCE: Banco de España.

a This percentage reflects the proportion of debt incorrectly assigned to each group (large corporations, SMEs) divided by total loans classified by the model in the same category [large corporation: 8 / (75 + 8); SMEs: 13 / (274 + 13)].

b Estimation, applying the methodology set out in this note, of the percentage that misclassified debt in a specific category would represent relative to the total debt of the sample of companies with size finally assigned. This is obtained by extrapolating the error rates of the probit model in the CBI to the debt assigned to the CCR companies not present in the CBI.

in which, in any event, the impact is also estimated with greater inaccuracy than in other sectors of activity) and relatively lower in construction and in real estate services. Thus, in the first of these sectors, an increase of €10,000 in bank loans raises the probability of a firm being classified as an SME by 3.7 pp, while in the second sector it does so by only 0.5 pp. In the other sectors this impact is, on average, 2.7 pp.

Table 3 draws together a series of results that allow for evaluation of the quality of the fit of this model in terms of the volume of debt assigned correctly to the two size categories. As can be seen in the top panel of the table, by applying the model to firms whose size can be identified ex ante on the basis of the CBI, the selected thresholds enable 78% of the outstanding loans of SMEs in December 2012 to be assigned.[8] Of this percentage, 97% is

8 For other periods, the results of the model in terms of volume of debt assigned and of goodness of fit are similar to those set out here.

classified correctly as SME, while the remaining 3% would, according to the exercise, be (erroneously) classified as lending to large corporations.

In the opposite direction, the model mistakenly identifies as lending to SMEs 7% of the lending to large corporations (since size is assigned to large corporations that concentrate almost 50% of the lending in this segment, and 14% of this is assigned incorrectly). To assess the potential scope of this error, it is important to bear in mind that most large corporations are present in the CBI database and, therefore, there are few companies of this size for which it will be necessary to use the model offered here in order to predict their size.

As can be seen in the middle panel of Table 3, if the percentages of error committed with the model (SME loans incorrectly assigned to large corporations, and vice versa) are extrapolated with the CBI sample to the set of corporations for which the model must indeed be used to identify their size, the weight of wrongly classified loans as a share of the aggregate volume of bank debt of the companies with size assigned is very low (0.5% at large corporations and 1% at SMEs) (see last column of the middle panel of Table 3). The outstanding loans of the group of companies to which this methodology does not allow a size to be assigned have a moderate weight in the total (7.3% of the debt reflected in the CCR) (see bottom panel of the table).

Lastly, as can be seen in Chart 1, the use of the model to increase the number of CCR companies identified by their size does not significantly affect the behaviour of the growth rates of lending to the companies. Nonetheless, if the companies identified using the model are ignored, the growth rates tend to be somewhat lower. This suggests that there may be minor bias in the growth of lending that is obtained from the CBI companies sample, which can be corrected by using the model proposed.

Results obtained

Chart 2 shows bank lending with a breakdown based on corporate size using the methodology set out in this article and distinguishing between two sectoral groupings: construction and real estate services, on one hand, and the other sectors of activity on the other.[9]

The results obtained with this methodology are in line with those from the approach used to date at the Banco de España to analyse developments in loans to different-sized companies, based on the outstanding balances of credit drawn down and recorded in the CCR. In construction and in real estate development, then, the rate of decline of lending has tended to be more marked in large corporations than in SMEs for much of the period analysed, with the differences particularly striking in the early years of the crisis (2008-2009).[10] By contrast, a different pattern can be seen for the other sectors of activity: while the decline in bank loans extended by residents institutions to SMEs was more marked than was the case for large corporations in the initial stages of the crisis, this pattern has subsequently been reversed and the rate of decline has become more acute since 2012 for bigger corporations.

The bigger fall witnessed in loans to large corporations compared with that for SMEs since 2012 should not be interpreted as a sign of a greater fall-off in finance for large-sized

---

9 The growth rates control for potential changes in sectoral composition and sample size: they are calculated as the ratio of the change in the outstanding loans balance of companies from a specific sector and of a specific size to the volume of loans, net of write-offs, that these same companies showed 12 months earlier.

10 These rates are not affected by the transfer of loans to Sareb, since the CCR continues to include information on these loans.
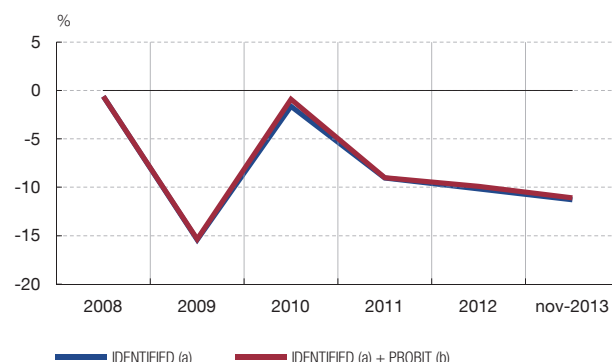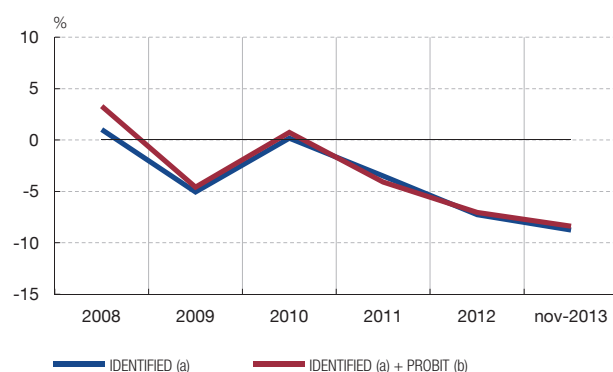
SMEs
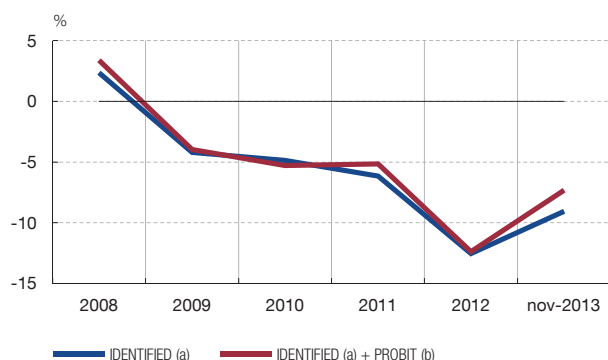
LARGE CORPORATIONS

CONSTRUCTION AND REAL ESTATE SECTOR
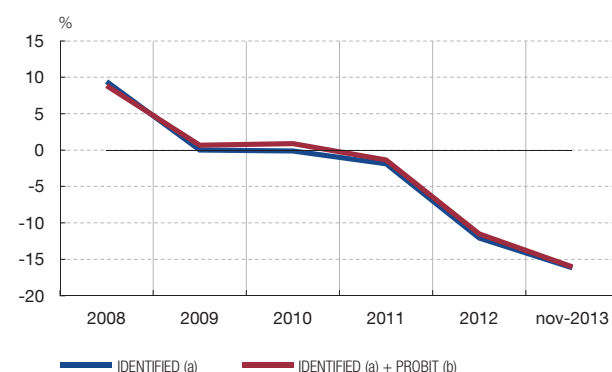
CONSTRUCTION AND REAL ESTATE SECTOR
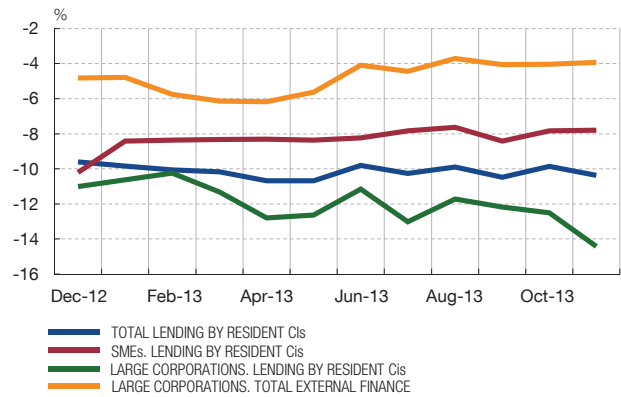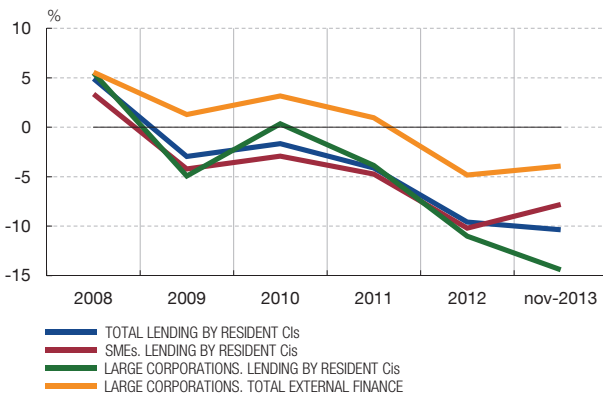

OTHER SECTORS

OTHER SECTORS

SOURCE: Banco de España.

a Companies with known size drawn from CBI information.
b Companies with estimated size using the probit model: when the model assigns a probability of at least 90% that the company is an SME, this size is assigned to it. When the probability is lower than 40%, it is classified as large.

companies, since the composition of the liabilities of the latter is more varied, and the weight in such liabilities of securities and loans from the rest of the world is high. The stepping up in the most recent period of the contraction in the bank debt of large corporations partly reflects replacement by other sources. In recent years fixed-income securities have been more buoyant than bank credit, while foreign loans, despite posting negative year-on-year rates of change since mid-2012, are contracting at a much more moderate rate than those granted by resident institutions. While there is no detailed breakdown available of funds obtained by non-financial corporations through these two types of instruments based on corporate size, it may reasonably be assumed that the bulk of such instruments has been channelled by large corporations. This assumption enables an approximate measure of their total borrowed funds to be obtained. As can be seen in the top panels of Chart 2, making this approximation shows that the rate of decline of external funds at large corporations would be more moderate than that corresponding to SMEs for the entire period under analysis[11], although since 2011 the difference between the rates of change recorded in both segments has tended to narrow somewhat (see top left-hand panel of Chart 2).

11 For SMEs, bank loans are a good indicator of their overall external funds, since such loans make up the bulk of the latter.

YEAR-ON-YEAR GROWTH RATE OF NON-FINANCIAL CORPORATIONS' EXTERNAL FINANCE (a)

CHART 2

NON-FINANCIAL CORPORATIONS' EXTERNAL FINANCE

TOTAL LENDING BY RESIDENT CIs
SMEs. LENDING BY RESIDENT CIs
LARGE CORPORATIONS. LENDING BY RESIDENT CIs
LARGE CORPORATIONS. TOTAL EXTERNAL FINANCE

TOTAL LENDING BY RESIDENT CIs
SMEs. LENDING BY RESIDENT CIs
LARGE CORPORATIONS. LENDING BY RESIDENT CIs
LARGE CORPORATIONS. TOTAL EXTERNAL FINANCE

LENDING BY RESIDENT CIs TO CONSTRUCTION AND REAL ESTATE COMPANIES

TOTAL   SMEs   LARGE CORPORATIONS

TOTAL   SMEs   LARGE CORPORATIONS
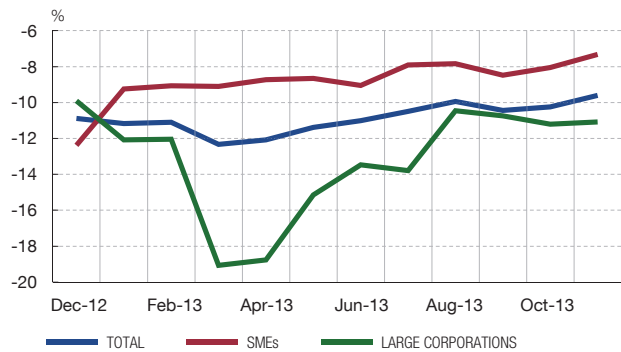
LENDING BY RESIDENT CIs TO COMPANIES FROM OTHER SECTORS

TOTAL   SMEs   LARGE CORPORATIONS

TOTAL   SMEs   LARGE CORPORATIONS
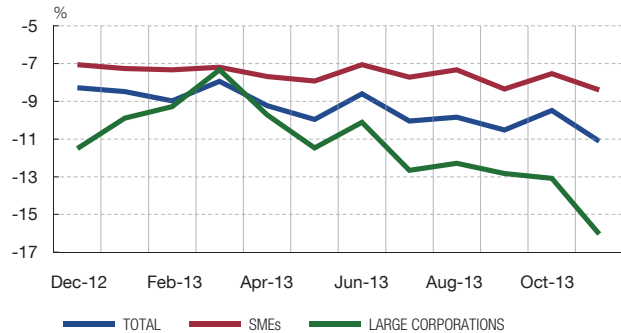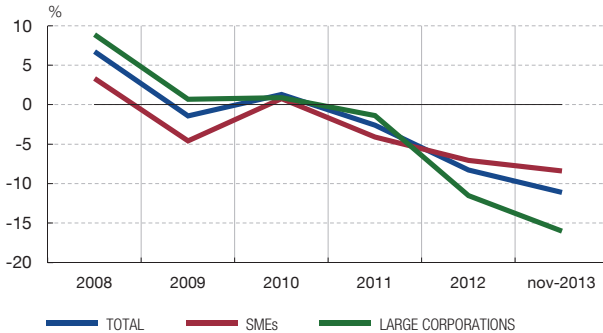
SOURCE: Banco de España.

a Definitions of sizes in line with the European Commission's recommendation (2003/361/EC).

The latest data reveal that the moderation witnessed in the rate of decline of loans extended by residents institutions to non-financial corporations since June 2013 taking the aggregate data can also be discerned in the SME segment (see top right-hand panel of Chart 2). In contrast, for larger corporations, the rate of contraction of bank loans has stepped up slightly during 2013. However, as the chart shows, the easing in the rate of decline is indeed perceptible in the broader financing aggregate, which includes securities and loans from abroad. An analysis by sector of activity shows that this change in trend is somewhat more marked in construction and in real estate services, where the rates of decline of loans

would have eased both for large corporations and for SMEs. It should be recalled that, in these sectors, the cumulative decline in lending since the start of the contractionary pattern has been much more marked than in the other productive activities. The rate of reduction of bank finance to SMEs can be seen to have stabilised in the other sectors.

Conclusions

This article has presented a new methodology that jointly exploits information from the CCR and from the CBI, providing for monthly monitoring of bank loans extended by resident institutions to Spanish SMEs and to larger corporations. As from spring 2015, this approximation will no longer be necessary since the new CCR and the new M14 supervisory return will enable this information to be obtained directly.

The results obtained show that since 2008 the rate of decline of lending to large corporations in construction and in real estate development has tended to be more marked than that of loans granted to SMEs operating in these sectors. Conversely, for the other sectors of activity, the fall-off in SMEs' bank finance was, to end-2011, more pronounced than that extended to larger corporations. From 2012 the opposite was the case. However, this should not be interpreted as a sign of a greater decline in the financing of large corporations, since the contraction in the funds for these corporations from resident banks reflects, in part, the replacement by other sources, such as securities issuance or foreign loans.

The latest information shows that the easing seen since June 2013 in the rate of decline of loans granted to non-financial corporations by resident banks taking the aggregate data is also discernible in the SME segment. By sector of activity, the turnaround is somewhat more marked in construction and real estate services, where the rate of decline of this source of finance eased both for large corporations and for SMEs. This pattern is certainly not far removed from the greater cumulative decline in the credit balance of these sectors since the start of the contraction. In the remaining sectors of activity, the decline in lending to SMEs has tended to stabilise.

8.1.2014.

REFERENCES

MENÉNDEZ, A. and M. MULINO (2012). "Encuesta del BCE sobre el acceso de la pymes a la financiación. Análisis de resultados y evolución reciente", *Economic Bulletin,* April, Banco de España.