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PART I – FINANCIAL SYSTEM STABILITY

Chapter 1.	Overview
Chapter 2.	Macroeconomic and Financial Risks
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1. OVERVIEW

The Portuguese financial system is facing several serious challenges, arising from the international financial instability, particularly marked in Europe during 2010, and worsened, in the Portuguese case, by the need of adjustment of structural imbalances, which are becoming more severe. The strong deterioration of the prospects of international financial markets players on the sustainability of the public finances situation in Portugal has been reflected in a strong increase in the risk premium on sovereign debt, which has had negative repercussions on the Portuguese banking system's access and funding costs in the international wholesale debt markets. This increase in risk premium occurred against a background of a significant differentiation in sovereign risk assessment in the euro area. The imbalances of the Portuguese economy are not only associated with a worsening fiscal situation but also with a persistent and significant deterioration of the economy's external position, against a background of high levels of private and public indebtedness and low economic growth over the course of the last decade.

As the Portuguese economy's external indebtedness has been almost fully intermediated by the public sector and the banking system, these sectors' difficulties in access to financing in the international debt markets force the intensification and acceleration of the adjustment between the Portuguese economy's savings and investment, involving all institutional sectors. This adjustment will require a significant deleverage both in the public and private sectors, including the banks, and will have inevitable negative effects on the Portuguese economy's growth prospects over the short and medium term, translating, in turn, into a more intense materialisation of credit and market risk. Indeed, the need for deleverage also includes the Portuguese banking system which has, over the course of the last decade, been obtaining financing from the international wholesale debt markets, in euros and in very favourable terms, to support its lending to the Portuguese economy. The difficulties in access to these financing sources, which were aggravated over the course of this year, imply a reinforcement of regulatory capital and a contraction of the banks' activity, which should, in turn, imply an acceleration of the private sector's deleverage process. Further, this banks' capital reinforcement will be consentaneous with the implementation of the new Basel III international regulatory package. It should be noted that in a context of the necessary deleverage of the Portuguese banks, the increased restrictiveness of credit supply will, in turn, tend to reinforce the recessionary pressures on economic activity.

During the course of 2010 the magnitude of this adjustment and deleverage process was not very significant. Lending to non-financial corporations and households by the Portuguese banks only decelerated gradually and the indebtedness of the public sector continued to increase. This evolution was, to a large extent, sustained by the support measures adopted on a supranational level within the framework of the international financial crisis. In particular, the unconventional monetary policy measures implemented by the European Central Bank (ECB) with the objective of ensuring the regular functioning of the monetary transmission mechanism, while also contributing to the financial stability in the euro area, were essential for ensuring continued access to financing by the Portuguese banks. These measures avoided significant falls in private and public sector financing flows. In addition, ECB interventions in the public debt securities markets in the euro area (i.e. Securities Market Programme) were also relevant in such a framework. However, the continued use of such measures will be unsustainable, owing to their temporary nature and purposes. These unconventional measures should be suspended as soon as the functioning of the financial markets in the euro area as a whole permits the adequate transmission of the ECB's monetary policy. Over the course of the last few months there was some decrease in the use of ECB financing by the Portuguese banks. Banks should, however, continue to promote balance sheet adjustment policies and secure alternative financial resources, namely by seeking to broaden their customer base and offering attractive saving products.

As already mentioned, notwithstanding the difficulties in access to financing in the international wholesale debt markets faced by the Portuguese banks, there has, to-date, been no contraction of their balance sheets. In the first half of 2010, the Portuguese banking system on a consolidated basis posted growth of 4.3 per cent vis-à-vis the end of the preceding year. However, this expansion of activity was not fundamentally based on lending to the non-financial private sector, as opposed to what is usually the case. Indeed, the annual rates of change in bank loans to the non-financial private sector remained globally stable over the course of 2010, after having decelerated significantly over the preceding two years. Growth of credit to the non-financial private sector was essentially geared to loans for house purchase, with a less significant change in lending to non-financial corporations having been noted over the course of 2010. However, the fact that several Portuguese companies succeeded in obtaining financing from non-resident financial institutions, through loans and the issue of short term securities, made it possible to attenuate the effects of the disruptions in the sovereign debt markets.

In this framework of moderate growth in lending to the non-financial private sector, the expansion of Portuguese banks' balance sheets in the first half of the year essentially reflected the financing of general government. On the one hand, lending to the public sector has been accelerating since mid 2009, having intensified in the second quarter of 2010, notwithstanding the contraction of credit flows to this sector over the most recent period, as discussed in "Box 4.3 Financial situation of the six major banking groups in the Portuguese banking system in the third quarter of 2010". On the other hand, banks increased their portfolio of Portuguese public debt securities, which made a relevant contribution to the growth of banks' assets in 2010. Notwithstanding the fact that Portuguese banks continued to be less exposed to these securities than most European banks, 2010 witnessed a significant increase in the banking system's exposure to the public sector. Although the public debt securities of the advanced economies are usually characterised by a reduced level of risk, the significant increase in sovereign risk in several European countries (including Portugal) over the last few months has implied significant drops in the price of such assets. However, as most of these securities are classified in the available for sale assets or assets held to maturity portfolios, the impact of this loss of value on profitability and banks' regulatory capital is relatively limited and restricted to the realisation of losses in the event of a sale of such financial assets or the recognition of impairment, namely in the case of default by a sovereign state¹. Reference should be made to the fact that these securities may be used as collateral for the Eurosystem's monetary policy operations. In addition, changes to the international financial regulation on liquidity risk under the Basel III regulatory package tend to create incentives for the reinforcement of public debt securities portfolios.

In short, notwithstanding the fact that the restrictions faced by the banks in access to market financing tend to contribute towards a contraction of the banking system's balance sheet, reinforced by lower demand-side pressure for credit from the private sector, this contraction has not, to-date, significantly taken place. This was mainly due to the possibility of access to Eurosystem financing, which has enabled the banks to finance a significant part of the public sector's borrowing requirements over the last year. However, in the third quarter there was a slight contraction of the consoli-

⁽¹⁾ The stress test exercise carried out in mid 2010 by the Committee of European Banking Supervisors (CEBS), in cooperation with the ECB, demonstrated that the magnitude of the direct impact on regulatory capital of changes in value associated with sovereign exposures in the Portuguese banks' portfolios considered in the exercise was very low owing to this prudential rule, as discussed in "Box 4.1 Main results of the stress test exercises in the European Union in the sample of Portuguese banks" of this Report. It should be stated that, even based on the highly implausible case of the realisation of latent losses on the sale of the whole sovereign debt portfolio, Portuguese banks would still continue to enjoy a relatively comfortable financial situation under the criteria used in the exercise.

dated balance sheet of the six largest banking groups.

There was a marked increase in the use of Eurosystem monetary policy operations starting in May 2010, when there was a strong increase in sovereign risk differentiation. The significant increase in the risk premium associated with Portuguese sovereign debt was reflected in a marked increase in risk premiums on Portuguese banks in the wholesale debt markets starting from the end of April and comprising strong quantitative restrictions in access to these financing markets. It should be noted that the difficulties being faced by Portuguese banks in accessing the international wholesale debt markets essentially reflect the increase in the sovereign risk premium, in a context of greater risk differentiation in the euro area, as well as the Portuguese economy's structural imbalances, but not any intrinsic profitability or solvency problems of the Portuguese financial system. The implementation of measures on a European level, the disclosure of some information on the implementation of the Basel III regulatory package and the results of the European stress test exercise enabled some reduction in the differentiation between risk premiums in the euro area in the summer. In this respect, the results for the Portuguese banks are analysed in "Box 4.1 Main results of the stress test exercises in the European Union in the sample of Portuguese banks" of this Report. In accordance with the results of the exercise, the four Portuguese banking groups analysed displayed a high level of resilience to a further materialisation of risks on a global and national level. Notwithstanding the positive developments noted at the start of the summer, new tensions emerged at the end of August, associated with the situation of the Irish banks and the announcement of worse than expected economic and fiscal data in several euro area economies.

In this context, Portuguese banks faced quantitative restrictions on access to interbank money market financing. In turn, net bond issues over the first three quarters of the year were negative, i.e. the amounts issued were insufficient to offset the bonds maturing in the same period. Portuguese banks failed to place debt issues in international financial markets after the first quarter. Most of the bonds issued since then were placed with institutions belonging to the perimeter of the respective banking groups. The changes noted in the Portuguese banks' financing structure translated into an across-the-board deterioration of their global liquidity situation. Banco de Portugal has accordingly endeavoured to encourage banking groups to look for alternative financing sources over the last few months. The realisation of several repo operations in the market, in conjunction with a slight growth of customer resources and some improvement in access conditions to the short term wholesale debt markets, permitted a recent decrease in the use of the Eurosystem's monetary policy operations, the magnitude of which, notwithstanding, continues to be highly significant. This evolution was also favoured by a major operation involving the sale of assets abroad.

Notwithstanding the fact that market financing is relatively important for Portuguese banks, their main financing source continues to be resources taken from customers. The first quarter of 2010 witnessed a decrease of such resources, which was latterly reversed in the following two quarters. The acceleration of non-monetary sector deposits in the third quarter essentially reflects the evolution of the deposits of non-financial corporations (partly related to the above mentioned sale of assets operation abroad), non-monetary financial institutions and central government, as there was a deceleration of household deposits in the most recent period. Deposits taken from the international activity of Portuguese banks were also highly relevant in this positive evolution. It should be noted that, notwithstanding the strategic importance of resources taken from customers in the current context, bank interest rates on deposits remain at historically low levels, although they have recently recorded some increase. Accordingly, in the first half of 2010, savers continued to prefer alternative financial investments with higher yields (albeit with lower liquidity and/or greater risk), notably life insurance investments.

The moderate acceleration of deposits by households in the first half of 2010 occurred in the con-

text of a slight increase in households' financing capacity. This period witnessed a positive change in labour remuneration and current net transfers to households (including social payments), enabling households' disposable income to record a positive evolution even against a background of contraction of employment. Notwithstanding the strong growth noted in private consumption, the households' savings rate was on a level close to that of the previous year, in a context of high levels of uncertainty and a deterioration of consumer confidence. A significant increase in households' financing capacity had already been noted in 2009, reflecting the start of an adjustment process. In turn, there was a positive change in the savings rate of non-financial corporations in the first half of 2010, reflecting a reduction of funding costs and a recovery in corporate profitability. The improved profitability indicators of Portuguese companies represents an inversion of the negative trend noted since 2007. However, a significant heterogeneity in the business sector is underlying this aggregate evolution: whereas many companies recorded a recovery in sales (particularly in external markets), there was also a large number of corporate bankruptcies. In global terms, the balance sheet adjustment needs of households and companies over the next few years will tend to imply a contraction of expenditure. The said adjustment, however, will be differentiated and tend to be of a greater magnitude for companies predominantly geared to the domestic market, as the recovery in external demand should allow exporting companies to remain globally viable.

In such a framework, 2010 continued to be marked by a significant materialisation of credit risk. The increase in default ratios was more expressive in loans to non-financial corporations and loans to households for consumption and other purposes, with a relative stabilisation of this indicator in loans to households for house purchase. The stabilisation of the default ratio in this latter segment at historically high, albeit contained, levels is associated with relatively low debt servicing levels (reflecting the continuation of low interest rates and prevalence of long maturities), in addition to the fact that the involvement of lower income families in this market remains low. This was offset by the significant materialisation of credit risk in loans to households for consumption and other purposes, which could be associated with the intensification of access to this market by lower income households in the years preceding the onset of the financial crisis. The greater vulnerability of these borrowers to the more recent developments in terms of unemployment contributed towards the referred to evolution, which trend is expected to continue in the near future. As regards non-financial corporations, notwithstanding the strong growth in default ratios, there was a decrease in flows of new loans in default which, nevertheless, have remained at historically very high levels. In global terms, the magnitude of default ratios has continued to be lower in the largest companies, to which the Portuguese banks are more heavily exposed (a detailed description of companies in default situations is given in "Box 4.2. Financial situation of non-financial corporations and the evolution of default in 2009" of this Report). There has also been differentiation in the evolution of loans according to the size of companies, with a growth in exposures to major companies and a contraction of lending to smaller companies having been noted at the same time. Notwithstanding the global worsening of default indicators, reference should be made to some slowdown in the materialisation of credit risk. However, the profound adjustment process to which the Portuguese economy will be subject over the next few years will take the form of additional increases in default levels, suggesting the need for the banks to reinforce the booking of impairments for losses in their credit portfolio, particularly in loans to non-financial corporations and to households for consumption and other purposes.

Notwithstanding the unfavourable prospects for the Portuguese economy, there was some dynamism in lending to the non-financial private sector over the course of 2010. As regards households, demand for loans was stimulated by the continuation of relatively low interest rates and by the acceleration of private consumption. In the case of companies, demand remained relatively stable, deriving essentially from liquidity difficulties associated with the need for debt restructuring and inventory and working capital financing. This evolution in the demand for credit was accompanied by a more restrictive approach in terms of supply, owing to Portuguese banks' difficulties in obtaining access to financing. These restrictions particularly affected loans with greater risk, revealing a higher risk aversion by Portuguese banks. This more prudent approach by the banks in their appraisal of credit risk in periods involving a greater materialisation of such risk is a stylised fact at this stage of the credit cycle.

Notwithstanding the markedly unfavourable setting over the last few years, Portuguese banks have succeeded in ensuring the funding of the economy and maintaining globally adequate solvency levels, although they have faced substantial falls in their profitability. In the first half of 2010, the profitability of the Portuguese banks decreased in year-on-year terms but recorded a slightly positive evolution vis-à-vis the end of the preceding year. This slight increase was essentially the result of the positive effects associated with other provisions and impairment losses (not related to credit to customers), in addition to the containment of operating costs. The results generated by international activity continue to make an increasingly more expressive contribution to the profitability of the Portuguese banks, representing around one third of the results generated in the first half of 2010 (notwithstanding the fact that their proportion of banking system activity was slightly more than 10 per cent). In turn, own funds adequacy ratios were significantly above the recent minimums observed at the end of 2008. In the first half of 2010 there was a slight deterioration of the overall own funds adequacy ratio.

Reference should be made to the fact that the need for the adjustment of the Portuguese banking system will be reinforced, over the medium and long term, by the implementation of new regulatory requirements on capital and liquidity ratios under Basel III. Although these adjustments, when considered globally, could have negative impacts on banking system profitability, they will help to reinforce the stability of the financial system, ensuring the necessary conditions for improving the capacity to resist future shocks. Convergence to the new regulatory requirements on an international level will also imply significant adjustment endeavours by Portuguese banks which, as a whole, will have to reinforce their regulatory capital base, increase the proportion of liquid assets in their balance sheets and endeavour to secure more stable financing sources. As regards capital ratios, the impacts on Portuguese banks will be mainly associated to changes to several positive own funds elements (notably minority interests), in addition to several deductions and prudential filters to be applied (namely, the recognition of defined benefit pension plans actuarial deviations and the deduction of holdings in banks, other financial institutions and insurance companies). The magnitude of the impacts on the Portuguese banking system may be very heterogeneous and will be conditioned by the point of departure of each banking group and the relative importance of the referred adjustments, as discussed in "Box 2.1. Main Basel III proposals" of this Report. It should, however, be stated that the Basel Committee has defined a very gradual implementation timetable.

In addition, the Portuguese economy's necessary deleverage process will imply changes in the size and composition of the balance sheet of the Portuguese banking system, in a context of more difficult financing conditions in the international wholesale markets. The Portuguese economy's prospects over the next few years will tend to condition the evolution of the banks' profitability (making it more difficult for them to reinforce their capital base), and will also imply an expectable intensification of the materialisation of credit and market risk. In addition, the unsustainability of the permanent large scale use of Eurosystem financing will require a redefinition of Portuguese banks' financing strategy, particularly in a framework of persisting major restrictions on access to financing in the wholesale debt markets. This being the case, the adoption of strategies for taking resources from customers is essential in order to mitigate the liquidity risk of the Portuguese banking system. Reference should be made to the fact that Portuguese banks, notwithstanding the highly adverse

setting in which they have been operating since the start of the international financial crisis, have displayed a remarkable capacity to resist and adapt themselves. However, given the prospects for the Portuguese economy, the reinforcement of banking system capital is considered to be indispensable for ensuring the continuity of their capacity to resist additional adverse shocks. The new regulatory demands in the context of Basel III will also require the reinforcement of Portuguese banks' regulatory capital base. In addition, the furthering of a credible fiscal consolidation process is essential for facilitating the reopening of the international financial markets to Portuguese banks, thus allowing for a more gradual adjustment of the Portuguese economy.

MAIN INDICATORS (to be continued)							
Per cent; end-of-period figures							
	2004	2005	2006	2007	2008	2009	Jun 2010 ^(a)
Macroeconomic and financial indicators							
Oil price (USD brent; y-o-y rate of change)	34.0	43.1	8.2	55.4	-58.4	94.4	8.2
Key interest rates - Monetary policy							
US	2.25	4.25	5.25	4.25	0.25	0.25	0.25
Euro area	2.00	2.25	3.50	4.00	2.50	1.00	1.00
3-month Euribor	2.2	2.5	3.7	4.7	2.9	0.7	0.8
Yields on (10-year) Government bonds	4.0		4 7	1.0	0.0	2.0	2.0
	4.2	4.4	4.7	4.0	2.3	3.8	2.9
Euro area Stock markets (annual rate of change)	3.7	3.3	3.9	4.3	2.9	3.4	2.0
Slock markets (annual rate of change)	0	3	13.6	35	-38.5	23.5	12.1
Dow longs Furo Stoxy	9	23	20.3	3.5 4 Q	-30.5	23.5	10.5
PSI Geral	18	17.2	33.3	18.3	-49.7	40	1.8
PSI Financial Services	12	24.4	34.8	4 9	-62.9	14 7	-11.8
Financial situation of the non-financial private sector	12	2	01.0	1.0	02.0		11.0
r manetal studion of the non-manetal private sector							
Households							
Indebtedness (financial debt) ^(b)							
As a percentage of GDP	77	82	87	90	92	97	96
As a percentage of disposable income	109	116	124	129	128	130	129
Loans granted by resident financial institutions ^(c)	10.0	40.7	0.4	0.0		0.0	0.5
Annual rate of change	10.3	10.7	9.4	8.3	4.4	2.2	2.5
Of Which:	10 F	11 1	0.0	0 5	1.2	2.6	2.2
Consumption and other purposes	10.5	0.4	9.9	0.0	4.3	2.0	0.0
Net lending $(+)$ / borrowing $(-)^{(d)}$	9.5	9.4	1.1	1.0	4.9	0.7	-0.5
As a percentage of GDP	2.6	29	15	11	25	48	5.0
As a percentage of disposable income	3.6	2.5 4 1	2.1	1.1	3.4	6.4	6.6
Current saving ^(d)	0.0				0.1	0	0.0
As a percentage of GDP	7.1	7.2	5.7	4.9	5.7	8.2	8.5
As a percentage of disposable income ^(e)	10.0	10.0	8.0	7.0	7.8	11.0	11.1
Investment in real assets ^(d)							
As a percentage of GDP	5.8	5.9	4.6	4.1	4.5	4.2	3.9
Non-financial corporations							
Total debt ^(t)							
As a percentage of GDP	113	116	119	126	136	146	147
Annual rate of change	2.6	6.1	7.2	12.3	10.6	5.2	2.7
	101	100		440	100	400	400
As a percentage of GDP	104	108	111	118	129	138	139
Appual rate of change	2.5	16	5.0	107	11.2	20	1 /
Net lending (+) / borrowing (-)(d)	5.5	4.0	5.9	12.7	11.2	2.0	1.4
As a percentage of GDP	-4 0	-6.2	-72	-8.7	-11.8	-6.8	-6.6
Current saving ^(d)	-4.9	-0.2	-1.2	-0.7	-11.0	-0.0	-0.0
As a percentage of GDP	8.1	6.4	6.0	5.6	3.4	4.7	5.4
As a percentage of GDP	13.6	13.9	14.1	15.3	16.2	12.3	12.6

Notes: y-o-y - year-on-year; n.a. not available. (a) In the case of flow variables, figures for the first half of 2010 were considered. (b) Financial debt is the sum of loans and debt securities issued by the sector. (c) Loans granted by monetary financial institutions and other financial intermediaries. (d) Net lending/borrowing, savings and investment ratios to GDP up to 2007 (inclusive) use National Accounts base 2005; from 2008 onwards those ratios are based on INE's quarterly accounts. Investment in real assets corresponds to the sum of GFCF, acquisitions less disposals of non-produced non-financial assets (mainly land). (e) Disposable income adjusted by the change in net equity of households in pension funds. (f) It includes loans granted to non-financial corporations by other institutional sectors; commercial paper and bonds issued by non-financial corporations held by other sectors and trade credits received from other sectors. (g) Corresponds to total debt excluding trade credits received from other sectors.

MAIN INDICATORS (continued)								
Per cent; end-of-period figures								
	2004	2005	2006	2007	2007*	2008*	2009*	Jun
								2010* ^(a)
Activity and profitability								
Annual rate of change of total assets ROE - Return on equity ^(h)	- 13.1	12.3 19.4	10.5 20.6	11.7 18.0	- 17.7	7.5	7.1 7.6	8.5 8.6
ROE - Return on equity - adjusted ⁽¹⁾ , ⁽¹⁾ ROA - Return on assets ^(h)	0.65	1.03	1.30	1.18	1.15	0.34	0.45	9.0 0.54
ROA - Return on assets - adjusted ^{(h),(i)} Net interest income (as a percentage of average assets)	1.91	1.86	1.18 1.89	1.88	1.95	0.62 1.92	0.58 1.62	0.62 1.45
Income from services and commissions (net, as a percentage of average assets) Cost to income ratio International exposure (for domestic banks):	0.72 71.7	0.77 58.3	0.78 53.4	0.76 53.7	0.77 54.5	0.73 55.6	0.70 56.8	0.72 57.1
Share of external assets in total assets ⁽ⁱ⁾	30.5	27.6	30.0	26.8	27.1	28.9	29.3	29.8
Local assets denominated in local currency	7.2	6.4	6.7	8.0	7.9	8.2	8.4	8.6
International assets by counterparty sector: Banking sector Non-bank sector	13.7 9.7	12.7 8.5	14.0 9.3	8.2 10.7	8.2 10.9	6.3 14.4	5.4 15.5	5.0 16.2
Capital adequacy ^(I)								
Óverall capital adequacy ratio Tier-I ratio	10.2 7.0	11.3 7.1	10.9 7.7	10.0 6.5	10.4 7.0	9.4 6.6	10.5 7.8	10.1 8.0
Market risk								
Coverage ratio of the pension funds of bank employees (as a percentage of regulatory capital)	-0.4	1.2	5.3	5.1	4.5	1.2	3.9	n.a.
Liquidity risk	130.9	137 5	145.6	153 9	153 4	151 0	151 7	156.9
Coverage of interbank liabilities by highly liquid assets ^(m)	110.0	98.5	99.2	88.1	76.9	68.7	101.7	100.0
Liquidity gap ^(m)						83.9	110.5	91.0
up to 3 months up to 3 months - Instruction No. 13/2009	1.4	-0.9	-1.5	-2.5	-1.5	-1.9 -7.6	-3.0	-6.8
up to 1 year up to 3 months - Instruction No. 13/2009	-5.4	-8.2	-8.9	-11.4	-9.9	-7.0 -15.0	-12 6	-16.8
For domestic banks	120.2	12/ 2	140.6	150.9	111 0	142.2	1/2 6	147.2
Coverage of interbank liabilities by highly liquid assets ^(m) Coverage of interbank liabilities by highly liquid assets - Instruction No.	127.3	126.5	115.7	107.8	113.7	102.6	143.0	147.5
Liquidity gap ^(m)						127.3	163.2	120.2
up to 3 months up to 3 months - Instruction No 13/2009	0.6	-0.7	-0.9	-2.1	-1.4	-2.6 -6.1	-3.1	-6.6
up to 1 year - Instruction No. 13/2009	-5.4	-7.4	-8.9	-10.1	-9.0	-7.5 -12.8	-12.2	-15.0
Credit risk								
Loans granted by resident financial institutions to the non-financial private sector ^(c)								
Annual rate of change Credit and interest overdue (on a consolidated basis)	7.1	8.0	7.8	10.2	10.2	7.4	2.4	1.0
As a percentage of credit to customers	1.8	1.7	1.5	1.5	1.6	2.0	3.0	3.4
Non-performing loans of households	1.3	1.1	1.0	1.0	1.1	1.5	2.1	2.4
As a percentage of loans to households Non-performing loans of non-financial corporations	1.8	1.7	1.5	1.6	1.6	1.9	2.4	2.6
As a percentage of loans to non-financial corporations Annual flow of new credit overdue and other doubtful credit ⁽ⁿ⁾ As a percentage of bank loans adjusted for securitisations	1.7	1.7	1.5	1.4	1.4	2.2	3.9	4.3
Households Adjusted for loan sales to the non-financial sector	0.2	0.2	0.3	0.4	0.4	0.7	0.6	0.4
Non-financial corporations	0.5	0.6	0.4	0.6	0.6	1.2	1.9	1.2
Provisions for overdue credit and other non-performing loans (individual basis) ^(o)		0.6	0.5	0.6	0.6	1.3	2.1	1.4
As a percentage of credit As a percentage of credit in default (prudential default concept) ^(p) Appropriation for impairment (consolidated basis) ^(q)	1.1 72.0	1.2 82.7	1.0 83.9	1.0 75.7	1.1 76.9	1.2 73.4	2.4 82.9	2.7 79.5
As a percentage of credit As a percentage of overdue credit	1.6 94.0	2.4 147.8	2.1 153.2	2.0 145.5	2.1 134.3	2.7 133.6	3.3 110.1	3.4 99.9

Sources: Bloomberg, INE, Thomson Reuters and Banco de Portugal.

Sources: Bloomberg, INE, Thomson Reuters and Banco de Portugal. Notes: * Series break related to the widening of the group of banking institutions under analysis. Breaks in the series do not apply to indicators based on Monetary and Financial Statistics, which consider resident banking institutions. (h) ROE and ROA indicators are based on Income before taxes and minority interests, considering average values for the period for the stocks variables. (i) The adjusted profitability indicators in 2006 are obtained after deducting from profit and loss account the impact of the restructuring of participating interests in companies (namely in the insurance sector) in one of the major banking groups considered in the analysis. In turn, the adjusted indicators after 2008 are obtained excluding BPN and BPP banks from the set of institutions under analysis. (j) Comparable figures from 2004 to 2007 are based on estimates on total assets. (i) From 2008, all analysed institutions have computed the capital adequacy ratio in accordance with Basel II criteria, which mainly affected the determination of capital requirements. (m) Up to 2008, this indicator is compu-ted using information from Instruction No. 1/2000, which is applicable only to financial institutions which collect deposits. (n) Change in amounts outstanding of credit overdue and other non-performing loans recorded in the balance sheet of resident MFIs adjusted for write-off/write-downs and reclassifications. Sales outside the banking system included in the adjusted flow correspond to credit overdue and other non-performing loans not written-off/written-down, in accordance with the quarterly report defined in Instruction No. 2/2007. (o) Values of credit to residents reported on an individual basis by the other monetary in ancalistitutions (banks, savinos banks and mutual agricultural credit luxes of credit to residents reported. Derecomised securitisations were to consi-In accordance with the quartery report entrol of the problem of the induction with a graciest of the induction and the state of the problem of the induction and the state of the problem of the induction and the state of the problem of the induction and the state of the problem of the induction and the state of the problem of the induction and the state of the problem of the prob

2. MACROECONOMIC AND FINANCIAL RISKS

The onset of the international financial crisis, in 2007, increased the visibility of a set of significant imbalances, both globally and nationally. At the same time, it increased the urgency in needs for an adjustment thereto.

The dimension and recurring nature of this crisis derives, to a certain extent, from the fact that it occurred after a very long period of particularly favourable conditions in international financial markets, in which the crises appearing from time to time (such as Russia's LTCM default, the technology bubble or crisis deriving from 11 September) were absorbed, creating the false illusion of resistance to shocks and, in general terms, of efficiency of the financial markets. This context witnessed increased situations of asymmetrical information on the distribution of risks on a global scale, in conformity with the unfolding of the crisis.

The increase in the level of imbalance also reflected, *inter alia*, a certain incapacity of the monetary and supervisory authorities and governments of several countries to adapt their conduct to significant changes in international economic and financial relations, in a context of in-depth world economic integration. Over the short term, although the pressing need to resolve financial problems became more acute, it should be remembered that a sustainable economic trajectory should promote the economic feasibility of individual agents, with it being fundamental that the incentives framework provided by policies and institutions should allow economic agents' decisions to result in a sustainable, socially balanced solution.

Notwithstanding the global nature of the financial crisis, its impact on the different countries and economic blocs was not homogeneous, in terms of intensity and persistence. This fact derived from different situations at the point of departure, both in terms of the financial system and the financial position of economic agents as in the normative framework of the relationships between them. In addition, it also possibly derived from authorities' different responses, within a framework, also differentiated, of available instruments and policies and each economy's sustained growth potential. Globally, these responses were designed to arrest the spiral of negative effects between the financial system and the economy. Such responses, however, in a particularly visible manner in 2010, became in themselves a part of the problem in a group of euro area countries, with the sovereign debt crisis elevating issues of liquidity and solvency of the respective public sectors to the highest level. This relocation of the focus of instability, with significant reflexes on the financing conditions of the banking systems in international markets, in terms of prices and quantities, has helped the intrinsic fragilities of the said economies to accentuate the effects of the crisis on the other economic sectors.

Differentiation in the recovery of economic activity in the first half of 2010 and persistence of significant imbalances on a global level

The first half of 2010 witnessed continued recovery, beginning mid 2009, from the profound economic recession unleashed by the international financial crisis. Globally in line with forecasts, this recovery was, however, highly heterogeneous in regional terms, with the economies of emerging markets exhibiting considerable dynamism as opposed to a clearly more reduced rate of recovery in a significant number of advanced economies, to a large extent reflecting the dynamics of the foreign component. In the particular case of the latter economies, there is still considerable uncertainty over issues of sustainability of the recovery. Growth in economic activity benefited from the adoption of strong monetary policy and budgetary stimuli since the beginning of the crisis, although they are now conditioned by the need to adjust the financial systems and balance sheets of public and private economic agents. The fragility of the recovery trajectory in the advanced economies will tend to have an effect on the economies of emerging markets, owing to the intensity of existing real and financial linkage. Recovery on a global level was not, in general, accompanied by a clear decrease in unemployment, to a certain extent reflecting time lags with economic activity, with the maintenance of levels comprising an important economic and social challenge, particularly in several of the advanced economies.

In such a framework, it should be stressed that the risks associated with financial imbalances on a global level have not decreased significantly in comparison to before the onset of financial crisis, to the extent that a structural adjustment between income and expenditure is not clearly evident. The balances existing between the major economies and economic blocs have therefore remained globally unchanged and have even been accentuated in several cases. Capital flows from emerging market economies have remained significant, in line with developments since 2009, notwithstanding the fall in the first half of 2010 following the turmoil in sovereign debt markets in the euro area. These international capital movements may help to reduce the global imbalances, evident in the high levels of the foreign trade deficit of several of the advanced economies, notably the US, and the surpluses of the Asian economies, notably if in conjunction with an appreciation in the value of the currencies of several of these economies. There are, however, no certain signs of significant changes in the near future (Chart 2.1). Notwithstanding a certain increase in the US household savings rate, there is a risk that it will resume levels similar to those prior to the financial crisis, as the situation in the mortgages and financial markets stabilises and consumer confidence increases. In contrast, the Asian economies appear to be maintaining a structurally high savings rate. In both sets of economies - those in surplus and those in deficit - it will be necessary to implement policies designed to help correct global imbalances. In particular, in the US, policies leading to structurally higher savings levels are needed; in the Asian economies, more flexible foreign exchange policies and policies designed to boost domestic demand and reduce restrictions on capital flows are required.

The maintenance of imbalances on an international level does not appear to be sustainable. The risk attached to such a situation is related with the possibility that its resolution could result in an uncontrolled process with marked effects on exchange rates and long term interest rates, and, in an extreme scenario, protectionism which would prejudice economic growth on a global level. Owing to its economic and financial openness, Portugal will also be affected by the occurrence of this risk. Similarly, financial institutions, on an international level, which have not adequately hedged their positions and/or which perform activity and obtain proceeds in foreign currency, may be negatively affected by the respective materialisation of foreign exchange and market risks.

There has been a marked recovery in economic growth in the US, although there were clear signs of deceleration in 2010. Economic activity was sustained by domestic demand, with net exports continuing to make a negative contribution. The US foreign trade deficit worsened in the first half of 2010, suggesting that the slight adjustment noted in the preceding quarters was essentially a blip, reflecting the slowdown of economic activity. The public account deficit remained very high, at an estimated more than 9 per cent of GDP in 2010 and for the coming decade a significant increase in public debt (from around 53 per cent in 2009 to approximately 70 per cent in 2020) is expected. Although US debt still enjoys the status of being a safe haven asset, in a context of greater uncertainty, the possibility that investors will demand increases in yields to hold US debt cannot be excluded. This evolution could contaminate the financial markets on a global level, increasing the costs of financing over the longer maturities and originating significant value losses in fixed-income debt securities portfolios. This risk framework is even greater when combined with continued high



Chart 2.1

Source: IMF (World Economic Outlook, October 2010)

ratios of indebtedness in the non-financial sector, with unemployment remaining at historically high levels and the resurfacing of unfavourable prospects for the housing market, which have already led to the renewal of several government support programmes to the sector. In this context, the Federal Reserve recently announced the continuation of unconventional monetary policy measures, notably monetary expansion. This type of measure increases the risk of a marked appreciation in the value of the euro against the US dollar and even against the currencies of Japan and China, owing to their historically high correlation with the dollar.

Recovery in the euro area, since the third quarter of 2009, has been irregular, with the growth of economic activity largely reflecting the dynamics of the foreign component. Private consumption is expected to grow moderately in 2010, in an environment in which the labour markets have still not displayed signs of a significant recovery and savings rates have remained at their highest levels of the last decade. Notwithstanding the recovery of investment in the second quarter of 2010 and improvement recorded in economic agents' confidence levels, which could indicate a certain sustainment of recovery, growth prospects in the near future are enshrouded in considerable uncertainty, with overall risk levels remaining negative. A part of the acceleration of activity in the first half of the year was associated with temporary factors such as the inventory building cycle and effect of the stimulus policies, which should lead to a lower rate of growth as such effects dissipate. At the same time, the budget consolidation measures could induce higher than expected recessionary

effects, particularly insofar as they are part of an effort simultaneously shared by several countries on an international level in a context of historically very low interest rates. There also continue to be pockets of fragility in the financial system and a new wave of turmoil in markets could condition the confidence of agents and affect credit evolution. Lastly, there are also downside risks associated with the possibility of further increases in the prices of oil and other raw materials, as well as the referred to protectionist pressures and possibility of a disordered adjustment of global imbalances.

Reference should be made to the fact that evolution of economic activity in the euro area was not homogeneous between countries and differentiation in recovery is likely to continue. As already stated, the diversity of national situations has caused the financial crisis to produce immediate impacts of differing intensity in euro area countries while also contributing to differences in the respective prospective recovery trajectories. Growth is likely to be slower and more moderate in countries with current account deficits and significant internal imbalances, as well as in countries facing substantial disruptions in their financial system and corrections to overvalued property markets. In this context, the sovereign debt crisis corresponds to international investors' reassessment of the risk associated with the situation of the public finances of different countries, which assessment considers a broader range of environmental and structural indicators, relating not only to the public sector but each economy as a whole.

Imbalances and the situation in asset markets

The eruption of the crisis, first financial and then economic, exposed a collection of underlying imbalances in several euro area economies, with successive observations of differentiation in risk in private and public sectors. Such imbalances included, on the one hand, situations involving the market's overvaluation of several assets (notably property markets, as in the case of the US) and, on the other, albeit not necessarily exclusively, the non-existence of the effective consolidation of public finances in several countries and, more generally, the insufficiency of internal savings. The onset of crisis, in mid 2007, which radically changed the context in which economic agents satisfied their borrowing requirements, highlighted such vulnerabilities and increased the urgency of their respective correction.

The situation in assets markets will continue to restrict the recovery of economic activity. Notwithstanding the recovery of share markets in 2009, in a context of high levels of volatility, euro area indices in mid November 2010 remained around 40 per cent lower than their peaks prior to the onset of the financial crisis (the indices relating to banks and insurance recorded clearly more significant losses, both in the United States as in the euro area, Chart 2.2). In this context, it should be noted that an eventually relevant risk for the stability of the financial system on a global level is associated with the possibility of an interruption of even a reversion of the financial assets valuation trend and growth of trading volumes. The increase in sovereign risk and its interaction with the performance of the financial system, have been reflected, since the end of 2009, in a fresh increase in volatility, uncertainty and risk aversion in the international financial markets, which could cancel out a part of the positive effect of expectations of a continued recovery in the results of financial and non-financial corporations (Charts 2.3 and 2.4).

On the other hand, there is no guarantee that price adjustments in the property markets are already over. This could jeopardise the recovery of activity in a sector which, at least in several economies, was among the most dynamic and with a greater knock-on effect on the rest of economic activity. This uncertainty is accentuated by the fact that the current situation in several countries is still benefiting from direct financial system and general economic support measures, in spite of the fact that there are no unequivocal signs of recovery in such markets.

Chart 2.2



Source: Bloomberg.

Note: Last observation: 15 November 2010.

Chart 2.3



Accordingly and in spite of a certain recovery vis-à-vis the minimum levels noted in the context of the crisis, the situation in the assets markets will continue to affect the solidity of a considerable number of financial institutions, which will tend to condition the monetary policy transmission mechanism and, consequently, economic activity.

Imbalances in the public finances, negative externalities on the banking system and the need for their correction

As already stated, the financial crisis exposed the public finances problems of several countries in the euro area. These problems may be assessed from different perspectives. On the one hand, it is important to assess the initial fragility of the public accounts (in terms of deficit and public debt levels), in addition to assessing the fragility deriving from several non structural dynamics of expenditure and/or revenues. On the other hand, it is also necessary to assess the impact of the measures taken in the context of the crisis, in support of the financial system and the economy, which add to the effect of the automatic stabilisers, that also condition the level and/or potential growth of GDP. Lastly, it is fundamental to assess different governments' capacity to adopt budget trajectories guaranteeing the sustainability of the public finances, *i.e.* their economic and political capacity to resolve the situation.

It should be noted that fears over the sustainability of the public finances are centred on economies which combine significant deterioration in their public accounts with the maintenance of several fragilities of a more structural type, which differ from country to country, such as the fragility of the respective banking sector, maintenance of significant net foreign borrowing requirements, high levels of (public and private) indebtedness and a reduced rate of potential economic growth. These dimensional analyses are also signs of states' capacities to consolidate their public accounts over the short to medium term, without incurring very high economic, social and political costs.

As regards the initial fragilities of several countries, the crisis laid bare the lack of sustained budget consolidation in the pre-crisis period. This was more immediately perceptible in countries with more significant budget deficits (tendentially above the 3 per cent limit), but was also the case (albeit less evidently so) of countries with a tendentially balanced (or even in surplus) budget situation based on non-sustainable situations in asset markets, notably in the property market. In both situations, the budget impact of the financial and economic crisis and challenge associated with the resolution thereof has been significant, enforcing the need to adopt substantial measures, both in terms of expenditure and through increases in the fiscal burden, with their inevitable short/medium term economic, social and political costs.¹ The magnitude of these costs, both in terms of intensity and duration, is associated with potentially significant risks regarding the furtherance thereof.

As opposed to the extraordinarily favourable framework for obtaining finance in the international financial markets in force in the pre-financial crisis period, in an environment of abundant liquidity, a reduced level of interest rates and the search for yield, clearly more restrictive financing conditions have been noted since the onset of the financial crisis an international level.² Over the course of 2010, a more restrictive approach has been associated with the increase in the sovereign credit risk premium and externalities therefrom deriving on other sectors. Starting at the end of 2009, the situation intensified at the end of April 2010, following the downgrading of credit ratings on Greek public debt and its contagion effect on other European countries with high budget deficits and structural fragilities, particularly Portugal, Ireland and Spain. The fact that the four countries were subject to several downgrades to their respective credit ratings helped to fuel volatility in the international financial markets. Investor confidence was also affected by uncertainties over economic recovery, notably as regards the impact of temporary factors. In this context, interest rate spreads on the public debt of euro area countries widened in comparison to Germany, to their maximums since the start of stage III of Economic and Monetary Union (EMU). Up to the start of May 2010, a significant increase in these spreads was noted with high volatility in the sovereign debt market, in a situation of successive upwards revisions of sovereign risk and uncertainty regarding the response of the authorities.

⁽¹⁾ In the case of Portugal, it should be noted that, since the start of its membership of the euro area, only on two occasions, in 1999 and 2007, were the general government accounts less than 3 per cent of GDP in terms of the National Accounts, excluding the effect of temporary measures.

⁽²⁾ The search for yield is related with the fact that, in a context of very reduced interest rate, it is frequent for there to be a compression of interest rate spreads between assets with different risk levels, as, in generating interest, even if marginal, higher than obtained from risk-free operations, preference is given to operations with some degree of risk, thus compacting risk premiums.

In such a framework, the authorities announced several measures, including budget consolidation plans by the governments of the most affected countries and, in early May, a joint European Union - IMF plan to support Greece. At the same time, the ECB announced measures designed to restore the liquidity and depth of dysfunctional market segments with the aim of restoring normality in the monetary policy transmission mechanism. One such measure consisted of a programme for the purchase of public and private euro area debt securities (Securities Market Programme). The ECB also expanded its longer maturity refinancing operations, resumed the full allotment procedure at a fixed rate in all reversible financing operations and restored the US dollar swap line with the US Federal Reserve. The continued eligibility of the securities issued or guaranteed by the Greek state as collateral for the refinancing operations, until otherwise indicated, was also announced.

Notwithstanding the performance of several authorities on an international level and the positive impact thereof on several financial markets segments, tensions in euro area sovereign debt markets have persisted, with an effect on the spreads of the yield rates of the public debt of several countries in comparison to Germany. This situation has been associated with market players' perception of added risk regarding the situation of the banking system in Ireland and their general assessment of the capacity of the governments of the countries in a greater risk situation to design and implement the measures required to consolidate their respective budget situations. In this context, the countries in which the spreads on 10-year public debt issues in comparison to Germany have remained higher are Greece, Ireland and Portugal (Chart 2.5). These spreads also reflect investors' higher demands for safe assets in a context of greater aversion to risk and volatility, taking 10-year German rates (and for the US and UK) to historically low levels, of less than 3 per cent. The fall in such rates reflects both the evolution of real interest rates, deriving from weak economic growth prospects, and expectations of very reduced inflation rates, both of which are at historically low levels. In turn, yields on Portuguese public debt securities have, in the more recent period, been at historically high levels since 1999. In short, at this stage of the financial crisis, idiosyncratic factors have predominated over common uncertainty factors, meaning that the global improvements in the markets, as assessed in comparisons between several indicators and those prevailing after the bankruptcy of Lehman Brothers, are not benefiting the economic agents of the different countries in equal measure (Chart 2.6).³





Source: Thomson Reuters. Note: Last observation: 15 November 2010.

(3) This fact is also supported by Barbosa, L. and Costa, S., "Determinants of sovereign bond yield spreads in the euro area in the context of the economic and financial crisis", Banco de Portugal, Working Paper 22, 2010.

The disruptions in sovereign debt markets generate negative externalities on other sectors. In the case of the banking sector, this occurs on several channels. Firstly, the fact that banks are one of the main investors in public debt, means that lower prices and volatility increases, both in the public as in the private debt portfolios of financial and non-financial issuers, generate potential losses in the banks' securities portfolios. Secondly, banks' financing costs, notably financing obtained in the international wholesale financing markets, tend to maintain a significant correlation with public sector financing cost and could inclusively translate into quantitative restrictions in access to these markets. Thirdly, the value of collateral and state guarantees decrease in line with the increase in sovereign risk. There is also an indirect effect of the state's activities in the economy, which affects the situation of the banks owing to the increase of the materialisation of credit and market risk.

In this framework, financing has become more difficult to obtain for a significant number of agents. This greater difficulty has translated into higher credit and liquidity risk penalties, reflected in an increase in risk premiums and even, in several situations, quantitative restrictions. This situation is particularly serious on account of the significant increase in the financing (and refinancing) needs of the public sectors in several countries. As such, the decrease in liquidity in the international financial markets has been accompanied by an increase in demand, which fuels greater price discrimination between borrowers and even quantitative restrictions for those considered to be at greater risk. Accordingly, satisfying the borrowing requirements of general government could imply greater private economic agents' difficulties in obtaining financing, notably by financial institutions.⁴ Given their financial intermediation role, notably in financing economic agents who do not have direct access to the wholesale financing market (households and the smaller non-financial corporations), this fact could have a negative impact on such agents' consumption and investment decisions. Reference should be made, in such a context, to the liquidity support measures brought in by the ECB, which prevented the need for an abrupt adjustment to the conduct of credit institutions, with serious consequences for the financial situation of different economic agents. It should be remembered, however, that these extraordinary measures are temporary.

The Portuguese situation

In this analysis framework, the Portuguese situation is difficult, owing to its specific structural vulnerabilities. There are, broadly speaking, a number of areas in which the Portuguese economy's fragilities are visible. These particularly include the increasing volume of public and private indebtedness, as reflected in the persistent and significant trade deficits and, consequently, in the evolution of its international investment position, and reduced rate of the economic growth trend over the last decade. These fragilities had already been noted prior to the onset of the international financial crisis. Their importance has, however, increased in the context of the assessment of sovereign risk in international debt markets.

In this context, reference should be made to the fact that the evolution of the provision of information on budget performance in 2009 and 2010 demonstrated the difficulty in ensuring a budget execution capable of preventing much higher deficits than forecast, as was the case in 2009, or which, as in 2010, requires the need to introduce extraordinary measures. The situation this year is all the more relevant when budget performance is benefiting from a higher growth of economic activity than considered in the budget's macroeconomic framework (and therefore benefiting from a positive cyclical effect), which situation will be reversed in 2011.

⁽⁴⁾ This framework could become more complicated in a framework of recovery of economic activity and to the extent that regulation on liquidity favours the holding of public debt instruments, normally considered to be of lower risk and higher liquidity.



Chart 2.6

The Portuguese economy's large foreign trade deficit remains within a framework of historically low savings and investment rates. Accordingly, the adjustment should be based on a reduction of expenditure, permitting a recovery of the savings rate and decrease in many economic agents' excessive leverage. In light of the externalities generated on the other resident economic sectors, higher savings in the public sector are a priority, notwithstanding its inevitable contraction impact on the economy over the short/medium term.

It is, at the same time, indispensable, owing to the scarcity of resources, for investments to be used for certifiably productive purposes, preferably with the potential to improve the country's position in the marketable goods and services sectors. This must also involve the necessary changes on an institutional level, generating progress in leveraging the increase in factor productivity and accordingly permitting a necessary increase in the Portuguese economy's growth potential. In short, it is necessary to provide a credible demonstration of the fact that the risk associated with the Portuguese economy will substantially and sustainably decrease.

In the context of a monetary union and in normal financial markets operating conditions, the adjustment of significant imbalances could be processed gradually, in order to minimise the impacts of the said process. However, in the current context of segmentation and differentiation between sovereign markets in the euro area, such an adjustment has become unavoidable and, given the dimensional aspect of the imbalances, tends to affect all of the sectors of the economy at the same time, generating a dynamic of contraction. Although they cannot be avoided, the costs associated with the adjustment process can be minimised to the extent by which this is credible, both on an international level, with foreign entities and investors, and nationally, leading all resident economic agents to adopt a conduct which favours the adjustment of imbalances. The importance of credibility stresses the need to enable public scrutiny of the implementation of the budget consolidation measures and their respective results, on a basis of rigour, transparency and promptness. This demand is particularly important in the case of the public sector, given its externalities *vis-à-vis* other sectors and the fact that this power comprises a mean of disciplining its performance.

The estimates available on the macroeconomic impact of the budget consolidation measures in the context of the State Budget for 2011 indicate a recessionary effect on the Portuguese economy, with negative consequences on unemployment. Both household and corporate income will tend to be affected and reflected in a deterioration of the asset quality of the banks, notably in their lending to such sectors. This framework could be mitigated to the extent that foreign demand targeted at the Portuguese economy continues to record a positive evolution and provided that Portuguese companies are competitive.

The situation of the Portuguese banks is worsened by the specific fragilities of the Portuguese economy, whose structural nature only adds to the difficulties, in terms of intensity and/or duration, associated with its correction. In this context, an external assessment of Portuguese banks has been highly penalised by the evolution of Portuguese sovereign risk. This has been shown by the downgrades of the ratings on the main Portuguese banks, in line with the rating on the Portuguese Republic, and difficulties in obtaining resources in the international financial markets (Table 2.1). These difficulties have translated into higher costs, shorter maturities and even the appearance of quantitative restrictions in several segments and with the usual counterparties. In such a framework, there has been added recourse to Eurosystem financing. Therefore, the ECB's unconventional policy measures have been decisive in guaranteeing the financing of the Portuguese economy, allowing for the containment of the repercussion, on a significant scale, of banks' difficulties in financing their customers, with a moderate expansion of credit to the private and public sectors even having been witnessed. The temporary nature of such measures must, however, be stressed. The elimination of the ECB's unconventional measures will tend to occur as soon as the operation of financial markets

Table 2.1

LONG TERM PORTUGUE	A DEBT RA	ATINGS RNMEN	OF THE T	FIVE LA	RGEST	PORTU	GUESE	BANKIN	G GROL	JPS ANI) THE	
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	31-Dec 2008	31-Dec 2009	30-Jun 2010	08-Nov 2010	31-Dec 2008	31-Dec 2009	30-Jun 2010	08-Nov 2010	31-Dec 2008	31-Dec 2009	30-Jun 2010	08-Nov 2010
CGD	AA-	A+	A-	A-	Aa1	Aa2	Aa3	A1	AA-	AA-	A+	A+
BCP	А	A-	BBB+	BBB+	Aa3	A1	A1	A3	A+	A+	A+	BBB+
BST	AA	AA-	А	А	Aa3	Aa3	Aa3	A1	AA	AA	AA	AA
BPI	А	А	A-	A-	A1	A1	A1	A2	A+	A+	A+	A-
BES	А	А	A-	A-	Aa3	A1	A1	A2	A+	A+	A+	BBB+
Portuguese Republic	AA-	A+	A-	A-	Aa2	Aa2	Aa2	A1	AA	AA	AA-	AA-

Source: Bloomberg

Note: For banks, S&P ratings refer to the LT Local Issuer Credit category; Moody's ratings refer to the Long Term Bank Deposits category; Fitch's ratings refer to the LT Issuer Default Rating category. For the Portuguese Republic, all ratings refer to the Local Currency LT Debt category.

is consentaneous with the adequate transmission of the ECB's monetary policy to the euro area as a whole, for which reason a significant adjustment of economic agents' balance sheets remains unavoidable and will include both public and private sector deleverage, including the banks.

Given the current framework and the one foreseeable over the next few years, the probability of the Portuguese banking system's return to profitability levels similar to those noted prior to the onset of the financial crisis is relatively reduced, owing to the unfavourable prospects regarding the materialisation of credit risk (with consequences on a level of impairment), the referred to possibility of a fresh fall of prices in stock markets (if the macroeconomic scenario turns out to be more adverse than anticipated, both nationally and/or internationally) the increase in the cost of financing (as already noted in securities financing and as can be anticipated in the case of interest on customer resources) and the possible decrease in activity (notably in terms of credit expansion, reflecting decreases in demand and, most probably, more active restrictions in terms of supply).

The failure to resolve the sovereign risk crisis would particularly darken the clouds enshrouding risks related with banking sector performance. The interaction between sovereign and banking system risk constitutes, in the case of Portugal, the main risk associated with the Portuguese banks' future performance. This risk becomes untenable in the event of a failure to implement policy measures permitting the credible and sustained consolidation of the Portuguese public finances. This will particularly derive from the risks associated with the refinancing of bank debt, given the high amounts involved, the greater short term concentration over the last few years and still high level of investor risk aversion, in a context of greater competition from the public sectors to obtain resources in the international financial markets.

It should, lastly, be noted, that the furthering of the budget goals is a necessary, albeit insufficient, condition to enable a smooth adjustment of the Portuguese economy, without particularly harsh foreign restrictions on financing over the short to medium term. Given Portugal's fragilities related with over-dependence on foreign financing, any significant market disruption, even if originating in another country, could compromise the desirable gradual nature of the inevitable adjustment of the financial position of resident economic agents.

Future challenges in terms of financial regulation on an international level

The successive waves of instability in the international financial markets, which have progressively established an interaction with the development of economic activity and more recent focus on

sovereign debt risk, have reinforced the perception of the need to increase the banking system's level of resistance. This will include the restoring of banks' balance sheets, increasing liquidity and capital buffers, in order to restore investor confidence. The eligible own funds elements will also be redefined, to satisfy the added demand for better quality elements, *i.e.* more stable and susceptible to spreading losses among shareholders. In this framework, the Basel Committee on Banking Supervision announced the revision of capital requirements to higher levels, as well as the transition period to new standards,⁵ in September. The convergence to the new regulatory rules will take place in the context of the necessary deleverage of the Portuguese economy. This particularly demanding framework will require adjustment dynamics to the Portuguese banking system's balance sheets over the course of time, in conjunction with a significant reinforcement of own funds.

⁽⁵⁾ For more detail see "Box 2.1 Main Basel III proposals, of this Report".

Box 2.1. Main Basel III proposals

The international financial crisis exposed several vulnerabilities in financial system regulation on a global level. Several banks displayed highly significant leverage ratios, notwithstanding the fact that their capital adequacy ratios were comfortably above the regulatory minimums. The reduced level of transparency of positions assumed by the banks on complex financial products and on the real perimeter of potential liabilities, in turn, increased the difficulty in the ex ante assessment of potential contagion effects on the financial system. The prevailing incentives structure allowed for excessive risk-taking, particularly owing to the fact that remuneration policies were anchored by short term objectives. Many banks also evidenced a strong mismatch between their assets and liabilities maturity structures, with several banks being excessively dependent on very short term wholesale financing markets. This behaviour was based on the hypothesis that the repos and trading markets in several categories of assets, in addition to the financing markets, would remain liquid under any circumstances.

All such vulnerabilities contributed, to a certain extent, to exacerbating the magnitude, scope and duration of the international financial crisis after the failure of the Lehman Brothers investment bank, in September 2008. In this context, a global debate emerged on the need to improve and strengthen several aspects of financial system regulation. At the Washington summit in November 2008, the G20 leaders announced a series of measures designed to strengthen financial regulation, increase the transparency of financial markets, improve financial system regulation, reinforce international cooperation in this domain and reform international financial institutions. The Basel Committee has been one of the main pillars of this international financial regulation reform process.¹ It has, in concrete terms, been submitting several proposals for the reinforcement of banks' own funds, introducing counter-cyclical measures for financial system regulation, mitigating financial system leverage, improving liquid-ity risk management and supervision and reducing the systemic risk underlying the liquidation of cross-border banking groups. This collection of proposals, to be implemented during the course of the next decade, has been designated as "Basel III",² and succeeds the Basel Capital Accord of 2006 (generally referred to as "Basel II").³

The objective of the series of proposals included in the Basel III package is to improve the banking system's capacity to absorb economic and financial shocks, improve banks' risk management and promote the transparency of banking activities. Most of the proposals are concerned with the microprudential sphere, i.e. they aim to improve the resilience of individual banking institutions to periods of financial pressure. However, this package also includes macroprudential measures designed to mitigate the build-up of systemic risks associated with the credit cycle.

The main proposals were submitted in December 2009 and put up for public consultation. Several other specific aspects of the proposals were announced in July and September 2010, particularly as regards their calibration, operationalisation and implementation. According to G20 guidelines, the new international financial regulatory package should be finalised by the end of 2010.

Notwithstanding the fact that many specific issues are still under discussion, this box aims to summarise the main changes to the international regulatory framework, notably as regards the reinforcement of regulatory capital, introduction of capital buffers, imposing of limits on the leverage ratio, liquidity risk regulation and the treatment of systemically important financial institutions.

Reinforcement of regulatory capital

The two earlier international capital accords (Basel I and II) defined regulatory minimums in terms of the capital requirements applicable to large internationally active banking groups. However, a more solid capital base could possibly have mitigated the impact of the international financial crisis. With this in mind, the Basel Committee

⁽¹⁾ The Basel Committee on Banking Supervision is a forum for cooperation on banking regulation and supervision on an international level. The Committee issues guidelines on regulation and supervision, particularly on capital requirement rules.

⁽²⁾ Information on the Basel Committee's main proposals is available at http://www.bis.org/list/basel3/index.htm.

^{(3) &}quot;Basel II: International Convergence of Capital Measurement and Capital Standards: A Revised Framework - Comprehensive Version" June 2006.

proposes a reinforcement of the quality of the capital required of banks, in addition to greater coverage of the risks assumed by the banks in their activity.

The reinforcement of regulatory capital quality is essentially associated with capital eligible as Tier 1. There will be a substantial increase in the level and proportion of this higher quality capital, particularly through reinforcements of eligible capital and retained earnings. The regulatory minimum required for the common equity ratio (Core Tier 1) will increase from 2 per cent to 4.5 per cent of risk-weighted assets, whereas the minimum value for the Tier I ratio will increase from 4 per cent to 6 per cent. Substantive changes will also be made to the level of eligibility conditions for the positive capital elements, the concept of own funds will be simplified, the Tier 3 category will be eliminated and the deductions will be made directly from Core Tier 1. The deductions of investments in other financial institutions will also be reinforced and deductions will be imposed on assets associated with pension plans.

Another important aspect under discussion is associated with the need to ensure that all of the instruments eligible for inclusion as regulatory capital have the capacity to absorb losses in situations in which a bank is not able to obtain funding on the financial markets. It was noted during the international financial crisis that several equity instruments (such as subordinated debt) eligible for inclusion as Tier 2 did not have this essential characteristic. The Basel Committee accordingly considers that all instruments eligible as capital should have the capacity to absorb losses. To guarantee this condition, there are three possibilities: i) to develop national and international resolution mechanisms for dealing with banks in a non-viable situation; ii) to prohibit systemically important banks from including Tier 2 instruments in their regulatory capital; iii) to require that all regulatory capital instruments should include a contractual mechanism guaranteeing their capacity to absorb losses in situations of a financial institutions' non-viability (i.e. with recourse to contingent capital and convertible debt instruments). The first possibility requires the harmonising of bankruptcy laws and international resolution schemes which, in spite of being desirable in certain aspects, would be unfeasible over the short term. The second possibility requires the public identification of institutions with systemic relevance, which originates important moral hazard problems. Given these limitations, the third possibility appears to be the most feasible. These proposals were in public consultation up to 1 October 2010.

As regards risk coverage, the new regulatory framework is expected to cover a broader range of risks than beforehand. In concrete terms, an increase in capital requirements for trading book, counterparty credit risk, securitisations and complex re-securitisations is expected. The Basel Committee has also put forward proposals aimed at mitigating the systemic risk originated by financial derivatives activities, creating the necessary incentives for institutions to prefer to trade these financial instruments through centralised counterparties.

Capital buffers

A central element of the new regulatory package consists of the imposition of additional capital buffers which may be used to absorb any losses in stress periods. The Basel Committee has proposed the creation of two distinct buffers: the capital conservation buffer and the counter-cyclical capital buffer.

The capital conservation buffer should have the capacity to absorb potential losses in the banking sector in severe financial and economic stress scenarios. The buffer should constitute an additional requirement to the Common Equity ratio and should have a minimum value of 2.5 per cent (i.e. taking both of the requirements into consideration, the total requirements for the Common Equity ratio should be 7 per cent). Although restrictions on earnings distribution will be imposed on banks which do not fulfil this additional requirement, this does not imply the immediate need for capital increases or a contraction of risk-weighted assets (as in the case of banks which fail to comply with the regulatory minimum for the Tier 1 ratio). These restrictions on earnings distribution will be all the more severe the lower is the available buffer. The buffer therefore aims to avoid situations in which banks continue to pay dividends in periods of financial pressure with the objective of restoring trust in their financial solidity, as noted in several situations over the last few years.

The counter-cyclical capital buffer, in turn, will complement the capital conservation buffer in periods of excessive credit growth or excessive risk accumulation, and can range between 0 per cent and 2.5 per cent. This buffer should be used when necessary to absorb any banking system losses which could constitute a risk to financial system stability. The decisions regarding the activation and release of this buffer are the responsibility of the national supervisors. The buffer will be managed by supervisors for all financial institutions with credit exposures in a specific jurisdiction, not taking each institution's individual conduct into consideration. This may raise several issues regarding incentives creation.⁴

Leverage ratio

The capital adequacy ratios defined in Basel II take risk weighted assets into consideration, recognising that assets with higher risk levels should imply more significant capital requirements. Over the course of the last few years, however, the discrepancy between the capital adequacy and leverage ratios of several major international banks has become evident. Although several banks have highly positive risk-weighted capital ratios, they also show a high level of indebtedness when non-risk weighted assets are considered (most notably, off- balance sheet exposures). Given this discrepancy, the Basel Committee has endeavoured to introduce a simple, transparent non risk-weighted measure, calibrated to constitute a complementary requirement to risk weighted capital ratios.

The minimum value for this ratio, which will be defined as Tier 1 capital as a percentage of assets, will be 3 per cent. There will, however, be an observation period between 2013 and 2015.

Liquidity risk regulation

The international financial crisis of the last few years has shown the importance of prudent liquidity risk management in the banking system. The financial crisis was preceded by a significant mismatch between the maturity of banks' liabilities and assets, with increased preference for the short term financing market. Given the opportunity cost of holding highly liquid assets in the balance sheet (notably short term assets and/or assets which are easily marketable in adverse market circumstances), many banks failed to maintain a sufficiently high liquid assets buffer to weather the occurrence of disruptions in many financing markets. In such a context, exposure to liquidity risk constituted a factor of amplification during the international financial crisis.

Notwithstanding the existence of regulation on liquidity risk in several jurisdictions, there are no common prudential rules in international terms.⁵ In this context, an important part of the Basel III package is associated with the introduction of prudential requirements on liquidity risk. The proposals include two complementary indicators:

i. Liquidity coverage ratio.

This liquidity requirement endeavours to ensure that the banks are in a permanent state of readiness to withstand a highly adverse financial shock for at least one month, for which they should have a highly liquid assets buffer.

ii. Net stable funding ratio.

This requirement is more structural in nature and aims to define the incentives necessary for banks to rely on highly stable sources of finance, in order to ensure their capacity to withstand medium and long term shocks.

The Basel Committee put forward an initial calibration proposal in December 2009. The proposal was put up for public consultation and analysed under the scope of the Quantitative Impact Study. Owing to the challenges associated with this calibration, the Basel Committee decided to establish an observation period starting 2011.

⁽⁴⁾ In addition to this counter-cyclical proposal, the Basel Committee is also considering ways of making the minimum capital requirements less pro-cyclical, to avoid a situation in which the estimated default probabilities decrease in the positive stages of the economic cycle, using, for example, estimates for default probabilities in recessionary periods.

⁽⁵⁾ Banco de Portugal, in line with its financial system prudential supervision responsibilities, has been monitoring liquidity risk over the course of the last decade. Instruction no. 1/2000 defined a requirementfor a liquidity report with detailed information on the maturity of banks' assets and liabilities. Instruction no. 13/2009 revoked the former report in mid 2009, requiring greater detail on the reporting information requested.

This period will be very important to ensure that the imposition of these two new regulatory limits will succeed in achieving the objective of making the banks more stable and resilient to shocks, without, however, significantly disrupting their essential financial intermediation and maturities transformation functions.

Systemically important financial institutions

The size of several of the financial institutions in the financial system is so significant that they benefit from an implicit public guarantee: the economic consequences of the bankruptcy of such an institution would be so serious that any government would be expected to make the necessary decisions to ensure their feasibility. This moral hazard problem also arises in the case of institutions having a systemic impact based on their loans and borrowing exposures to other banks. Such institutions, which are generally designated as being too big to or too interconnected to fail, have incentives to assume excessive risks, as they benefit from this guarantee of implicit support. However, such support generally comes with a very high fiscal cost which should, desirably, be internalised by these institutions.

Regarding this issue several proposals have been put forward to mitigate the perception of several banks as being too big to fail and to limit their over-exposure to other parts of the financial system. The Basel Committee and the Financial Stability Board have been assessing the additional capital requirements to be imposed on systemic financial institutions. The Basel Committee has also issued a series of recommendations on the liquidation and resolution of cross-border banking groups. Additional capital requirements may also be imposed on highly correlated interbank exposures, in addition to trading, derivatives and securitisation activities having a systemic impact. Incentives designed to encourage the use of centralised counterparties for over-the-counter derivatives are also expected to contribute to lessening contagion effects on the financial system, in addition to the above mentioned use of contingent capital and convertible debt.

Assessment of the impact of Basel III

The implementation of these proposals will have an impact on the activity of the banks and the economy and will imply adjustment costs. The banks will, over the short term, have to strengthen their regulatory capital base, change their risk management policy and set up liquidity buffers. During this implementation period, the additional regulatory requirements may originate certain pressures on lending to the economy.

However, over the long term, such measures are likely to have a globally positive impact on the economy, through a lessening of the impact of eventual negative shocks and greater financial stability.⁶ The new financial system regulation package will, accordingly, ensure a compromise between financial stability and the risks underlying financial intermediation activities.

The long term global impact will also depend on the importance of the banking system in each country, in addition to the set of financial institutions which will be subject to the new regulatory framework. The Basel Committee's proposals are targeted at large internationally active banking groups. However, in the European Union these proposals will be reflected in a new Capital Requirements Directive (CRD IV), which applies to all credit institutions and investment companies operating in the European Union. It should be noted, in this context, that the consistent implementation of the new regulatory requirements is essential to avoid distortions in the competitive framework between different jurisdictions.

The interim report of the Macroeconomic Assessment Group established by the Basel Committee and the Financial Stability Board was published in August 2010.⁷ This group endeavoured to assess the macroeconomic impact in the period of implementation of Basel III. According to the report, banks should provide for the new regulatory

⁽⁶⁾ Notwithstanding, over the long term there may also be several negative impacts, notably if the more demanding capital and liquidity requirements comprise an increase in the cost of financing of the economy. An analysis of these long term effects is available at http://www.bis.org/pub/bcbs173.pdf.

⁽⁷⁾ http://www.bis.org/publ/othp10.htm.

demands through retained earnings, capital increases and the reduction of the credit to assets ratio. During the adjustment period, the fact that several banks may implement price and quantity restrictions on loans will necessarily have impacts on economic growth. This impact will be greater in countries in which bank loans represent the main source of private sector financing (i.e. in which access to the capital markets is more restricted). The impact will also vary in countries with different growth trajectories after the economic and financial crisis of the last few years. In addition, the longer the transition period, the lower the short term costs deriving from the implementation of the new international financial regulation framework. According to the results announced by the referred to group, if the new capital requirements were imposed over a transition period of around four and a half years, it is estimated that the level of GDP would diminish by a maximum of 0.19 per cent for each percentage point increase in the capital ratio (equivalent to a 0.04 pp reduction in the annual growth rate in the period). The impacts of the imposition of limits on liquidity indicators will also be limited, notwithstanding the fact that there is still a high level of uncertainty over the effective calibration of these indicators. The estimates indicate that GDP will resume its long term trend in a few years. Such estimates, however, are subject to a high level of uncertainty, in addition to several limitations of a methodological type.

The changes brought in by Basel III will necessarily imply adjustments by Portuguese banks, owing to more demanding capital requirements and the greater scope of the risks covered by the new international financial regulation framework.

The main impacts will affect Portuguese banks' regulatory capital base, owing to changes in positive capital elements, in addition to the deductions and application of prudential filters. Greater restrictions on the eligibility of minority interests as a positive element will have a particularly negative effect on the capital of several banking Portuguese groups, as only minority interests in individual banking subsidiaries eligible for recognition as Common Equity Tier 1 capital will now be considered. Such subsidiaries' surplus capital vis-à-vis their respective capital requirements is excluded from the calculation of capital on a consolidated level, taking the proportion of minority interests into consideration.[®] Changes in the deductions of assets associated with the recognition of pension liabilities for bank employees will also have a relevant impact, particularly for banking groups with significant actuarial deviations.[®] Basel III requires the deduction of assets associated with defined benefit pension plans, with the exception of those with a surplus (with the authorisation of the domestic supervisory authorities), whereas currently national regulations only provide for the deduction of accumulated actuarial deviations above the prudential corridor. The elimination of this prudential corridor will, accordingly, have a negative effect on Portuguese banks, namely those with liabilities in excess of the value of the assets of their respective pension funds. In addition, the capital of Portuguese banks will also be negatively affected by greater restrictions on the deduction of investments in banking, financial and insurance institutions.

Without considering any adjustment by the banks, these changes would, as a whole, tend to imply a decrease in the Portuguese banking system's capital. At the same time, risk-weighted assets would also tend to increase given the greater scope of the risks covered. Taking such impacts into consideration, in conjugation with the new demands in terms of minimum capital ratios (including the introduction of capital buffers), Portuguese banks as a whole will be expected to reinforce their capital base, in line with most European banking groups. However, the magnitude of this adjustment may be reasonably heterogeneous and conditioned by each banking group's point of departure and by the relative importance of the above referred to adjustments. In this context, there will be situations in which the impact of the changes in positive capital elements and deductions and prudential filters may be highly significant.

The needs for the reinforcement of the regulatory capital base of Portuguese banks occur in the context of a necessary deleverage of the Portuguese economy, with consequences on the materialisation of credit and market risk. In such an environment, convergence with the new regulatory demands over the course of the next few years may be supported by capital increases, retained earnings and/or a contraction of banking assets, particularly in

(8) Reference should be made to the fact that in the Portuguese legislation there are currently no limits on eligibility for minority interests, except for hybrid instruments.

⁽⁹⁾ The magnitude of this impact will be conditioned by the transfer of several liabilities from bank employees' pension funds to the general Social Security regime, provided for in the proposed State Budget for 2011.

more demanding risk-weighted exposures.

As regards the new leverage ratio, Portuguese banks may not have to make such substantial adjustments. In June 2010, the ratio between Portuguese banks' original own funds (Tier I) and assets (not considering offbalance sheet exposures) was around 5 per cent. Notwithstanding the fact that the definition of original own funds used in the calculation is not as demanding as in Basel III and that off-balance sheet positions are not considered in assets, the adjustments needed to achieve a leverage ratio of 3 per cent in 2018 should be of a relatively small magnitude.

Lastly, Portuguese banks may also have to reinforce the weight of the liquid assets in their balance sheets and concentrate on globally stable financing sources, with the objective of converging with the new regulatory demands in terms of liquidity risk. On this item and as analysed in "Section 4.4 Liquidity risk" of this Report, the significant dispersion in Portuguese banks' liquidity situation will also be reflected on highly heterogeneous adjustment endeavours.

Implementation of Basel III

The proposals submitted by the Basel Committee have been raised gradually in public consultations. A Quantitative Impact Study has also been carried out to assess the effect of regulatory reform on specific banks and the banking system as a whole.¹⁰ The impact study will be used to fine tune the calibration of the new capital and liquidity requirements.

Taking into consideration that the adjustment costs for the banks and the economy resulting from the convergence with the new regulatory requirements will be all the higher the shorter the transition period, the Basel Committee announced an implementation timetable designed to mitigate such impacts, in September 2010. Information on the new capital requirements is set out in Chart 1, and Table 1 summarises the implementation timetable.



Chart 1

Source: Basel Committee on Banking Supervision. Note: (a) The counter-cyclical capital buffer will be activated only when national supervisory authorities consider that there is excessive credit growth or excessive build-up of risks in the banking system.

(10) This study was managed by the Basel Committee (http://www.bis.org/bcbs/qis/index.htm). At the same time. the Committee of European Banking Supervisors (CEBS) undertook a Europe-wide impact study, in cooperation with the Basel Committee, with the objective of analysing the effect of several proposals vis-à-vis certain European specificities.

Table 1									
BASEL III IMPLEMENTATION									
	2011	2012	2013	2014	2015	2016	2017	2018	2019
Leverage ratio	Supervisory	monitoring	Parall	el run; disclosure	starts 1 January	2015		Migration to Pillar 1	
Common Equity ratio			3.5	4.0	4.5	4.5	4.5	4.5	4.5
Capital conservation buffer						0.625	1.25	1.875	2.5
Common Equity ratio + Capital conservation buffer			3.5	4.0	4.5	5.125	5.750	6.375	7.0
Phase-in of deductions from Core Tier 1				20	40	60	80	100	100
Tier 1 ratio			4.5	5.5	6.0	0.9	6.0	6.0	6.0
Total Capital ratio			8.0	8.0	8.0	8.0	8.0	8.0	8.0
Total Capital ratio + Capital conservation buffer			8.0	8.0	8.0	8.625	9.250	9.875	10.5
Capital instruments that no longer qualify as regulatory capital					Phased out over	a 10 year horizon	n beginning 2013		
Liquidity coverage ratio	Observation period begins				Introduce minimum standard				
Net stable funding ratio		Observation period begins						Introduce minimum standard	
Source: Basel Committee on Banking Supervision. Notes: In percentage. Transition periods shaded in white. All dates are as o	of 1 January.								

3. FINANCIAL SITUATION OF THE NON-FINANCIAL PRIVATE SECTOR

During the course of the first half of 2010, the non-financial private sector's net borrowing was lower than in the same period 2009, at a level close to that recorded for the whole of the past year. This fact reflected the increase in the saving rate of both households and non-financial corporations and the maintenance of historically minimum investment rates. Nevertheless, this development translates the different behaviour of households and non-financial corporations as regards the adjustment of the imbalances of these sectors during the course of this decade. In the last decade, the Portuguese economy was characterised by the very high net borrowing of non-financial corporations, which were much higher than most of the other countries in the euro area. This differential, up to 2004, translated into higher investment rates than in most euro area countries. Latterly, the larger borrowing requirements of Portuguese companies reflected significantly lower levels of saving rates in addition to a decrease in the investment rate's positive differential. Work on the adjustment of this deficit only appears to have begun in 2009, in contrast to other countries with large net borrowing requirements, which began the adjustment process following the onset of the financial markets crisis (Chart 3.1). In the case of households, the differences in comparison to other euro area countries were not particularly marked during the course of the decade, even in periods in which the sector's net lending was below the average for euro area countries. In spite of the fact that households' saving rate in Portugal had been systematically and persistently below the level of the euro area countries, over the decade, the investment rate was slightly above the euro area average in the first half decade and slightly below the more recent average. Also as in the case of other euro area countries with similar levels of households' net lending to Portugal, the balance sheet adjustment process of this sector began in 2008 and proceeded through the following years (Chart 3.1).

In the course of the crisis, this adjustment process of the non-financial private sector translated into a stabilisation of levels of indebtedness, firstly in the household sector and more recently of nonfinancial corporations. However the fact that these remain among the highest within the euro area reflects the negative levels of internal financial saving over the course of the last decade, translating into a huge trade gap.

The need to adjust corporate and household balance sheets will have different characteristics by sector and will be reinforced by the increase in banks' financing costs related to rises in sovereign risk premia. Accordingly, in the household sector, the adjustment which began in 2008 will proceed over the next few years, with relatively important effects on domestic demand as well as in companies predominantly geared to the domestic market as a consequence. This development should further worsen the labour market conditions, which adjustment has to be supported by the strengthening of the tradable goods and services sector. In general, the low growth rate of private consumption is foreseen for a long period. In turn, the most vulnerable indebted households, such as the younger people and those with lower income, albeit representing a very small part of the banks' credit portfolio, are expected to have increasing difficulties in meeting their respective debt servicing obligations.

As far as the corporate sector is concerned, somewhat heterogeneous situations should exist. For firms with an important share of activity in foreign markets, and since the recovery in world economy has been confirmed, sales expansion will take place and, in a context of moderate wage costs, allow a strengthening of the respective self-financing capacity. Thus, these firms will become less vulnerable to an increase in credit cost from domestic banks. Moreover, some corporations may benefit from funding provided by foreign banks which face lower financing cost. Other firms with an important level of internationalization may have a larger contribution to their income from activity



Chart 3.1

Note: The (weighted) average and median consider the 16 euro area countries whenever there is information available.

abroad, namely in the economies of emerging markets. This development should be seen even in firms operating in the construction and services sectors, allowing for a mitigation of the impact of domestic demand fall in their activity and financial situation. Finally, the enterprises primarily focusing on the domestic market will be the most negatively affected. A further mention should be made of the stricter conditions faced by the domestic banks in wholesale debt markets which will tend to increase difficulty of debt restructuring by non financial corporations. This fact should be translated into higher default rates and a continuation of a large number of bankruptcies.

Households

In the first half of 2010, households' net lending increased slightly as compared to the same half-year in 2009, reflecting the maintenance of the saving rate and a decrease in the investment rate

The first half of 2010 witnessed a slight increase in households' net lending in a context of a moderate but unsustainable recovery of economic activity (Chart 3.2). A significant increase in the sector's financing capacity had already been noted in 2009 reflecting a rise in the saving rate and particularly a reduction in the investment rate to minimum values for the decade. Such developments represent, to a large extent, the start of an adjustment process of households' expenditure as uncertainty regarding the path of permanent income increases, in a framework of a continued increase in unemployment, significantly high levels of indebtedness and a trend towards more restrictive conditions on access to bank credit. Notwithstanding the decrease in employment in the first half of 2010, the increase in employees' compensations and net current transfers allowed disposable household income to post a positive real increase in the period. This fact enabled the saving rate to be maintained at the preceding year's level, notwithstanding the significant growth of consumption during the course of the first half of 2010 (almost 3 per cent in volume). This development took place in a context of maintenance of high uncertainty, notably as regards the costs that the necessary adjustment of the macroeconomic imbalances in the Portuguese economy will have on households situa-



Chart 3.2

Source: INE.

Notes: (a) Disposable income adjusted for the change in net equity of households on pension funds. (b) Corresponds to the sum of GFCF, changes in inventories, acquisitions less disposals of valuables and acquisitions less disposals of non-produced non-financial assets.

tion. In fact, consumer confidence has been substantially eroded following the announcement of the measures to be included in the State Budget for 2011, suggesting that the adjustment on household expenditure will be accentuated in the future.

The increase in household's net lending in the first half of 2010 translated into a slight increase of net transactions in financial assets ...

In the first half of the year, the effect of fluctuations in asset values translated into a decrease in the value of the households portfolio in comparison to the end of 2009. This decrease took place notwithstanding net purchases of financial assets (Chart 3.3). In this portfolio, reference should be made to the increase in assets with higher yields than on deposits, thus reverting the trend noted between summer 2007 and mid 2009. This period witnessed significant net disinvestment by households in equity securities (investments in mutual funds and shares), whose returns were particularly affected by the turmoil in the financial markets. In a context of growing liquidity difficulties in the wholesale financing markets which favoured more attractive returns on funds taken from customers by Portuguese banks, the above said movement of net disinvestment facilitated the accumulation of deposits in the banking system in the same period.

Notwithstanding the progressive easing of tensions in the international wholesale financing markets starting from the first quarter of 2009, the marked increase in Portuguese sovereign risk premiums has significantly increased the difficulty for the Portuguese banks to access market financing and, accordingly, forced them to use Eurosystem funding. Interest rates on deposits have remained at low levels (albeit higher than on the money market), with households having preferred to invest their respective savings in instruments with higher returns, even if they are less liquid. In view of that, the first half of 2010 witnessed a limited increase in households' deposits, while an important growth in households' investments in life insurance was noted (Chart 3.4). In the third quarter of the year, the domestic banks intensified their quest for taking in households' savings as a form of financing the balance sheet.





Sources: INE and Banco de Portugal

Note: Consolidated figures. (a) Includes other technical insurance reserves and other receivables.

... and a net redemption of financial liabilities by this sector

There was, in turn, a negative flow of net financial liabilities in the first half of the year, very much in line with developments in the same half of 2009 (Chart 3.5). This development occurred in a context of reduction, albeit slight, in demand for such loans, according to the replies of the Portuguese banks to the Bank Lending Survey. Underlying this reduction was a deterioration in consumer confidence and more unfavourable prospects relating to the evolution of the housing market. Notwithstanding, in accordance with the *Confidencial Imobiliário* indicator, there was a slight increase in the house price index in the first half of 2010 (Chart 3.6).

The more restrictive criteria applied by the major Portuguese banks for the approval of loans to households favoured growth in the market share of smaller and foreign banks, mainly in the segment of credit for house purchase (see "Section 4.5 – *Credit Risk*", of this Report). According to information compiled by the INE, in the first half of 2010, the average value of instalments on housing loans was down by around 22 per cent in comparison to the same period 2009 (down 19 per cent up to August). The proportion of the interest component in the total instalment (accounting for slightly more than 60 per cent of the total average instalment in the first half of 2009) stabilised in comparison to the end-2009 at around one third of the total (Chart 3.7).

There was a net redemption in loans to households for consumption and other purposes, with bank loans for consumption having recorded a marginally positive flow. In accordance with the replies to the Bank Lending Survey, during the course of the first half of 2010, there was no significant change in demand for loans in this segment in comparison to the last quarter of 2009. As indicated by the banks in the survey, expenditure on the consumption of durable consumer goods remained practically unchanged, with the deterioration in consumer confidence, on the one hand, and use of savings, on the other, having contributed to depress demand. Also the more restrictive criteria on the approval of bank loans for consumption and other purposes, namely through higher spreads and other more demanding contractual conditions have probably discouraged demand in this market segment.

Reflecting the net redemption of loans, household's financial debt was slightly down as a percentage


Chart 3.4

Source: INE and Banco de Portugal.

Note: Consolidated amounts. (a) Includes other technical insurance re-serves and other accounts receivable.

Sources: INE and Banco de Portugal. Note: Consolidated amounts. (a) Includes other technical insurance re-serves and other accounts receivable.

Chart 3.6







Note: Last observation: August 2010.

Chart 3.8

of disposable income, resuming the value at end-2008, albeit still amongst the highest in euro area countries (Charts 3.8 and 3.9).

The need to proceed with adjustments to household balance sheets, aimed at adjusting expenditure to lower levels of permanent income, will have a strong restraining effect on the path of domestic demand in coming years. This development will have a significant impact on the economic sustainability of some companies and will have a negative effect on the trend of the labour market. As a consequence, several Portuguese households are expected to experience a substantial reduction in their disposable income. In light of the high level of indebtedness in this sector, this reduction may cause difficulties to the payment of debt service charges thereon. This fact will be especially relevant in the case of more vulnerable indebted households, such as young and lower income aggregates although they represent a minor proportion of the credit portfolio of banking system. In general, it is expected that consumption and saving decisions of a high number of household aggregates will be strongly affected by the macroeconomic framework of the Portuguese economy in the near future, with consequences to the profile of economic activity recovery in the medium term.







Sources: INE and Banco de Portugal.

Sources: Eurostat. Note: Consolidated values except Ireland and United Kingdom.

Non-financial corporations

In the first half of 2010, the net borrowing of non-financial corporations was slightly down over the same period 2009

The decrease in net borrowing of non-financial corporations was essentially due to the increase in the saving rate, while investment in real assets as a percentage of GDP remained at the same level as in the first half of the preceding year (Chart 3.10).

Contributory factors to the increase in the saving rate were, on the one hand, the slight increase

noted in the sector's gross operating surplus, in line with the recovery of corporate operational profitability and on the other the reduction of interest charges, with a large proportion of income continuing to be distributed to shareholders, although less than in the preceding year (Chart 3.11). It should be noted that the saving rate of non-financial corporations has been falling continuously since 2003, this path being interrupted in 2009. At the same time, the proportion of gross operating income transferred to other institutional sectors has grown considerably. On the one hand, the growth in financial debt has translated into a significant rise of the weight of interest payable while on the other, there has also been an increase in dividends paid to shareholders in a context in which borrowing costs have remained relatively low for a prolonged period. This development has not been evident in other euro area countries which took advantage of the increase in operating profitability to raise own funds. Compared with the median for euro area countries, the proportion of income paid out by Portuguese non-financial corporations, particularly after 2006, was markedly up, which together with the increase in the proportion of interest costs has contributed to a decrease in the path of saving rate (Chart 3.12).



Source: INE.

Note: (a) Corresponds to the sum of gross fixed capital formation, changes in inventories, acquisitions less disposals of valuables and acquisitions less disposals of non-produced non-financial assets. Sources: INE and Banco de Portugal.

Note: Net means the difference between resources and uses. Starting 2008 (inclusive), quarterly accounts.





USES OF THE GROSS OPERATING SURPLUS OF NON-FINANCIAL CORPORATIONS

Source: Eurostat

Note: The (weighted) average and median of the euro area consider the 16 countries whenever there is any information available. The dotted line corresponds to the full amount of the gross operating surplus. The difference between the total value set out in the columns and this line refers to the sum of the other operations (uses and resources) not evidenced in the chart. This corresponds to the difference between the sum of the other operations of the primary income account of the non-financial corporations (uses minus resources) and interest receivable. Thus, the amount in column above (or below) the dotted line means that difference is negative (positive).

The improved profitability of non-financial corporations has occurred in the context of a certain recovery in activity

According to quarterly information provided by Banco de Portugal's Central Balance Sheet Database, returns both on capital invested and on own capital were up in the first half-2010, after a downwards trajectory since 2007¹ (Chart 3.13). Reference should be made to the fact that the increase reflected some reduction in labour costs of the companies in the sample and a recovery in the turnover, generated both by domestic and foreign markets (see "Section 5. *Supply*", Banco de Portugal, *Economic Bulletin*, Autumn - 2010 in the essay on the Portuguese economy in 2010).

However, it should be noted that the improvement in the non-financial corporations sector is a reflection of heterogeneous situations among Portuguese companies. In particular, together with companies recording higher sales there has been a significant number of corporate dissolutions which have affected the labour market, in which significant unemployment has been recorded. According to information compiled by Coface², there was a more than 50 per cent increase in the number of

⁽¹⁾ For an in-depth characterisation of surveys of companies participating in Banco de Portugal's Balance Sheet Database, annual (CBA) and quarterly (CBT) surveys, see Banco de Portugal, Supplement 5/2005 of the Statistical Bulletin, December 2005 and Supplement 1/2008 of the Statistical Bulletin, May 2008. It should be noted, in the case of the quarterly survey and, to a lesser extent, the annual survey up to 2005, that there is an important bias to the larger companies. Starting 2006, with the use of Simplified Corporate Information, there was a marked improvement in CBA coverage which is close to 100 per cent in terms of total gross value added of non-financial corporations.

⁽²⁾ Coface (Compagnie Française d'Assurance pour le Commerce Extérieur) is part of one of the biggest financial groups in France. One of the tasks of this company is to compile financial and credit information on corporations, including ratings, thus providing support to its customers to assess their own risk exposure. Coface is accepted by the Banco de Portugal as an ECAI (External Credit Assessment Institution). This means that the Portuguese credit institutions may use the ratings provided by Coface Serviços Portugal to calculate their own funds requirements on their positions on "Corporations".

Chart 3.13



Source: Banco de Portugal.

Notes: Return on capital invested = (current income + interest paid) / (shares and other investments + financial debt).CBA: Annual Central Balance Sheet Database. CBT: Quarterly Central Balance-Sheet Database. In the case of the CBT the ratios refer to the first half of each year and the year as a whole. The ratios are calculated by applying rates of changes calculated on the basis of common companies for two consecutive years to the last available amount. Starting (and including) 2006 the CBA ratio is calculated using the data in the Simplified Corporate Information.

insolvency actions/decisions in the period from January to August 2010, after having grown by around 36 per cent in 2009 as a whole.

In the near future, less homogeneous evolution in terms of the activity of non-financial corporations is expected, even if the adjustment trajectory of the respective net borrowing is maintained

Budget measures to contain expenditure will tend to restrict domestic demand, thus, it is expected that companies more focused on the domestic market will retract. On the contrary, as foreign demand melds with the recovery of the global economy, companies with a major part of their activity geared to foreign markets will witness an increase in activity. Based on quarterly information supplied by Banco de Portugal's Central Balance Sheet Database, in respect of a sample in which exporting companies account for a relatively higher proportion than for the total sector, it has been noted that profitability levels are, in general, higher for companies with sales to foreign markets.

The reduction of non-financial corporations' net borrowing has been accompanied by a significant drop in transactions on financial liabilities, translating into a stabilisation of debt at a high level

Particular reference should be made to the net flow of loans taken out by non-financial corporations, as in 2004, albeit much lower than recorded since then (Chart 3.14). A slight slowdown in lending to this sector by resident financial institutions was noted in the first half of 2010 following a marked deceleration in 2009. Simultaneously, other loans granted to non financial corporations recorded a net repayment. In the first half of 2010, special reference should be made to loans granted by shareholders, with an amount of net repayments higher than that in the first half of the preceding year. On the contrary, the important flow of loans from abroad reflected higher demand for funds from non-residents by companies owing to internal credit restrictions. Financing through medium term

debt securities was also significantly down over 2009. On the contrary, net issues of short term securities remained at levels close to those recorded in the preceding year. Reference should be made to purchases of non-financial corporations' debt securities by non-residents which also contributed to mitigate supply constraints on internal funding (see "Section 4.5 - Credit Risk", of this Report).

According to the replies from Portuguese banks in the Bank Lending Survey, demand for loans and credit lines from non-financial corporations in the first three quarters of 2010 remained practically unchanged from the preceding year. At that time there was a slight but steady reduction. As then, demand for credit in 2010 has been essentially based on the liquidity difficulties of several nonfinancial corporations. Debt restructuring and the need to finance inventories and working capital continued to be the main factors indicated by the banks participating in the survey as contributing towards an increase in demand for loans from companies. Also as has been the case since the end of 2007, the financing of investment and of mergers/acquisitions and corporate restructuring contributed towards a reduction in this demand.

In a context in which an important contribution to activity's acceleration in the first half of the year came from exporting companies, reference should be made to the fact that, according to information available from Banco de Portugal's Central Balance Sheet Quarterly Database, the differential between the average collections and payments periods in the case of foreign transactions is longer than for the sector in general (Chart 3.15). As corporate activity expands, restrictions on the amount of credit to such companies from the major Portuguese banks may restrict their growth rate, by conditioning the satisfaction of the borrowing required to pursue their current activity. However, this effect could be mitigated by credit supply from foreign and non-resident banks.

There were no significant change in the debt costs of non-financial corporations in the first Chart 3.14



Chart 3.15



Sources: INE and Banco de Portugal.

Notes: Consolidated figures. (a) Including insurance technical reserves and other accounts payable

Source: Banco de Portugal

Notes: Indicators based on the same corporations of the quarterly Balance Sheet Database. Data relative to December each year. Days in receivables = (total trade credits and advances granted / turnover) x num-ber of days in period. Days in accounts payable = (total trade credits and advances received) / (purchases of goods for resale, raw materials, secondary and consumables + supplies and external services) x number of days in period. The indicators are calculated by applying rates of change calculated on the basis of common companies for two consecutive years to the last available figure

half of 2010, notwithstanding the increase in bank loan spreads in 2009 and the increase in sovereign risk premium in 2010

According to available information, the average interest rate on the outstanding loans to non-financial corporations remained steady over the course of the first half of 2010, practically unchanged in comparison to the end of the preceding year and lower than the value one year before. Also according to Banco de Portugal's Balance Sheet Quarterly Database, the debt cost of companies in the sample have continued to move downwards since 2008, reflecting the low level of money market rates. This path is confirmed by the available estimates on interest rates payable by the sector in aggregate terms (Chart 3.16). The recent increases in Portuguese government debt spreads, associated with the sovereign debt crisis, had a lagged and still limited effect on debt costs of the private non-financial sector. Information available up to the third quarter does not evidence significant transmission to the banks rates on loans to non-financial corporations. The materialisation of this transmission should occur in the near future. This fact brings an important element of pressure to bear on corporate costs in penalising profitability rates. The effect is all the more important to the extent that the level of indebtedness of Portuguese companies, in aggregate terms, is one of the highest in the euro area (Chart 3.17). At the end of the first half of 2010, the sector's financial debt practically stabilised at around 140 per cent of GDP³ (Chart 3.18).

Higher borrowing costs will tend to restrain the dynamism of economic activity, as it will be the companies which could make the largest contribution to the recovery which may be the most affected. The need to increase production to fulfil the expansion of order books from abroad may imply rising borrowing requirements from those companies which continue to be viable. These needs, if met by the domestic banks, will be at a significantly higher cost than in the recent past. This effect will,

Chart 3.16



Source: Banco de Portugal.

Notes: Debt cost = Interest paid / financial debt. CBA: Annual Balance She et Database. CBT: Quarterly Balance Sheet Database. In the case of the CBT the ratios refer to the first half of each year and the year as a whole. The ratios are calculated by applying rates of change, calculated on the basis of common companies for two consecutive years, to the last available amount. Starting (and including) 2006 the CBA ratio is calculated using the data in the Simplified Corporate Information. (a) Interest payable by non-financial corporations as a percentage of the sector's gross operating surplus, adjusted for the total amount of financial intermediation services indirectly measured (FISIM); the part of FISIM comprising interest (uses) is included in interest payable. Chart 3.17



Source: Eurostat. Note: Consolidated figures, excluding Ireland and United Kingdom.

(3) This concept of financial debt includes the issue of loans and debt securities in the portfolio of the other institutional sectors.



Chart 3.18



Notes: Consolidated figures. (a) Total debt comprises financial debt plus trade credits and advances received from other sectors. (b) Financial debt includes loans from resident and non-resident credit institutions; loans/partners' loans from other sectors, namely non-resident companies belonging to the same economic group; commercial paper and bonds issued by non-financial corporations held by other sectors.

however, tend to be mitigated if the financing is provided by foreign entities, which have lower funding costs. In turn, in a framework of export expansion and wage moderation, further own funds may be generated. Moreover, some firms may benefit from their international activity in emerging market economies, even in such sectors as construction and services. Lastly, more restrictive conditions in domestic banks' access to the wholesale debt markets will increase difficulties in the debt restructuring processes of some non-financial corporations, which may be reflected in higher default rates and the maintenance of a significant number of bankruptcies.

4. BANKING SYSTEM¹

4.1. Activity and Profitability

Significant differentiation between sovereign risk premiums in several euro area economies has been noted since the end of 2009. This situation has particularly affected countries combining substantial and unexpected increases in the deficit and public debt with a set of structural fragilities, in particular as regards the degree of external indebtedness, the trend growth of the economy, such as in the case of Portugal, or the robustness of the banking system. The increase in sovereign risk in Portugal over the course of 2010 – with several periods of particularly marked risk differentiation – brings about profound implications regarding the Portuguese banking system's financing capacity and conditions. In fact, the deterioration of the assessment made by international investors as to the general government solvency conditions has led to much tighter access to international wholesale debt markets by the Portuguese banking system – in terms of prices and quantities.

In this context, reference should be made to the unconventional monetary policy measures implemented by the ECB which were essential for ensuring access to financing by the Portuguese banking system instead of financing from the international wholesale debt markets. The banking system therefore continued to ensure the growth of credit to households and non-financial corporations over the course of 2010. In addition the financing of the public sector this year was also, to a large extent, sustained by the resident banking system, as well as by purchases under the Eurosystem's Securities Markets Programme.

Expansion of banking system activity was essentially sustained by the increase in the available for sale financial assets portfolio and credit to customers

In June 2010, activity in the Portuguese banking system, assessed by total assets, on a consolidated basis, recorded a 4.3 per cent rate of change as compared to the end of the previous year (8.5 per cent in year-on-year terms; Table 4.1.1). This evolution essentially reflected the increases in the available for sale financial assets and credit to customers portfolios (Chart 4.1.1). In the first case, reference should be made to the purchase of public debt securities.² In the second case, it should be pointed out the importance of loans to central government and, to a lesser extent, non-financial corporations for the bank assets growth in the second quarter of 2010.³ However, this evolution failed to persist during the course of the third quarter, as, according to the most recent information supplied by the Monetary and Financial Statistics, the net flows of loans from the resident banking

- (2) The securities and financial investments portfolio is analysed in detail in "Section 4.3 Market Risk", of this Report. It should be remembered that public debt securities are eligible as collateral for ECB liquidity injection operations.
- (3) For a detailed analysis see "Section 3.2 Monetary and financial conditions of the Portuguese economy"; Banco de Portugal, Economic Bulletin--Autumn 2010.

⁽¹⁾ In the analysis made in this chapter, the aggregate defined as the Portuguese banking system refers to credit institutions and financial corporations operating in Portugal under the supervision of Banco de Portugal, except for the institutions headquartered in the Madeira offshore zone. Financial groups are therefore considered, on a consolidated basis, if they include at least one credit institutions or an investment companies, on an individual basis, if they are not subject to consolidation in Portugal (including the branches of credit institutions or investment companies). The analysis of these institutions is important to the extent that they are subject to the new Capital Adequacy Directive, and are considered to be the benchmark universe in most European countries. It is not possible to provide data prior to 2007 for the aggregate under consideration as the adopting of the International Accounting Standards (IAS) was not transversal to all institutions. In particular, up to 2004 the collection of institutions referred to banks and savings banks, with the exception of banks headquartered or operating exclusively in the Madeira offshore zone and/or operating mainly with non-residents. The branches of credit institutions headquartered in another European Union Member State - excluding those not classified as financial monetary institutions - as well as the branches of credit institutions prediced as banks. From December 2004 to 2009, two groups of institutions were considered. A first, for the period December 2004 to December 2007, comprising thirteen banking groups using the IAS or AAS (adjusted accounting standards) for the production of the institutions of the institutions of the institutions of the institutions of the changes. To facilitate the reading of this chapter, whenever necessary, the charts and tables have a straight line to indicate a break in the series.

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		EUR r	nillions		Structure of t	(as a per otal asset	centage s)	Year-or chanç	ı-year rate je (per ce	ss of nt)	Ha rates (p	llf yearly of chan er cent)	ge	Quart rato of cha	erly ss inge ent)
	2008	5	600	2010	20(6	2010	200	6	2010	200	6	2010	20.	0
	Dec.	Jun.	Dec.	Jun.	Jun.	Dec.	Jun.	Jun.	Dec.	Jun.	£	H2	£	ø	Q2
Cash and claims on central banks	9 920	9 452	10 889	9 134	1.9	2.1	1.7	19.4	9.8	-3.4	-4.7	15.2	-16.1	-6.3	-10.4
Claims on other credit institutions	4 666	4 921	4 918	5 126	1.0	1.0	1.0	17.0	5.4	4.2	5.5	-0.1	4.2	-10.9	17.0
Investments in credit institutions	29 756	37 312	38 356	32 725	7.6	7.5	6.1	-2.5	28.9	-12.3	25.4	2.8	-14.7	-2.1	-12.9
<i>of which:</i> in central banks	802	8 393	4 377	1 940	1.7	0.9	0.4	1 900.7	446.0	-76.9	946.9	-47.8	-55.7	-30.0	-36.7
Financial assets at fair value through profit or loss	21040	21 074	20 805	22 583	4.3	4.1	4.2	-14.6	-1.1	7.2	0.2	-1.3	8.5	12.3	-3.3
Equity	1 145	1731	2 052	1 958	0.4	0.4	0.4	22.7	79.2	13.1	51.2	18.6	-4.6	2.0	-6.5
Debt instruments	9 015	9 283	9 772	9 637	1.9	1.9	1.8	-31.4	8.4	3.8	3.0	5.3	-1.4	10.4	-10.6
Other	10 881	10 060	8 982	10 988	2.1	1.8	2.1	3.4	-17.5	9.2	-7.5	-10.7	22.3	16.7	4.8
Available for sale financial assets	27 034	31 390	43 131	49 941	6.4	8.4	9.4	12.2	59.5	59.1	16.1	37.4	15.8	14.1	1.4
Equity	5 669	6 355	7 517	6 693	1.3	1.5	1.3	0.3	32.6	5.3	12.1	18.3	-11.0	4.2	-14.5
Debt instruments	19 534	23 181	33 282	41 555	4.7	6.5	7.8	16.9	70.4	79.3	18.7	43.6	24.9	17.6	6.1
Other	1831	1853	2 331	1 694	0.4	0.5	0.3	2.1	27.3	-8.6	1.2	25.8	-27.3	-3.4	-24.8
Investments held to maturity	5 0 0 9	6 052	7 641	12 973	1.2	1.5	2.4	163.6	52.5	114.3	20.8	26.2	69.8	9.6	54.9
Hedge derivatives	2 304	1 810	1 742	2 052	0.4	0.3	0.4	13.2	-24.4	13.4	-21.5	-3.8	17.8	8.5	8.6
Investment in subsidiaries	2 766	2 877	3 348	3 231	0.6	0.7	0.6	-12.6	21.0	12.3	4.0	16.4	-3.5	5.4	-8.4
Net credit to customers	321 444	318 398	319 369	331 341	64.9	62.5	62.2	3.1	-0.6	4.1	-0.9	0.3	3.7	0.1	3.6
Gross credit	330 986	329 352	331 386	344 203	67.2	64.9	64.7	4.2	0.1	4.5	-0.5	0.6	3.9	0.2	3.7
of which: overdue credit to customers	7 144	10 041	10 917	12 869	2.0	2.1	2.4	61.6	52.8	28.2	40.6	8.7	17.9	7.8	9.3
Impairment and value adjustments in credit to customers	-9 542	-10 954	-12 017	-12 862	-2.2	-2.4	-2.4	50.3	25.9	17.4	14.8	9.7	7.0	1.7	5.2
Securitised non-derecognised assets	28 260	32 893	34 063	34 444	6.7	6.7	6.5	42.9	20.5	4.7	16.4	3.6	1.1	5.0	-3.7
of which: credit to customers	27 769	32 362	33 547	34 016	9.9	6.6	6.4	40.6	20.8	5.1	16.5	3.7	1.4	4.6	-3.1
Tangible and intangible assets	5 914	5 909	5 930	6 042	1.2	1.2	1.1	5.9	0.3	2.3	-0.1	0.4	1.9	1.3	0.6
Other assets	18 769	18 348	20 396	22 768	3.7	4.0	4.3	14.3	8.7	24.1	-2.2	11.2	11.6	9.9	4.7
Total assets	476 883	490 437	510 587	532 360	100.0	100.0	100.0	5.8	7.1	8.5	2.8	4.1	4.3	2.2	2.0

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	2008	5(60(2010	20(60	2010	200	6	2010	200	6	2010	20	0
	Dec.	Jun.	Dec.	Jun.	Jun.	Dec.	Jun.	Jun.	Dec.	Jun.	Ħ	H2	Ħ	a1	Q2
Resources from central banks	14 407	13 076	19 419	45 962	2.7	3.8	8.6	89.6	34.8	251.5	-9.2	48.5	136.7	6.9	121.5
Resources from other credit institutions	74 303	73 009	74 316	79 026	14.9	14.6	14.8	-2.3	0.0	8.2	-1.7	1.8	6.3	9.9	-0.2
Resources from customers and other loans	217 870	217 232	218 478	219 351	44.3	42.8	41.2	6.9	0.3	1.0	-0.3	0.6	0.4	9.0-	1.0
Liabilities represented by securities	94 219	108 696	116 807	106 129	22.2	22.9	19.9	3.1	24.0	-2.4	15.4	7.5	-9.1	3.0	-11.8
Subordinated liabilities	11 842	12 098	11 463	10 606	2.5	2.2	2.0	5.6	-3.2	-12.3	2.2	-5.2	-7.5	-3.3	-4.3
Financial liabilities held for trading	17 152	17 494	14 867	14 416	3.6	2.9	2.7	45.1	-13.3	-17.6	2.0	-15.0	-3.0	8.9	-10.9
Hedge derivatives	2 493	1 488	1 461	2 048	0.3	0.3	0.4	-38.8	-41.4	37.6	-40.3	-1.8	40.1	14.9	22.0
Liabilities for non-derecognised assets in securitisation operations	4 076	3 817	6 971	6 307	0.8	1.4	1.2	-15.2	71.0	65.2	-6.3	82.6	-9.5	-3.6	-6.1
Other liabilities	14 199	14 421	15 040	16 445	2.9	2.9	3.1	-1.0	5.9	14.0	1.6	4.3	9.3	6.3	2.8
Total liabilities	450 560	461 331	478 822	500 289	94.1	93.8	94.0	6.0	6.3	8.4	2.4	3.8	4.5	2.1	2.3
Capital	26 322	29 106	31 765	32 072	5.9	6.2	6.0	2.5	20.7	10.2	10.6	9.1	1.0	2.8	-1.8
Total liabilities and capital	476 883	490 437	510 587	532 360	100.0	100.0	100.0	5.8	7.1	8.5	2.8	4.1	4.3	2.2	2.0
Memo															
Credit to customers including non-derecognised securitisation operations	358 755	361 714	364 933	378 219	73.8	71.5	71.0	6.7	1.7	4.6	0.8	0.9	3.6	0.6	3.0
Credit to customers not represented by securities including non-derecognised securitisation operations	342 400	345 584	348 408	360 524	70.5	68.2	67.7	4.7	1.8	4.3	0.9	0.8	3.5	0.6	2.9
Resources from customers (including securities issued by the banks and placed with customers)	241 087	245 089	247 073	242 226	50.0	48.4	45.5	8.6	2.5	-1.2	1.7	0.8	-2.0	-1.9	-0.1
Comment Down of Dorth and															



Source: Banco de Portugal.

Notes: The break in the series in 2007 comprises an increase in the number of institutions under analysis. Securities, derivatives and investments include financial assets at fair value through profit or loss, available for sale financial assets, investments held to maturity, investments in subsidiaries and hedge derivatives. Net credit to customers - adjusted for securities operations excludes the other credits and amounts receivable (securities) component, classified in the credit portfolio. (a) In comparison to the same period last year.

system both to general government and non-financial corporations were negative in the said period.

According to Monetary and Financial Statistics data, reference should also be made to the fact that after the significant deceleration noted in loans to the non-financial private sector between the first half of 2008 and the end of 2009, the corresponding annual rate of change remained relatively stable over the first nine months of 2010. Reference should, however, be made to different situations according to the segment. Growth of credit was particularly sustained by loans to households, which recorded a slight acceleration over the course of 2010. This acceleration resulted from the greater dynamism in loans for housing purchases, as the annual rate of change in loans for consumption and other purposes remained stable in this period. In turn, loans to non-financial corporations continued to decelerate in 2010, after the marked slowdown noted in the preceding year, notwithstanding having evidenced a certain recovery starting in the second quarter of the year.⁴

Notwithstanding, the deceleration noted in bank loans to the non-financial private sector in Portugal was less significant than that seen in the euro area as a whole. It should be noted, in particular, that the non-financial corporations segment in the euro area recorded negative rates of change since September 2009.

Bank financing strongly dependent on resources obtained from the Eurosystem

In the first half of 2010, and particularly in the second quarter of the year, the expansion of Portuguese banking activity was essentially guaranteed by Portuguese banks' recourse to the ECB's monetary policy operations at fixed interest rates and with full satisfaction of demand. Due to the restrictive financing conditions encountered by banks in the international wholesale debt markets, there was a significant decrease of debt securities in the second quarter of the year which more than offset the increase noted in the first quarter.⁵ In this context, between April and June, Portuguese

⁽⁴⁾ For a detailed analysis of the evolution of the credit portfolio and respective quality see "Section 4.5 Credit Risk", of this Report.

⁽⁵⁾ A detailed analysis of the financing of the banking system during the course of 2010, in addition to its respective liquidity position is provided in "Section.4.4 Liquidity Risk", of this Report.

banks significantly reduced their investments with other credit institutions, albeit with a significant increase of financing to their branches abroad. The latter case involves intra-group banking operations and therefore is not visible in the accounts on a consolidated basis.⁶

The reduction noted in the first quarter of the year was followed by a certain recovery in customer resources in the form of deposits in the second quarter of 2010. In the third quarter, deposits recorded a new increase, essentially reflecting funds taken from non-financial corporations.⁷ According to information from the Monetary and Financial Statistics available up to September, interest rates on new deposit operations recorded a certain increase from the end of the first half of 2010. Accordingly banks will have begun to draw up strategies for taking in customer resources, in a context of deteriorating access conditions to wholesale debt markets. These strategies are particularly relevant owing to the temporary nature of the Eurosystem's unconventional monetary policy measures and their already heavy reliance on resources obtained from the ECB.⁸

The domestic banking system's international exposure remains concentrated in developed countries and in the non-financial private sector

At the end of the first half of 2010, the value of Portuguese banking groups' foreign assets, on a consolidated basis, was up 4.8 per cent over December 2009 (9.1 per cent over June 2009), representing around 30 per cent of domestic institutions' assets (Table 4.1.2).⁹ As noted in the second half of 2009 there was a growth of investments in the public sector, although such investments' proportion of total international assets remained relatively contained (5.5 per cent at the end of the year). As regards geographical counterparty, exposure to developed countries predominates, particularly euro area countries. The information obtained from the European stress test exercise, announced in July 2010, indicates that the sovereign debt of European Union countries, including debt securities and other credit, in the portfolios of the four major Portuguese banks is dominated by Portuguese debt.¹⁰ Reference should, lastly be made to the fact that, notwithstanding the increase in sovereign debt securities – Portuguese and foreign – in bank portfolios, Portuguese banks are less exposed to these securities than other euro area financial systems.

Profitability of the Portuguese banking system remains positive and at low levels

In the first half of 2010, income before tax and minority interests in the banking system, on a consolidated basis, was down 2.4 per cent, in comparison to the first half of 2009 (Table 4.1.3). This evolution was reflected in a decrease both in return on assets (ROA) and return on equity (ROE) in comparison to the same period of the preceding year, with the respective indicators at the end of the first half-year being 0.54 and 8.6 per cent (excluding the values relative to BPN bank, these indicators were 0.62 and 9.0 per cent, respectively).¹¹ Profitability indicators in comparison to the second half of 2009 were slightly up, essentially reflecting the positive contributions associated with provisions and impairment losses, in addition to the containment of operating costs (Chart 4.1.2).

(10) The evolution of investments in public debt securities is analysed in detail in "Section 4.3 Market Risk", of this Report

⁽⁶⁾ For a detailed analysis see "Section 3.2 Monetary and financial conditions of the Portuguese economy", Banco de Portugal, Economic Bulletin, Autumn - 2010.

⁽⁷⁾ A major operation involving the sale of assets abroad, in September, contributed to the increase in the deposits of non-financial corporations.

⁽⁸⁾ The temporary nature of the Eurosystem's monetary policy measures and its considerable proportion in the assets of Portuguese banks were behind Banco de Portugal's actions to incentivise resource to alternative financing sources. For a detailed analysis see "Section 4.4 Liquidity Risk", of this Report.

⁽⁹⁾ The analysis of international exposure is made in accordance with Bank for International Settlements methodological guidelines for reporting and publicising "Consolidated banking statistics". This analysis only considers the subgroup of domestic institutions on a consolidated basis, as nondomestic institutions are included in the consolidation perimeter of the banking systems of the countries in which their head offices are located.

⁽¹¹⁾ It should be noted that BPP was liquidated in April 2010, after which it ceased to be included in the universe of banking institutions.

Table 4.1.2

CONSOLIDATED FOREIGN CLAIMS OF THE DOMESTIC BANKING SYSTEM FROM THE PERSPECTIVE OF IMMEDIATE RISK - STRUCTURE

Per cent				
	Dec-2008	Jun-2009	Dec-2009	Jun-2010
Total (10 ⁶ €)	108 913	113 005	117 727	123 330
As a percentage of total assets	28.9	29.0	29.3	29.8
International claims	71.7	72.1	71.2	71.0
Maturity				
Up to 1 year	23.6	21.8	19.0	19.1
From 1 up to 2 years	4.6	4.1	4.7	4.9
More than 2 years	36.5	38.7	39.1	40.6
Other	7.1	7.5	8.4	6.3
Institutional Borrower				
Banks	21.8	20.1	18.3	16.6
Public sector	2.2	2.8	4.5	5.5
Non-banking private sector	47.0	48.9	48.1	48.3
Other	0.7	0.3	0.2	0.6
Geographical Borrower				
Developed countries	49.6	53.3	51.6	48.3
Offshore centres	7.4	6.1	5.8	6.6
Developing countries in Europe	6.2	5.3	5.2	5.4
Other	8.5	7.4	8.5	10.7
Local assets in local currency	28.3	27.9	28.8	29.0
Geographical Borrower				
Developed countries	20.5	20.3	20.0	20.1
Offshore centres	0.4	0.4	0.5	0.5
Developing countries in Europe	4.7	4.3	5.1	4.7
Other	2.8	2.9	3.1	3.7
Memo:				
Local liabilities in local currency (10 ⁶ €)	21 472	23 007	24 819	23 105

Source: Banco de Portugal.

In fact, in the first half of 2010, the empirical distribution curves for returns on assets and equity moved to the left in comparison to the same period 2009, indicating an across-the-board decrease in the profitability of banking groups. In turn, they moved slightly to the right in comparison to the second half of the preceding year (Charts 4.1.3 and 4.1.4).

The highly negative impact of net interest income – as the main component part of the results of institutions – was very much in evidence in the decrease in returns on assets in comparison to the first half of 2009. The impact was mitigated by the positive contributions associated with provisions and impairment losses, in addition to the containment of employee costs. In the first half of 2010, provisions and impairment losses were down 15.5 per cent over the same period of the preceding year, translating into a positive contribution of 18 basis points to the increase in the return on assets (with the part regarding credit to customers contributing with 12 basis points).¹² Contributory factors to this decrease were the reduction of the annual flow of new overdue credit and non-performing loans from the non-financial private sector after peaking in October 2009, thus interrupting the trend towards an increase beginning at the end of 2007.¹³ The remaining results components had, in relative terms, a reduced impact on the evolution of profitability (Chart 4.1.5). In turn, to the increase in return on assets over the second half of 2009, particular reference should be made to the positive contributions associated with other provisions and impairment losses, as well as to the containment

⁽¹²⁾ For an analysis of the contribution of impairment associated with securities and financial instruments portfolio to return on assets see "Section 4.3 Market Risk", of this Report.

⁽¹³⁾ For a detailed analysis of the evolution of default in the private non-financial sector see "Section 4.5 Credit Risk", of this Report.

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PROFIT AND LOSS ACCOUNT OF THE BANKING SYSTEN

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		EUR	nillion		Stru	cture (as	a percenta assets) ^(a)	ge	Year-o	on-year ra (per c	te of char ent)	ge
		2009		2010		2009		2010		2009		2010
	H	H2	Year	£	£	H2	Year	E	£	H2	Year	포
1.Interest income	12 952	10 073	23 024	10 056	5.39	4.04	4.70	3.86	-14.8	-39.8	-27.9	-22.4
2.Interest expenses	8 658	6459	15 117	6 262	3.60	2.59	3.09	2.40	-20.5	-47.0	-34.5	-27.7
3.Net interest income (1-2)	4 294	3 614	7 908	3 794	1.79	1.45	1.62	1.45	-0.3	-20.7	-10.8	-11.6
4.Income from capital instruments	183	40	222	211	0.08	0.02	0.05	0.08	-17.1	-36.5	-21.4	15.6
5. Income (net) from services and commissions	1 650	1 780	3 4 30	1 875	0.69	0.71	0.70	0.72	0.8	4.2	2.5	13.7
6.Income from financial assets and liabilities at fair value through profit or loss	371	155	526	221	0.15	0.06	0.11	0.08	'	-35.6	ı	-40.2
7. Income from available for sale financial assets	73	321	394	242	0.03	0.13	0.08	0.09	-82.1	145.7	-26.5	232.7
8. Income from foreign exchange revaluation	83	185	269	128	0.03	0.07	0.05	0.05	4.5	101.0	56.2	53.2
9. Income from the sale of other financial assets	192	314	506	121	0.08	0.13	0.10	0.05	466.6	78.5	141.4	-37.0
10.Other operating profit and loss	276	130	406	162	0.11	0.05	0.08	0.06	-23.9	-57.4	-39.2	-41.3
11.Gross income (3+4+5+6+7+8+9+10)	7 121	6 5 3 9	13 660	6755	2.96	2.63	2.79	2.59	4.2	-10.1	-3.2	-5.1
12.Staff costs	2 098	2 120	4 218	2 103	0.87	0.85	0.86	0.81	1.7	-0.3	0.7	0.2
13. General administrative costs	1 354	1 535	2 889	1 419	0.56	0.62	0.59	0.54	-5.8	-2.5	-4.1	4.8
14. Depreciation and amortisation	320	338	658	334	0.13	0.14	0.13	0.13	6.3	0.0	3.0	4.6
15. Provisions net of refunds and write-offs	139	278	417	27	0.06	0.11	0.09	0.01	290.3	-52.0	-32.2	-80.4
16.Impairment losses and other net value adjustments	1 789	1 732	3 522	1 601	0.74	0.70	0.72	0.61	31.5	-35.9	-13.3	-10.5
17. Negative consolidation differences	0	-28	-28	5	0.00	-0.01	-0.01	00.00	'	ı	ı	ı
18. Appropriation of income from associated companies and joint ventures (equity method)	13	191	204	129	0.01	0.08	0.04	0.05	-73.0	ı	ı	ı
19. Income before tax and minority interests (11-12-13-14-15-16-17+18)	1 435	755	2 190	1 400	09.0	0.30	0.45	0.54	-14.9	•	38.1	-2.4
20.Income tax on profit	297	149	446	166	0.12	0.06	0.09	0.06	-17.7	-42.4	-28.0	-44.1
21.Income before minority interests (19-20)	1 138	606	1 744	1 234	0.47	0.24	0.36	0.47	-14.1	•	80.5	8.4
22. Minority interests	305	340	646	361	0.13	0.14	0.13	0.14	3.8	88.7	36.1	18.1
23.Net icnome (21-22)	833	266	1 098	873	0.35	0.11	0.22	0.33	-19.2		123.3	4.9
Memo:												
Income from financial operations and associated impairment	629	776	1405	599	0.26	0.32	0.29	0.23	'			'
Provisions and impairment associated with credit to customers	1 551	1 368	2 918	1 371	0.65	0.56	0.60	0.53	69.7	-19.2	12.0	-11.6
Source: Banco de Portugal. Note: (a) Haif year data have been annualised.												

Chart 4.1.2



Source: Banco de Portugal.

Notes: The break in the series in 2004 corresponds to the implementation of the International Accounting Standards, which also implied a redefinition of the group of banking institutions under analysis. The half year data have been annualised.



Chart 4.1.4



Source: Banco de Portugal.

Note: Empirical distribution obtained by the use of a gaussian kernel in which institutions are weighted by assets; indicator calculated by income before taxes and minority interests.

Source: Banco de Portugal.

Note: Empirical distribution obtained by the use of a gaussian kernel in which institutions are weighted by assets; indicator calculated by income before taxes and minority interests.

of operating costs (Chart 4.1.5). On the contrary, *i.e.* making a negative contribution to the change in profitability, results associated with financial operations should be noted. This evolution essentially reflected the losses recognised on shares classified in the assets at fair value through profit or loss portfolio, in line with the unfavourable evolution of stock markets.¹⁴

(14) For a detailed analysis of the evolution of the assets at fair value through profit or loss portfolio see "Section 4.3 Market Risk", of this Report.



Chart 4.1.5

Note: Return on assets calculated on income before tax and minority interests.

Net interest income was sharply down in comparison to the first half of 2009 as a consequence of the fall in interest rates in operations with customers, but stabilised in comparison to the second half of the year

In the first half of 2010, owing to its relevance to financial institutions' results (60 per cent of net operating income), particular reference should be made to the reduction of around 12 per cent in net interest income in comparison to the same period of the preceding year, which translated into a highly negative contribution of close to 33 basis points in the evolution of return on assets. Reference should, however, be made to the fact that in comparison to the second half of 2009 net interest income's contribution to the change in the return on assets was virtually nil. As in the preceding year, the interest rate effect was the main factor underlying the evolution of net interest income. The total implicit interest rate spread in the principal lending and borrowing operations balance was significantly down in the first half of 2010 in comparison to the same period 2009, displaying a certain stability in comparison to the second half of the preceding year (Table 4.1.4). In a breakdown of net interest income by type of operation, the evolution noted in comparison to the same period particularly reflected the reduction of the margin in operations with customers, partially offset by the change in margin associated with money market operations and financial instruments (Chart 4.1.6). Lastly, reference should be made to the fact that net interest income attained minimum levels in historical terms, notably lower than in the context of the recessionary period of 2003.

The evolution of the spread between lending and borrowing rates with customers is also visible in the behaviour of the spread between the interest rates on loans and customer deposits provided by the Monetary and Financial Statistics. Since the end of 2008, there has been a significant increase

IMPLICIT AVERAGE INTEREST RA	ATES OF	THE MAIN	N BALANC	E SHEET IT	(EMS ^(a)											
Per cent																
	2001	2002	2003	2004	2005	2006	2007	2008	2009	200	7	2005		2006		2010
										H	H2	Ħ	H2	H1	H2	H
Interest bearing assets of which:	5.44	4.24	3.88	3.30	4.22	4.56	5.48	5.93	3.76	5.23	5.72	5.83	6.04	4.41	3.13	3.05
Interbank assets ^(b) Non-interbank assets	4.09	2.79	2.23	1.77	2.69	3.71	4.16	4.31	1.74	3.92	4.39	4.45	4.22	2.27	1.28	1.30
Credit	6.26	4.94	4.60	4.00	4.56	4.86	5.87	6.33	4.16	5.64	6.08	6.17	6.49	4.83	3.49	3.32
Securities	5.05	4.08	3.96	2.94	4.85	4.52	5.60	6.32	4.80	5.33	5.95	6.12	6.63	5.51	4.19	4.60
Interest bearing liabilities of which:	3.59	2.61	2.28	1.87	2.32	2.71	3.49	3.92	2.25	3.23	3.73	3.82	4.02	2.67	1.86	1.70
Interbank liabilities ^(c)	4.42	3.00	2.42	2.02	2.89	3.58	4.39	4.64	2.00	4.13	4.66	4.65	4.64	2.44	1.56	1.27
Non-interbank iabilities																
Deposits	2.81	2.10	1.80	1.45	1.60	1.80	2.46	3.04	2.00	2.26	2.65	2.90	3.17	2.39	1.61	1.38
Securities	4.12	3.17	3.12	2.46	3.03	3.72	4.38	4.79	2.74	4.02	4.73	4.63	4.99	3.16	2.38	2.52
Subordinated liabilities	5.48	4.53	4.30	3.72	4.61	4.82	5.30	5.55	3.99	5.26	5.32	5.56	5.50	4.51	3.50	3.33
Spreads (percentage points):																
Interest bearing assets - interest bearing liabilities	1.86	1.63	1.60	1.43	1.90	1.84	1.99	2.01	1.51	2.00	1.99	2.01	2.01	1.75	1.28	1.34
Credit-deposits	3.45	2.84	2.81	2.56	2.96	3.05	3.41	3.29	2.16	3.39	3.43	3.27	3.32	2.44	1.87	1.94
Source: Banco de Portugal. Notes: The hreak in the series in 2004 corresnon	ds to the imp	lementation c	of the Internat	ional Accountin	a Standards.	which also impli	ed a redefiniti	on of the arou	ID of banking in	stitutions unde	ranalvsis In	turn. the brea	ak in the serie	s in 2007 cor	responds to a	in increase

Notes: The break in the series in 2004 corresponds to the implementation of the international Accounting Standards, which also intripred a reventition to use your or usuations under analysis, (a) implicit average interest rates are calculated as the table between interest flows in the period under consideration and the average stock of the corresponding balance sheet item. (b) includes cash, deposits with Banco de Portugal, claims and investments with credit institutions. (c) Includes resources from central banks and other credit institutions.

Table 4.1.4

in the spreads associated with the rates charged by the banks for their lending operations and a decrease of the spreads *vis-à-vis* interest rates on the money market associated with the interest rates paid on deposits (Chart 4.1.7). These movements were partially justified by the usual time lag noted in the transmission of the changes in these interest rates to those charged by the banks on new operations with customers, in addition to the fact that new operations – in which interest rates are fixed/renegotiated – represent only a fraction of the gross flow of credit and deposits. Evolution over the course of 2010 suggests, however, that the transmission of the changes of interest rates in the money market to bank interest rates will have already finished, with the spreads charged by the banks in their lending operations being markedly higher than at the beginning of the financial crisis, with the opposite being the case for deposits.

The transmission to bank interest rates of the strong disruptions in the sovereign debt markets was so far relatively limited. Notwithstanding the indications given by the banks regarding the increase in bank spreads on new operations, this increase will only been implemented in the case of loans for house purchases, and only starting in August, attaining levels close to those noted at the beginning of 2009. Loans to households for consumption purposes even witnessed a decrease in comparison to 2009 as a whole, partly explained by the non inclusion of the major increases in returns on public debt bonds – generally used as a benchmark for the interest rate charged on loans for consumption with a maturity of more than 5 years – in consumption credit rates. This partially explains the lower values for the banking spread in this segment.¹⁵

However, as regards the risks associated with the refinancing of bank debts – owing to the large amounts involved, the greater short term concentration over the last few years and the still high level of investor risk aversion – in a context of additional competition from states for obtaining resources

Chart 4.1.6



Chart 4.1.7



Source: Banco de Portugal. Note: Half-year data have been annualised.

Source: Banco de Portugal.

Note: The spread on lending operations was calculated as the difference between the interest rates on outstanding amount of loans (supplied by the Monetary and Financial Statistics) and the 6-month moving average of 6-month Euribor, whereas the spread on borrowing operations is the difference between the 6-month moving average of 6-month Euribor and the interest rates on outstanding amounts of deposits. The total spread comprises the difference between the interest rate on loans and deposits. Last observation: September 2010.

(15) For a detailed analysis of the evolution of bank spreads see "Section 4.5 Credit Risk", of this Report.

in the international financial markets, a continued increase in returns from customer resources and a decrease in banking activity are expectable, particularly as regards lending operations, reflecting a decrease in demand and probable increase in restrictions in the supply of credit.¹⁶

Finally, reference should be made to the fact that net interest income's contribution to the change in the profitability of Portuguese banking system was in contrast to that observed for the major European banks. Underlying this difference was the fact that, in these countries, the proportion of variable-rate loans was not as relevant as in Portugal. Therefore, whereas in Portugal, interest rates on lending to customers followed the fall in money market interest rates, this was not the case in the said countries, reflecting to a large extent differences in terms of rate repricing dates. It should also be noted that since the end of the second quarter of 2009, the net interest income of the major European institutions with an expressive level of international activity has been increasing, in line with the increase in the inclination of the yield curve in the said period.

Containment of operating costs partly offset the reduction in net interest income

In the first half of 2010, the evolution of operating costs once again made a positive contribution to the change in return on assets. Costs containment essentially focused on the staff costs component, but was also evident in the administrative costs component. Notwithstanding the containment of operating costs, as gross income was down, there was a slight deterioration of the cost to income ratio over the same period of the preceding year, standing at around 57 per cent.¹⁷ This was a widespread change among banking groups and was reflected in the movement to the right of the empirical distribution of this indicator in comparison to the first half of 2009 (Chart 4.1.8). It should, however, be noted that the cost to income ratio showed an across the board improvement over December of the preceding year.

Chart 4.1.8



30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110

Source: Banco de Portugal

Note: Empirical distribution obtained by the use of a gaussian kernel in which institutions are weighted by total assets; indicator calculated as the ratio between operating costs (defined as the sum of staff costs, administrative costs and depreciation and amortisations) and gross income.

(16) See "Chapter 2. Macroeconomic and financial risks", of this Report.

⁽¹⁷⁾ The cost to income indicator is defined as the ratio between operating costs (comprising the sum of staff costs, administrative costs and depreciation and amortisation) and gross income.

The results of international activity recorded a significant increase in the first half of 2010

As opposed to 2009, foreign operations made an expressive contribution to the Portuguese banking system's results in the first half of 2010. Although the weight of foreign subsidiaries in terms of total assets of the banking system has remained at similar levels to 2009, at around 11 per cent, the results associated with the activity of the subsidiaries of several of the major banking groups abroad recorded a significant increase in the first half of 2010 (20.9 per cent), representing around 34 per cent of total results generated by the financial institutions under analysis (Table 4.1.5). This evolution is in contrast with the 11.2 per cent drop in results generated by domestic activity.

Table 4.1.5

RELEVANCE OF INTERNATIONAL ACTIVITY FOR BANKING SYSTEM INCOME Per cent

	Re of fore	lative wei ign subsi	ght diaries	Intern Year-	ational a on-year r change	ctivity ate of	Don Year-	nestic act on-year r change	ivity ate of
	Jun-09	Dec-09	Jun-10	Jun-09	Dec-09	Jun-10	Jun-09	Dec-09	Jun-10
Net interest income	14.8	15.4	18.5	-11.4	-18.1	10.2	1.9	-9.3	-15.4
Commissions	14.1	14.9	14.6	-12.0	-3.8	17.4	3.2	3.7	13.0
Gross income	14.0	14.5	20.3	-13.8	-21.7	37.6	7.9	0.9	-12.1
Administrative costs	13.7	13.7	14.5	-9.2	-8.5	7.6	0.7	0.3	1.4
of which: staff costs	13.5	13.6	15.0	-10.6	-10.7	11.1	3.9	2.7	-1.5
Impairment	7.5	9.3	12.5	175.7	38.9	48.6	26.2	-16.5	-15.3
Income before tax and minority interests	27.2	33.3	33.7	-33.4	-34.6	20.9	-5.0	209.9	-11.2

Source: Banco de Portugal.

4.2. Own funds adequacy¹

In June 2010, the global Portuguese banking system's own funds adequacy ratio, on a consolidated basis, was 10.1 per cent, while the original own funds adequacy ratio, Tier I, stood at 8.0 per cent. It should, however, be noted, that the banking system's own funds adequacy ratios continued to be negatively affected by the particularly adverse financial situation of the *BPN* (which, together with *BPP*, was intervened by national authorities at the end of December 2008). Excluding the amounts related to *BPN* and *BPP*,² the global own funds adequacy ratio and Tier I were 10.9 and 8.8 per cent, respectively (Chart 4.2.1; Table 4.2.1).

Decrease in total own funds reflected the strong increase in deductions from own funds and the reduction in additional own funds

In the first half of 2010, total own funds were down 4.1 per cent over December 2009 (an increase of 1.7 per cent in year-on-year terms). This decrease essentially reflected the increase in deductions from total own funds observed in one of the major Portuguese banking groups and, to a lesser extent, a reduction of additional own funds by two other groups. The decrease in subordinated liabilities eligible as capital was particularly responsible for the reduction. It should be noted, however, that none of these factors affects the value of original own funds.

In fact, during the course of the first half of 2010, there was an increase in original own funds in comparison to the end of the preceding year. The increase in reserves associated with retained income from previous years, legal reserves, statutory and other non distributed income reserves included in other positive elements contributed, to a large extent, to this evolution as did the increase in minority interests (Chart 4.2.2).



Chart 4.2.1

Source: Banco de Portugal.

Notes: The break in the series in 2004 corresponds to the implementation of the International Accounting Standards, which also implied a redefinition of the group of banking institutions analysed. In turn, the break in the series in 2007 corresponds to the increase in the number of institutions under analysis. Starting 2008, the capital adequacy ratio was determined according to the Basel II criteria for all institutions under analysis, which basically changed the methodology used for the calculation of capital requirements. (a) It should be noted that *BPP* was liquidated in April 2010, after which it ceased to be included in the universe of banking institutions.

The set of financial institutions analysed in this section differs from the preceding section, as the branches of financial groups headquartered in European Union member countries are excluded.

⁽²⁾ It should be noted that BPP was liquidated in April 2010, after which it ceased to be included in the universe of banking institutions.

Table 4.2.1

OWN FUNDS ADEQUACY					
On a consolidated basis - EUK minions	20	08	20	09	2010
	Jun.	Dec.	Jun.	Dec.	Jun.
1 Own funds					
1.1. Total original own funds for solvency purposes	22 436	21 044	23 904	25 596	26 147
1.1.1. Original own funds (gross)	23 310	21 983	25 233	27 023	27 440
1.1.2. Deductions to the original own funds	874	939	1 329	1 427	1 293
1.2. Total additional own funds for solvency purposes	9 799	10 045	9 6 4 6	9 0 4 9	8 385
1.2.1. Additional own funds (gross)	10 649	10 949	10 861	10 352	9 593
1.2.2. Deductions to the additional own funds	850	904	1 215	1 303	1 207
1.3. Deductions to the total own funds	1 020	1 279	1 284	386	1 676
1.4. Total supplementary own funds eligible to cover the market risk	0	0	34	0	0
Total own funds	31 215	29 810	32 300	34 259	32 857
2. Capital requirements					
2.1. Capital requirements for credit risk, counterparty credit risk and free deliveries	22 492	23 001	22 898	23 571	23 452
2.2. Settlement risk	0	0	1	0	0
2.3. Capital requirements for position, foreign exchange and commodities risks	838	648	711	759	855
2.4. Capital requirements for operational risk	1 783	1 820	1 732	1 795	1 765
2.5. Capital requirements - fixed overheads	5	5	5	5	5
2.6. Large exposures - trading book	2	0	0	0	0
2.7. Other and transitional capital requirements	0	0	0	0	0
Total capital requirements	25 121	25 474	25 346	26 130	26 077
3. Ratios (per cent)					
3.1. Own funds/Total requirements	124.3	117.0	127.4	131.1	126.0
3.2. Own funds/(Total requirements x 12.5)	9.9	9.4	10.2	10.5	10.1
3.3. Original own funds/(Total requirements x 12.5)	7.1	6.6	7.5	7.8	8.0
Memo:					
Capital ratios excluding BPN and BPP ^(a)					
Own funds/Total requirements	-	129.4	141.4	145.4	136.6
Own funds/(Total requirements x 12.5)	-	10.4	11.3	11.6	10.9
Original own funds/(Total requirements x 12.5)	-	7.5	8.6	8.9	8.8

Source: Banco de Portugal.

Note: (a) It should be noted that BPP was liquidated in April 2010, after which it ceased to be included in the universe of banking institutions.

Disruptions in the sovereign debt markets did not have marked effects on capital requirements in the first half of 2010

During the course of the first half-year, total capital requirements were slightly down in comparison to the end of 2009 (minus 0.2 per cent). This reduction reflected different evolutions of its components. There was, on the one hand, a decrease in requirements associated with credit risk, counterparty credit risk and free deliveries – representing around 90 per cent of the total requirements –, highly concentrated in one of the major banking groups which reduced its risk weighted exposure to corporations. On the other hand, and partially offsetting this decrease, was the increase in the capital requirements for position, foreign exchange and commodities risks observed in some of the major banking groups, essentially those associated with debt securities, particularly Portuguese public debt.

Slight deterioration in global own funds adequacy ratio

The deterioration of the regulatory capital ratio between December 2009 and June 2010 was observed in general among banking groups and with a slight increase in the dispersion between them,



Chart 4.2.2

as shown in the empirical distribution of the capital adequacy ratio (Chart 4.2.3). In the case of the original own funds adequacy ratio, there was a significant concentration in the interval between 8 and 9 per cent in June 2010 (Chart 4.2.4).

In June 2010 there was a decrease in the ratio between capital and total assets in the balance sheet, in comparison to the end of the preceding year, even with the exclusion of intangible components (*i.e.* Goodwill), thus interrupting the trend towards an increase observed since the end of 2008 (Chart 4.2.5).

Chart 4.2.3



Source: Banco de Portugal.

Note: Empirical distribution using a gaussian kernel that weights institutions by total assets. The ratio was calculated by applying the criteria defined in Basel II by all institutions under analysis. Given the financial situation of the *BPN* and *BPP* banks, these institutions were not included in the distributions.

Chart 4.2.4



Source: Banco de Portugal.

Note: Empirical distribution using a gaussian kernel that weights institutions by total assets. The ratio was calculated by applying the criteria defined in Basel II by all institutions under analysis. Given the financial situation of the *BPN* and *BPP* banks, these institutions were not included in the distributions.

Chart 4.2.5



Source: Banco de Portugal. Note: The break in the series in 2007 corresponds to an increase in the number of institutions under analysis

Transition towards a more demanding medium term regulatory framework

The international financial crisis has exposed several vulnerabilities in financial system regulation on a global level. In this context, the Basel Committee on Banking Supervision has submitted various proposals, notably for the reinforcement of the quality of banks' own funds, introducing countercyclical measures for the regulation of the financial system and mitigating financial system leverage.

The adoption of more demanding regulation, under the scope of the future Capital Requirements Directive therefore represents an additional challenge for the banks on an international level, including Portuguese banks.³ A central element of the new regulatory package consists of the imposition of additional capital buffers in benign periods of the credit cycle, which can be used to absorb eventual losses in stress periods. The Basel Committee has proposed the creation of two distinct buffers: the capital conservation and counter-cyclical buffers.

The main impacts will be on Portuguese banks' regulatory capital base, owing to the changes in the positive own funds elements, in addition to the application of deductions and prudential filters. However, the magnitude of this adjustment may be highly heterogeneous and conditioned by each banking group's point of departure and the relative importance of the above referred to adjustments. There will, in this context, be situations in which the impact of the changes on the positive capital elements and deductions and prudential filters may be highly significant.

Lastly, the inevitable need for public and private sector deleverage, owing to the recessionary effects associated with economic activity, should lead to a growing materialisation of credit and market risk, implying the recognition of more significant losses by the banks. This framework, together with the challenges associated with the adoption of the future Capital Requirements Directive, implies the need to attach greater importance to setting up higher regulatory minimum capital buffers.

⁽³⁾ For more detail on the proposals for the new regulatory framework see "Box 2.1 Main Basel III Proposals", of this Report.

4.3. Market risk

2010 was marked by the crisis in the sovereign debt markets, reflected in the substantial increase in the yields on the public debt of several European countries, notably Portugal. Portuguese banks have consequently been encountering difficulties in access to the international wholesale debt markets, having essentially obtained financing from the ECB. In this context, there has been a significant increase in the Portuguese banks' portfolio of Portuguese public debt securities, notwithstanding the fact that the proportion of sovereign debt securities held in the Portuguese banks' portfolios is lower than that recorded by the monetary financial institutions of other euro area countries. In addition, taking into consideration the fact that most of the debt securities have been posted to the available for sale financial assets and assets held to maturity portfolios, the impact on banks' profitability and solvency is limited to the extent that it would only be effective in situations of sale or impairment. On the other hand, the equity securities in Portuguese bank portfolios are mainly those of Portuguese companies. Accordingly, bank profitability and solvency may be affected by the unfavourable evolution of the stock prices of Portuguese companies, owing to the need for private sector deleverage and the recently approved fiscal consolidation measures which, albeit indispensable, will have negative consequences on economic growth in the near future.

The securities and financial investments portfolio continued to grow significantly, increasing the importance of sovereign debt securities in assets

The Portuguese banking system's securities and financial investments portfolio grew significantly in the first half of 2010, in line with the evolution occurring in the second half of 2009 (Chart 4.3.1).¹ It was the evolution of this portfolio that made the largest contribution to the expansion of the banking system's balance sheet. This evolution was mainly on account of (net) purchases of debt instruments, essentially Portuguese sovereign debt, in a context of some decline of the main stock indices and disruptions in sovereign debt markets.

The portfolio components under analysis with the biggest contribution to growth were the available for sale financial assets and the investments held to maturity (Chart 4.3.2). In the former case, the increase was essentially due to the purchase of debt securities, particularly Portuguese public debt, as referred to above. In turn, the increase in the value of investments held to maturity was related not only with the purchase of securities but also the reclassification of several securities previously classified in other components of the portfolio. This reclassification was possible following the accounting changes brought in as a consequence of the strong disruption in financial markets in the second half of 2008 (see "Box 1. *Main measures taken by the Portuguese authorities regarding the financial system in the context of the international financial crisis*", Banco de Portugal, *Economic Bulletin*, Autumn - 2008).

The proportion of debt securities on the banking system assets kept the growth trend which has been noted since mid 2009, representing more than 12 per cent of banking system assets at the end of the first half of 2010 (around 7 per cent at the end of 2008). A breakdown of these securities shows that most of them comprise sovereign debt securities, equally apportioned between Portuguese and foreign public debt (Chart 4.3.3). During the first half of 2010, as it already happened during the course of 2009, the proportion of Portuguese sovereign debt increased significantly, with the value of foreign public debt held by Portuguese banks having increased on a much smaller scale. It should be noted

⁽¹⁾ The securities and financial investments portfolio comprises financial assets at fair value through profit or loss including trading derivatives (net of financial liabilities held for trading), available for sale financial assets, investments held to maturity, investments in subsidiaries and the net value of hedge derivatives.



that, notwithstanding the significant increase in the proportion of public debt securities in Portuguese banks' portfolios in the second half of 2009, Portuguese banks are less exposed to these securities than the monetary financial institutions of other euro area countries (Chart 4.3.4).

As sovereign debt securities tend to be issued at fixed rates, the banks may be more exposed to interest rate risk if they have not hedged their positions and to the extent that their portfolio positions have long maturity periods. According to information available, more than half of Portuguese public debt held in bank portfolios has a contractual maturity of more than 5 years. Reference should also be made to the fact that interest rate derivatives markets tend to use German public debt yields as a benchmark. This situation comprises exposure to what is referred to as basis risk which results from the fact that the evolution of yields on German public debt is different from the yields on the







public debt securities of other countries, including Portugal, making it more difficult to set up interest rate hedges.

In terms of the distribution of sovereign debt securities within this bank portfolio, around 28 per cent of Portuguese sovereign debt securities held by the banks is classified in assets at fair value through profit or loss, 52 per cent of these securities is classified as available for sale assets and the remainder in the investment held to maturity portfolio (foreign public debt accounts for 18 per cent and 70 per cent of the assets at fair value through profit or loss and available for sale portfolios, respectively). The classification of securities in the different portfolio components is relevant to the assessment of results and regulatory capital. Therefore, although securities classified as assets at fair value through profit or loss and available for sale assets are posted at their market value, the fluctuations in their value have a different impact in terms of results and regulatory capital. Fluctuations in the value of assets at fair value through profit or loss have a direct impact on results and, consequently, on institutions' regulatory capital, whereas fluctuations in the value of assets classified as available for sale only have an impact on results when derecognised from the balance sheet on sale or when impaired. In addition, there is differentiation in the impact of fluctuations in the value of assets in the available for sale component on regulatory capital: equity securities have a full effect on regulatory capital if comprising potential capital losses (Tier I) but only 45 per cent in the case of potential capital gains (Tier II), whereas the changes in the value of debt securities do not affect institutions' regulatory capital. Lastly, changes in the market value of securities classified in the investments held to maturity component do not have any accounting or prudential effect.

Assets in the available for sale and held to maturity components should be tested for impairment, although there is no definition of impairment solely based on quantitative and objective criteria. In general, an asset is considered to be impaired if there is objective proof of impairment as a result of one or more events such as a borrower's significant financial difficulties, breach of contract or if the borrower is likely to open bankruptcy or financial reorganisation proceedings. Accordingly, the recognition of impairment on a sovereign debt security presupposes the probability of a sovereign state's default. In the case of equity securities, a significant or prolonged decline in fair value is added to the above referred to list of events. In Portugal, auditors usually record impairment in equity securities when there is a depreciation in the value of the assets by at least 30 per cent below their acquisition price or in the event of potential capital losses for a period of 9 to 12 months.

Results associated with the securities and financial investments portfolio have made a positive contribution to the return on assets, notwithstanding the unfavourable evolution of stock markets and disruptions in the sovereign debt market

Results associated with the securities and financial investments portfolio in the first half of 2010 were down in comparison to 2009, but continue to make a positive contribution to the return on assets (Chart 4.3.5). The main positive contribution to return on assets derived from changes in the value of debt securities classified in the assets at fair value through profit or loss component. In turn, the unfavourable evolution of stock markets had a negative effect on return on assets through a reduction in the value of equity capital securities classified in the assets at fair value through profit or loss component. Several institutions, however, succeeded in realising capital gains on their sale of equity securities classified in the available for sale assets component. In the first half of 2010, the negative contribution of impairment associated with the securities and financial instruments portfolio to return on assets remained at levels close to those of the same period last year albeit less than in the second half of 2009. It should be stated that the negative contribution of impairment on securities to return on assets reached very significant levels in 2008 following the crisis in the financial markets at the end of that year.





There was a very slight increase in net commissions associated with financial operations in comparison to the first half of 2009, with the main contribution to this evolution having been originated by commissions on the structuring of operations.

As already stated, results generated by available for sale financial assets were positive owing to capital gains realised on asset sales. This was, however, accompanied by a significant loss of value in assets classified in this component, particularly debt securities. The depreciation deriving from debt securities resulted in a reduction of institutions' accounting capital but did not have any impact on their own funds.

Sovereign risk expected to have a limited impact on banks' solvency and profitability ...

Owing to the relevance of sovereign debt securities in bank assets, the turmoil occurring in such markets, resulting in price decreases on several of these assets, may contribute towards the recognition of losses in the banking system. However, as most of the sovereign debt securities are classified in the available for sale or held to maturity components, the impact on results and regulatory capital is limited and will only be reflected in the banks' solvency if the securities are derecognised from the balance sheet in the event of sale, which is not likely to occur as they are eligible for the purpose of obtaining finance from the ECB, or if impairment is registered, which would involve the default of a sovereign state. The information published in July 2010 in the sphere of the European-wide stress test exercise, indicates that the sovereign debt of European Union countries held in the portfolio of the four major Portuguese banks, including debt securities and other credits, mainly derives from euro area countries, particularly Portugal (see Chart 4.3.6 and "Box 4.1. *Main results of the stress test exercises in the European Union for the sample of Portuguese banks*", of this Report).



Chart 4.3.6

... in which the downward risks on economic activity could originate a loss of value in equity portfolios, highly concentrated on shares issued by resident entities

Although the equity portfolio represents less than 2 per cent of banking system assets, it is highly concentrated on shares of Portuguese companies (more than 70 per cent of the equity securities in bank portfolios has been issued by resident entities). In addition, this risk is heightened by the risk of fluctuation in the value of the equity portfolio of bank employees' pension funds. On account of the above, Portuguese banks are therefore exposed to fluctuations of economic activity in Portugal which, over the short term, are expected to be unfavourable owing to the need for deleverage in the Portuguese economy, which could reflect an unfavourable evolution in the stock price of Portuguese firms.

The regulatory changes provided for by Basel III will increase the sensitivity of bank capital to the financial evolution of bank employees' pension funds

One of the changes provided for in the new Basel III regulatory framework is related with the corridor applied to bank employees' defined benefit pension funds. According to national regulation, in the case of institutions which follow the corridor rule provided for in IAS 19, only the part of the accumulated actuarial losses which exceeds the value of the said corridor, which is equal to 10 per cent of the maximum value of assets or liabilities of pension funds, should be deducted from Tier I. It is planned to eliminate the corridor under the new regulatory framework, i.e., deductions from capital should be for the full amount of the accumulated actuarial losses, with this change expected to be applied gradually starting in 2014 and over the course of the following 5 years. The impact of this measure will be significant for several of the major domestic banks to the extent that the value of their fund assets are less than the current value of their liabilities. It should be stated that the magnitude of this impact will be conditioned by the transfer of several liabilities from the bank employees' pension funds to the general social security regime, as provided for in the State Budget proposal for 2011.

4.4. Liquidity risk

There has been a significant deterioration in Portuguese banks' liquidity situation over the course of 2010. Although banks' access difficulties to the international wholesale financing markets were essentially motivated by the knock-on effect of disruptions in sovereign debt markets rather than profitability or solvency problems within the domestic banking system, the liquidity position of the Portuguese banks was considerably affected given the importance of the debt market in its financing structure. In such a context, banks' borrowing requirements were essentially met through the use of Eurosystem fixed-rate tender operations with full allotment. This evolution, although making a positive contribution to banks' profitability, resulted in a more fragile financing structure. Therefore, taking into account the fact that unconventional monetary policy measures are temporary in nature, it is important for the banks to find alternative financing sources, as has been the case over the last few months and which should also be accompanied by the need for balance sheet deleverage. It is therefore fundamental, in order to meet banks' borrowing requirements in the international whole-sale debt markets, that the situation in sovereign debt markets should be normalised, which, in turn, requires a guarantee of the sustainability of public and foreign accounts.

Increase in sovereign risk as one of the main risk factors

The increase in the differentiation of the sovereign risk of the Portuguese Republic in international debt markets has had a major impact on banks' liquidity position, by conditioning their capacity to access the wholesale debt markets. As large scale recourse to ECB financing is not a sustainable alternative to debt placements in the international marketplace, this evolution will also have an effect on other resident economic agents, owing to the banks' adoption of a more restrictive credit policy. The establishing of a credible public and foreign accounts adjustment trajectory is therefore of extreme importance. The measures required for such an adjustment will contract demand for credit, with a positive impact on banks' liquidity situation. Therefore the need for economic deleverage does not derive exclusively from the instability in the financing markets, even though an eventual decrease of the tensions in such markets will enable a less abrupt adjustment trajectory to be achieved.

Significant worsening of Portuguese banks' access conditions to the international wholesale financing markets

The easing of tensions in financial markets, noted since March 2009, has been followed by an increase in the risk premium demanded by investors for their purchase of Portuguese public debt since the end of 2009. This has been particularly marked since the end of April 2010, in the context of the emergence of serious disruptions in the euro area's sovereign debt markets (Chart 4.4.1). This situation translated into a sharp increase in credit default swaps for the Portuguese Republic and the main Portuguese banking groups over the course of 2010 which were clearly higher, in both cases, than those of the European financial sector, translating into serious difficulties in access to the international wholesale financing markets.

As shown in Chart 4.4.2, money market interest rates remained at low levels during the course of 2010, in line with the ECB's official interest rates. Nonetheless, banks have been affected by strong quantitative restrictions in money market access, essentially since the second quarter of the year. In a framework characterised by an increase in differentiation in terms of sovereign risk, April and May 2010 witnessed strong increases in secondary market yields on bonds issued by Portuguese banks with a state guarantee and on the subordinated bonds of Portuguese banks. This evolution was accompanied by quantitative restrictions in access to the wholesale debt markets.

Part I | Financial System Stability

Chart 4.4.1



Sources: Bloomberg and Thomson Reuters. **Note:** Last observation: 15 November 2010.

Chart 4.4.2



Sources: Bloomberg and Banco de Portugal.

Note: The series with yields on bonds issued by Portuguese banks refer to a weighted average of bonds from *BCP*, *BES* and *CGD*. The lack of depth in the market has a strongly restrictive effect on bonds with comparable characteristics within each segment and the rates should therefore be considered merely indicative. Bonds issued with a state guarantee are subject to a commission to be paid to the government of 50 basis points, to which a risk premium for the credit default swap of the bank itself (or similar banks, if there are no CDSs for this issuer) is added if the maturity is longer than one year.

Financing of the Portuguese banking system largely dependent on resources obtained from the Eurosystem

In the first half of 2010 and particularly in the second quarter of the year, the expansion of activity in the Portuguese banking system was essentially financed by the strong increase in the use of Eurosystem liquidity injection operations (Chart 4.4.3). Although this was also accompanied by an increase in net resources from other credit institutions, this evolution was not related with improved access to the money market. Hence, in the case of non-domestic banks, there was a significant increase in resources taken from the head office and branches of the institutions themselves and, in the case of domestic banks, a decrease in resources taken from other credit institutions was ob-



Chart 4.4.3

Notes: The estimates for securities issued by banks but placed with their costumer base are excluded from the item "Debt securities". There is a series break in mid 2007 which corresponds to an enlargement in the number of institutions analysed.

served, although this was offset by the more expressive decrease in cash balances and loans and advances to other credit institutions. On the other hand, given the situation in wholesale financial debt markets, there was a significant decrease in debt securities in the second quarter of the year which more than offset the increase noted in the first quarter. After the first quarter of the year, Portuguese banks have not had access to the issue of debt securities in the markets, for which reason issues since then have been essentially placed with institutions belonging to the banking groups themselves.

In the first quarter of 2010, fixed-income bond issues were significantly higher than those of variable-income bonds (Table 4.4.1). In addition, between the third quarter of 2009 and the first quarter of 2010, there was a decrease in average issue maturity periods (Chart 4.4.4). Reference should also be made, in the context of banks' strategies of obtaining securities to be used as collateral for Eurosystem liquidity injection operations, to the increased importance of covered bonds, whose proportion of the total of bonds issued increased from less than 40 per cent in the last quarter of 2009 to more than 85 per cent in the third quarter of 2010. As regards the banks' securities market financing structure, the first half of 2010 and particularly the third quarter, witnessed a considerable decrease in the stock of certificates of deposit in terms of bank liabilities, leading to a decrease in the proportion of these instruments in total debt securities (Chart 4.4.5). Net bond issues were also negative in the same period, as net redemptions in the second quarter of the year more than offset the positive evolution occurring in the first quarter. Notwithstanding, the proportion of bonds in terms of total debt securities increased in the first half of the year. Access difficulties to the wholesale financing markets translated into a decrease in the outstanding balance on bonds issued by Portuguese banks in the first three quarters of the year (Chart 4.4.6).

Customer resources in the form of deposits continued to be the banks' main source of financing, representing around 41 per cent of assets on a consolidated basis in June 2010, or 46 per cent including debt securities placed with customers. It should be noted, in this regard, that there was a significant decrease in this type of placement of debt securities by banks in the first half of 2010. The decrease in customer resources noted in the first quarter of 2010 was latterly reversed, with deposits and the like by the non-monetary resident sector, in Portugal, having recorded an increase in the second and third quarters of 2010. Owing to the slowdown in deposits made by individuals in

Table 4.4.1

BONDS ISSUED BY PORTUGUESE BANKING GROUPS (GROSS) Structure by rate type (percentage of total)								
	2004	2005	2006	2007	2008	2009	2010 ^(a)	Position on 30 September 2010
Variable-rate Fixed-rate and others	87.8 12.2	98.1 1.9	82.7 17.3	75.9 24.1	49.7 50.3	32.4 67.6	56.4 43.6	56.4 43.6

Sources: Bloomberg, Dealogic Bondware and Thomson Reuters. Note: (a) Includes observations up to 30 September.

Chart 4.4.4



Chart 4.4.5

Bonds

STRUCTURE OF LIABILITIES REPRESENTED BY SECURITIES

On a consolidated basis

Certificates of deposit Other debt securities



Sources: Bloomberg, Dealogic Bondware and Thomson Reuters. Note: Includes issues of branches and subsidiaries of Portuguese banks abroad.

Chart 4.4.6



Sources: Bloomberg, Dealogic Bondware and Thomson Reuters. Note: Includes issues of branches and subsidiaries of Portuguese banks abroad.

the third quarter, the acceleration of deposits in the non-monetary sector noted during the same period essentially reflected the evolution of the deposits of non-financial corporations, other financial intermediaries other than monetary financial institutions (except pension funds) and financial auxiliaries and general government.¹ On the other hand, deposits by non-residents in Portugal have been decreasing since the second quarter. Deposits made in Portugal by the non-monetary resident and non-resident sectors were down in the first half of the year, for which reason the contribution made by international activity, reflected both in growth of assets and in resources taken by the branches of Portuguese banks abroad, was a determining factor in the recovery of customer resources. Yearon-year, the first half of 2010 witnessed a slight acceleration of customer resources in the banking system, on a consolidated basis, in line with the evolution of deposits in Portugal made by resident individuals in the second quarter of the year (Charts 4.4.7 and 4.4.8).

Chart 4.4.7



Source: Banco de Portugal.

Note: (a) Excluding liabilities recorded as a counterpart for non-derecognised securitisation operations, recorded as deposit (and deposit-like instruments) of other financial intermediaries and auxiliaries.

The evolution of customer resources should be analysed in light of developments in the household investments portfolio. In this context, the deterioration in banks' access conditions to the wholesale debt markets, taking into account the temporary nature of the Eurosystem's unconventional monetary policy measures and their already high level of dependence on resources obtained from the ECB, has been fuelling an increase in the importance of customer resources in terms of their financing strategy. Notwithstanding, the year-on-year rate of change in deposits by individuals remained during the course of the year at relatively low levels. In the first half of 2010, this evolution essentially reflected an increase in household investments in life insurance, with higher returns than those obtained on deposits. In this context, taking into account the significant proportion of the capital of insurance companies held by banking groups and the fact that investments in life insurance have longer maturities than on deposits, this evolution may not necessarily represent a negative contribution to the banks' liquidity situation. Contributing favourably to the banks' liquidity position were also relatively high rates of change in term deposits for longer maturities up to September, as an offset to the decrease in term deposits with a maturity of up to one year (Chart 4.4.9).



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Increase in the ratio between credit and customer resources in the first half of 2010, with a slight decrease in the third quarter

Notwithstanding disruptions in the international wholesale financing markets, the increase in credit was higher than the increase in customer resources on a consolidated basis in the first half of 2010, in an inversion of the trend of the recent past, with a similar profile of evolution for the banking system as a whole and for domestic banks (Chart 4.4.10 and 4.4.11). This conclusion is robust in terms of the consideration of different credit aggregates, in addition to the exclusion of securities placed with customers from the concept of customer resources. It should be stated that the increase in the credit to deposits ratio noted in the context of the turbulence in financing markets reflected the fact that the banking system continued to finance the non-monetary resident sector. Reference should be made to the significant increase in loans to central government and to major non-financial corporations.² The third quarter of 2010 witnessed a decrease in the ratio between credit and customer resources, essentially reflecting the increase in customer deposits. The increase in the ratio between credit and customer resources in the first half of 2010 and latter decrease noted in the third quarter were across-the-board to most domestic institutions (Chart 4.4.12). This was, notwithstanding, particularly marked in the case of a banking group in which a significant decrease in debt securities placed with customers in the first half of 2010 was observed, in part offset by the significant increase in deposits noted in the third quarter. The credit to deposits ratio in respect of international activity also recorded an increase in the first half of 2010, although remaining at a significantly lower value than noted in the case of domestic activity. The Portuguese banking system has a relatively high credit to deposits ratio in the context of the euro area (Chart 4.4.13).

⁽²⁾ For further details see "Section 3.2 Monetary and financial conditions of the Portuguese economy", Economic Bulletin- Autumn 2010.


Source: Banco de Portugal.

Notes: (a) The concept of customer resources includes debt securities issued by the banks and placed with their customer base. The break in the series in 2007 comprises an increase in the number of institutions under analysis. (b) Information obtained under the report set by Banco de Portugal Instruction no. 13/2009, which considers a smaller set of institutions.

Chart 4.4.12

RATIO OF CREDIT TO CUSTOMER RESOURCES^(a) – DOMESTIC BANKS Empirical distribution



Source: Banco de Portugal.

Notes: (a) The concept of customer resources includes debt securities issued by the banks and placed with their customer base. Data on a consolidated basis. Information obtained under the report set by Instruction no. 13/2009 of Banco de Portugal. Empirical distribution obtained through recourse to non-parametric methods, namely to a gaussian kernel that weights institutions by their assets.

Chart 4.4.13



Source: ECB (*EU Banking Stability Report - September 2010*). Note: The credit aggregate considered includes interbank loans and securitised and non-derecognised credits.

Against a background of significant difficulties in access to wholesale financing markets, there has been a marked increase in net resources from the Eurosystem

In the context of the significant deterioration in conditions of access to the international debt markets, both in terms of prices and quantities, there was a marked increase in Portuguese banks' recourse to Eurosystem financing in 2010, particularly in the second quarter of the year (Table 4.4.2). These resources enabled the banking system to continue to finance the non-monetary resident sector in a framework of disruptions in international financial markets and limited increases in customer resources. The former resources were additionally used, in part, to finance the foreign branches of Portuguese banks.³ In the first quarter of 2010, net resources of other credit institutions remained relatively stable for domestic institutions. In the case of non-domestic institutions there was, during the same period, an increase in net resources of other credit institutions, essentially on account of the increase in other credit institutions' resources abroad. The evolution noted for resources of other credit institutions in the second quarter of 2010 reflected the added tensions in sovereign debt markets and the effects thereof on Portuguese banks' access to the wholesale debt markets. Hence, in this period, domestic institutions recorded an increase in net resources of other credit institutions, reflecting the decrease of cash balances and other loans and advances in credit institutions abroad which was higher than the decrease noted in the resources of other credit institutions abroad. In the case of non-domestic institutions reference should be made, in the same period, to the significant increase in resources obtained from the head office and branches of the institutions

Table 4.4.2

POSITION OF PORTUGUESE BANKS VIS-À-VIS OTH on a consolidated basis; EUR millions	HER CREDIT IN	STITUTIC	ONS AND) CENTR	AL BANK	S
Banking system	Dec-07	Dec-08	Jun-09	Dec-09	Mar-10	Jun-10
Net resources from Central banks	-6 931	3 686	-4 769	4 153	7 488	34 888
Net resources from other credit institutions	32 670	40 683	39 168	35 419	39 823	43 114
Cash, claims and investments in Central banks	12 662	10 722	17 845	15 266	13 232	11 073
Claims and investment in other credit institutions	39 692	33 620	33 841	38 897	38 892	35 911
in the country	8 539	11 922	10 989	13 191	12 233	12 975
abroad	31 153	21 698	22 852	25 706	26 659	22 937
head office and branches of the institution	3 216	1 033	911	509	1 834	9 422
Resources from central banks	5 731	14 407	13 076	19 419	20 721	45 962
Resources from other credit institutions	72 362	74 303	73 009	74 316	78 715	79 026
in the country	7 672	10 195	7 753	8 554	6 927	7 503
abroad	64 690	64 107	65 256	65 762	71 787	71 522
head office and branches of the institution	12 586	15 630	14 649	13 008	14 056	26 497
Domestic banks	Dec-07	Dec-08	Jun-09	Dec-09	Mar-10	Jun-10
Net resources from Central banks	-8 099	2 367	-6 225	2 240	5 611	30 531
Net resources from other credit institutions	9 753	8 395	8 634	6 048	6 181	8 503
Cash, claims and investments in Central banks	11 601	9 180	16 457	13 440	11 348	9 205
Claims and investment in other credit institutions	26 027	23 446	22 812	23 441	23 195	18 443
in the country	6 112	9 282	8 658	10 850	9 772	9 323
abroad	19 915	14 164	14 154	12 591	13 423	9 120
head office and branches of the institution	1	0	0	0	32	0
Resources from central banks	3 502	11 547	10 232	15 680	16 960	39 736
Resources from other credit institutions	35 780	31 841	31 447	29 489	29 376	26 945
in the country	5 483	7 898	5 582	6 018	4 709	4 754
abroad	30 297	23 943	25 865	23 471	24 667	22 191
head office and branches of the institution	0	0	0	0	5	0

Source: Banco de Portugal.

(3) For further details, see "Section 4.1 Activity and profitability", of this Report.

themselves which more than offset the decrease in the net resources of other credit institutions (other than the headquarters and branches of the institution itself) thus sustaining an increase in the total net resources of other credit institutions. The information available for the third quarter of 2010, which only considers institutions which take in customer deposits, indicates, in the case of domestic institutions, a decrease in the net resources of other credit institutions. This evolution reflected a reduction of resources from other credit institutions abroad, with the opposite having been noted for the non-domestic institutions aggregate.⁴

Decrease in recourse to financing from the Eurosystem in the most recent period, although still remaining high

Owing to the temporary nature of the Eurosystem's unconventional monetary policy measures, major recourse to liquidity injection operations does not constitute a sustainable financing source, having attained a considerable proportion of the financing structure of Portuguese banks (around 7.2 per cent of assets on a consolidated basis in June 2010). This fact was behind a series of actions taken by Banco de Portugal with the said institutions with the aim of incentivising the use of alternative sources of finance. In this context, a decrease in the balance of the monetary policy operations of Portuguese banks has been noted since September, in line with the increase in customer resources, the placement of several securities repos operations in the market and a certain improvement in access conditions to short term wholesale debt markets (Chart 4.4.14). Reference should also be made to the contribution made by a major operation comprising the sale of assets abroad. The resident banking system, notwithstanding, continues to hold a significant proportion of the balance corresponding to the Eurosystem total, which has recorded a reduction in comparison to July (Chart 4.4.15).

Decrease in coverage of interbank liabilities by highly liquid assets in the first half of 2010 and a certain recovery in the third quarter

The decrease in the coverage ratio of interbank liabilities by highly liquid assets in the Portuguese banking system reflected higher interbank liabilities and particularly, resources from central banks, which more than offset the increase in highly liquid assets (Chart 4.4.16). In the latter case, it should be noted that despite the occurrence of a decrease in interbank assets, owing to the evolution noted for the domestic banks, the said decrease was less than the increase in securities eligible for credit operations with central banks. This will have represented a substitution of financing sources with longer maturities by shorter term financing from the Eurosystem. Although the decrease in the coverage of banking liabilities by highly liquid assets was considerably more marked in the case of domestic institutions, in which the increase in resources from central banks was more significant, the corresponding ratio remained at a higher value than that of non-domestic institutions. In September, central banks' resources resumed their June value, whereas assets eligible for credit operations with central banks continued to increase, as reflected in an increase in the coverage of interbank liabilities by highly liquid assets.

Across-the-board deterioration of liquidity gaps in the first half of 2010, largely reversed in the third quarter

Liquidity gaps in the Portuguese banking system deteriorated in all maturity periods under consideration in the first half of 2010 (Chart 4.4.17).For domestic institutions, this deterioration was



Source: Banco de Portugal.

Notes: (a) Includes "Fine-tuning operations" and "Structural operations". (b) Includes Fixed-term deposits" and "Reverse transactions".



Chart 4.4.17



Source: Banco de Portugal.

Note: Information obtained under the report set by Instruction no. 13/2009 of Banco de Portugal.

Source: Banco de Portugal.

Notes: The liquidity gap is defined as (Liquid Assets – Volatile Liabilities)/ (Assets – Liquid Assets) x 100 for each cumulative ladder of residual maturity. Information obtained under the report set by Instruction no. 13/2009 of Banco de Portugal. The dashed lines show domestic institutions. particularly marked over the shorter maturity horizons.⁵ This evolution essentially derived from the increase in volatile liabilities which more than offset the increase in eligible assets, largely reflecting the substitution of financing over the longer maturities by Eurosystem financing which, starting May, comprised shorter periods than in the second half of 2009 (Chart 4.4.18). Notwithstanding the fact that the decrease in liquidity gaps was noted for most of the institutions under analysis, the first half of 2010 witnessed an increase in the dispersion of the values noted for this indicator, particularly for the shorter maturities (Charts 4.4.19 and 4.4.20). The third quarter of the year witnessed an improvement in liquidity gaps, particularly in the case of domestic institutions, for which, over the longer maturities, the indicators attained higher values than those observed in December 2009.

Chart 4.4.18



Note: Information obtained under the report set by Instruction no. 13/2009 of Banco de Portugal.

Transition to a more demanding regulatory framework over the medium term

The adoption of more demanding regulation for liquidity management, under the future Community Directive on liquidity requirements, comprises an additional challenge for the banks on an international level, including Portuguese banks.⁶ Since the proposals currently under discussion are aimed at decreasing liquidity risk over the medium and long term they will, in several cases, require significant adjustments to be made to the balance sheet of several institutions during the period of adaptation to the new regulatory framework, reinforcing the proportion of liquid assets on their balance sheets and favouring globally stable financing sources. The significant dispersion of the Portuguese banks' liquidity rules should be mirrored in heterogeneous adjustment endeavours. The adoption of the new liquidity rules should also coexist with the implementation of new prudential rules in other domains. However, the timetable currently proposed for the implementation of the new standards on liquidity coverage ratio, starting January 2011, was established, with the implementation of the regulatory minimum in early 2015, whereas for the net stable funding ratio the period of observation will start in early 2012, with a forecast of January 2019 for the implementation of the regulatory minimum.

(5) Liquidity gap defined as (Net Assets - Volatile Liabilities)/(Assets - Net Assets)*100, in each cumulative maturity bracket.

⁽⁶⁾ For further details on the proposals for the new regulatory framework, see "Box 2.1 Main Basel III proposals", of this Report.



Note: Data on a consolidated basis. Information obtained under the report set by Instruction no. 13/2009 of Banco de Portugal. Empirical distribu-tion obtained through recourse to non-parametric methods, namely to a gaussian kernel that weights institutions by their assets.

Note: Data on a consolidated basis. Information obtained under the report set by Instruction no. 13/2009 of Banco de Portugal. Empirical distribution obtained through recourse to non-parametric methods, namely to a gaussian kernel that weights institutions by their assets.

4.5. Credit Risk

After significant deceleration over the course of 2008 and 2009, the annual rate of change in bank loans to the non-financial private sector was relatively stable at around 2 per cent, over the course of 2010. Credit growth was sustained by housing finance loans in addition to loans for consumption and other purposes. There was a slightly lower rate of growth in loans to non-financial corporations by resident banks. Reference should, however, be made to the fact that non-resident financial institutions made a significant contribution to financing in this sector. Accordingly and as opposed to the rest of the euro area, credit to the non-financial private sector did not contribute towards a reduction of the banking sector's balance sheet in Portugal. Given the unsustainable nature of the Portuguese economy's current financing framework, the near future is likely to witness an inevitable adjustment in the credit supply. There remains, however, a high level of uncertainty regarding the nature of this adjustment, notably regarding its duration, magnitude and composition.

In terms of default, 2010 was marked by a strong materialisation of credit risk (Chart 4.5.1). The situations were, however, different depending on the segment. Accordingly, whereas the default ratio on housing finance loans remained stable at historically high, albeit relatively contained levels, the default ratio on loans to households for consumption and other purposes and loans to non-financial corporations continued to increase. Notwithstanding the worsening situation, several signs indicating a slowdown in the materialisation of credit risk should be stressed. There has been a strong decrease in the annual flow of new overdue credit and non-performing loans to the private non-financial sector in comparison to its maximum in October 2009. This inflection of the previous upward trend, led financial institutions to recognise a decrease in their appropriations for impairment (Table 4.5.1). Notwithstanding this decrease, the current flows of new loans in default, except for housing finance loans, remain at historically high levels. Given the current economic context, characterised by public and private sector deleverage, the prospects of an increase in the default ratio suggests

Chart 4.5.1



Source: Banco de Portugal.

Notes: (a) Defined as being credit in default (overdue loans and other non-performing loans) as a percentage of the loans balance adjusted for securitisation. (b) The estimate of the annual flow of new overdue loans and other non-performing loans is presented as a percentage of the loans, adjusted for securitisation, and is calculated by adjusting the change in the overdue credit balance and other non-performing loans for write-offs/ downs from assets, reclassifications and, starting December 2005, sales outside the banking system of overdue credit and other non-performing loans not written off/down from assets, reported on a quarterly basis according to Banco de Portugal Instruction 2/2007.

Table 4.5.1

PROVISIONS AND IMPAIRMENT INDICATORS Per cent								
	Dec. 2004	Dec. 2005	Dec. 2006	Dec. 2007	Dec. 2008	Jun. 2009	Dec. 2009	Last month: June 2010
Provisions for overdue credit and other non-performing loans (individual basis) ^(a)								
As a percentage of credit	1.1	1.2	1.0	1.1	1.2	2.0	2.4	2.7
As a percentage of credit in default (prudential default concept) $^{\scriptscriptstyle (b)}$	72.0	82.7	82.7	76.9	73.4	80.3	82.9	79.5
Appropriation for impairment (consolidated basis) ^(c)								
As a percentage of credit	1.6	2.4	2.1	2.1	2.7	3.0	3.3	3.4
As a percentage of overdue credit	94.0	147.8	153.2	134.3	133.6	109.1	110.1	99.9

Source: Banco de Portugal.

Note: (a) Values of credit to residents reported on an individual basis by the other monetary financial institutions (banks, savings banks and mutual agricultural credit banks) and other financial intermediaries. Derecognised securitisations were not considered. (b) Credit in default defined on the basis of the prudential concept comprising credit and interest overdue for more than 90 days and other non-performing loans, referring to future payments of credit when there are any doubts over its collection, as established in Banco de Portugal's Official Notice 3/95 (available at www.bportugal.pt/servs/sibap/sibap_e.htm). (c) Credit values reported on a consolidated basis for the aggregate of the Portuguese banking system, including credit to residents and nonresidents in addition to credit from the foreign subsidiaries of Portuguese banks. Derecognised securitisations were not considered. Break in series in 2007. For additional information please consult the Financial Stability Report for 2008.

the need for a reinforcement of the impairment appropriation on credit portfolio losses, particularly for loans to households for consumption and other purposes and to non-financial corporations.

Relative sustainment of growth in loans to households...

In line with the developments starting in the third quarter of 2009, 2010 was marked by a slight acceleration in loans to households (Charts 4.5.2 and 4.5.3). This acceleration derived from greater dynamism in housing finance loans which, after a period of slowdown between mid 2006 and mid 2009, witnessed a gradual increase in its annual rate of change. This should be related with the historically low interest rate levels. Accordingly, loans to households for house purchase, in September 2010 were up by an annual rate of 3 per cent, in line with the euro area as a whole. The fact that the annualised quarterly rate of change has been lower than its annual equivalent since the second quarter of 2010 may be a sign that it will weaken in the near future. It should be noted that, according to the results published by Castro and Santos (2010),¹ the growth of housing finance loans to households has, since 2005, been higher than expected in comparison to its long term determinants (interest rates and investment in housing).

As regards loans to households for consumption and other purposes, the annual rate of change has remained stable at around 2 per cent. Notwithstanding this growth is in line with its long term determinants (interest rates and private consumption on durable goods), it is still much higher than in the 2003 recessionary period. Additionally, this growth rate is also higher than the euro area as a whole, in which values have been negative since the second quarter of 2009. Contributing towards the demand for credit by households has been greater dynamism in private consumption, in particular expenditure on the purchase of motor vehicles. Nevertheless, the analysis of a broader aggregate, notably all loans supplied by resident financial institutions, which includes other monetary financial institutions, shows that the annual rate of change on loans to households for consumption and other purposes was slightly negative.

⁽¹⁾ Castro, G. and C. Santos, (2010), "Bank interest rates and loan determinants", Banco de Portugal, Economic Bulletin - Spring.

Chart 4.5.2



Chart 4.5.3



Source: Banco de Portugal.

Note: The annual and quarterly rates of change are calculated on the basis of the ratio between bank loans at the end of the month, adjusted for securitisation operations, and monthly transactions, calculated on the basis of outstanding amounts adjusted for reclassifications, write-offs/ downs from assets and foreign exchange and price revaluations. The quarterly rate of change is seasonally adjusted.

Source: Banco de Portugal.

Note: The annual and quarterly rates of change are calculated on the basis of the ratio between bank loans at the end of the month, adjusted for securitisation operations, and monthly transactions, calculated on the basis of outstanding amounts adjusted for reclassifications, write-offs/ downs from assets and foreign exchange and price revaluations. The quarterly rate of change is seasonally adjusted.

... notwithstanding the intensification of restrictions on the supply side

According to the Bank Lending Survey, after a progressively less tighter squeeze on the level of restrictiveness in credit approval criteria over the course of 2009, the five banks in the survey reported a substantial increase in requirements for loans starting from the second quarter of 2010. This increase was particularly associated with a deterioration of access conditions to market financing. As a result, the banks consulted indicated their intention to increase spreads both on housing finance loans as on loans for consumption and other purposes. The increase was more significant in higher risk loans.

Notwithstanding the indications provided by the banks regarding increases in bank spreads on new operations, Chart 4.5.4 shows that the said increase only occurred in the case of housing finance loans and only from August, returning to levels close to those noted in early 2009. Regarding loans to households for consumption, there was even a decrease in bank spreads on new operations. This evolution could, however, be related with a composition effect, i.e. the fact that banks are limiting their issue of higher risk loans could be having a mitigation effect on spread increases. In the case of housing finance loans, this possibility is in line with the surveyed banks indications of their intentions to decrease the loan to value guarantee ratio. Also in the case of loans for consumption, the banks under analysis have indicated a decrease in loan maturities, which could be in line with the strategy of allocating loans with longer maturities only to lower risk borrowers. However, in this case, the decrease in the spread is also related with the use of the yield on Portuguese treasury bonds as a benchmark in relation to the interest rate charged on loans for consumption with a maturity of more than 5 years. Accordingly, the failure to apply the marked increase in yields on public debt bonds to the rates on credit for consumption partially explain the lower amounts of the banking spread in this segment.

The gradual increase in interest rates on new operations, over the course of 2010, particularly reflected the increase in Euribor rates. In the case of housing finance loans, the increase was higher in August and September also as a result of the higher bank spread.

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Chart 4.5.4



Source: Banco de Portugal.

Notes: (a) Interest rate spread on new loans to households for house purchases using 6 months Euribor (b) Interest rate spread on new loans to households for estimated consumption using, respectively, 6 months Euribor, 1 year Euribor and the yield on Portuguese Treasury bonds with a period to maturity of 5 years, in cases in which the initial pricing of the rate is 1 year, between 1 and 5 years and more than 5 years (c) Average interest rate calculated on the basis of the rates on new loans per initial price fixing period rate, weighted by the amounts of new operations in each period.

Regarding the distribution of the growth rate of loans to households, the current highly uncertain economic framework has led to a greater level of homogenisation of the strategies implemented by the different financial institutions (Chart 4.5.5). In the case of housing finance loans, where such homogenisation was already evident in June 2009 there was an even higher concentration around the mode of the distribution, which remained practically unchanged. Notwithstanding this convergence movement, strong growth was recorded by several small non-domestic institutions, which lay at the





Source: Banco de Portugal

Note: Empirical distribution obtained by the use of a Gaussian Kernel which weights financial institutions by their lending.

basis of the acceleration of housing finance loans. The situation in the case of loans to households for consumption and other purposes, was slightly different as, in June 2009, the distribution thereof indicated a highly differentiated profile in terms of growth rates. In this case, there was also a higher concentration of observations, albeit centred on a relatively broad interval. Accordingly, in 2010, although fewer institutions implemented strong growth strategies, there were also fewer institutions which opted for a strong reduction of their exposure to this segment.

Increased materialisation of credit risk for households, notwithstanding the stabilising of the default ratio in housing finance loans

In line with the upward trend starting in the first quarter of 2008, a slight increase in the default ratio of bank loans to households (Chart 4.5.6) was noted over the course of 2010. This growth, however, reflects two distinct situations. Accordingly, in the case of housing finance loans, the default ratio stabilised at levels higher than noted prior to the onset of the financial crisis but may still be considered relatively contained. This stabilisation was associated with a gradual decrease in the flows of new loans in default starting from the first half of 2009 (Chart 4.5.7), which, in September, were close to the average levels noted since the inception of the euro area. A contributory factor was the low debt servicing ratio in Portugal (partly deriving from the long loan maturities),² in addition to the fact that the level of participation of lower income households in this type of market was low. These characteristics also had consequences on default profile. Accordingly and as opposed to loans to households for consumption, in the case of housing finance loans, there was no marked difference between the default ratio noted in the larger as opposed to other exposures (see Table 4.5.2). However, available information indicates that when other characteristics are factored in, the larger the

Chart 4.5.6

Households

8

-Total

-Housing

DEFAULT RATIOS ON BANK LOANS -Consumption and other purposes



Source: Banco de Portugal

Note: Defined as credit in default (overdue credit and other non-performing loans) as a percentage of the loans balance adjusted for securitisa-tion.

Chart 4.5.7



Source: Banco de Portugal

Note: The estimate of the annual flow of new overdue credit and other non-performing loans is presented as a percentage of the loans, adjusted for securitisation, and is calculated by adjusting the change in the amount of overdue credit and other non-performing loans, write-offs/downs from assets, reclassifications and, starting December 2005, sales outside the banking system of overdue credit and other non-performing loans not written off/down from assets, reported on a quarterly basis in accordance with Banco de Portugal Instruction 2/2007.

(2) Information available in Housing Finance in the Euro Area, Occasional Paper Series No 101, European Central Bank, 2009.

Table 4.5.2

DEFAULT INDICATORS ON LOANS TO HOUSEHOLDS, BY SIZE OF EXPOSURE ^(a) Per cent										
	Jun-2009	Dec-2009	Jun-2010							
Housing										
Total exposure										
Number of debtors in default (%)	6.7	5.3	5.4							
Overdue credit and interest (%)	1.6	1.7	1.9							
Exposures for more than the 90th quantile										
Proportion of the outstanding amounts	28.3	28.5	28.6							
Number of debtors in default (%)	7.9	6.6	6.4							
Overdue credit and interest (%)	1.5	1.6	1.8							
Consumption										
Total exposure										
Number of debtors in default (%)	11.6	12.2	12.7							
Overdue credit and interest (%)	5.9	6.9	7.5							
Exposures for more than the 90th quantile										
Proportion of the outstanding amounts	54.6	54.6	54.8							
Number of debtors in default (%)	12.7	13.0	13.3							
Overdue credit and interest (%)	4.5	5.4	6.0							

Source: Banco de Portugal

Notes: (a) Indicators based on information supplied by the Central Credit Register (CRC). Elements of the financial system were taken to be all banks, savings banks, mutualist credit agricultural institutions, financial credit institutions, factoring companies, leasing companies, credit card issuing or management companies, finance houses for credit purposes and other resident financial intermediaries. Only exposures to a specific financial institution of more than EUR 50 were considered. A household is considered to be in default if the amount of credit overdue is higher than 0.5% of its total exposure in relation to the financial system. This amount of credit differs from the amount recorded in the monetary and financial statistics essentialy on account of the fact that institutions with the obligation to report directly for such purposes (Banks, Savings Banks and Mutualist Agricultural Savings Institutions) are a sub grouping of the entities participating in the CRC.

housing finance loan the lower the propensity to default.³

In the case of loans to households for consumption and other purposes and in contrast to housing finance loans, there was a marked increase in the default ratio over the course of 2010 (Chart 4.5.6). This increase was not unconnected with the fact that the flows of new loans in default, notwithstanding the significant reduction thereof, remained at historically high levels (Chart 4.5.7), even in comparison to the previous recessionary period of 2003.⁴ There were mainly two factors contributing to the greater persistence of the flows of new loans in default. On the one hand, greater access to this market by lower income households over the years preceding the current financial crisis could have made this segment more sensitive to the marked increase in unemployment in the context of the current crisis.⁵ On the other hand, the fact that credit for consumption and other purposes is largely at fixed rates has caused it to derive less benefit from the marked falls in interest rates in the money market. Notwithstanding, the decrease in interest rates in the money market has contributed to an increase in available household income, via housing finance loans, therefore making an indirect contribution to containing higher default rates on the loans for consumption and other purposes segment.

⁽³⁾ In this respect, see Farinha, L. and Lacerda A. (2010). "Households credit delinquency: Does the borrowers' indebtedness profile play a role?" of this report.

⁽⁴⁾ It should be noted that the high annual rate of change in loans in default to households for consumption and other purposes, in September particularly derives from a base effect and not a considerable increase in the monthly flow of credit in default.

⁽⁵⁾ Results set out in the Household Wealth and Indebteness Survey, in 2000 and in 2006/2007.

Slightly positive growth in loans to non-financial corporations by resident banks. However, non-resident banks make a significant contribution to sector financing

After significant deceleration over the course of 2009, bank loans to non-financial corporations were slightly up during the course of 2010 in comparison to the same period of the preceding year (Chart 4.5.8). Accordingly, in September, the annual growth rate in lending to these corporations was of around 1.2 per cent. Notwithstanding, this was higher than for the euro area as a whole which since September 2009 had recorded annual negative rates of change. This growth is also higher than the expected based on its long term determinants (corporate investment and bank interest rates). The analysis of a broader aggregate, notably all loans to non-financial corporations, which in addition to loans made by resident banks, also include loans made by non-residents, other financial intermediaries and financial auxiliaries and households, shows that, in June, the annual growth of total lending to non-financial corporations was 3.2 per cent (Chart 4.5.9). This growth is largely associated with a significant inflow of funds from abroad, notably from non-resident financial institutions,⁶ making it possible to attenuate the effects of the disruptions in the sovereign debt markets on the financing of non-financial corporations.

According to the Bank Lending Survey, after approximately a year of progressively less sharp increases in the level of restrictiveness in lending criteria, substantially more demanding criteria were adopted by the banks in the survey from the second quarter of 2010. This evolution was caused by disruption in the sovereign debt markets, translating into a sharp deterioration of banks' access conditions to the financing market. The more demanding lending criteria were reflected in higher spreads, in addition to an aggravation of all other contractual terms. In line with the results of the survey, Chart 4.5.10 shows that there was an increase in spreads over the course of 2010, following the strong increase noted in the preceding year. Nevertheless, this increase was not very pronounced indicating that something along the lines of loans to households may have occurred, i.e. a

Chart 4.5.8



Chart 4.5.9



Source: Banco de Portugal.

Note: The annual and quarterly rate of change are calculated on the basis of the ratio between outstanding bank loans amounts (or bank loans and short term securities held by the banking system) at the end of the month, adjusted for securitisation operations, and monthly transactions, calculated on the basis of outstanding amounts adjusted for reclassifications, write-offs/downs from assets and foreign exchange and price revaluations. The quarterly rate of change is seasonally adjusted.

Source: Banco de Portugal.

Note: The annual rate of change on resident bank loans is calculated on the ratio between outstanding bank loans at the end of the month adjusted for securitisation operations, and monthly transactions, calculated on the basis of outstanding amounts adjusted for reclassifications, write-offs/ downs from assets and foreign exchange and price revaluations. The annual rate of change on loans to non-financial corporations is based on the national financial accounts. The annual rate of change on loans to non-financial corporations (except resident bank loans) is obtained from the other two.

(6) See "Section 8 Balance of Payments", Banco de Portugal, Economic Bulletin, Autumn - 2010.

Chart 4.5.10



Notes: Rates and spread refer to end of period outstanding amounts. End of years are underlined. Up to December 2002, the rates on the balances are estimated. The spread is calculated as the difference between the rate on the outstanding amounts and the six month moving average of 6 month Euribor.

progressively higher proportion of lower risk loans in terms of total lending. Regarding the contractual maturity of loans to non-financial corporations, reference should be made to an increase in the contribution made by loans with a maturity of more than 5 years, countering the previous downward trend (Chart 4.5.11). Accordingly, this was the only maturity to make a positive contribution to the growth in loan balances. Negative contributions were made by bank overdrafts, other loans with a maturity of up to 1 year and loans between 1 and 5 years. However, although in the case of bank overdrafts the contribution was progressively less negative, in other cases a progressively more negative contribution was noted.

As a consequence, *inter alia*, of more demanding lending criteria, the distribution of the growth rate of loans to non-financial corporations made by the different institutions moved to the left (Chart 4.5.12). This movement was accompanied by a greater homogenisation of growth rates at lower values. Accordingly and as opposed to June 2009, when strong growth rates were recorded by a considerable number of institutions, the first half of 2010 witnessed a strong concentration of growth rates, with a larger number of institutions recording a decrease in their loans to non-financial corporations portfolios. It should also be noted that, as in the case of loans to households, a larger contribution to credit growth in loans to non-financial corporations was also made by non-domestic financial institutions.

As regards the size of exposures, lending to non-financial corporations portfolio remains concentrated in the higher value loan brackets, which continue to register higher growth rates (see Table 4.5.3). This evolution contrasts with exposures of less than €551 thousand, comprising 90 per cent of the total, which, in June 2010, witnessed a 3 per cent drop in comparison to the same period of the preceding year. As smaller companies tend to have higher default rates, the said differentiation in growth rates translates in more restrictive criteria on lending to such companies by financial institutions.

Lastly and as the banking sector is also exposed to the credit risk of non-financial corporations on account of its securitised debt position, it is relevant to analyse the behaviour of a broader credit

Chart 4.5.11



Chart 4.5.12



Source: Banco de Portugal.

Notes: The contributions refer to unadjusted outstanding amounts of bank loans recognised as banks assets, for which the year-on-year rate of change is presented. The annual rate of change is calculated on the basis of the ratio between outstanding amounts of bank loans adjusted for securitisation operations and monthly transactions calculated on the outstanding amounts adjusted for reclassifications, asset write-offs/downs and exchange rate and price revaluations. Bank overdrafts were classified as having a maturity of less than a year. Source: Banco de Portugal.

Note: Empirical distribution obtained by the use of a gaussian kernel which weights financial institutions by their lending.

aggregate which not only includes loans but also this type of debt held by the banks. Accordingly, in September 2010, securitised debt issued by non-financial corporations held by the banks, totalled around €18.6 billion, comprising around 14 per cent of the total credit supplied by financial institutions to this segment. As set out in Chart 4.5.8, and after stronger growth in the period preceding the current financial crisis, the annual rate of change of this type of credit was in line with that of bank loans to non-financial corporations.

Different evolution of loans to non-financial corporations according to sector of activity

After a clear and transversal deceleration of growth in loans to non-financial corporations during 2009, 2010 witnessed differentiation in the sectoral growth profile (see Table 4.5.4). The sectors most directly affected by the current financial crisis notably "Construction" and "Real estate activities", which, as a whole represent around 38 per cent of all loans to this segment, accentuated their negative growth trend, with annual rates of changes of minus 3 and minus 2.9 per cent in August 2010, respectively. There was also a slowdown in loans to the "Electricity, gas and water" and "Manufacturing " sectors although growth rates remained positive. This was offset by an acceleration in loans to other sectors, notably to "services provided mainly to companies", which improved its annual growth from minus 2 per cent in December 2009 to 5.5 per cent in August 2010. Although not so marked the "Trade, restaurants and hotels" sector also posted strong acceleration from an annual rate of change of minus 0.4 to 2.1 per cent.

Table 4.5.3

LENDING TO NON-FINANCIAL CORPORATIONS – BY DIMENSION OF EXPOSURES^(a) Annual rates of change at end of period, per cent

					Memo (June 2010):			
	Dec-08	Jun-09	Dec-09	Jun-10	Lower limit ^(d) (10³€)	Average out- standing amounts (10³€)	Propor- tion of the out- standing amounts in the total (%)	
Total	10.6	6.1	1.4	-0.1			100	
Exposures for more than the 90th quantile ^(b)	11.5	6.6	1.6	0.3	551	4 469	87	
of which: exposures for more than the 99th quantile $99^{(b)}$	13.2	8.1	2.8	1.9	7 518	28 700	56	
of which: exposures for more than the 99.5th quantile $99.5^{(b)}$	12.7	8.4	3.2	2.1	14 200	47 300	46	
of which: exposures for more than the 99.9th quantile $99.9^{(b)}$	11.3	7.0	2.0	1.7	56 900	130 000	25	
Smaller exposures ^(c)	5.2	2.6	0.1	-3.0	0.05	72	13	

Source: Banco de Portugal.

Notes: (a) Indicators based on information supplied by the Central Credit Register (CRC), with each exposure being characterised by the total value of loans in the financial system of a specific non-financial corporation. Elements of the financial system were taken to be all banks, savings banks, mutualist credit agricultural institutions, financial credit institutions, factoring companies, leasing companies, credit card issuing or management companies, finance houses for credit purposes and other resident financial intermediaries. Only exposures to a specific financial institution of more than EUR 50 were considered. (b) For the calculation of year-on-year rates of change, the lower limits of each exposure bracket coincide with the quantile which, at any time, are defined on the basis of the number of companies ranked by the amount of total exposure. (c) Comprises 90 per cent of companies with debts to the institutions registered with the CRC. (d) Lowest amount of exposure in the whole quantile.

Table 4.5.4

LOANS TO NON-FINANCIAL CORPORATIONS – BY SECTOR^(a) Annual rates of change at end of period, per cent^(b)

	2005	2006	2007	2008	2009	2010	Proportion in total loans
						Aug.	Aug. 2010
Total	5.0	7.1	11.2	10.5	1.9	1.0	100.0
By branch of activity:							
Agriculture, fi shing and mining	3.6	6.4	13.6	20.3	4.0	4.7	2.3
Manufacturing	-3.0	0.7	7.9	7.7	3.2	1.8	12.9
Electricity, gas and water	37.9	-11.3	13.7	47.8	10.7	2.9	3.2
Construction	10.7	5.4	10.7	8.6	2.5	-3.0	18.7
Trade, restaurants and hotels	3.0	7.1	6.3	7.5	-0.4	2.1	17.2
Transport, post and telecommunications	-10.6	0.7	11.0	18.3	3.9	4.9	6.5
Real estate activities	12.0	12.9	14.4	8.5	1.3	-2.9	18.9
Services provided mainly to corporations	6.6	13.8	16.6	14.1	-2.0	5.5	14.5
Other services activities	-3.6	9.6	10.0	6.2	9.1	5.8	5.8

Source: Banco de Portugal.

Notes: (a) Considering loans from other monetary financial institutions, with the allocation of loans by sector of activity being estimated on the basis of the structure of Central Credit Register. (b) 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 bases 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.

Decrease in the flows of new loans in default fails to avoid a strong increase in default ratios in loans to non-financial corporations

The default ratio of loans to non-financial corporations, in 2010, continued its upward trend starting in 2008 (Chart 4.5.13). Accordingly, non-performing loans totalled around 4.7 per cent of total lending to non-financial corporations in September, which corresponds to the highest level since the end of 1998. Notwithstanding the deterioration of default indicators and in line with the trend beginning at the end of 2009, the flow of new credits in default was considerably down. Nevertheless, this remained at historically very high levels in line with expectations based on its determinants, namely the output gap and the interest rate on loans to companies (Chart 4.5.14).⁷ There was, however, differentiation in the increase in default ratios by size of exposure. According to information supplied by the Central Credit Register (Table 4.5.5) the default ratios continued to be gradually less for larger exposures. In the case of non-financial corporations with loans of more than €56.9 million a decrease in the default ratio was even recorded. This was offset by loans of less than €551 thousand which recorded the highest increases in default ratios.

In sectoral terms, the increase in the default ratio was transversal to all sectors. Different situations may, however, be distinguished. Accordingly to Chart 4.5.15, "Construction", "Trade, restaurants and hotels" and "Real estate activities" were the sectors with the highest increase in contribution to the default ratio over the course of the last year. These are also the sectors with the largest contribution to this ratio. On the contrary, "Electricity, gas and water", "Agriculture, fisheries and mining" and "Transport, postal services and telecommunications" were the sectors with the lowest contribution to the default ratio.

Chart 4.5.13



Source: Banco de Portugal.

Notes: (a) Defined as being credit in default (overdue credit and other non-performing loans) as a percentage of the outstanding bank loans adjusted for securitisation. (b) The estimate of the annual flow of new overdue credit and other non-performing loans is presented as a percentage of the loans, adjusted for securitisation, and is calculated by adjusting the change in the outstanding amount of overdue credit and other nonperforming loans for write-offs/downs from assets, reclassifications and, starting December 2005, sales outside the banking system of overdue credit and other non-performing loans not written off/down from assets, reported on a quarterly basis according to Banco de Portugal Instruction 2/2007.

(7) See "Box 4.5 Likely developments in the default situation among non-finanantial corporations", Banco de Portugal, Financial Stability Report – 2008, for the methodology used in Chart 4.5.14.





Source: Banco de Portugal

Notes: Estimated and noted evolution on the mean probability of default of a sample of non-financial corporations, weighted by total exposure of the respective sector of activity and category of size of total credit. Values in natural units. The estimated model uses, among other regressors, the output gap and the interest rate on loans to companies. GDP Values are based on projections published in the Spring Economic Bulletin. The values used and noted differ from those set out in Table 4.5.5 on the basis of several methodological differences, notably the definition used for default, size of default, stratification of sample and other factors. Size of exposure in euros.

Table 4.5.5

CREDIT DEFAULT INDICATORS FOR NON-FINANCIAL CORPORATIONS, BY SIZE OF EXPOSURE ^(a)										
	Dec-07	Jun-08	Dec-08	Jun-09	Dec-09	Aug-10				
Total exposure										
Number of debtors in default ^(b) Overdue credit and interest ^(c)	14.4 1.8	15.8 2.1	16.3 2.3	18.5 3.9	18.7 4.1	20.1 5.1				
Exposures for more than the 90th quantile ^(d)										
Number of debtors in default ^(e) Overdue credit and interest ^(f)	8.0 1.2	10.0 1.5	11.5 1.8	15.6 3.4	14.3 3.5	16.7 4.5				
of which: exposures for more than the amount of the 99th quantile $^{(d)}$										
Number of debtors in default ^(e) Overdue credit and interest ^(f)	4.5 0.4	6.7 0.6	9.1 0.8	13.8 2.6	11.4 2.3	14.4 3.0				
of which: exposures for more than the amount of the 99.5th quantile $^{(d)}$										
Number of debtors in default ^(e) Overdue credit and interest ^(f)	4.0 0.3	5.5 0.4	7.5 0.6	12.9 2.3	9.3 1.9	13.2 2.5				
of which: exposures for more than the amount of the 99.9th quantile $^{(d)}$										
Number of debtors in default ^(e) Overdue credit and interest ^(f)	2.1 0.0	2.9 0.1	6.3 0.2	11.3 1.9	7.1 1.3	9.5 1.3				
Smaller exposures ^(g)										
Number of debtors in default ^(e) Overdue credit and interest ^(f)	15.2 5.1	16.4 5.5	16.9 5.8	18.8 7.4	19.2 7.8	20.5 9.1				

Source: Banco de Portugal.

Notes: (a) Indicators based on information from the Central Credit Register (CRC). Comprising credit from banks, savings banks, mutual agricultural credit banks, credit financial institutions, factoring companies, leasing companies, credit card issuing or management companies, credit-purchase financing companies and other resident financial intermediaries. Only exposures to a specific financial institution of more than EUR 50 were considered with unused lines of credit having been excluded. A non-financial corporation is in default if the amount of overdue credit is more than 0.5% of its exposure to the financial system. (b) As a percentage of the number of non-financial corporations with debts to financial institutions participating in the CRC. (c) As a percentage of the total credit from financial institutions participating in the CRC to resident non-financial corporations. (d) Percentiles defined on the basis of the number of companies ranked by their total amount of exposure. (e) As a percentage of the number of debtors in this portfolio. (f) As a percentage the total credit in this portfolio. (g) Exposures whose amounts are less than the 90th percentile, comprising 90 per cent of the companies with debt to institutions participating in the CRC.

Chart 4.5.15



Source: Banco de Portugal.

Note: Considering loans from other monetary financial institutions, with the allocation of loans per sector of activity estimated on the basis of the structure of the Central Credit Register.

Box 4.1. Main results of the stress test exercise in the European Union in the sample of Portuguese banks

The Committee of European Banking Supervisors (CEBS), in cooperation with the European Central Bank (ECB), European Commission and national supervisory authorities, coordinated a stress test exercise in European Union countries, whose results were published last July.¹ The objective of this exercise was to assess the resilience of a representative sample of banks in European Union countries to an adverse, albeit plausible, scenario, essentially considering unfavourable developments involving market and credit risks, as well as sovereign risk.² In particular, the objective of the exercise was to assess the capital adequacy of financial institutions to absorb shock simulations, with 6 per cent being used as the benchmark for the original own funds adequacy ratio (Tier I).

In Portugal, the exercise was carried out by Banco de Portugal, in a top down approach, involving the four major domestic banking groups, namely Caixa Geral de Depósitos, Banco Comercial Português, Espírito Santo Financial Group S.A. and Banco BPI, including also the respective bank employees' pension funds.³ These institutions, as a whole, accounted for around two thirds of the Portuguese banking system's total assets in December 2009. Banco Santander Totta, which represented around 9 per cent of total assets on the said date, was included in the stress test exercise conducted by Banco of España as a Banco Santander subsidiary, given that the exercise was performed to the highest level of consolidation.⁴

The underlying macroeconomic scenarios of the exercise, referred to as benchmark and adverse, were supplied by the CEBS, in close cooperation with the ECB and the European Commission, with the years 2010 and 2011 as the projection horizon (Table 1). The benchmark scenario was anchored by the available forecasts for each country at the start of the exercise. This scenario, in the case of Portugal, implied a deceleration of economic activity over the projection horizon, in a context of fiscal consolidation, private sector deleverage and progressive recovery in foreign demand. In turn, the adverse scenario incorporated severe shocks across all economies and idiosyncratic shocks, including significant losses in equity markets, reductions in property prices and higher interest rates along the yield curve. In this scenario, the Portuguese economy would suffer from the deepest and most protracted recession ever recorded with a historically high increase in the unemployment rate (Charts 1 and 2). Owing to the upwards reassessment of sovereign risk in international financial markets, an additional shock on the yield curve specific to each country was introduced in this scenario. To calibrate this shock, it was assumed that the spread on each country's public debt securities would remain as high as recorded in the period starting early May 2010. At the same time, a 30 basis points add-on was included in the long term interest rate in weighted average terms for the euro area, split up among the different countries according to the volatility of long term rates after the start of May 2010. Sovereign default was not considered.

The analysis presented in this box is based on the results relating to the benchmark and the adverse with an additional sovereign risk shock scenarios. The results obtained from the adverse scenario without the referred to shock are not presented.

(1) The aggregate results of this exercise, in addition to detailed information thereon, can be found in the document "Aggregate outcome of the 2010 EU wide stress test exercise coordinated by CEBS in cooperation with the ECB", published by the CEBS.

(2) Liquidity risk was not considered in this exercise

(3) The document containing the results for Portugal is available at: http://www.bportugal.pt/en-US/OBancoeoEurosistema/ComunicadoseNotasdeInformacao/Paginas/ combp20100723.aspx.

(4) The same exercise, at a later stage, was applied to the sub-consolidated activity of Banco Espírito Santo and Banco Santander Totta SGPS, after a request made by them to Banco de Portugal. The results for these institutions were disclosed at the beginning of August and are available at: http://www.bportugal.pt/en-US/OBancoeoEurosistema/ ComunicadoseNotasdeInformacao/Paginas/combp20100806.aspx. The results were only published by Banco de Portugal, as they were not a part of the exercise coordinated by the CEBS at the European Union level.

Table 1

MACROECONOMIC SCENARIOS ^(a)		
	Port	tugal
Benchmark scenario	2010	2011
GDP at constant prices (y-o-y, per cent)	0.5	0.2
Unemployment (as a percentage of labour force, year-end)	11.1	11.9
Short-term interest rates (3-month Euribor, year-end)	1.2	2.1
Long-term interest rates – 10-year TBs (year-end)	4.7	5.1
Commercial property prices (y-o-y, per cent, year-end)	0.0	0.0
Residential property prices (y-o-y, per cent, year-end)	0.0	0.0
Haircut on equity instruments in the available for sale portfolios (per cent) ^(b)	10.0	10.0
Adverse scenario with additional sovereign risk shock	2010	2011
GDP at constant prices (y-o-y, per cent)	-0.3	-2.3
Unemployment (as a percentage of labour force, year-end)	11.3	12.8
Short-term interest rates (3-month Euribor, year-end)	2.1	3.3
Long-term interest rates – 5-year TBs (year-end) ^(c)	5.8	7.4
Long-term interest rates – 10-year TBs (year-end) ^(c)	7.0	8.5
Commercial property prices (y-o-y, per cent, year-end)	-5.0	-5.0
Residential property prices (y-o-y, per cent, year-end)	-5.0	-5.0
Haircut on equity instruments in the available for sale portfolios (per $ent)^{(b)}$	20.0	20.0

Sources: CEBS, ECB and European Commission.

Notes: y-o-y – Year on year rates of change. (a) The macroeconomic scenarios were developed by the CEBS in close cooperation with the ECB and the European Commission. (b) A shock of a similar magnitude was applied to equity trading portfolio and the bank employees' pension fund shares portfolio. (c) Including the widening of spreads on German public debt.

Chart 1

DISTRIBUTION OF ACCUMULATED GDP CHANGE RATES BETWEEN 2009 AND 2011 FOR EUROPEAN UNION COUNTRIES

Maximum, minimum, interquartile range and median



Chart 2

DISTRIBUTION OF CHANGE IN UNEMPLOYMENT RATE BETWEEN 2009 AND 2011 FOR EUROPEAN UNION COUNTRIES



Sources: CEBS, ECB and European Commission.

Note: The boxes represent the range between quartiles 25 and 75, with the division between the blue and red component corresponding to the median distribution figures. The minimum and maximum figures, in turn, correspond to the extremities of the black lines.

Sources: CEBS, ECB and European Commission.

Note: The boxes represent the range between quartiles 25 and 75, with the division between the blue and red component corresponding to the median distribution figures. The minimum and maximum figures, in turn, correspond to the extremities of the black lines.

Main hypotheses and transmission mechanisms

Several hypotheses harmonised between participating institutions were adopted for estimating the impact of macroeconomic scenarios on institutions' financial situations, notably profit and loss accounts and capital adequacy.

The exercise was based on accounting and prudential information for December 2009, reported to Banco of Portugal for supervision purposes, assuming that balance sheet exposures to market and credit risks remain constant over the projection horizon in both scenarios.

As regards risk sources, equity market risk was taken for all financial assets portfolios and fully reflected in the profit and loss accounts. Interest rate risk was reflected in valuation changes of fixed-income financial instruments in the trading portfolio. In turn, the projection of net interest income considered the transmission of estimated interest rates on interest-bearing assets and liabilities, multiplied by the respective average balance sheet stock. Loss of value in the property market was reflected in results through the recognition of impairment in the real estate portfolio held for purposes other than own use (i.e. property owned by institutions owing to foreclosure or debtors' default). Credit risk on exposures to the private sector was incorporated using estimates on the trajectory of probabilities of defaults and loss given defaults (PDs and LGDs, respectively) supplied for each of the macroeconomic scenarios by the ECB, and defined by country and credit segment (Charts 3 and 4). Based on this information, and according to the structure of each institution's credit portfolio, estimated loss rates by segment were obtained, which enabled the evolution of impairment on credit to be projected. Albeit ruling out sovereign defaults, sovereign risk was considered in the exercise through the securities classified in the trading portfolio, applying haircuts compatible with the projected increase in long term interest rates for each country. At the same time, sovereign risk was included in the exercise through its impact on estimated private sector PDs and LGDs for each country's credit segment, as long term interest rates were included within the explanatory variables in the estimation models of such parameters. Sovereign exposure classified in available for sale financial assets, held to maturity and credit portfolios (banking book) was not considered in the exercise, as the unrealised changes in value in the portfolios do not affect regulatory capital and impairments are only recognised in situations of default (or the like) which have not been assumed in the exercise's hypotheses. It should, however, be noted that information on exposures of financial institutions to sovereign debt of countries in the European Economic Area, recognised either in the trading or banking book portfolios, was disclosed at the same time as the results of the exercise.5

Lastly, given the liabilities associated with employees' defined benefit pension funds assumed by banking groups, the financial position of these funds was also affected by several risk factors, notably interest rate, and equity and property price risks. An increase in the actuarial discount rate, consistent with the evolution of long term interest rates, was also considered, while the remaining actuarial premises remained constant. Any short-fall exceeding the designated "corridor" (defined as 10 per cent of the maximum between the value of the assets portfolio and the value of fund liabilities and adjusted for the deferral of the liabilities deficit at 31 December 2008) was directly recognised as a negative element of original own funds.

Main results for the Portuguese banks

According to the results of the exercise, the four Portuguese banking groups under analysis displayed a high level of resistance to the resurfacing of risk materialisation at the global and national level. All of the banking groups had Tier I capital ratios higher than 6 per cent in 2010 and 2011, notwithstanding a significant reduction in solvency levels in the adverse scenario with an additional sovereign risk shock, in comparison to the bench-

(5) Together with the results of the stress test exercise, a table was published for each financial institution providing a breakdown of sovereign risk exposure to European Economic Area countries at 31 March 2010, by country and type of financial assets portfolio (trading and banking book).



Chart 4

DISTRIBUTION OF CHANGES IN LGDs IN COMPARISON TO 2009 IN EUROPEAN UNION COUNTRIES BY CREDIT SEGMENT IN THE ADVERSE SCENARIO WITH ADDITIONAL SOVEREIGN RISK SHOCK^(a)

Maximum, minimum, interquartile range and median



Sources: CEBS, ECB and European Commission.

Notes: (a) PDs - Probabilities of default. The boxes represent the range between quartiles 25 and 75, with the division between the blue and red component corresponding to the median distribution figures. The minimum and maximum figures, in turn, correspond to the extremities of the black lines.

Sources: CEBS, ECB and European Commission.

Notes: (a) LGDs - Loss given defaults. The boxes represent the range between quartiles 25 and 75, with the division between the blue and red component corresponding to the median distribution figures. The minimum and maximum figures, in turn, correspond to the extremities of the black lines.

mark scenario (Chart 5). In general terms, with the exception of Banco BPI, the evolution of the capital ratio in the adverse scenario reflected a significant decrease in original own funds, essentially related with a marked reduction in institutions' profitability and increase in accumulated negative actuarial deviations related with bank employees' pension funds.

The results of the exercise for the adverse scenario were highly conditioned by the significant increases in impairment vis-à-vis the benchmark scenario (Chart 6). The background of an increase in the unemployment rate, a marked reduction in economic activity and a significant hike in interest rates resulted in an increase in the materialisation of credit risk, implying an expressive increase in credit impairment. It should, however, be noted that the evolution of this component differed across institutions in line with the composition of the respective credit portfolios, both in terms of credit segment and as regards the countries in which they operate. In the opposite direction, i.e. with a favourable impact on results, was the behaviour of operating income, particularly net interest income, which reflected the increase in short term interest rates (Chart 7). Indeed, the net interest income of Portuguese institutions is highly sensitive to the evolution of money market interest rates. This sensitivity reflects, on the one hand, the fact that a highly significant proportion of bank loans was taken out at a variable rate, indexed to Euribor (notwithstanding the loans' maturity) and, on the other, the fact that the interest rates on deposits were not so closely tied to the evolution of these rates. It should also be stated that the direct impact associated with sovereign risk on income was limited, as only a small proportion of public debt held by institutions is classified in the trading portfolio.

In turn, the negative impact on regulatory capital associated with bank employees' pension funds was mainly related with the decrease in value of the assets portfolio, given the materialisation of market risk. This reduction reflected the fact that the assets portfolio of the pension funds of some banking groups was highly exposed to price fluctuations in stock markets. However, the increase in the actuarial discount rate, in line with the increase in long term interest rates, implied a reduction in the value of fund liabilities and accordingly mitigated the impact



on the financial situation of pension funds deriving from the reduction in value of the respective assets portfolio. It should be noted that the negative impact on the capital ratio associated with the pension funds was especially relevant to institutions with accumulated negative deviations much higher than the "regulatory corridor" in 2009.

Some final considerations

Notwithstanding the fact that the stress test exercises are an important element for assessing the capacity of banking institutions/systems to absorb adverse shocks, to the extent that their results enabled the identification of the main sources of risk and vulnerabilities, the results should not be interpreted as forecasts of the evolution of the profitability and solvency of the institutions/systems in the analysis. Indeed, underlying such exercises are several extreme and/or simplifying hypotheses, even in benchmark scenarios. This aspect is particularly relevant in the exercise coordinated by the CEBS owing to the high number of financial institutions under analysis and the diversity of the respective business models.

As regards the exercise's hypotheses, and as already mentioned, the risk associated with sovereign exposure classified in available for sale financial assets, held to maturity and credit portfolios was not explicitly consid-



ered. In Portugal, a highly significant part of exposure to sovereign risk is classified in these portfolios. However, a sensitivity analysis on this situation, admitting the possibility of potential capital losses in these portfolios, based on the application of haircuts of a similar magnitude to those considered in the trading portfolio, shows that the Portuguese banking system would continue to display a high capacity to absorb extreme adverse shocks.

Box 4.2. Financial situation of non-financial corporations and the evolution of overdue credit in 2009

The recent financial crisis has led to the deepest recession of the last decades, in which recovery has been slower than usual and enshrouded in a high level of uncertainty. In the case of Portugal, as in other countries, these developments have been reflected in higher levels of overdue credit in bank portfolios, particularly in loans to non-financial corporations. This situation is particularly relevant as, in aggregate terms, Portuguese companies are amongst the most highly leveraged in the euro area and a significant proportion of their debt is in the form of bank loans. In fact, non-financial corporations account for around one half of Portuguese banking system loans. In such a context, a characterisation of non-financial corporations with the highest vulnerability in terms of their balance sheets (associated with high levels of indebtedness, low profitability and financing constraints) and which could constitute a risk for the Portuguese financial system, is particularly relevant.

Notwithstanding the marked drop in money market interest rates starting in the last quarter of 2008 and government measures to support companies, defaults by non-financial corporations have worsened over the last few years, even exceeding the levels recorded in the former recessionary period. This phenomenon continues to be particularly relevant in the current environment, owing to the need for private sector deleverage and implementation of fiscal consolidation measures designed to ensure the sustainability of the public accounts. Such processes will have negative consequences on economic growth in the near future and will imply a greater materialisation of credit risk.

This box aims to provide a comparison between defaulting and non-defaulting companies in 2009, taking into consideration a collection of corporate characteristics, such as profitability, financing and activity, assessed in December 2008. The same analysis has also been performed for the more representative economic sectors: construction and real estate activities, trade and manufacturing. The referred to characteristics enabled the identification of groups of companies that had a more evident contribution to the increase of overdue credit in bank portfolios in 2009.

Characterisation of companies by default status in 2009

The analysis contained in this box is based on information from the Central Credit Register and the Central Balance Sheet Database. It should be noted that, starting 2006, the Central Balance Sheet Database is based on information of companies provided under the IES (Simplified Corporate Information) scheme. The Central Balance Sheet Database therefore includes information on more than 350 thousand non-financial corporations operating in Portugal.¹ In this box, a company is considered to be in default if it has missed three or more consecutive monthly payments over the course of 2009.

In comparison with non-defaulting companies, defaulting companies in 2009 have displayed significant differences in terms of their economic-financial situation in December 2008, assessed on the median value of a collection of indicators. As expected, defaulting companies had lower profitability levels (see Table 1).² It is also these companies which are more heavily leveraged and which face higher financing costs, which could well be a reflection of price adjustments to the credit risk of such exposures. Although this evidence is transversal to the different economic sectors under analysis, reference should be made to the fact that there is less heterogeneity for companies in the construction and real estate activities sector in terms of the median value of the indicators. As regards the maturity of the debt, non-defaulting companies had a higher percentage of short term to total liabilities. In terms of the number of companies with lines of credit available, around 50 per cent of the companies in each group had authorised overdraft facilities. However, for companies with this type of financing available,

⁽¹⁾ Although including the majority of firms operating in Portugal, notice that the Central Balance Sheet Database does not have information for some firms in the Central Credit Register.

⁽²⁾ Median equality tests were performed on all of the variables for the companies as a whole. For all variables, except debt maturity, the null hypothesis of median equality between the two groups of companies was rejected with a confidence level of 1 per cent. In the case of the variable which measures debt maturity, the hypothesis of median equality was rejected with a confidence level of 5 per cent.

Table 1

CHARACTERISATION OF COMPANIES IN DECEMBER 2008 BY THE EXISTENCE OF DEFAULT IN 2009 Median values for each set of companies

			Of which:					
	TO	TOTAL		acturing	Construe real estate	ction and e activities	Tra	ade
Existence of default in 2009:	No default	Default	No default	Default	No default	Default	No default	Default
Profitability								
ROI (%)	4.8	0.0	5.5	0.6	4.1	1.9	4.9	-1.2
Return on sales (%)	3.1	0.1	3.4	0.3	2.1	-2.2	4.7	4.0
Financing								
Solvency (%)	32.7	12.6	33.8	12.4	31.7	15.7	30.2	9.3
Financing costs (%)	6.7	7.3	7.2	8.7	6.2	6.8	7.1	7.8
Short term liabilities / liabilities (%)	80.0	79.0	78.6	79.3	73.0	71.8	87.0	84.6
Credit lines / bank loans $(\%)^{(a)}$	15.9	5.9	10.4	4.0	20.7	7.1	16.5	6.0
Other								
Sales growth (%)	2	-12	2	-12	0	-20	0	-16
Average inventory period (in days)	62	110	51	87	198	350	76	132
Average collection period (in days)	84	114	100	126	91	134	72	105
Average payment period (in days)	73	149	98	183	84	177	85	162
Exports / sales (%) ^(a)	9	18	14	17	20	43	3	6
Tangible assets / assets (%) ^(a)	23	21	27	28	12	9	16	17
Dimension - assets (in In)	12.4	12.6	12.8	12.9	12.9	13.2	12.5	12.4
Dimension - sales (in In)	12.3	12.1	12.8	12.5	12.3	12.3	12.7	12.1
Credit (% of total)	83	17	12	3	31	8	13	2
Number of companies (% of total)	87	13	12	2	18	3	26	3

Source: Banco de Portugal (Central Balance Sheet Database and Central Credit Register).

Notes: Only indebted companies upon which information was available in the Central Balance Sheet Database, in December 2008, were considered. A company was considered to be in default if missing three or more consecutive monthly payments over the course of 2009. ROI is defined by the ratio between current income and interest paid as a percentage of shareholders' equity and financial debt, with median ROI values only being calculated for companies with positive values for the sum of their shareholders' equity and financial debt. Return on sales is defined by the ratio of income before interest and taxes as a percentage of sales. The solvency ratio is defined by the value of shareholders' equity as a percentage of total assets. (a) Only considering companies with non-null lines of credit, exports, or tangible assets, for the corresponding indicators.

the amount of the line of credit (as a percentage of bank loans) was lower in companies that defaulted in 2009. Manufacturing companies had the lowest median values for the amounts of their lines of credit.

Defaulting companies in 2009 had a lower sales growth rate in 2008, showing a negative median growth rate. This group of companies also took longer to pay their suppliers, provided their customers with longer payment periods and maintained higher average inventory levels. The sudden drop in the level of economic activity in the fourth quarter of 2008, following the bankruptcy of the Lehman Brothers investment bank, may have represented an unexpected drop in sales for defaulting companies in 2009, fuelling an increase in stocks. This evolution, together with a longer period for receiving payments from their customers, were contributory factors for such companies finding themselves in a more difficult financial situation in December 2008. Sales policies associated with extended credit terms to customers may, therefore, have led to definitive non-performing loans and liquidity problems in a context of difficulties in access to formal credit, such as bank loans.

As regards the number of companies participating in foreign markets in 2008, no distinction was made between firms that defaulted and not defaulted in 2009, as around 20 per cent of the companies in each of the groups were exporters. In general, the percentage of companies participating in foreign markets is higher for manufacturing firms, which would be expected owing to the type of their final product. Taking only exporting companies into account, it was noted that defaulting companies in 2009 had a higher proportion of exports in their turnover and could have been more affected by the drop in international demand noted in recent times.³

The differences between defaulting and non-defaulting companies in 2009 can also be seen on the composition of their assets, in which the former companies had lower levels of tangible assets. If asset value is considered as a proxy for a company's size, the median value of the size of defaulting companies is higher.

Analysis of contributions to the increase of overdue credit in 2009

Starting 2008, a substantial increase in overdue credit in bank portfolios was witnessed. This was particularly associated with a greater materialisation of credit risk, as the effect of the increase in credit was negligible.⁴ This was particularly evident in 2009 owing to the marked deceleration in the growth rate of credit to non-financial corporations. This analysis therefore endeavours to identify the group of companies associated with the largest increase in overdue credit in bank portfolios, omitting the effect of credit growth rate. The identification of the characteristics of defaulting and non-defaulting companies realised beforehand is the reason for an analysis in which, for the distribution of each indicator, the companies making the largest contribution to the increase in the overdue credit in 2009 are identified.

The analysis reveals similarities between the different economic sectors analysed, although there are several differences in respect of companies in the construction and real estate activities sector. The increase in overdue credit in bank portfolios in 2009 was mainly originated by the companies which in 2008 were in the first quartile of profitability, solvency and growth rate of sales (see Chart 1). This increase derives mainly from the deterioration in the default ratios of the companies in the first quartile, to the extent that the credit extended to these firms is not comparatively higher than that of other categories. In relation to trade and manufacturing sectors, the least profitable companies (as well as with the lowest solvency and sales growth rates) are responsible for more than half of the change in overdue credit in bank portfolios. The exception refers to companies in the construction and real estate activities sector in the second quartile of the ROI, which is justified by the high proportion of loans to such companies. The increase in overdue credit in bank portfolios does not appear to be solely associated with companies with higher debt costs, being this effect more evident in the construction and real estate activities sector. The larger companies (i.e. in the last quartile of the distribution of the volume of sales) are responsible for most of the increase in overdue credit, with the largest companies in the trade and manufacturing sectors being responsible for around 90 per cent of this increase, which is associated with the high volume of credit concentration in such companies. Reference should, lastly, be made to the fact that companies which are, at the same time in the first quartiles of ROI, solvency and sales growth rate, and which comprise around 3 per cent of the companies in the sample, are responsible for around 20 per cent of the change in the overdue credit, a value significantly lower than noted in Chart 1 for each variable in isolation (except for the ROI variable for companies in the construction and real estate activities sector). The results set out in this box stress the importance of the study of the indicators shown as well as the interaction between them, notably through a multivariate analysis, to characterise companies based on their default status. Moreover, this analysis is also relevant from a micro prudencial perspective as some of these indicators are used in internal credit risk models for the purpose of rating corporate loans.

⁽³⁾ Only exporting companies have been considered in this analysis. If all companies were considered, the median value of the exports ratio as a percentage of sales would be null for the group of all companies and by economic sector. In this situation, the average value of this indicator would be higher for companies in the manufacturing sector. Put in other words, if, on the one hand the proportion of exporting companies in the construction and real estate activities sector is lower than in the manufacturing sector, on the other, the proportion of turnover in foreign markets is higher for exporting companies in the construction and real estate activities sector than for firms in the manufacturing sector.

⁽⁴⁾ The change in overdue credit in bank portfolios is based on the following breakdown: $\Delta INC_{t-1} = \Delta RI_{t-1}Cred_t + RI_t\Delta Cred_{t-1} + \Delta RI_{t-1}\Delta Cred_{t-1}$, in which, INC_t, RI_t and $Cred_t$ respectively designate the amount of overdue credit, the amount of overdue credit as a percentage of total credit and the amount of credit at time t. The last term of the formula is the product of the two preceding effects and is, in general, residual. Only the first term, which contributed more than 90 per cent to the total change in overdue credit was considered in this analysis.



Source: Banco de Portugal (Central Balance Sheet Database and Central Credit Register).

Notes: The identified quartiles refer to each of the indicators for each economic sector under analysis, assessed in December 2008. The economic sectors and the indicators are defined as in Table 1.

Box 4.3. Financial situation of the six major banking groups in the Portuguese banking system in the third guarter of 2010

There was a reduction in the activity of the six major Portuguese banking groups in the third quarter of 2010, in comparison to the preceding quarter, essentially reflecting the decrease in credit to customers. The profitability indicators, for the period, remained relatively stable vis-à-vis the previous quarter. In turn, the regulatory capital ratios remained globally in line with those noted in the first half of the year.

Considering the data of the six major banking groups in the Portuguese banking system¹, for the third quarter of 2010, activity measured by total assets on a consolidated basis, was down by 0.4 per cent in comparison to the end of the second quarter (year-on-year increase of 5.3 per cent; Table 1). The decrease in credit to customers portfolio, reflecting to a large extent the evolution of loans both to general government and non-financial corporations, was the essential contributory factor in this slight reduction. In the opposite direction i.e. contributing to an increase in assets, reference should be made to the increase in the available for sale financial assets portfolio, in which Portuguese public debt securities are in evidence, albeit with a lesser magnitude than in the second quarter. In the third quarter of 2010, customer resources in the form of deposits comprised the main source of financing activity. After the reduction noted in the first quarter of 2010, deposits recorded an increase in the second and, particularly, in the third quarter of the year. It should be noted that resources obtained from the Eurosystem remained virtually unchanged in comparison to the end of the second quarter of 2010.

Table 1

BALANCE SHEET OF THE SIX MAJOR BANKING GROUPS

	Structure (as a percentage of assets)			Year-on-year rates of change (per cent)					Quarterly rates of change (per cent)		
	2008	2009	2010	2009			2010		2010		
	Dec.	Dec.	Sep.	Sep.	Dec.	Mar.	Jun.	Sep.	Mar.	Jun.	Sep.
Cash and claims on central banks	2.3	3.3	1.6	-6.8	50.5	80.1	-44.6	-25.2	-15.4	-19.4	-25.1
Claims and investments in other credit institutions	5.2	5.6	4.4	-6.9	15.6	0.3	-16.7	-21.3	-4.3	-17.0	2.0
Securities, derivatives and investments	12.9	15.9	18.9	22.8	31.6	39.8	40.0	28.7	13.7	5.1	3.2
Net credit to customers	67.5	63.6	62.4	1.8	0.8	2.1	5.6	2.9	-0.2	3.8	-1.9
Securitised non-derecognised assets	6.9	6.6	7.2	34.8	3.4	-6.2	-10.7	3.8	5.9	-4.3	10.5
Tangible and intangible assets	1.1	1.0	0.9	29.9	-3.8	-0.8	0.2	-24.6	0.8	0.4	-3.3
Other assets	4.1	4.1	4.6	14.7	7.7	18.0	28.4	21.7	9.2	5.8	0.0
Total assets	100.0	100.0	100.0	6.5	7.1	8.4	6.6	5.3	2.1	1.8	-0.4
Resources from central banks	3.2	3.8	9.6	28.2	25.1	147.1	263.5	272.8	6.5	145.6	0.4
Resources from other credit institutions	7.6	7.3	7.1	-1.8	4.1	-3.1	1.5	-1.3	7.9	-2.6	-4.7
Resources from customers and other loans	48.1	45.1	45.9	3.2	0.3	0.8	0.5	7.6	-0.8	1.0	5.2
Liabilities represented by securities	24.2	27.4	21.4	11.5	21.4	19.0	-4.6	-18.7	3.1	-13.4	-9.4
Subordinated liabilities	2.7	2.5	2.2	-1.8	-2.3	-2.4	-12.3	-10.5	-3.7	-4.3	-0.5
Other liabilities	8.2	7.0	7.0	2.0	-7.9	-7.0	-0.5	-2.9	8.9	-0.9	-4.8
Capital	6.0	6.9	6.7	22.3	23.3	26.6	7.9	3.2	3.0	-4.6	2.6
Total liabilities and capital	100.0	100.0	100.0	6.5	7.1	8.4	6.6	5.3	2.1	1.8	-0.4
Memo:											
Credit to customers including non-derecognised securitisation operations	75.8	71.9	71.4	4.7	1.6	1.5	4.2	3.3	0.3	3.2	-0.7

Source: Banco de Portugal.

(1) The total assets of the six major banking groups analysed in this box (Caixa Geral de Depósitos, Espírito Santo Financial Group, Millennium BCP, Banco Português de Investimento, Banco Santander Totta and Caixa Económica Montepio Geral) represented around 78 per cent of Portuguese banking system assets in December 2009. Income before tax and minority interests for the institutions under analysis in the third quarter of 2010 were down in comparison to the results for the same period 2009, implying a reduction in profitably indicators (Table 2 and Chart 1). The containment of operating costs and decrease in provisions and impairment losses, in comparison to the same period of the preceding year, were not sufficient to offset the reduction in gross income which essentially reflected the evolution of net interest income (Chart 2). It should be noted that in comparison to the second quarter of 2010 the profitability indicators have remained relatively stable, in line with the increase in net interest income noted since the first quarter of 2010. This increase benefited from a recomposition of the

Table 2

PROFIT AND LOSS ACCOUNT OF THE SIX MAJOR BANKING GROUPS On a consolidated basis

	Structure (as a percentage of average assets) ^(a)					Year-on-year rates of change (per cent)					
	20	09		2010		2009		2010			
	Sep.	Dec.	Mar.	Jun.	Sep.	Sep.	Dec.	Mar.	Jun.	Sep.	
Net interest income	1.57	1.49	1.30	1.33	1.38	-7.0	-12.6	-22.1	-14.5	-6.4	
Income (net) from services and commissions	0.67	0.68	0.70	0.70	0.71	2.9	4.4	13.8	13.2	13.0	
Income from financial operations	0.36	0.38	0.36	0.33	0.27	114.2	35.3	-2.7	7.1	-17.9	
Other income	0.13	0.12	0.08	0.15	0.16	-34.5	-24.1	-35.2	0.1	34.2	
Gross income	2.73	2.67	2.45	2.52	2.52	0.9	-4.5	-12.3	-4.6	-1.2	
Operating costs	1.46	1.46	1.35	1.38	1.39	0.5	-0.6	-2.6	1.4	1.8	
Provisions and impairment	0.63	0.65	0.46	0.62	0.64	-0.9	-8.1	-24.0	1.8	9.9	
Of which: associated with credit to customers	0.50	0.51	0.37	0.50	0.46	41.9	19.6	-25.2	-2.9	-1.1	
Consolidation differences and appropriation of income	-0.03	-0.04	-0.04	-0.05	-0.06	3.1	-	-	-	-	
Income before tax and minority interests	0.67	0.61	0.68	0.57	0.55	3.6	-0.6	-10.5	-14.8	-12.7	
Income tax on profit	0.12	0.09	0.11	0.05	0.06	-2.4	-30.6	-32.4	-54.7	-47.4	
Income before minority interests	0.55	0.52	0.57	0.52	0.49	4.9	7.1	-4.3	-6.9	-5.4	
Minority interests	0.14	0.15	0.16	0.17	0.17	-0.5	28.3	28.8	20.6	32.6	
Net income	0.41	0.37	0.41	0.35	0.31	6.9	0.3	-13.0	-16.0	-18.4	

Source: Banco de Portugal.

Note: (a) Quarterly data have been annualised.

Chart 1



Source: Banco de Portugal.

Note: Quarterly data have been annualised. Indicators calculated on income before tax and minority interests.

financing of the banking groups under analysis, i.e. additional recourse to Eurosystem financing as opposed to the international wholesale debt markets, which is typically more expensive.

As regards capital adequacy, in September 2010, the own funds adequacy ratios of the institutions under analysis remained globally in line with those noted at the end of the first half of the year (Table 3). In year-on-year terms, the capital ratios were more reduced, essentially reflecting the increase in deductions from total own funds made by one of the banking groups under analysis and a reduction of additional own funds by two other groups. A particularly important contribution was made by the decrease in subordinated liabilities eligible as capital. It should, however, be noted that none of these factors affects the value of original own funds.

Chart 2



Source: Banco de Portugal.

Table 3

OWN FUNDS ADEQUACY OF THE SIX MAJOR BANKING GROUPS On a consolidated basis

	2009			2010				
	Sep.	Dec.	Mar.	Jun.	Sep.			
1. Own funds	29 810	30 735	30 968	28 698	28 411			
1.1. Original own funds	23 010	23 060	23 648	22 717	22 858			
1.2. Additional own funds	8 000	7 995	7 704	7 508	7 365			
1.3. Deductions from total own funds	-1 201	- 320	- 384	-1 527	-1 811			
2. Capital requirements	20 907	21 377	21 514	21 336	21 541			
3. Ratios (per cent)								
3.1. Overall own funds adequacy ratio	11.4	11.5	11.5	10.8	10.6			
3.2. Original own funds adequacy ratio	8.8	8.6	8.8	8.5	8.5			

Source: Banco de Portugal.



PART II – ARTICLES

Inter-sector relations in the Portuguese economy: an application of contingent claim analysis

Household credit delinquency: does the borrowers' indebtedness profile play a role?

Access to bank credit after corporate default

INTER-SECTOR RELATIONS IN THE PORTUGUESE ECONOMY: AN APPLICATION OF CONTINGENT CLAIM ANALYSIS

Nuno Silva*

1. INTRODUCTION**

Financial crises are relatively rare events. However, when they occur, they imply very high costs both in terms of economic activity in the short run and long term economic growth. In particular, the financial crisis that began in 2007 has had strong consequences on global economic activity, justifying the definition of new policies targeting the implementation of a more transparent international financial architecture, where the dominant micro-prudential vision is complemented by a broader approach. In this context, it is most important to understand the mechanisms underlying the outbreak of systemic risk. In particular, financial stability analysis needs to address the interconnections between all players in the economy. As long as these inter-linkages constitute the main channels through which shocks are propagated, understanding them can help to detect the mechanics behind shock transmission and systemic risk.

Traditionally, the literature in financial stability focuses either on financial institutions *per se* or on the relations among them. More recently, this analysis has been extended to the private non-financial and public sectors. Examples are the works of Gray (1999), Setser, Allen, Keller, Rosenberg and Roubini (2002), Gapen, Gray, Lim and Xiao (2004, 2008) and Gray (2008). These studies rely on the identification of unstable positions in sector balance-sheets. However, by focusing their analysis on emerging markets crises, especially those in Southeast Asia (1997) and Brazil (2002), these studies lack some generality as they concentrate on economies subject to currency risk. Thus, these crises should not be taken as example for countries that have most of their activity concentrated in their own currency, as is the case with countries in the euro area and the US. The last three articles stand out from the first two by incorporating contingent claim analysis as developed by Merton (1974) following the work of Black and Scholes (1973). Unlike other approaches that rely either on accounting or macroeconomic analysis, Merton's model (as it is also known) takes into account markets uncertainty and the nonlinearities intrinsic to debt valuation. The model leads to a set of objective metrics that are easy to calculate and interpret. However, none of these articles have a global view on the economy and the transmission mechanism across sectors.

Broadening the scope of the analysis, Gray, Merton and Bodie (2007) proposed to apply Merton's

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model to an economy composed of five sectors, which are seen as a set of balance sheets interrelated by equity and implicit guarantees on debt payments. However, there are still few empirical applications. Recently, Castrén and Kavonius (2009) developed a network of bilateral relations for the main sectors of the euro area. Once built, this network introduces the nonlinearities common in risk transmission mechanisms through contingent claim analysis. This study broadly follows the latter. However, two major changes are introduced, namely, losses (or gains) related with credit risk are taken into account and households' real estate assets are included in their balance sheets.

This study is composed of 7 sections. Section 2 presents the data. Section 3 builds a network of bilateral relations within the Portuguese economy and explains the shock transmission system. Section 4 presents the Merton model and applies it to the Portuguese economy. Section 5 proceeds with the simulation of two shocks based on the transmission model presented in section 3, namely, a sudden loss on non-financial corporations equity and an increase in credit impairment. Section 6 discusses the limitations of the analysis. Section 7 concludes.

2. THE DATA

The data used in this study corresponds to the Portuguese non-consolidated national financial accounts compiled and published quarterly by Banco de Portugal. These accounts are a synthetic representation of the financial structure of the economy. This data is broadly organized in matrix form with eight sectors (non-financial corporations, central bank, other monetary financial institutions, other financial intermediaries, insurance companies and pension funds, general government, households and the rest of world)¹ and seven types of financial instruments (monetary gold and special drawing rights, currency and deposits, securities other than shares, loans, shares, insurance and other accounts receivable). Monetary gold and special drawing rights were excluded from the analysis since they have no counterparty sector.² In order to simplify the exposition, shares and insurance were joined.³ All transactions are recorded in accordance with the double entry principle. In practice, all assets have a counterparty liability. This generates a closed system useful for studying shock propagation channels. Given its matrix form, this allows not only to assess the role of the financial sector as an intermediary in the economy, but also estimate each sector leverage ratio, which is an important resilience indicator. In addition, it is possible to determine the net financial position of resident sectors in relation with the rest of the world, revealing their degree of immunity to external shocks. Unfortunately, this data does not have any information on the real side of the economy. For instance, household real estate assets and non-financial corporations capital stock are not taken into account.

Chart 1 breaks down each sector balance-sheet instrument-by-instrument for the fourth quarter of

⁽¹⁾ The acronyms OMFI, OFI and INS will be henceforth used to refer to other monetary financial institutions, other financial intermediaries and insurance companies and pension funds, respectively. Non-financial corporations, general government and the rest of the world appear in charts as NFC, GOV and RoW, respectively.

⁽²⁾ This instrument is however considered to calculate central bank's equity under the contingent claim analysis model.

⁽³⁾ In order to facilitate exposition, these instruments shall be henceforth referred only as "deposits", "debt", "loans", "shares" and "other".

Chart 1


2009.⁴ Based on each sector net financial position, one can distinguish three types of sectors. Nonfinancial corporations and the general government have a negative net financial position. Regarding non-financial firms, this is mostly due to their relatively large capital stock, while for the general government it should roughly reflect the consecutive budget deficits incurred. On the other side, households and the rest of the world show a largely positive net financial position, which in the latter case corresponds to the accumulation of successive balance of payments deficits. Finally, all financial institutions (central bank, OMFI, OFI and INS) have a relatively balanced financial position. Among financial institutions the high value of assets and liabilities of OMFI reflects their role as financial intermediaries in the economy.

On an instrument basis, for all sectors but financial institutions, the asset side of the balance sheet consists broadly of "deposits" and "shares". In addition, non-financial corporations have some of their assets invested in "other" and "loans", which should correspond mainly to trade credit. The rest of the world has also an important part of its assets invested in "debt".⁵ In contrast, financial institutions assets correspond mostly to "loans" (OMFI and OFI) and "debt" (INS)⁶. The central bank has its assets spread between "debt" and "deposits". Liability positions vary widely among sectors. For non-financial corporations, they correspond mostly to "shares" issued and "loans" from financial institutions. Among financial institutions, one can find very different situations. While the central bank and OMFI liabilities correspond mostly to "deposits" and to a lesser extent "debt", OFI liabilities are largely composed by "shares". Regarding the central bank, notice that the value assigned to "deposits" refers largely to liabilities under the TARGET payment system. General government liabilities correspond predominantly to "debt". Households have most of their liabilities under mortgage "loans". Finally, the rest of the world has its liabilities spread between "debt", "deposits" and "shares".

Table 1 shows each sector net financial position, i.e. the difference between financial assets and financial liabilities. The data is shown as a percentage of total financial assets of the economy for

Table 1

SECTOR NET F PERCENTAGE FINANCIAL ASS	INANCIAL POSITIC OF THE ECONOMY ETS IN 2009 Q4	DN IN /'S TOTAL
	Portugal	Euro area
NFC	-13.8%	-8.4%
Central Bank	-0.5%	-0.3%
OMFI	0.8	0.7%
OFI	-1%	0%
INS	0.1%	0.1%
GOV	-4.5%	-4.6%
Households	9.9%	11.1%
RoW	9%	1.6%

Sources: ECB and Banco de Portugal (National Financial Accounts).

(5) Regarding households, notice that 40% of their investments in "shares" correspond to their positions in insurance companies and pension funds.

⁽⁴⁾ In order to facilitate the analysis developed in Section 4, "shares" of non-listed companies have been adjusted to reflect price movements in financial markets.

⁽⁶⁾ Notice that most of OFI "loans" correspond to long term loans to OMFI as counterpart of credit securitizations.

the fourth quarter of 2009.⁷ The results obtained are very similar to those presented by Castrén and Kavonius (2009) for the euro area. The exceptions are non-financial corporations, which have a more negative position as compared with the euro area, and the rest of the world, which shows a more positive position. However, in this case the numbers are not comparable, since euro area values do not correspond to country averages, but the rest of the world position regarding the whole euro area.

3. THE SHOCK TRANSMISSION MECHANISM

Inter-sector exposure plays an essential role in the way shocks are transmitted in the economy. Unfortunately, for instruments other than "deposits" and "loans", national financial accounts do not contain information on bilateral balance sheet positions (also known as who-to-whom accounts). Nevertheless, these can be estimated through maximum entropy as done in several studies on the interbank loans market (e.g. Sheldon and Maurer (1998), Upper and Worms (2004) and Wells (2004)).⁸ Castrén and Kavonius (2009) also use this methodology.

Consider that bilateral balance sheet positions between two sectors in a given instrument k can be represented by a $N \times N$ matrix where N represents the number of sectors and x_{ij}^k the exposure of sector i to sector j in instrument k:

$$\begin{bmatrix} x_{11} & \cdots & x_{1j} & \cdots & x_{1N} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ x_{i1} & \cdots & x_{ij} & \cdots & x_{iN} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ x_{N1} & \cdots & x_{Nj} & \cdots & x_{NN} \end{bmatrix}^{k} \text{ with } \sum_{j=1}^{N} x_{ij}^{k} = a_{i}^{k} \text{ and } \sum_{i=1}^{N} x_{ij}^{k} = l_{j}^{k} \quad (1)$$

In this case, a_i^k and l_j^k correspond to total assets and total liabilities of sector i and j in instrument k, respectively.

In addition, consider that a_i^k and l_j^k may be seen as the components of $f^k(a)$ and $f^k(l)$, the marginal distributions of assets and liabilities, respectively, and that x_{ij}^k is the realization of the joint distribution $f^k(a, l)$. Assuming independence, or maximum entropy, it comes that x_{ij}^k can be estimated as the product of the two marginal distributions. In order to improve results, two restrictions were imposed a posteriori: intra-rest of the world positions were eliminated and the central bank was considered to be entirely owned by the general government.⁹ In order to preserve equality between assets and liabilities for each instrument, the RAS algorithm was applied as described by Schneider and Zenios (1990).

Define gross exposure between two sectors as the sum of bilateral assets and liabilities across instruments. Despite simple, this measure uncovers the major inter-sector and intra-sector relations

⁽⁷⁾ In opposition to all other sections in this study, to facilitate comparison with the euro area, figures on unlisted "shares" were not adjusted to reflect stock price movements. Total financial assets in the economy include financial assets from the rest of the world.

⁽⁸⁾ This estimation procedure is also frequently used in input-output analysis (see Lahr e De Mesnard (2004)).

⁽⁹⁾ Additionally, it was considered that all long-term debt issued by the central bank until the fourth quarter of 2004 was wholly owned by MFIs.

taking place in the economy. Chart 2 shows gross bilateral exposure between all sectors for the Portuguese economy in the first quarter of 2002 and the fourth quarter of 2009.¹⁰ This representation allows us to draw three conclusions. First, the financial sector plays an essential role in the economy, not only as an intermediary of financial resources but also as a large holder of "shares" and "debt" of non-financial corporations. Moreover, this role has grown steadily over the last decade. Secondly, notice the progressive interconnection of the rest of the world with all other sectors as result of the growing process of economic and financial integration at the European and global levels. Finally, one should be aware of the high intra-sector exposure both of non-financial corporations and financial institutions. For non-financial institutions, despite the strong growth shown in the graph, this may be spurious, since it is largely associated with the introduction of IAS (International Accounting Standards) in 2005, which made the securitized assets derecognition process substantially more demanding. Since securitization vehicles are included in OFI, this change in accounting standards had implications on this sector assets growth rate.

Chart 2 is a simplification of reality in the sense that it does not distinguish neither assets and liabilities nor equity and debt, which limits its use in analysing shock transmission. Nevertheless, taking these differences into account, it is possible to have a richer characterization of the financial intermediation process. In particular, we may have more insights on the shock transmission mechanism across sectors. Regarding the latter, it should be emphasized the contributions of Kiyotaki and Moore (1997, 2002), Boissay (2006), Battiston, Delli Gatti, Gallegati, Greenwald and Stiglitz (2007) and Gray *et al.* (2007) to the rationalization of these channels. Shortly, the chain transmission mechanism works as follows. Consider that financial assets held by each sector can be classified in two types: equity ("shares") and debt ("deposits", "debt", "loans" and "other"). Additionally, assume that all these







(10) In order to simplify the analysis, the central bank, OMFI, OFI and INS were all joined in a single node.

instruments are constantly valued at market prices. In this model, any shock is likely to be transmitted in either of two ways. On the one hand, equity holders of the sector that suffers the shock bear a loss (or gain) in proportion to their share. Second, given debt contingency on total assets, any shock that produce changes in debt's quality also generate immediate losses (gains) to those sectors that hold this type of assets. These losses must be then distributed across all sectors that hold equity from those sectors that have previously registered losses and so on until the shock is totally dissipated. Note however that, in theory, nothing ensures that the shock is dissipated before any sector has disappeared due to exhaustion of its equity base. When this happens it is said that the shock does not converge.

In order to better understand the transmission mechanism, consider an iterative system where losses related to any of these routes are calculated and distributed at the end of each iteration. Thus, each sector assumes not only losses corresponding to the sum of products between its exposure to the equity of each loss-registering sector and their losses but also the sum of the products between its debt exposure to each loss-registering sector and the losses caused by the deterioration of its debt quality.¹¹ Denominate each of these outcomes as effect 1 and effect 2, respectively. These effects have two very different economic interpretations. While effect 1 corresponds to losses actually incurred by each sector, effect 2 considers creditors' expected losses as the result of changes in borrowers' likelihood of default and losses given default. In the absence of credit risk, i.e. assuming that all economic agents are going to fulfil their contractual responsibilities, effect 2 is not present. As regards the shock transmission mechanism presented, and unlike losses related to equity holdings (effect 1), which are easy to infer based on previous iterations, losses related with changes in debt quality (effect 2) require the adoption of a debt pricing model. Section 4 presents contingent claim analysis as a way of quantifying these losses.

4. CONTINGENT CLAIM ANALYSIS

4.1. The model

Contingent claim analysis appeals to Merton's model (1974) to assess the creditworthiness of a debt issuer, which we will call the "firm", but which could be a whole economic sector. Consider a firm that issues debt at a given time with a certain maturity. The question that arises is whether the firm has enough assets to honour its obligations at maturity. The firm will honour its commitments if the value of its assets exceed, at maturity, its debt. If not, the firm declares bankruptcy and all assets are liquidated to creditors. The negative difference between assets and liabilities will then be debt holders' losses. Deciding on whether or not to pay back debt at maturity is very similar to exercising a call option. In this context, the option holder will buy the underlying asset if its market price at maturity exceeds the strike price. Otherwise, the call option is not exercised. In our case, the underlying asset that the market value of debt should be equal to its face value discounted by a risk-free interest rate

(11) Note that since our analysis use non-consolidated data, a particular sector may keep building up further losses inside it. Hypothetically, in an extreme case, if the whole equity of a given sector was held by the sector itself, it would generate a cycle that invariably would end in its own destruction.

less the value of a put option on the firm. That is, in the absence of arbitrage opportunities, investors should be indifferent between taking an amount of riskless debt, or take the same amount at risk but ensuring that, in case of non-repayment, they can recover the difference between what they have received (the asset value of the firm) and what they should have received (debt repayment). This is achieved through the put option. In practice, knowing a firm's equity market value, the volatility of its equity returns, its nominal debt and the risk-free interest rate, one can use contingent claim analysis to calculate a series of risk measures, namely the distance to distress, the probability of default and the ex-ante expected loss.

Consider that A, B and E correspond respectively to assets, debt and equity market value for a given firm or sector. If there are no market frictions and assuming all assets are liquid in maturity, we have that

$$A = E + B \tag{2}$$

i.e. the market value of equity should equal the difference between assets and the market value of the risky debt. Suppose that A follows a stochastic diffusion process with a deterministic trend governed by the risk-free return. Consider that at t = 0, the firm issues zero coupon bonds with nominal value B_T amounting to all its liabilities. This firm is bankrupted if the value of its assets, A, is lower than B_T at maturity.

It follows that, in accordance with option pricing theory, the equity market value of the firm, E, equals an European call option on the underlying assets, A, with maturity t = T and strike price equal to its nominal debt, B_T . Applying Itô's lemma, imposing no-arbitrage and frontier conditions equivalent to a call option, and defining $\tau = T - t$, one can obtain the following equation for E,

$$E = A\Phi(d_1) - B_T e^{-r\tau} \Phi(d_2) \tag{3}$$

where

$$d_1 = \frac{\ln \frac{A}{B_T} + (r + \frac{1}{2})\tau}{\sigma_A \sqrt{\tau}} \tag{4}$$

$$d_2 = \frac{\ln \frac{A}{B_T} + (r - \frac{1}{2})\tau}{\sigma_A \sqrt{\tau}}$$
(5)

In the above equations σ_A stands for the volatility of asset returns, r is the risk-free interest rate, which we considered to be constant, τ is the time interval up to maturity and Φ is the standardized cumulative normal function. Equation (3) has a simple interpretation. The first term evaluates assets weighted by a coefficient related to the probability of the call option being exercised; the second term weights the discounted nominal debt by a coefficient slightly smaller given that losses are limited.

In turn, the put option value, P , can be calculated as

$$P = e^{-r \tau} B_{\tau} + E - A \tag{6}$$

In a risk-free world P = 0 and asset value equals equity plus nominal debt discounted at the risk-free rate.

Equation (3) has two unknowns, A and σ_A . In order to obtain their value one needs to impose a second condition. One possibility is to say that E also follows a geometric Brownian motion but with different parameters than A.

Applying Itô's lemma and equating the volatility terms, we obtain

$$E\sigma_{E} = A\sigma_{A}\Phi(d_{1}) \tag{7}$$

where $\sigma_{\scriptscriptstyle E}$ is the volatility of equity returns.

Solving the system composed of equation (3) and (7) at each point in time, it is possible to obtain a time series for A and σ_A .¹² Substituting A and E into equation (2), we can then find B and calculate the distance to distress, d_2 , the probability of default, $\Phi(-d_2)$, and the expected losses, P.

4.2. Application to the whole economy

The model presented so far was designed to be applied to listed firms for which information on market value and volatility of equity returns is widely available. The application of contingent claim analysis to economic sectors, though possible, requires several assumptions regarding the definition of equity and the volatility of equity returns. In sight of this, one can broadly distinguish two groups of sectors. On the one hand, we have those sectors that issue "shares", some of them are even listed in stock exchanges. This applies to non-financial corporations, OMFI, OFI and INS¹³. For these sectors, as suggested by Gray et al. (2007), it makes sense to think that unlisted "shares", if listed, would follow a trend similar to those that are effectively listed. Nevertheless, the way this behaviour is actually reproduced is not clear. In this study, unlisted "shares" value were estimated as the exponential of the sum of the logarithm of unlisted "shares" with the logarithmic distance of listed "shares" to their trend. We have calculated a different trend for each sector. As already mentioned, our data already incorporates this adjustment. Thus, non-financial corporations, OMFI, OFI and INS equity were estimated assuming that their "shares" are equivalent to call options on their assets with exercise price equal to their liabilities. For the volatility of equity returns, we used the volatility of the PSI-20 and the PSI-Financial Services for non-financial corporations and OMFI, respectively, and the volatility of German 10-year bond yields for OFI and INS. For the central bank, though it issues "shares", which are fully owned by the general government, there is no index to compare. Thus, we chose to define central bank's equity

(12) Note that, unlike the original Black and Scholes (1973) model, the hypothesis of stationarity of σ_A is neglected when solving this system. (13) For INS most of its "shares" refer to household's net equity on pension funds. as its net welth position, which includes monetary gold and special drawing rights. This had been excluded from who-to-whom accounts since it had no counterparty sector. The volatility of Portuguese 10-year bond yields was used as a proxy for the volatility of equity returns of the central bank.

For those sectors that do not issue "shares", the situation turns harder. This is the case for the general government, households and the rest of the world. Among these, the general government is probably the most difficult case since it generally has a negative net financial position. Some authors such as Sims (1999), Keller, Kunzel and Souto (2007), Gray et al (2007), Gray (2008) and Gapen et al (2008) suggested that general government assets could be estimated based on the different priority levels of its liabilities. However, none of the several options proposed is consensual. A first hypothesis is to consider that the general government also includes the central bank. In this case, its assets would be largely made up of international currency reserves, future tax revenues and all types of real and financial assets held by the general government. Similarly, liabilities would be composed by the monetary base, the sum of future expenses and all sorts of liabilities, either in national or foreign currency. However, unlike liabilities in national currency, which are easier to control either by printing money or normatively, i.e. imposing credit restructuring; liabilities towards the rest of the world may require the acquisition of foreign currency. This leads these authors to compare national currency denominated liabilities to firm's equity. Thus, in the same way firm's equity grows according to its performance, domestic currency debt changes in value according to some exchange rate which reflects how well the economy is performing. Firm's equity devalues whenever new "shares" are issued or stock splits occur and grows whenever firms buy their own "shares". Similarly, national currencies appreciate or depreciate depending on whether the central bank issues or withdraws currency. Finally, both can serve as a buffer whenever the financial situation deteriorates. Seemingly simple, deficit monetization is usually associated with inflationary periods and lack of credibility from national institutions with consequences in the long-term growth rate of the economy. Regardless of its pros and cons, if we would follow this hypothesis and using option pricing theory, general government assets could have been calculated considering that national currency liabilities were equal to a call option on assets with an exercise price equal to foreign currency liabilities. The volatility of national currency liabilities could then be inferred from exchange rate volatility. Although interesting, this hypothesis does not make sense in the Portuguese case for three reasons. Firstly, the institutional framework of the Economic and Monetary Union (EMU) embodies monetary policy independency of the central bank. Thus, unlike firms, which are free to raise equity, the treaties governing the European Union explicitly prohibit countries participating in the euro area and, in general, all European Union states, to resort to deficit monetization. Second, most public debt in euro area states is denominated in Euros. Thus, euro area countries liabilities would be almost negligible according to the application of the criteria explained above, which would distort our conclusions. Finally, though euro area countries have most of their liabilities denominated in their own currency, each of them has little power to influence monetary policy, which again contradicts the previous arguments for defining the prioritization of liabilities.

A second alternative proposed by Castrén and Kavonius (2009) is to consider general government equity as the sum of its net financial position plus "debt", which is usually quoted in the market. This

method explores the fact that non mark-to-market liabilities have, at least theoretically, to be paid at face value while mark-to-market liabilities can be obtained at below par in secondary markets. Since most countries liabilities correspond to quoted debt, this method solves the equity definition problem. Nevertheless, it should be noted that in this case, equity would be greater, the greater the proportion of assets financed by "debt". Ultimately, this situation would mean that a country able to securitize all its liabilities would never default.

Finally, one may consider that liabilities in the hands of non-resident economic agents have priority over all other liabilities. The argument is that if a default would occur, resident economic agents would have to be more flexible. This rationale seems to be more suitable to the Portuguese case. For Portugal, unlike the euro area as a whole, where most liabilities are financed by residents in the euro area, liabilities are mainly held by non-residents. Although we have followed this principle, we recognize that this is not immune to criticism. Thus, from a legal standpoint it is difficult to justify the fact that there are two securities with similar rights where one is being fulfilled and the other is not. It may also be argued that one needs only one security to enter in default in order to all others being considered automatically in default. In spite of these critics, applying option pricing theory, general government assets can be estimated using the volatility of Portuguese 10-year government bond yields as a proxy for risk.

For the remaining two sectors, although they do not issue "shares", they have a positive net worth, which eases the analysis. For households, it was considered that their net worth amounts to their real estate holdings plus their net financial position. Risk-adjusted assets could then be estimated considering households' net worth as equivalent to a call option on their assets with an exercise price equal to their liabilities.¹⁴ Similar to Castrén and Kavonius (2009), we used the volatility on 10-year national bond yields as a risk indicator. The rest of the world has a residual role in this model. Their inclusion is though necessary to close the financial system and to transmit shocks to other sectors. Therefore, it was considered that its net worth amounts to a call option on its assets with an exercise price corresponding to its financial liabilities. The VStoxx was used as a risk indicator.¹⁵

Based on these definitions, and assuming that each sector liabilities equal the sum of its short-term liabilities plus 50% of its long-term liabilities; we have applied contingent claim analysis to the Portuguese economy.¹⁶ Chart 3 shows assets, the volatility of asset returns, the distance to distress and the leverage ratio for non-financial corporations, OMFI, OFI, the general government and households.

Broadly, one can find two very different patterns: before and after the mid-2007 financial crisis. Thus, the period between January 2002 and June 2007 is characterized by a very substantial increase in assets for all sectors, especially OFI, whose assets grew 138%.¹⁷ On the other hand, households had the slowest growth (27%). This increase in assets led to a decrease in leverage ratios for all

⁽¹⁴⁾ For a more detailed analysis of the method used to estimate households' real estate assets see Cardoso, Farinha e Lameira (2008).

⁽¹⁵⁾ VStoxx is an implicit volatility measure based on the Dow Jones Eurosotxx 50.

⁽¹⁶⁾ Notice that the value used for nominal debt corresponds to the standard in the literature in contingent claim analysis, which is based on the idea that in the long run firms are able of adjusting their behavior in accordance with market developments.

⁽¹⁷⁾ Note that this increase is largely motivated by the changes carried on accounting rules regarding the derecognition of securitized assets.





sectors except the general government and households whose ratios grew only 11 p.p. and 1 p.p., respectively. In turn, the period after the summer of 2007 is characterized by a strong and sudden fall in most sectors assets, namely OFI (33%), non-financial corporations (14%) and households (4%). Nevertheless, the central bank and the general government increased their assets by 98% and 31%, respectively. In the first case, this reflects the non-conventional monetary policy measures implemented by the European Central Bank. The large decline in asset prices also had impact on sector leverage ratios (debt to assets). The largest increases were observed for non-financial corporations (12 p.p.), OMFI (8 p.p.) and OFI (8 p.p.). Similar to other indicators, the volatility of asset returns and the distance to distress also show a different behaviour before and after the financial crisis. Thus, the volatility of asset returns has an oscillating behaviour around relatively low values until the second quarter of 2007, when it has a strong and sudden rise. Likewise, the distance to distress evolves in accordance with assets and their volatility. It shows very high values for most of the sample, dropping dramatically after 2007. OMFI shows the lowest values for this indicator. The 2003 recession is also peculiar in terms of the volatility of asset returns and the distance to distress.

Source: Author's calculations.

5. SIMULATION

In order to evaluate the iterative scheme presented in section 3 we defined two shocks. The first shock is a decrease in non-financial corporations growth perspectives leading to a permanent devaluation in share prices of approximately 30%. The choice of shock magnitude was based on annual return analysis (250 business days rolling windows) of the PSI-20 index between 1993 and 2010. Assuming a normal distribution, it was chosen a shock equivalent to the 10th percentile. The second shock consists of an unrecoverable loss of 1.1% in "loans" granted by OMFI to households for house purchase and a loss of 6.6% in all other "loans" granted either by OMFI, OFI and non-financial corporations to households. We will interpret this mostly as "loans" for consumption and other purposes. A 4.3% loss in "debt", "loans" and "other" granted to non-financial corporation was also assumed. This corresponds to an annual loss of 0.4%, 2.2% and 1.4% in each of these credit segments with a horizon of three years. This accounts for the persistence usually posted by credit losses. The shock magnitude was designed under the assumption of a normal distribution with expected value equal to the average annual flow of non-performing loans as a share of the total stock of credit on each segment. The values chosen correspond to the 90th percentile.

Based on the values for debt and equity estimated in Section 4 for the fourth quarter of 2009, we have simulated the impact of these shocks based on the mechanism defined in Section 3 and contingent claim analysis. Regarding the volatility of equity returns, it was considered to change according to the following function presented by Bensoussan, Crouhy, Galai, Wilkie and Dempster (1994)

$$\sigma_{E} = \overline{\sigma_{A}} \left(1 + \frac{B_{T}}{E} e^{-r\tau} \Phi(d_{2}) \right)$$
(8)

where $\overline{\sigma}_A$ corresponds to the expected value of σ_A .¹⁸ The introduction of the above function is intended to incorporate the normal increase in volatility that generally occurs after a shock. Consider the following example. Assume that non-financial corporations suffer a negative shock of 1 million Euros with impact on its equity market value. In addition consider that liabilities stand at 10 million. To simplify, assume that both equity and debt of nonfinancial corporations are equally owned by other non-financial corporations, OMFI, OFI, general government and households (20% each). Finally, consider that losses caused by this shock lead nonfinancial corporation's debt to depreciate 0.1% due to an increase in its probability of default. In this case, each of the sectors involved would have an initial total loss of 210 thousand Euros, in which 200 thousand Euros correspond to effect 1 and 10 000 Euros to effect 2. In turn, this loss would then be reflected in the shareholders of those sectors affected by these losses and so on. Effect 2 is calculated using contingent claim analysis, which takes into account each sector leverage ratio and the volatility of its equity returns.

Chart 4 shows current and accumulated losses as a proportion of initial equity for our two shocks in an iterative scheme.¹⁹ Current losses tend to zero after a few iterations signalling shock convergence.

⁽¹⁸⁾ In the current application, we used B_T , E and d_2 from the previous iteration. Similarly, $\overline{\sigma}_A$ is substituted by σ_A from the fourth quarter of 2009. Note that, as in many other applications of the Merton model, the hypothesis of constant volatility is violated.

⁽¹⁹⁾ The algorithm used in this study considers 20 iterations.

Likewise, accumulated losses converge to a value below initial equity indicating that all sectors are able to absorb the shock. For the first shock, the most affected sector is OMFI, whose equity suffers a loss of 83%. It follows non-financial corporations and the rest of the world with losses amounting to 45% and 40% of their initial equity, respectively. Overall, the shock led to a devaluation of around 18% of all financial assets in the economy (360 billion Euros). The second shock shows a slightly different transmission pattern in the sense that OMFI is affected before all other sectors. In the end, OMFI is once more the most affected sector with losses summing up to 47% of its equity. Losses in other sectors are considerably lower. In sum, the shock led to a total loss slightly above 4% of total assets (94 billion Euros).

In order to better understand the impact of credit risk in the economy we have decomposed total losses for both shocks in effect 1 and effect 2. Under this model, this can be done by assuming that the volatility of equity returns is zero for all sectors. In practice, this implies no losses associated with changes in debt's quality. Chart 5 compares total losses for the cases with and without credit risk. For the first shock, the difference between these two cases, i.e. losses that can be directly assigned to



Chart 4

credit risk sum up to 8500 million Euros, 0.35% of initial assets and only 2.3% of total losses originated by the shock. For the second shock, this figure was less than 600 million Euros, or 0.02% of initial assets and 0.6% of the total losses. We can then conclude that effect 1 is considerably greater than effect 2 for any of these two shocks. Despite this superiority, and given the nonlinearities inherent in debt valuation models, it is appropriate to examine how much is this effect for shocks of greater magnitude. Chart 6 shows the losses caused by effect 2 after 20 iterations for different shock magnitudes.

Although effect 2 is clearly smaller as compared to shock 1 for shocks of low magnitude, it seems to have an exponential behaviour. Notice that for shocks in "shares" price in excess of 35%, effect 2 tends to infinity signalling the collapse of the system. In other words, for shocks in non-financial corporations equity above 35% there is at least one sector whose equity becomes negative before all losses are dissipated, thus preventing shock convergence. As shown in Chart 4 this sector is OMFI for our two shocks. Since contingent claim analysis cannot be estimated with negative equity, the system is said to become unsolvable.

Chart 7 shows all combinations of loss rates in each credit segment that lead the system to collapse. The system seems particularly sensitive to losses on credit to non-financial corporations ("loans", "debt" and "other"). A loss of 11.5% in these instruments is sufficient to destabilize the system. In opposition, the economy appears to be quite resilient to shocks in "loans" for consumption and other purposes as it takes a loss of more than 50% on the whole exposure to this type of "loans" to drive down the system. Notwithstanding these findings, we must take two facts into account. Firstly, these figures represent final losses. Thus, assuming a loss-given-default of 50%, a final loss of 11.5% in non-financial corporations credit implies a flow of non-performing loans of 23% of the whole credit exposure to this sector. Secondly, given the high correlation between these credit segments, the greatest risk comes from the intermediate points rather than from the extreme ones. For instance, a combined shock of 3% in mortgage "loans", 13% in "loans" for consumption and other purposes and

Chart 5



DECOMPOSITION OF TOTAL LOSSES BETWEEN EFFECT 1 AND EFFECT 2



7% in credit to non-financial corporations is sufficient to lead the system to collapse.

Chart 6 and 7 illustrate a very important phenomenon in this type of networks. After a certain point the shock transmission process becomes highly nonlinear so that it becomes difficult to stop. This is consistent with the findings of Castrén and Kavonius (2009), Allen and Gale (2000), Gallegati, Greenwald, Stiglitz and Richiardi (2008) and Haldane (2009) who argue for the existence of a tipping point. Once crossed this point, all interconnections in the economy become amplification channels instead of shock absorbers. This leads Haldane (2009) to conclude that this network, though apparently robust, is extremely fragile because the boundary between stability and depression is very weak. In this model, the existence of absorbing nodes, able of receiving negative shocks and not passing them to other sectors, is essential to stop the contagion. In advanced economies, the general government is probably the sector better prepared to play this role. This happens essentially for two reasons. Firstly, since this sector does not issue "shares", it does not produce effect 1. Secondly, general government liabilities are generally considered to be of higher quality because their resources are somehow only limited by total national wealth. Thus, even in a context of financial crisis, this sector is able of raising funds imposing taxes on those who are better off, generally, households. As a consequence, the general government usually shows low volatility in equity returns. Without a credible fiscal policy, where there are no doubts on general government's ability to appeal to households to finance its expenditure, and in sight of a non convergent shock, international intervention may be needed to prevent contagion to the whole economic system.²⁰

⁽²⁰⁾ A shock is considered as non convergent if it produces sufficient losses to lead at least one sector to bankruptcy.

6. LIMITATIONS TO THE ANALYSIS

Like any other method, the model presented in this study has some limitations. The whole exercise is conditioned by contingent claim analysis own caveats, for instance the model is largely dependent, not on reality, but on markets perception of reality. The model does not sign what the market does not perceive. This is visible in cases like Enron and even on the current financial crisis, where the market had a delayed reaction. There are also other technical aspects which are often criticized. For instance, the assumption that assets follow a Brownian motion, the violation of the return on assets constant volatility assumption, and the subjectivity around the distress barrier and the horizon of the analysis.

There are also some limitations related to the degree of disaggregation of the analysis. Whenever the analysis is focused on the probability of default of a sector as a whole, we are underestimating the risks in the economy broadly for two reasons. Firstly, any analysis at the aggregate level tends to ignore the heterogeneity within each sector. For example, households have a largely positive net position. However, it is known that this wealth is unequally distributed, meaning that the risk in household's debt depends on each individual borrower. Second, when we analyze the data in aggregate we ignore what Haldane (2009) calls *small world property*. Consider, for example, that a particular economic sector makes most of its transactions with a small number of companies. The existence of this type of structure leads shocks to propagate and grow very quickly inside clusters before passing out. In other words, the existence of small worlds increases the likelihood of a local problem to swell and become global. Thus it might be useful to introduce in the model some measure correlated with the level of relational entropy within each sector.

7. CONCLUSION

This study has broadly three goals. First, it aspires to highlight the importance of inter-sector relations in the economy. In particular, it places an emphasis on the overwhelming role played by the financial system as the centre of this dense network of relations. In this context, we aimed at estimating a network of bilateral balance-sheets similar to that of Castrén and Kavonius (2009) for the euro area. The results obtained for Portugal were quite similar to those achieved for the euro area with the financial system concentrating 2/3 of all bilateral relations in the economy. Nevertheless, Portuguese non-financial corporations presented a net financial position below the euro area aggregate.

Secondly, this study sought to apply contingent claim analysis to the whole economy. The method proposed by Gray *et al.* (2007) has been adapted to the specificities of a small country belonging to the euro area. The results were in line with expectations. Assets have grown considerably until the 2007-2008 financial crises. For households and the general government, this growth has been fuelled mostly by debt, leading to an increase in leverage ratios. At the same time, the volatility of asset returns has been kept low for most of the sample, leading to high values on distance to distress. This pattern has changed suddenly in 2007 after the first rumours on the sub-prime credit crisis. Assets and distance to distress started then to decrease while the volatility of asset returns and the

leverage ratio increased steeply. The worst situation was recorded for OMFI, with the distance to distress falling to below 3, followed by non-financial corporations.

Finally, we analyzed the inter-sector shock transmission mechanism and the role played by risk both on this mechanism and on each sector solvability. We have simulated two shocks: a decrease on non-financial corporations future profits and a simultaneous loss on mortgage "loans" granted by OMFI, all other "loans" granted to households and "loans", "debt" and "other" granted to non-financial corporations. This has allowed not only to measure direct effects from loss propagation but also the nonlinear effects of the accumulation and transmission of risk in the economy. The application of both shocks to an economy with and without risk allowed us to separate both effects, leading to the conclusion that the former represent the vast majority of losses. Nevertheless, given the non-linearity associated with risk accumulation and transmission, losses related with risk should not be neglected. Depending on the shock, there is a level of losses which, once crossed, avoids the convergence of the system, leading the system to collapse. These simulations also highlight the importance of the banking system in the economy. Any shock in this sector, even if of lesser magnitude, after a certain level tends to have more impact on the overall system than a shock in any other sector. This comes both from the large exposure that all sectors have in relation with OMFI, but also from its current situation characterized by some fragility.

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HOUSEHOLD CREDIT DELINQUENCY: DOES THE BORROWERS' INDEBTEDNESS PROFILE PLAY A ROLE?*

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1. INTRODUCTION

The recent economic crisis, in a context of high households' indebtedness level, exacerbated the concerns about the debt sustainability and the short-term ability of households to honour their debt payments. In fact, over the course of more than a decade, households' indebtedness has significantly increased in most European economies. The dynamics of the increase in the households' indebted-ness reflected demand factors partly explained by the changeover to a new regime characterised by lower and less volatile interest rates. The deregulation process, that removed barriers to entry and increased market competition, affected credit supply, leading to a greater access to credit. In addition, the existence of lower transaction costs (to a large extent information costs) following the rapid technological development set the ground for the supply of new products.

This new environment promoted an intensification of households' relations with the banking system, both in terms of the frequency of utilization and the diversity of credit products. In fact, this interaction is so intense that households' shocks related to their economic conditions (e.g., transition to unemployment) are believed to be first reflected in their credit profile (e.g., their number of loans, use of credit cards, etc.) before they entry in default. In fact, prior to default, a more intense usage of the credit card, a renegotiation of credit conditions or getting into new loans, for instance, is expected to occur, delinquency being expected to occur only after these changes in the borrower credit profile. In this context, our study departs from the literature that relies on the importance of adverse conditions on employment and/or health to explain credit delinquency and focus on the indebtedness profile of households, namely the diversity of products and the nature of banking relationships. The analysis allows exploring the interactions between the different credit products and their relation with delinquency.

The empirical evidence shows that both the level and dynamics of defaults on mortgages differ significantly from those observed in consumer credit and other credit. In fact, default rates on mort-gages, which in Portugal stand for around 75 per cent of the credit granted to households, tend to be significantly lower than in other household credit segments. In order to consider this evidence, our analysis is run separately for five credit segments, namely housing credit, auto credit, credit card debt, other consumer credit and other loans. As far as we know, existent literature analyses specific

* The analyses, opinions and findings of this article represent the views of the authors, which are not necessarily those of Banco de Portugal or the Euro system. Any errors and omissions are the sole responsibility of the authors.

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credit segments and does not investigate the potential differences between credit segments. Moreover, as previously stressed, we address the interaction between segments, which is also a novelty of our work. The innovation of our analysis is also related with the data, as it does not rely on survey data. Our dataset has information on the amounts of outstanding credit of all Portuguese households with responsibilities to the banking system, with information segmented by credit type and financial institution.

The paper is organised as follows. Section 2 focuses on the related literature. Section 3 presents the empirical analysis. Section 4 concludes.

2. RELATED LITERATURE

Recent empirical literature on household credit delinquency assesses the relative importance of different variables in predicting default. The analysis is conducted for different segments and uses as explanatory factors boath loans' and borrowers' characteristics. In Gross and Souleles (2002) using a panel dataset of credit card accounts from several different card issuers, representative of all open accounts in 1995 in the United States, the credit card bankruptcy and delinquency are analysed. They find that several risk controls are highly significant in predicting bankruptcy and delinquency and that the propensity to default increased significantly between 1995 and 1997 in the United States. The credit card bankruptcy and delinquency is also analysed in Agarwal et al. (2009), with an emphasis on the impact of social capital formation. After controlling for some borrower's characteristics as well as for the legal and economic environments, they find that default/bankruptcy risk rises and then falls over the lifecycle. Borrowers who own a home, are married, continue to live in their state of birth or move to a rural area have a lower risk of default/bankruptcy. The conclusions are derived from a panel dataset from a large financial institution that issues credit cards nationally. In Agarwal et al. (2008) the analysis focus on the probability of default and prepayment of automobiles loans, with data coming from a large financial institution that originates directly this type of loans. The fact that the car is new or used, that it is a luxury or economic, the credit risk score of the loan holder, the LTV, income changes, changes in the employment situation and the market interest rate proved to be relevant in their analysis.

Empirical evidence on the determinants of default for insured residential mortgages can be found in Campbell and Dietrich (1983). The statistical significance of contemporaneous payment to income, loan to value ratios (LTV), unemployment rates, age and original loan to value ratio is reported. In a very recent paper, Elul *et al.* (2010) found that the mortgage default is significantly associated with both negative equity (as measured by LTV) and illiquidity (as measured by high credit card utilization), with comparably sized marginal effects. Moreover, the two factors interact with each other. County level unemployment shocks and the existence of a second mortgage imply significantly higher default risk.

Using data from US households' filings for bankruptcy several studies identify factors not related to adverse conditions on employment and/or health to explain bankruptcy. Fay *et al.* (2002) estimated

a model of the household bankruptcy filing decision, using data from the PSID on bankruptcy filings.¹ They also find support for the strategic model of bankruptcy, which predicts that households are more likely to file when their financial benefit from filing is higher, while finding little support for the hypothesis that households file when adverse events that reduce their ability to repay occur (the nonstrategic model of bankruptcy). They also present evidence that households are more likely to file for bankruptcy if they live in districts with higher aggregate filing rates. Livshits *et al.* (2010) using a heterogeneous agent life-cycle model with competitive lenders find that income shocks and expense uncertainty cannot fully explain the rise in bankruptcies. The rise in filings appears mainly to reflect changes in the credit market environment, namely a decrease in the transaction cost of lending and in the cost of bankruptcy. In Dick and Lehnert (2010) a relation between U.S. credit supply and personal bankruptcy rates is reported. They find that the banking deregulation in the 1980s and 1990s, leading to a relaxation of entry restrictions, explains at least 10% of the rise in bankruptcy rates. Increased competition impelled banks to adopt new risk scoring methods, allowing for new credit extension to existing and previously excluded households.

3. EMPIRICAL ANALYSIS

3.1. Data

Our analysis relies on the Central Credit Register, managed by Banco de Portugal, which brings together information provided by all credit institutions operating in Portugal. The dataset collects monthly information on all loans granted to households and potential credit liabilities, namely overdrafts facilities and personal guarantees. The information on loans is categorized by credit product allowing for decomposition into housing credit, auto credit, credit card debt, other consumer credit and other loans.² It is also possible to disentangle if credit was granted to a single person (individual credit) or to more than one person (joint credit). This dataset also provides information on residual and original maturities of the loans. The frequency of the data is monthly and covers the period from January to May 2010. For each month there are around 20 million observations that correspond to approximately 5 million borrowers. The richness of the database used in this analysis allows us to characterise borrowers' credit profile according to several dimensions such as type of credit he holds, size of exposures, number of banks and loans, average loan maturities, and guarantees. This richness is expected to compensate the fact that data on social and economic characteristics of borrowers (apart from their age, residence location, and entrepreneurial activities) is not available.

3.2. Model and variables

The objective of this analysis is to assess the impact on credit delinquency of several features that characterise borrowers' situation in the credit market. As our data allows taking into account the possible borrower's heterogeneity across credit segments, the analysis is carried out separately by

⁽¹⁾ PSID - Panel Study of Income Dynamics.

⁽²⁾ Other loans refer mainly to credit granted to self employed or owners of non-incorporated businesses.

credit segment. Consistently with prudential criteria, we consider that delinquency in a given segment occurs if the borrower has overdue credit in that segment for at least three consecutive months, after being uninterruptedly a non-defaulter for at least three months. In this sense, we considered only borrowers that do not have overdue credit during the period from January to March 2010, studying the determinants of being delinquent during the subsequent period.³ In order to assess the impact of several factors on delinquency, a regression analysis of the following type was carried out

$$DEL_i^J = \alpha^J + \sum_k \beta_k^J X_{ik}^J + \sum_k \delta_k^J Y_{ik}^J + \sum_k \gamma_k^J Z_{ik}^J + \boldsymbol{\eta^J} \boldsymbol{D}_i^J + \theta^J M_{\boldsymbol{i}}^{\boldsymbol{J}} + \varepsilon_i^J$$

where the dependent variable that measures delinquency of borrower i in credit segment J is a binary variable that assumes the value 1 when the borrower is in default in April and May 2010 and 0 otherwise. The regressors are evaluated in March 2010. As already mentioned, the credits segments under analysis are: housing credit, auto credit, credit card debt, other consumer credit and other loans.

The existence of default is modelled as a function of three main groups of variables. The first, identified as X_{k}^{J} , captures the nature and characteristics of the responsibilities of each borrower vis-à-vis the banking system. Variables that characterize the contractual nature of the loans are also considered, identified as $Y_{::}^{J}$. The explanatory variables also include personal borrower characteristics (age, residence location, being a guarantor or not, being an entrepreneur or not), identified as Z_{d}^{i} . For each credit segment, the first set of variables includes dummies indicating the type of credit each borrower holds and variables for the amount that each borrower holds. The inclusion of these variables allows us to identify the direct effect of credit granted in one segment on delinquency in that segment and the interactions between credit granted in one segment and delinquency in another. Each of these variables was broken down in two, as individual and joint credit can be measured separately. These variables besides being useful in capturing the financial position of each borrower may provide indication on the marital status, which is relevant in the credit risk characterization of each borrower. The number of loans that each borrower has in each segment, as well as the number of banks granting credit to each borrower, is also considered as an explanatory variable of default. A larger number of loans and banks may be a sign of higher credit risk, as borrowers with a more solid financial position tend to have exclusive relationships and, therefore, diversification may be a sign of difficulty of obtaining credit from the usual bank. The debt service payment is also considered as an explanatory variable.

The impact on delinquency of the maturity at origination and the time elapsed since origination of the loans is also explored in our analysis, included in the second group of variables identified in the regression equation. The square of elapsed time is also included to account for the eventual non-linearity in the impact of this variable on delinquency. The group of variables Y_{ik}^J also includes information on the existence of guarantees, which may be real guarantees, personal guarantees or other guarantees. The existence of guarantees is expected to have some discriminant power that may dif-

⁽³⁾ As the last available month in our database is May 2010, in this analysis borrowers are considered defaulters if they have overdue credit in April and May 2010.

fer with the type of guarantee. Real guarantees are expected to lower the probability of delinquency, as the non-payment of overdue instalments may be associated with the loss of the related property and in the case that households are responsible for the total amount that is owed other personal assets may have to be deliver to the bank. On the other side, personal guarantees may be associated with a higher probability of default, as anedoctical evidence points out that they are required for riskier borrowers.

At last, we considered personal characteristics of the borrower, identified as Z_{ik}^J . These characteristics include the borrowers' age and residence location as well as the borrowers' condition as guarantor to other parties and as an entrepreneur. Considering his position as a guarantor to other parties, we were able to disentangle between guaranties to housing credit, car loans, other consumer credit or other credit. Guarantors are expected to be less risky, in the sense that being a guarantor to other parties may be associated with enhanced financial position. On the other side, being an entrepreneur is typically associated with a higher risk profile. In order to control for regional differences in economic conditions we also introduced location dummies (*per distrito*) to account for the borrower residence.

We also control for the characteristics of the bank granting the credit, as the choice of the bank may be a sign of the borrowers' attitude towards risk. For this purpose in each credit segment we included a set of bank dummies (D_i^J) and the market share of the main bank (M_i^J) in our estimated model. An enumeration and description of the used variables is presented in the Appendix.

3.3. Sample characterization

The number of borrowers in our sample is 3 million.⁴ Around 69 per cent of these borrowers have a housing loan, housing loans accounting for nearly 90 per cent of the total amount of credit granted to these borrowers. Around 45 per cent of the borrowers have credit card debt and 36 per cent have at least a loan for other consumer purposes. 78 per cent of the borrowers holding housing debt have a joint housing loan and only 25 per cent have an individual housing loan. This specially contrasts with credit card debt where the proportions are respectively 32 and 82 per cent. Concerning default, we observe that 5 per cent of the borrowers get into default in one of the credit segments. The percentage of borrowers holding housing debt and getting into default in that segment is significantly lower (0.5 per cent).

Table 1 provides a characterisation of the sample presenting summary statistics of some variables broken down by credit segment and separating the defaulters from the non-defaulters. For the comparison between defaulters and non-defaulters a t-test on the equality of means and a non-parametric test on the equality of medians were performed. Borrowers that exhibited delinquency tend to have higher average and median amounts of housing loans, credit card debt and other consumer credit. However, in general, the abovementioned tests do not allow us to conclude about this differentiation in the car loans and other credit segments. According to information provided in Table 1 we cannot establish a unique profile for all credit segments in what concerns the maturity at origination and

(4) These are the borrowers that did not have overdue credit during the period from January to March 2010 at least in one of the credit segments and have complete and consistent information on all the variables used in the analysis.

MAIN CHARACTERISTICS OF DEBTOR'S	: PROFILE: §	SUMMAR	Y STATIST	ICS										
							Housing	loans						
			ž	on-defaultir	ß						Defaulting			
Variable	z	p5	median	mean	p95	min	тах	z	p5	median	mean	p95	min	max
Credit (in euros)	1951926	5861.0	63603.0	74036.2	181941.0	53.0	696095.3	9896	14246	75157.97	89866.1	217053.9	52	436648.1
Individual credit (in euros)	481598	6724.0	58390.0	65590.9	150000.0	52.0	335701.9	2457	11834	65533	74511.7	172253	368	332628.8
Joint credit (in euros)	1521263	5398.0	63765.0	74230.9	184000.1	52.0	408500.1	7898	12390	75462.49	89420.0	215389	54	407962.8
Number of banks	1951926	-	-	1.0	-	-	9	9896	-	-	1.1	2	-	4
Maturity at origination	1951926	15	27.5	27.0	35	0.125	35	9896	15	27.5	28.3	35	0.375	35
Time elapsed since origination	1951926	0.003	5	5.5	15	0.003	34.875	9896	0.003	5	4.9	12.5	0.003	32
Debt service payments	1951926	69.0	267.0	291.4	605.0	1.0	1306.0	9896	67	299	328.0	702.0001	Ð	1299
Number of loans (individual)	481598	-	~	1.1	2	~	6	2456	-	-	1.2	2	-	5
Number of loans (joint)	1521262	~	-	1.2	2	-	8	7894	-	-	1.3	2	-	5
Major bank market share	1951926	0.011	0.160	0.1	0.228	0.000	0.228	9896	0.0043383	0.1100439	0.1	0.228329	0.0000545	0.228329
Debtor's age	1951926	29	42	43.5	63	19	95	9896	28	41	42.2	59	20	95
							Car lo	ans						
			Ň	n-defaultir	ß						Defaulting			
Variable	z	p5	median	mean	p95	min	тах	z	p5	median	mean	p95	min	тах
Credit (in euros)	490920	1237.0	7153.0	8497.8	20375.0	53.0	65128.0	7398	1129.0	7148.0	8956.9	23168.0	68.0	58655.0
Individual credit (in euros)	243530	1142.0	6477.0	7678.3	18285.0	53.0	35414.0	4203	1031.0	6247.0	7742.4	19469.0	68.0	34449.0
Joint credit (in euros)	258992	1280.0	7572.0	8887.7	21058.0	50.0	38951.0	3587	1069.0	7647.0	9401.1	24305.0	100.0	38195.0
Number of banks	490920	-	-	1.1	2	-	9	7398	-	~	1.2	2	-	5
Maturity at origination	490920	3.0	7.5	5.8	7.5	0.1	27.5	7398	3.0	7.5	6.2	7.5	0.1	15.0
Time elapsed since origination	490920	0.003	0.6	2.1	4.5	0.003	12.5	7398	0.003	2.9	2.6	6.8	0.003	8.5
Debt service payments	490920	100.0	217.0	232.4	417.0	1.0	773.0	7398	99.0	212.0	230.7	421.0	19.0	773.0
Number of loans (individual)	243522	-	-	1.0	-	-	5	4196	-	-	1.1	2	-	4
Number of loans (joint)	258989	-	-	1.1	2	-	5	3577	-	-	1.2	7	-	ю
Major bank market share	490920	0.001	0.004	0.028	0.228	0.000	0.228	7398	0.001	0.004	0.009	0.011	0.000	0.228
Debtor's age	490920	24	40	41.6	63	19	95	7398	24	37	39.2	60	19	86
							Credit ca	rd debt						
			Ň	n-defaultir	ß						Defaulting			
Variable	z	p5	median	mean	p95	min	max	z	p5	median	mean	p95	min	тах
Credit (in euros)	1284986	131.0	772.0	1581.3	5963.0	50.0	27867.0	22121	198.0	1570.0	2736.9	9551.0	50.0	27211.0
Individual credit (in euros)	1054350	118.0	749.0	1522.1	5760.0	50.0	16795.0	20676	178.0	1478.5	2576.7	8955.0	50.0	16776.0
Joint credit (in euros)	416566	106.0	500.0	1025.4	3893.0	50.0	11964.0	5978	122.0	631.0	1215.8	4502.0	50.0	11787.0
Number of banks	1284986	~	~	1.4	с	-	11	22121	-	7	1.9	4	-	6
Number of loans (individual)	1051122	-	~	1.4	с	-	11	16822	-	4	1.7	4	-	6
Number of loans (joint)	416360	-	-	1.1	2	-	9	5757	-	-	1.1	2	-	5
Major bank market share	1284986	0.001	0.110	0.092	0.228	0.00003	0.228	22121	0.001	0.034	0.061	0.228	0.00004	0.228
Debtor's age	1284986	26	43	44.7	68	19	95	22121	24	39	40.4	62	19	95

(to be continued)

Table 1

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MAIN CHARACTERISTICS OF DEBTOR'S PROFILE: SUMMARY STATISTICS

							Other const	umption credit						
			Ž	on-defaulti	ng						Defaulting			
Variable	z	p5	median	mean	p95	nin	тах	z	p5	median	mean	p95	min	тах
Credit (in euros)	1017054	394.0	4916.0	9557.0	33993.0	50.0	165211.0	12378	498.0	6942.0	12711.3	45208.0	51.0	136035.0
Individual credit (in euros)	481022	203.0	1968.0	4812.6	19153.0	50.0	59648.0	7677	240.0	2718.0	5724.1	22178.0	50.0	59474.0
Joint credit (in euros)	663788	656.0	6114.0	11155.7	38809.0	50.0	120562.0	7903	385.0	8015.0	14261.6	51147.0	50.0	119607.0
Number of banks	1017054	-	-	1.3	с	-	6	12378	-	2	1.9	4	-	12
Maturity at origination	1017054	1.6	6.9	7.8	27.9	0.1	35.0	12378	2.9	6.1	7.2	25.7	0.1	35.0
Time elapsed since origination	1017054	0.003	0.012	1.8	7.1	0.003	34.6	12378	0.003	0.7	2.0	6.7	0.003	20.0
Debt service payments	1017054	12.0	110.0	147.1	420.0	1.0	834.0	12378	18.0	114.0	156.3	443.0	1.0	826.0
Number of loans (individual)	480484	-	-	1.3	с	-	6	7217	-	-	1.7	4	-	6
Number of loans (joint)	663694	-	-	1.5	с	-	12	7798	-	2	2.0	5	-	11
Major bank market share	1017054	0.002	0.110	0.100	0.228	0.000005	0.228	12378	0.002	0.110	0.081	0.160	0.000005	0.228
Debtor's age	1017054	26	43	43.8	65	19	95	12378	25	40	41.5	62	19	86
							Othe	r credit						
			ž	on-defaulti	вu						Defaulting			
Variable	z	p5	median	mean	p95	min	тах	z	p5	median	mean	p95	min	тах
Credit (in euros)	500836	296.0	6502.0	17228.7	71127.0	50.0	736969.1	18683	365.0	5988.0	16592.9	70506.0	50.0	612365.1
Individual credit (in euros)	264368	193.0	4263.0	10765.2	40855.0	50.0	288788.1	10471	233.0	2920.0	9326.2	35005.0	50.0	287960.9
Joint credit (in euros)	266197	814.0	8459.0	21723.6	89482.0	50.0	530000.2	10265	680.0	8380.0	20686.9	87056.0	52.0	500131.0
Number of banks	500836	-	-	1.1	2	-	80	18683	-	-	1.3	2	-	7
Maturity at origination	268912	1.8	7.5	9.0	27.5	0.1	35.0	7324	1.8	7.5	8.6	27.4	0.1	35.0
Time elapsed since origination	264636	0.003	2.1	2.8	7.5	0.003	24.5	6690	0.003	2.0	2.7	7.5	0.003	20.0
Number of loans (individual)	264297	-	-	1.1	2	-	16	10229	-	-	1.2	2	-	9
Number of loans (joint)	266076	-	-	1.2	2	-	13	9993	-	-	1.3	с	-	80
Major bank market share	500836	0.000	0.007	0.023	0.160	0.0000001	0.228	18683	0.000	0.007	0.018	0.119	0.000005	0.228
Debtor's age	500836	27	44	45.2	67	19	95	18683	25	42	43.4	65	19	95

Sources: Banco de Portugal (Central Credit Register) and authors' calculations. Note: N is the number of observations (borrowers); for each variable, P5 and P95 are the values of the respective percentiles, for non-defaulting and defaulting borrowers.

the time elapsed since origination of the loans. Concerning housing credit, the mean of maturity at origination is higher for defaulters and time elapsed slightly higher for non-defaulters. The default borrowers of car loans present mean values of maturity at origination and time elapsed higher than the non-default borrowers. In the case of time elapsed the median is also higher for default borrowers. The performed statistical tests do not allow us to conclude about this differentiation in the median. The loans labelled as other consumer credit and other credit present a distinct profile *vis-à-vis* housing credit. In the case of other consumer credit, the group of non-defaulters presents higher mean and median values for the maturity at origination and lower values of the mean and the median of time elapsed since origination. The differences go in the same direction but are less significant in the case of the other credit segment.

The dummy variables that concern the existence of guarantees and the role of the borrower as a guarantor are presented in Table 2A. As expected, more than 90 per cent of the borrowers with housing loans are protected by a real guarantee. Personal guarantees are also relevant in this credit segment as more than 10 per cent of the borrowers have personal guarantees in housing credit. The existence of guarantees seems to have some discriminant power, as the proportion of borrowers with a personal guarantee in the group of defaulters is higher than in the non-defaulters group, as presented in Table 2A. The same pattern is observed if we consider car loans or other consumer credit. The existence of real guarantees also seems to have some discriminant power, in particular in the car loans segment. In fact, for this segment the proportion of borrowers with real guarantees is substantially higher in the defaulting group than in the non-defaulting group. Concerning other guarantees, a different pattern is observed, as the proportion of borrowers with other guarantees is higher in the non-defaulting group than in the defaulting group. Considering the existence of guarantees to other parties, the same profile applies to all segments and to all possible guarantees, as the defaulting group tends to present a higher proportion of borrowers that are guarantying other parties' loans. Table 2A also shows that households that are entrepreneurs are a minority and their proportion tends to be slightly higher among defaulter than among non-defaulters in all the credit segments, except in other credit.

Table 2B presents the distribution of non-defaulters and defaulters according to the borrower's age class. The information provided in this table suggests that default tends to decrease with the age of the borrower. In fact, the proportion of borrowers above 50 years old is higher among the non-defaulters group than among the defaulters in all the credit segments analysed.

3.4. Estimation results

In order to test the impact of borrowers' indebtedness profile on delinquency a separate regression by credit segment was carried out. Table 3 presents the marginal effects of the regressors on the probability of getting into default in each of the credit segments.⁵ Marginal effects were computed for a reference debtor that belongs to the youngest age bracket and is neither an entrepreneur nor

⁽⁵⁾ In the logit model the estimated regression coefficients do not give directly the marginal effects of the regressors on the dependent variable. In fact, the marginal effects are a function of the estimated coefficients and vary with the values of the regressors.

Table 2							
PERSONAL CHARACTERISTICS OF NON	N-DEFAULTING	AND DEFAULTIN	G BORROWERS				
Table 2A					Table 2B		
DISTRIBUTION ACCORDING TO THE PR	ESENCE OF GI	UARANTEES AND) ENTREPRENEL	IRSHIP	DISTRIBUTION ACCORDING	3 TO AGE	
		Housing	g loans			Housin	g loans
	Non-de	faulting	Defau	lting		Non-defaulting	Defaulting
	YES	Q	YES	Q			
Borrower has a real guarantee	0.927	0.073	0.956	0.044	Age class of the borrower		
Borrower has a personal guarantee	0.112	0.888	0.186	0.814	< 30 years	0.068	0.073
Borrower has other guarantees	0.022	0.978	0.024	0.976	>= 30 and < 40 years old	0.345	0.358
Borrower serves as a guarantor for third parties					>= 40 and < 50 years old	0.311	0.349
an housing and the	0 106		3010	100 0	>= 50 and < 65 years old	0.239	0.203
on nousing crean	0.100	0.004	0.100	0.034	>= 65 years old	0.037	0.017
	0.007	0.065	0.017	0.004		- - - -	
on other consumer creat on other credit	0.026	0.974	0.091	0.909	Total	1.000	1.000
Borrower is not entrepreneur	0.973	0.027	0.949	0.051			
Total number of horrowers	105	1076	080	u u			
	001	076	200	2			
		Car lo	oans			Carl	oans
	Non-de	faulting	Defau	lting		Non-defaulting	Defaulting
	YES	Q	YES	Q			
Borrower has a real guarantor	0.152	0.848	0.298	0.702	Age class of the borrower		
Borrower has a personal guarantee	0.116	0.884	0.145	0.855	< 30 years	0.184	0.232
Borrower has other guarantees	0.063	0.937	0.031	0.969	>= 30 and < 40 years old	0.302	0.329
Borrower serves as a quarantor for third parties					>= 40 and < 50 years old	0.243	0.247
					>= 50 and < 65 years old	0.229	0.167
on housing credit	0.054	0.946	0.040	0.960	>= 65 years old	0.041	0.025
on car loans	0.040	0.960	0.054	0.946			
on other consumer credit on other credit	0.037	0.963 0.980	0.050	0.950	Total	1.000	1.000
Borrowar is not antranzanaur	0 073	2000	0.067	0.032			
	0.00	170.0	100.0	0000			
I OTAI NUMPER OF DOPROVERS	490	920	135	Q			
		Credit ca	ard debt			Credit c	ard debt
	Non-de	faulting	Defau	Iting		Non-defaulting	Defaulting
Borrower serves as a guarantor for third parties	YES	ON	YES	ON			
on housing credit	0.059	0.941	0.040	0.960	Age class of the porrower	0110	1000
on car loans	0.008	0.992	0.013	0.987	< 3U years	0.113	0.201
on other consumer credit	0.048	0.952	0.056	0.944		0.287	0.322
on other credit	0.035	0.965	0.047	0.953	>= 40 and < 50 years old	U.Z03 0.266	CC2.U
Borrower is not entrepreneur	0.967	0.033	0.966	0.034	∠= 30 and > 30 years old >= 65 vears old	0.082	0.107
						1	>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
lotal number of borrowers	1287	1980	1.77	17	Total	1.000	1.000
							(to be continued)

Table 2 (continued)							
PERSONAL CHARACTERISTICS OF NON	J-DEFAULTING	AND DEFAULTIN	3 BORROWERS				
Table 2A					Table 2B		
DISTRIBUTION ACCORDING TO THE PRE	ESENCE OF GI	JARANTEES AND	ENTREPRENE	URSHIP	DISTRIBUTION ACCORDING	TO AGE	
		Other consum	ption credit			Other consumption c	credit
	Non-def	aulting	Defa	ulting		Non-defaulting D	efaulting
	YES	NO	YES	NO)	
Borrower has a real guarantee	0.096	0.904	0.091	0.909	Age class of the borrower		
Borrower has a personal guarantee	0.111	0.889	0.164	0.836	< 30 years	0.128	0.168
Borrower has other guarantees	0.319	0.681	0.290	0.710	>= 30 and < 40 years old	0.284	0.308
Borrowor convoc oc a guarantar for third nartice					>= 40 and < 50 years old	0.262	0.266
DUILOWEI SELVES AS A GUARATION TOT UTILA PARTIES					>= 50 and < 65 years old	0.271	0.225
on housing credit	0.060	0.940	0.049	0.951	>= 65 vears old	0.055	0.033
on car loans	0.008	0.992	0.016	0.984			
on other consumer credit	0.073	0.927	0.084	0.916	Total	1.000	1.000
on other credit	0.028	0.972	0.062	0.938			
Borrower is not entrepreneur	0.967	0.033	0.952	0.048			
Total number of borrowers	1017	054	120	378			
		Other o	redit			Other credit	
	Non-def	aulting	Defa	ulting		Non-defaulting D	efaulting
	YES	N	YES	N			
Borrower has a real guarantee	0.155	0.845	0.113	0.887	Age class of the borrower		
Borrower has a personal guarantee	0.195	0.805	0.161	0.839	< 30 years	0.101	0.135
Borrower has other guarantees	0.139	0.861	0.078	0.922	>= 30 and < 40 years old	0.270	0.284
Borrower serves as a quarantor for third parties					>= 40 and < 50 years old	0.268	0.273
	0000	100 0		0.050	>= 50 and < 65 years old	0.285	0.255
on nousing dean	0,009	0.991	0.014 0.014	0.986 0.986	>= 65 years old	0.076	0.054
on other consumer credit	0.055	0.945	0.063	0.937			
on other credit	0.121	0.879	0.121	0.879	Total	1.000	1.000
Borrower is not entrepreneur	0.940	0.060	0.954	0.046			
Total number of borrowers	519	519	186	383			

Sources: Banco de Portugal (central Credit REgister) and author's calculations.

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Table 3

ESTIMATION RESULTS: LOGIT MARGINAL EFFECTS (The dependent variable takes the value of 1 in the presence of default and 0 otherwise

	Housing loans	Car loans	Credit card debt	Other consumer credit	Other credit
	(1)	(2)	(3)	(4)	(5)
D Housing credit (only individual)	-0.000518*	-0.034973***	-0.002251***	-0.004508***	-0.017723***
	(-2.39)	(-4.48)	(-4.70)	(-4.46)	(-5.32)
D Housing credit (only joint)	× ,	-0.035032***	-0.001015*	-0.003415***	-0.012148***
D Housing credit (individual and joint)	0.002565*	-0.041667***	-0.001893**	-0.005281***	-0.020054***
D Car loans (only individual)	0.001076	(-0.46) -0.016716*	0.000263	-0.000313	0.021211
D Car loans (only joint)	(1.54) 0.000190	(-2.41)	(0.32) 0.001585	(-0.20) 0.001862	(1.46) 0.007900
D car loans (individual and joint)	(0.52) 0.002105	0.122987***	(1.44) 0.002625	(0.92) 0.000979	(0.83) 0.028795
D Credit card debt (only individual)	(1.53) -0.000741***	(3.33) -0.016566***	(1.39)	(0.36) -0.003732***	(1.18) -0.010711***
D Credit card debt (only joint)	(-10.66) 0.000021	(-4.23) 0.010301	0.002964***	(-5.87) 0.003456*	(-5.37) -0.000284
D Credit card debt (individual and joint)	(0.10)	(1.02)	(4.01)	(2.46)	(-0.07)
	-0.000852***	-0.018565**	-0.000700*	-0.003559***	-0.012737***
D Other consumption credit (only individual)	(-9.22)	(-2.87)	(-2.41)	(-4.96)	(-4.76)
	0.001952***	0.019048**	0.002219***	-0.002876***	0.039666***
D Other consumption credit (only joint)	(5.95) 0.010043***	(2.79) 0.079597***	(6.08) 0.003895***	(-4.63)	(4.85) 0.085916***
D Other consumption credit (individual and joint)	(10.79) 0.014283***	(5.80) 0.076109***	(8.51) 0.007142***	0.004370***	(6.45) 0.144228***
D Other credit (only individual)	(7.54)	(4.43)	(7.80)	(3.38)	(5.74)
	0.001344***	0.040025***	0.000152	0.003513**	-0.012891
D Other credit (only joint)	(4.07) 0.005644***	(3.47) 0.059673**	(0.50) 0.004786***	(3.04) 0.026311***	(-1.94)
D Other credit (individual and joint)	(5.33) 0.008094***	(2.82) 0.081275**	(4.27) 0.004286***	(4.20) 0.024738***	-0.010739***
Housing credit (individual)	(4.37)	(2.69)	(3.48)	(3.64)	(-5.23)
	-0.000085*	0.005087*	0.000092	0.000446	0.003082**
Housing credit (joint)	(-2.23)	(2.18)	(0.86)	(1.89)	(2.66)
	-0.000173***	0.004897***	-0.000080	0.000244*	0.001080*
Car loans (individual)	(-5.24)	(3.51)	(-1.33)	(1.96)	(2.06)
	-0.000094*	-0.006442***	-0.000093	0.000021	-0.001507
Car loans (joint)	(-2.18)	(-4.11)	(-1.07)	(0.11)	(-1.75)
	-0.000057	-0.008351***	-0.000246**	-0.000292	-0.001076
Credit card debt (individual)	(-1.58)	(-4.72)	(-2.80)	(-1.60)	(-1.31)
	0.000258***	0.006801***	0.001017***	0.001432***	0.003679***
Credit card debt (joint)	(10.11)	(5.64)	(20.04)	(5.92)	(5.77)
	0.000055	0.000372	0.000301***	-0.000095	0.000459
Other consumption credit (indiv)	(1.81)	(0.29)	(5.45)	(-0.74)	(0.77)
	-0.000100***	0.000218	-0.000191***	0.000428***	-0.001776***
Other consumption credit (joint)	(-5.75)	(0.34)	(-6.11)	(4.42)	(-4.38)
	-0.000251***	-0.003848***	-0.000331***	-0.000527***	-0.003326***
Other credit (indiv)	(-13.18)	(-5.35)	(-11.16)	(-4.43)	(-6.48)
	-0.000080***	-0.001341	0.000020	-0.000041	0.000797*
Other credit (joint)	(-4.04)	(-1.72)	(0.52)	(-0.50)	(2.41)
	-0.000174***	-0.002378*	-0.000308***	-0.000854***	0.001905***
Credit card limit	(-7.27)	(-2.11)	(-5.40)	(-4.91)	(4.71)
	-0.000127***	-0.003823***	-0.000577***	-0.000594***	-0.001642***
Number of banks - housing credit	(-11.34)	(-6.42)	(-26.72)	(-6.01)	(-6.18)
	0.000433***	-0.003645	0.000443	0.000603	0.000512
Number of banks - auto credit	(6.71)	(-0.71)	(1.91)	(1.27)	(0.32)
	0.000396***	0.019377**	0.001078***	0.001673***	0.005639**
Number of banks - credit card	(4.02) 0.000062*	(2.90) 0.006049***	(5.11) 0.013686*** (24.07)	(3.37) 0.001159***	(2.92) 0.003263***
Number of banks - credit card (undrawn)	(2.19)	(4.41)	(24.97)	(5.48)	(4.82)
	-0.000402***	-0.014015***	-0.001106***	-0.002563***	-0.007931***
Number of banks - other consumption credit	(-10.66)	(-6.21)	(-15.74)	(-6.20)	(-6.65)
	0.000515***	0.009275***	0.000962***	0.004557***	0.007054***
Number of banks - other credit	(13.09) 0.000392*** (7.50)	(5.82) 0.006919**	(15.57) 0.000968***	(6.28) 0.001163*** (4.24)	(6.59) 0.015854***
	(00.1)	(3.1∠)	(0.90)	(4.21)	(0.9∠)

(to be continued)

Table 3 (continued)

LOGIT MARGINAL EFFECTS

(The dependent variable takes the value of 1 in t	the presence of	default and C	otherwise)		
	Housing loans	Car loans	Credit card debt	Other consumer credit	Other credit
	(1)	(2)	(3)	(4)	(5)
Maturity at origination - respective segment	0.000032***	-0.000649		-0.000122***	-0.000132**
	(8.63)	(-1.50)		(-4.42)	(-2.64)
Elapsed maturity - respective segment	0.000020**	0.003630***		0.000459***	0.000105
	(3.13)	(4.25)		(5.30)	(0.56)
Square of elapsed maturity - respective segment	-0.000001	-0.000053		-0.000020**	-0.000018
	(-1.92)	(-0.39)		(-3.06)	(-0.99)
Debt service payments - respective segment	0.000448***	0.008090***		0.000944***	
	(9.89)	(4.06)		(5.46)	
Number of loans (individual - respective segment)	0.000576***	0.013776*	-0.012608***	-0.001826***	-0.004378***
	(8.42)	(2.07)	(-24.99)	(-5.59)	(-4.51)
Number of loans (joint) - respective segment	0.000730***	0.007057	-0.011773***	0.000249*	-0.001824*
	(13.03)	(1.14)	(-23.41)	(1.99)	(-2.55)
D has not real guarantees - respective segment	0.000047	-0.028779***		-0.002063***	-0.000041
	(0.68)	(-6.71)		(-4.64)	(-0.05)
D has personal guarantees - respective segment	0.000305***	0.003671*		0.000329	0.001166
5	(6.14)	(2.00)		(1.65)	(1.74)
D has other guarantees - respective segment	-0.000168*	-0.017754***		-0.001107***	-0.005416***
	(-2.04)	(-4.69)	0 000077*	(-4.67)	(-5.76)
D Guarantees to third parties - HC	-0.000158***	-0.003069	-0.000277*	-0.000707*	-0.000255
D. Oversets as the third section . O	(-3.90)	(-1.16)	(-1.96)	(-2.50)	(-0.22)
D Guarantees to third parties - CL	0.000496	0.005799"	0.000698	0.001290	-0.000178
D. Cuerentees to third parties . OCC	(3.30)	(2.10)	(2.19)	(2.02)	(-0.07)
D Guarantees to third parties - OCC	0.000020	-0.000664	-0.000067	-0.000001	-0.002009
D. Cuerentees to third parties	(0.37)	(-0.30)	(-0.55)	(-0.00)	(-2.77)
D Guarantees to third parties - OC	(7.95)	(2.74)	(2.60)	(2.00)	(5 50)
D Entropropour	0.000541***	(2.74)	(2.00)	(3.99)	0.001002*
DEntrepreneur	(5.71)	(1.87)	(3.64)	(4 37)	-0.001992
D Age class of the borrower (30-40 years)	-0.00058	-0.001853	-0.000672***	-0.00027***	-0.003579**
D Age class of the borrower (30-40 years)	-0.0000000	-0.001000	-0.000072	-0.000327	-0.003373
D Age class of the borrower $(40-50 \text{ years})$	0.000058	-0.005500**	-0.00042***	-0.001560***	-0.002316*
D Age class of the borrower (40-50 years)	(1.03)	-0.000000	-0.000342	-0.001300	-0.002310
D Age class of the borrower (50-65 years)	-0.00007	-0.016146***	-0.001508***	-0.002661***	-0.004828***
D Age class of the borrower (00-00 years)	(_0 10)	(-5.97)	(_14 97)	(-5.83)	(-4.02)
D Age class of the borrower (more than 65 years)	-0.00201*	-0.020286***	-0.002273***	-0.003757***	-0.008421***
D Age class of the borrower (more than of years)	(-1.96)	(-5.65)	(-18.26)	(-5.97)	(-5 17)
Major hank market share - respective segment	-0.000341	-0.414369***	-0.005030*	0.018955***	0.032781**
major bank market share - respective segment	(-0.57)	(-5.52)	(-2 20)	(3.81)	(2.66)
R-sar	0 131	0 109	0.268	0 123	0 110
Number of observations	1957310	497711	1304653	1027833	268793
	1001010	107711	1001000	1021000	200100

Sources: Banco de Portugal (Central Credit Register) and authors' calculations.

Notes: Robust z-statistics in parentheses, *** p<0.01, ** p<0.01, * p<0.05. A description of the variables is presented in Appendix A. Marginal effects were computed for a reference debtor that belongs to the youngest age bracket and is neither an entrepreneur nor a guarantor of credit to third parties. In each model this debtor has credit only in the respective segment. He has only joint credit in the case of housing credit, car loans other consumption credit and other credit. In the case of credit card debt, the reference debtor has only individual credit. The amount of credit, the number of banks, the number of loans, the maturities and the debt service payments are evaluated at the respective median values corresponding to each type of debtor. The reference debtor has real guarantees in all the credit segments, except in credit card debt. The five different credit segments are treated independently

a guarantor of credit to third parties. In each model this debtor has credit only in the respective segment. He has only joint credit in the case of housing credit, car loans other consumer credit and other credit. In the case of credit card debt, the reference debtor has only individual credit. The amount of credit, the number of banks, the number of loans, the maturities and the debt service payments are evaluated at the respective median values corresponding to each type of debtor. The reference debtor has real guarantees in all the credit segments, except in credit card debt. The results are discussed in what follows.

Nature and characteristics of the responsibilities of the borrower vis-à-vis the banking system

One of the main objectives of this study is to investigate the potential interactions across different credit segments and their impact on the probability of getting into default in the segments under analysis. Our results provide clear evidence on a significant number of interactions. It is worth noting, for instance, that holding housing debt lowers significantly the probability of getting into default in the other credit segments. However, comparing the magnitudes of the estimated marginal effects, the results also suggest that the impact of being a holder of car loans, other consumer loans or other loans tends on the probability of default in housing credit is smaller than their impact on the probability of default in the other segments. Moreover, the results also suggest that the cross effects of the size of the exposures and the number of bank relationships tend to be smaller in the case of the probability of default in housing credit. These results partly reflect the nature of housing as subsistence good and the need to avoid above all mortgage foreclosure. Additionally, our results are also likely to reflect bank practices in granting credit. Anecdotic evidence on those practices suggests that this may be an important source of interactions.

As referred above, the results suggest that housing loans borrowers have a smaller probability of getting into default in all of the remaining credit segments. This result may be interpreted as a signal that housing loans are granted to less risky households in the sense that they tend to belong to higher income/wealth strata. The same result is obtained for borrowers that have credit card debt, that is, credit card holders tend to default less in the other credit segments. The opposite result is obtained for households that have other consumer credit and other credit. In fact, borrowers that have loans for these purposes tend to exhibit higher probability of default in the other credit segments. It should be stressed, however, that for borrowers of other consumer credit and other credit, the larger their exposure the lower is the probability of default in all other credit segments.

The results provide strong evidence on the impact of the size of each exposure on the delinquency of the respective segment, although the sign of the effect observed in different segments is not always the same. Concerning housing credit and car loans, the size of the exposure seems to reflect a higher repayment capacity as holders of larger exposures tend to have a lower probability of default in the respective credit segment. On the contrary, credit card borrowers with a higher debt amount exhibit higher probability of default. This may be related to the fact that high exposures are possibly associated with borrowers that do not make full payment of their balances, which are riskier borrowers. It should be remarked that we are also controlling for the effect of the credit card limit and that the results suggest that for borrowers that have credit cards, the larger is their credit card limit the lower tends to be the probability of default. In the case of other credit borrowers, the larger is the exposure the higher tends to be the probability of default in the segment. Concerning other consumer credit less obvious results are obtained as higher individual exposures are associated with higher probability of default, while higher joint exposures are associated with lower probabilities of default.

Our model allows distinct impacts of individual and joint credit on the probability of default in the respective segment. The estimated results suggest that borrowers that have joint credit tend to have a higher probability of default than those that have only individual credit in all credit segments except in credit card debt where the results are less obvious.

The results also suggest that in each segment the number of banks granting credit to borrowers is also an indicator of the risk degree of the borrower. The higher is the number of banks where he borrows the higher is the probability that he gets into default in the respective credit segment. There is also evidence of effects across different credit segments, as a higher number of banks in one segment tend to increase the probability of default in other segment. A distinct effect is captured when analysing the number of credit cards, proxied by the number of banks potentially granting credit card debt. In this case, the results suggest that borrowers with more credit cards exhibit lower probabilities of default, in all other credit segments. This result suggests that additional credit cards are granted to borrowers that belong to higher income/wealth strata, being in line with the negative sign of the effect of the credit card limit on the probability of default.

The number of loans the borrower has in the housing credit segment is also capturing borrowers' risk position. The results suggest that households that have more loans have a higher probability of getting into default. An opposite result is obtained in the credit card debt and other credit.

The larger the amount of debt service payments the higher the probability of default. Though this is measured in absolute terms, we interpret this result as the effect of the debt service ratio since we are controlling for the scale effect by including the amount of credit which also proxies the income/ wealth strata of borrowers.

Contractual characteristics of the loans

The results point out that borrowers whose housing loans have a higher average maturity at origination tend to have higher probabilities of default, while the opposite holds for other consumer credit and other credit. The results concerning the effect of the original maturity of housing loans suggest that longer maturities are associated with borrowers with a lower repayment capacity. The results on the effect of time elapsed since origination also suggest that as time goes by the probability that a loan gets into default increases. In the case of housing credit this result may partly be explained by the fact that relatively recent loans largely predominate in the data as a consequence of the relatively recent credit growth. A negative and significant sign of the square of this variable in the case of other consumer credit, suggests that the positive effect of time elapsed tends to vanish with time, but the magnitude of the coefficient is not sufficiently large to compensate for the positive effect for reasonable values of the original loan maturities. Nevertheless, in the case of credit for other purposes an increase in time elapsed may be associated with a lower probability of default if the loan has already been granted a considerable time ago.

Borrowers that have got a personal guarantee in order to have access to housing credit are likely to be riskier, this being reflected on a higher probability of getting into default. This result suggests that the requirement of personal guarantees to particular types of borrowers, namely the youngest, should be encouraged in order to avoid that losses materialise. On the other hand, if borrowers have other guarantees (for instance financial guarantees) their probability of getting into default is lower. This suggests that borrowers that can use this type of guarantees are likely to belong to higher income/ wealth class. Having a real guarantee does not seem to affect the probability of getting into default in housing credit, although the impact is positive in the car loans segment. The fact that we obtain a statistically non-significant effect in the case of housing loans may be due to the lack of cross-section variability in this indicator since almost all housing loans are mortgages.

Personal characteristics of the borrower

Borrowers age is likely to strongly influence his ability to pay for his debts in due time, as the probability of default of the youngest borrowers is significantly higher than the probability of default of borrowers in all the other age classes. This result is less clear in the housing credit segment. In fact, in this segment, the results suggest that only the oldest borrowers have a lower probability of default than the youngest, the probability of default in the other age classes not being statistically different.

According to our results, the location of borrowers' residence is likely to affect his probability of default. The inclusion of location dummies (whose marginal effects are omitted in Table 3, because of space reasons) globally improves the quality of the regression. There is also evidence that a higher probability of default may be linked to particularly adverse economic conditions in certain locations.

Borrowers that give guarantees to third parties in the housing credit segment tend to have a lower probability of default in that segment, which corroborates the idea that guarantors have an enhanced financial position. However, an opposite result is obtained in the case of borrowers that give guarantees to third parties in the car loans and other credit segments. This suggests that the high risk of borrowers in these segments (particularly other credit) is transmitted to the borrowers that give the guarantee.

The results also suggest that the probability of getting into default in any credit segment is higher if the borrower is an entrepreneur, as the involvement in small business activities is likely to increase the volatility of their income and, therefore, their credit risk.

As the choice of the bank may be a sign of the borrowers' attitude towards risk the models also control for the characteristics of the credit institutions. Besides the inclusion of dummy variables that take the value 1 if a bank is the main bank of the borrower the estimated models also include as an explanatory variable the market share of the major bank for the borrower in the specific segment of credit. In the case of housing credit this variable does not seem to affect the borrower's probability of default. In the car loans segment and to a lesser extent in credit card debt segment, higher market shares are associated with lower probability of default.

4. CONCLUSIONS AND FUTURE RESEARCH

This study analyses the incidence of delinquency in household's debt repayment behaviour. Using a unique dataset we investigate the role of households' responsibilities *vis-à-vis* the banking system as determinants of entry in default. A separated analysis by credit segment allows us to identify possible interactions across different credit segments. Credit characteristics, such as the amount of credit granted by segment, the respective number of loans, as well as the number of banks granting them, are considered in the analysis. The impact of the contractual characteristics of the loans, such as their maturity and the existence of guarantees are also considered. In our analysis we also control for personal characteristics of the borrowers, namely their age and place of residence, and a few characteristics of the financial institutions. Our empirical results provide new evidence on the role of these characteristics in explaining default.

One of the main objectives of this study is to investigate the potential interactions across different credit segments. Our results provide clear evidence on a significant number of interactions. It is worth noting, that holding housing debt lowers significantly the probability of getting into default in the other credit segments. However, the probability of default in housing credit is less likely to be affected than the probability of default in the other credit segments by the fact that debtors hold other types of debt, by the size of the exposures and by the number of bank relationships. These results partly reflect the nature of housing as a subsistence good and the need to avoid above all mortgage foreclosure.

According to our results, borrowers that have housing credit and those that have at least one credit card tend to have a lower probability of default in all other segments. In the case of housing loans, that exhibit the largest median exposure, the larger is the exposure the lower is the probability of default in the respective segment. The same holds for car loans which come in second place in terms of the median value of the exposures. On the contrary, in the case of credit card debt, larger exposures are associated with higher probabilities of getting into default. Cross effects of exposures are not very obvious except in the case of credit card debt where larger exposures are associated with a higher probability of default in all segments. Our results suggest, as expected, that the higher is the number of credit cards the lower is the probability of default. However, in general, borrowers with more credit to borrowers with a lower repayment capacity. Additionally, we find that the probability of getting into default increases with the passage of time, at least for loans recently contracted but, as expected, this effect tends to vanish near the end of the contract. The results also suggest that borrowers that have got personal guarantees tend to have a higher probability of default reinforcing the importance of its requirement in order to avoid the materialisation of losses.

This study presents static evidence on the effect of a large variety of factors in explaining the probability of default in households' credit. As more data become available, more interesting results may be obtained, namely on the effect of the same type of factors on the duration of default spells. This will be the object of future research.

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EXPLANATORY VARIABLES		
Variables	Variable type	Description
D Housing credit (only individual)	Dummy	Takes the value 1 if the borrower holds housing credit (only individual credit)
D Housing credit (only joint)	Dummy	Takes the value 1 if the borrower holds housing credit (only joint credit)
D Housing credit (individual and joint)	Dummy	Takes the value 1 if the borrower holds housing credit (both individual and joint credit)
D Car loans (only individual)	Dummy	Takes the value 1 if the borrower holds car loans (only individual credit)
D Car loans (only joint)	Dummy	Takes the value 1 if the borrower holds car loans (only joint credit)
D car loans (individual and joint)	Dummy	Takes the value 1 if the borrower holds car loans (both individual and joint credit)
D Credit card debt (only individual)	Dummy	Takes the value 1 if the borrower holds credit card debt (only individual credit)
D Credit card debt (only joint)	Dummy	Takes the value 1 if the borrower holds credit card debt (only joint credit)
D Credit card debt (individual and joint)	Dummy	Takes the value 1 if the borrower holds credit card debt (individual and joint credit)
D Other consumption credit (only individual)	Dummy	Takes the value 1 if the borrower holds other consumption credit (only individual credit)
D Other consumption credit (only joint)	Dummy	Takes the value 1 if the borrower holds other consumption credit (only joint credit)
D Other consumption credit (individual and joint)	Dummy	Takes the value 1 if the borrower holds other consumption credit (individual and joint credit)
D Other credit (only individual)	Dummy	Takes the value 1 if the borrower holds other credit (only individual credit)
D Other credit (only joint)	Dummy	Takes the value 1 if the borrower holds other credit (only joint credit)
D Other credit (individual and joint)	Dummy	Takes the value 1 if the borrower holds other credit (individual and joint credit)
Housing loans(individual)	Continuous	Logarithm of the value of loans granted to a single person for house purchases (euro)
Housing loans (joint)	Continuous	Logarithm of the value of loans granted to more than one person for house purchases (euro)
Car loans (individual)	Continuous	Logarithm of the value of loans granted to a single person for car financing (euro)
Car loans (joint)	Continuous	Logarithm of the value of loans granted to more than one person for car financing (euro)
Credit card debt (individual)	Continuous	Logarithm of the amounts already drawn on credit cards (as individual credit) (euro)
Credit card debt (joint)	Continuous	Logarithm of the amounts already drawn on credit cards (as joint credit) (euro)
Other consumer credit (individual)	Continuous	Logarithm of the value of consumer credit (other than car credit and credit cards amounts already drawn) granted to a single person (euro)
Other consumer credit (joint)	Continuous	Logarithm of the value of consumer credit (other than car credit and credit cards amounts already drawn) granted to more than one person (euro)
Other credit (individual)	Continuous	Logarithm of the value of other credit granted to a single person (euro)
Other credit (joint)	Continuous	Logarithm of the value of other credit granted to more than one person (euro)
Credit card limit (individual)	Continuous	Logarithm of the undrawn amounts on credit cards (as individual credit) (euro)
Credit card limit (joint)	Continuous	Logarithm of the undrawn amounts on credit cards (as joint credit) (euro)

(to be continued)

Appendix

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EXPLANATORY VARIABLES		
Variables	Variable type	Description
Number of banks – HC	Discrete	Number of banks granting housing credit to the borrower
Number of banks – CL	Discrete	Number of banks granting auto credit to the borrower
Number of banks – CC	Discrete	Number of banks granting credit through credit cards to the borrower (drawn amounts)
Number of banks – CC (undrawn)	Discrete	Number of banks granting credit through credit cards to the borrower (undrawn amounts)
Number of banks – OCC	Discrete	Number of banks granting other consumer credit to the borrower
Number of banks – OC	Discrete	Number of banks granting other credit to the borrower
Maturity at origination - respective segment	Continuous	Expressed as an average of the different loans in the respective segment (years)
Residual maturity – respective segment	Continuous	Expressed as an average of the different loans in the respective segment (years)
Debt service payments – respective segment	Continuous	Logarithm of the value of debt service payments in the respective segment (euro)
Number of loans – respective segment	Discrete	Number of loans the borrower holds in the respective segment
D Real guarantees – respective segment	Dummy	Takes the value 1 if the borrower has at least one real guarantee in the respective segment
D Personal guarantees – respective segment	Dummy	Takes the value 1 if the borrower has at least one personal guarantee in the respective segment
D Other guarantees – respective segment	Dummy	Takes the value 1 if the borrower has at least one guarantee of other type in the respective segment
D Guarantees to third parties – HC	Dummy	Takes the value 1 if the borrower gave guarantee to ensure the payment of housing loans granted to other borrowers
D Guarantees to third parties – CL	Dummy	Takes the value 1 if the borrower gave guarantee to ensure the payment of car loans granted to other borrowers
D Guarantees to third parties – OCC	Dummy	Takes the value 1 if borrower gave guarantee to ensure the payment of other consumer loans granted to other borrowers
D Guarantees to third parties - OC	Dummy	Takes the value 1 if borrower gave guarantee to ensure the payment of other loans granted to other borrowers
D households	Dummy	Takes the value 1 if borrower is not an entrepreneur
D Age class of the borrower (30-40 years)	Dummy	Takes the value 1 if borrower's age is 30 years old or more and less than 40
D Age class of the borrower (40-50 years)	Dummy	Takes the value 1 if borrower's age is 40 years old or more and less than 50
D Age class of the borrower (50-65 years)	Dummy	Takes the value 1 if borrower's age is 50 years old or more and less than 60
D Age class of the borrower (more than 65 years)	Dummy	Takes the value 1 if borrower's age is 65 years old or more
Major bank market share - respective segment	Continuous	Market share in total credit of the segment of the borrower's major lender in the segment (HC, CL, CC, OCC, OC)

Sources: Banco de Portugal (Central Credit Register) and authors' calculations. Note: HC, CL, CC, OCC, OC holds respectively for housing credit, car loans, credit card debt, other consumer credit and other credit.

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ACCESS TO BANK CREDIT AFTER CORPORATE DEFAULT*

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1. INTRODUCTION

During the last decade the literature on the factors affecting corporate default increased exponentially. This growth was to a large extent spurred by the discussions around the implementation of Basel II.¹ However, surprisingly little is known about what happens to firms after they default on their bank loans. How many firms are able to overcome the financial distress that led to the default on bank loans? Do these firms regain access to credit? How fast is this process? Which firms have more difficulty in regaining access? In this article, we shed some light on these important questions.

In this study, we take the occurrence of defaults as given and analyse what happens to the ability of firms to access credit markets after an episode of financial distress. This is a relevant question, as not all the firms that default on their debts are economically unviable. In many cases, firms default on their liabilities due to unexpected events which do not compromise their economic viability. This question relates closely to the literature on default recoveries (Antunes (2005), Altman *et al.* (2005) or Bruche and González-Aguado (2010) are examples of some relevant contributions to this literature) but it goes one step further and asks about the ability to borrow again after an episode of financial distress.

In order to undertake this project we use a unique Portuguese dataset, the Central Credit Register (CRC), which includes data on all loans above 50 euros that were granted during the period 1995-2008. This data is shared by all financial institutions, thus mitigating the traditional asymmetric information problem between lenders and borrowers.

This project would be interesting in any context, but the recent increase in loan defaults worldwide makes it even more relevant. Even though some of the firms currently facing difficulties in honouring their debt may file for bankruptcy, many firms are expected to survive. By analysing under what conditions do firms regain access to credit, we expect to provide relevant and timely empirical evidence on this issue.

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⁽¹⁾ In the Basel II International Capital Accord banks are allowed, under some conditions, to use their own internal credit risk models to determine capital requirements. These internal models must allow for a rigorous calculation of default probabilities, hence motivating the extensive research on credit risk modelling during the last decade.
This article proceeds as follows. In Section 2 we present a brief review of the literature on default and recoveries and in Section 3 we describe the dataset used. Our main results are analysed in two separate sections: in Section 4 we examine in some detail what is happening to firms while they are in default, whereas in Section 5 we focus our analysis on what happens to firms after they are no longer classified as being in default. In Section 6 we summarize our main findings.

2. LITERATURE REVIEW

The bulk of empirical research on default and recovery after financial distress focuses on publicly traded firms in the United States, with an emphasis on bankruptcy reorganization and liquidation procedures.² For instance, Franks and Torous (1989), Platt and Platt (1991), Bandopadhyaya (1994), Helwege (1999), and Denis and Rodgers (2007) all consider samples of publicly traded firms that file for Chapter 11 bankruptcy reorganization to analyse the effect of various regressors as well as time on the duration of default. The time in default ranges from 16-32 months on average, but size (measured by liabilities, number of employees, or number of creditors) is an important determinant of the duration of default, with smaller firms exiting sooner (Denis and Rodgers (2007), Morrison (2007)).

Post default performance of large firms appears to be poor. On average, only 29 per cent of firms in Chapter 11 bankruptcy reorganization successfully reorganize each year, but Hotchkiss *et al.* (2008) note that many of the confirmed reorganizations are, in fact, liquidation plans. Analysis of post-bankruptcy cash flows for 89 firms by Alderson and Betker (1999) corroborates earlier findings by Hotchkiss (1995), LoPucki and Whitford (1993), and Hotchkiss and Mooradian (1997) that operating margins are poor and debt ratios are above industry median levels post-bankruptcy. As a consequence of this performance, recidivism rates are high, with one-quarter to one-third of firms subsequently restructuring their debt within five years of initially emerging from bankruptcy. Acharya *et al.* (2007) also find that creditor recoveries are significantly lower when the firms in default operate in a distressed industry.

It is clear that the experiences of publicly traded US firms are not representative of the overall universe of firms, which, on average, have only 25 employees. However, few papers examine small or privately-held firms; Berkowitz and White (2004) is one notable exception. The authors consider how personal bankruptcy procedures affect small firms' access to credit in an environment where unincorporated firms debts are the liabilities of the firm owner. Therefore, if the firm fails, the owner can file for bankruptcy and business, as well as unsecured personal debts, will be discharged. Using variation in personal bankruptcy exemptions across US states, it is found that small business are more likely to be denied credit if they are located in states with high homestead exemptions, and if loans are received, the values are smaller, with higher interest rates.

Analysis on firm default and recovery outside of the US is limited, but such analysis is important since bankruptcy and liquidation procedures vary across the world. In general, Claessens and Klap-

⁽²⁾ Our literature review focuses on research related to what happens to firms after an episode of financial distress. However, there are also some relevant recent papers that examine post-distress patterns amongst other borrower types, namely personal bankruptcy (Cohen-Cole *et al.* (2009) and Han and Li (2009)), commercial real estate loans (Brown *et al.* (2006)) and home mortgages (Adelino *et al.* (2009) and Haughwout *et al.* (2009)).

per (2005) find that bankruptcy filing rates are higher in countries with more efficient judicial systems. In response to different degrees of creditor protection, Davydenko and Franks (2008) find that banks in France, Germany, and the UK significantly adjust their lending and reorganization to the national bankruptcy code. At the time of loan origination collateral requirements will directly reflect a bank's ability to realize assets upon default. As a result, adjustments by banks will be able to reduce, but not fully eliminate, the effect of the bankruptcy code on default outcomes.

Evidence on the duration and severity of defaults by firms outside the US is also scarce. Franks and Sussman (2005) consider a sample of 542 small- and medium-sized financially distressed UK firms that are transferred to their bank's workout unit, finding that, on average, these firms spend 7.5 months in the bank's workout unit and 60 percent of firms in the sample operate as going concerns. Secured creditors in the country fare well within the formal bankruptcy regime and 75 per cent of small firms that default subsequently enter formal bankruptcy receivership (Franks and Sussman, 2005), while average bank recovery rates are 75 per cent as firm assets are pledged as collateral to banks in most cases. In a study of Sweden's auction bankruptcy system for small firms, Thorburn (2000) finds that three-quarters of firms are auctioned as going concerns, and the direct costs average 6.4 per cent of pre-filing value of assets, suggesting that it is an efficient restructuring mechanism for small firms. In Portugal, Antunes (2005) finds that the severity of default influences the probability of liquidation, but the number of employees is the largest determinant of the time profile of the liquidation/ recovery process.

Finally, another important dimension of the costs of default are the losses incurred directly (and indirectly) by banks. The implementation of Basel II contributed to some expansion of the literature on recovery rates and loss given default (LGD). Some recent examples are Altman *et al.* (2005), Carvalho and Dermine (2006), Bruche and González-Aguado (2010), and Bastos (2010).

3. DATA

The main data source used in this paper is the Central Credit Register (CRC), which is held and managed by Banco de Portugal. Financial institutions granting credit in Portugal are obliged to report to the CRC, on a monthly basis, all loans granted above 50 euros.³ This database includes information on loan amounts as well as some loan characteristics. It is possible to know if the loan is a joint or single liability, or if it is an off-balance sheet item (such as the undrawn amount of a credit line or a credit card). More importantly for the purposes of our study, the database includes information on loan defaults and renegotiations. All financial institutions are obliged to report data to the CRC and are allowed to consult information on their current and prospective borrowers, with their previous consent. As a result, when granting a new loan, a bank can easily observe whether the applicant has any amount of credit overdue at that moment, as well as the total amount borrowed from different banks.

Using information contained in the CRC between 1995 and 2008, we identify all firms that record

(3) Due to the confidentiality of the information used in this work, data was treated anonymously and within Banco de Portugal.

at least one episode of default during this period.⁴ In the CRC, a default can be classified as a loan with late repayment (coded as Type 7 in the database) or as a liability involving litigation (coded as Type 8).⁵ We consider that there is a default only when a firm records a loan in either of these two categories for an entire quarter. This avoids mining the data with very short-lived episodes, possibly related to reporting errors or problems in bank transfers, for instance.⁶

Our unit of observation is a firm-quarter pair. Using quarterly data for the period 1995-2008, there are more than 1 million default observations, referring to 165,165 different default episodes in more than 100 thousand firms. We consider that a firm emerges from default when it does not record a default on bank loans in a given quarter, but it was in default during the entire previous quarter. This may mean that the firm is observed in the CRC but with no records referring to outstanding defaults, or that the firm is no longer present in the CRC. This latter possibility may imply that the firm was extinguished or that the firm continues to operate but without access to bank credit.

The amount and quality of the information available are superior to that used in most papers focusing on default recoveries, which usually analyse only a limited set of publicly traded firms, and allow us to conduct a richer analysis.⁷

4. WHAT HAPPENS WHILE FIRMS ARE IN DEFAULT?

What happens after the day the bank records the first default on a firms' debt? In this section we analyse what happens between that moment and the day the default is resolved. Our analysis of default spells will focus on the time and amounts in default, as well as on the severity of default and the losses recorded by banks.

In Table 1 we present some of the main characteristics of the default episodes that we observe. During our sample period there was a substantial expansion of credit to firms in Portugal, as shown by the significant increase in the number of firms with access to loans (column 1). As discussed in Antão *et al.* (2009), the liberalization of the Portuguese financial system in the late 1980s and early 1990s created the conditions for an expansion of credit granted to the private sector. This growth was fuelled by the significant decrease in bank interest rates during the 1990s, as the economy gradually converged to meet the euro accession criteria. The participation in the euro area improved the funding conditions of Portuguese banks in international wholesale markets, with virtually no exchange rate risk, thus further contributing to improve the access of Portuguese non-financial firms to bank loans. Against this background, loans granted to non-financial firms increase in the amount of loans granted to each firm (column 2), but also an increase in the number of firms that obtain ac-

⁽⁴⁾ We exclude unincorporated businesses from this analysis, as their assets are not autonomous from those of the owner. For statistical purposes, these businesses are usually classified as households.

⁽⁵⁾ For further details on this database, please see <u>http://www.bportugal.pt/en-US/PublicacoeseIntervencoes/Banco/CadernosdoBanco/Tumbnails%20</u> List%20Template/Central%20Credit%20Register.pdf.

⁽⁶⁾ We do not include loan write-offs in the definition of default, even though this information is also available in the CRC. This choice is motivated by the fact that when a bank writes-off a loan from its books it is implicitly assuming that the probability of repayment is very small, though still positive.

⁽⁷⁾ In Portugal there are less than one hundred publicly traded companies, while in 2008 there were more than 350 thousand firms operating in the country. This number highlights how partial and incomplete would the results be if our study would focus only on these companies.

FIRM	S IN DEFAULI: S	OME CHARACIE	-RIS IICS								
	Number of firms with a loan	Average amount outstanding	Number of new firms with a loan	Number of firms in default	Percentage of firms in default	Amount in default	Credit overdue ra defa	atios for firms in tult		New episodes of defa	rit
	Number	Mean (euros)	Number	Number	%	Mean (euros)	As a % of total credit	As a % of total credit inc. off- balance sheet	Number	Average amount (euros)	As a % of the number of firms with a loan (default rate)
	(1)	(2)	(3)	(4)	(5)	(9)	(1)	(8)	(6)	(10)	(11)
1995	126 590	384 566	29 153	17 719	14.0	190 124	72.1	69.8	5 543	45 741	4.4
1996	138 471	382 397	24 530	18 353	13.3	188 366	74.7	72.4	6 634	64 970	4.8
1997	149 890	401 970	23 981	19 221	12.8	159 071	74.4	72.0	7 086	47 246	4.7
1998	165 463	425 245	26 560	18 854	11.4	147 865	74.0	71.6	6 000	42 107	3.6
1999	183 340	478 633	28 085	17 531	9.6	142 006	72.5	69.8	7 454	41 767	4.1
2000	202 693	534 377	27 440	19 485	9.6	118 813	69.69	67.1	8 213	24 165	4.1
2001	227 642	546 375	33 979	24 880	10.9	108 053	61.5	59.6	11 997	31 827	5.3
2002	253 211	568 362	35 010	29 122	11.5	98 057	59.2	56.8	15 522	32 089	6.1
2003	262 423	544 646	26 312	31 522	12.0	92 733	58.2	55.7	14 578	22 903	5.6
2004	272 855	523 897	24 253	33 322	12.2	83 908	59.9	57.2	13 353	24 502	4.9
2005	279 364	535 183	22 987	33 189	11.9	75 962	62.7	59.8	12 903	29 974	4.6
2006	288 852	556 805	25 633	34 440	11.9	73 246	60.6	57.9	14 983	22 058	5.2
2007	300 161	575 760	28 496	40 198	13.4	66 348	60.0	57.3	20 629	24 615	6.9
2008	307 840	608 527	25 442	45 120	14.7	74 241	60.5	57.8	20 270	35 721	6.6
Total	479 298	525 118	381 861	108 479	12.1	105 142	64.1	61.5	165 165	31 919	5.2

Table 1

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Sources: Banco de Portugal and authors' calculations. Notes: Default is defined as the sum of liabilities with late repayments and of loans in litigation. We consider that there is a default only when a firm records a loan in any of these two categories for an entire quarter.

cess to credit (column 3). In fact, around 80 per cent of the firms analysed started to have access to credit after 1995Q1.

Column (4) refers to the number of firms that, in each quarter, record any amount in default and Column (5) presents the percentage of firms in default, computed as the ratio between the number of firms in default (column 4) and the total number of firms with a loan (column 1), in each quarter. We observe that this percentage had a U-shaped evolution, having decreased during the late 90s, but increasing again in the more recent years.

The average amount in default is slightly above 100 thousand euros per firm (column 6). This average amount decreased steadily during the sample period. Thus, even though there were more firms defaulting over time, the average size of the defaults became smaller. In Columns (7) and (8) we depict the credit overdue ratios for firms in default. These ratios decreased slightly during this period.⁸ Hence, even though defaults became more frequent, their size and severity decreased simultaneously.

Finally, the new episodes of default reported in columns (9), (10) and (11) refer to defaults recorded by firms without any default in the previous quarter. In column (11) we present the number of new default episodes as a percentage of the number of firms with a loan (column 1), *i.e.*, the default rate. The average amount initially in default is much smaller than the average total amount in default, as may be observed from the comparison of columns (6) and (10). Default rates peaked in 2002, possibly reflecting the increase in interest rates and the marked slowdown of economic activity after 2000 (Chart 1). The number of new default episodes and the default rate increased substantially since 2007, thus illustrating the deterioration in credit quality induced by the global financial crisis.

How long do firms stay in default? In Chart 2 we depict the hazard function, defined as the probability of a firm leaving default in the time interval [t, t + dt], conditional on being in default,

$$h(t) = \lim \frac{\Pr(t \le T \le t + dt \mid T \ge t)}{dt}, dt \to 0$$

and in Chart 3 we present the survivor function, defined as the probability of remaining in default until t,

$$S(t) = \Pr(T \ge t) = 1 - F(t)$$

The exit rate from default drops sharply in the first 2 years, from around 20 per cent to slightly more than 6 per cent (Chart 2). This suggests that when a default episode is not resolved within the first quarters, then it may take a long time to be cleared. The median default duration is 5 quarters.

During the period that firms remain in default their default intensity worsens, as illustrated in Table 2.

⁽⁸⁾ In column (7), the credit overdue ratio is defined as the sum of loans in late repayment and in litigation at the end of each quarter, as a percentage of total credit granted to that firm. In column (8) this definition is extended to include off-balance sheet liabilities in the denominator of this ratio (these include the unused amounts of credit lines, for instance).

Chart 1



Sources: INE, Banco de Portugal and authors' calculations.















Sources: Banco de Portugal and authors' calculations.

Note: Analysis time defined as quarters since the beginning of the first default episode. The survivor estimate is defined as the probability of remaining in default until $t: S(t) = \operatorname{Prob}(T \ge t) = 1 - F(t)$.

We observe that, as would be expected, the amount of credit overdue varies positively with the time in default. The same can be observed for the credit overdue ratio, which increases from 38 per cent of total credit when the firm first records a default, to 75 per cent if the firm remains in default for at least another year and a half. The total amount outstanding is smaller for firms with longer default spans, thus suggesting that larger firms exit default earlier.

A default does not necessarily generate losses for the banks. Indeed, when the default is originated by a small and temporary episode of financial distress, it would be expected that most firms are able to overcome such difficulties and pay back the amount overdue, eventually after some renegotia-

	Number of observations	Amount of c (eu	redit overdue ros)	Credit over	due ratio (%)	Amount of outstandi	total credit ng (euros)
		Mean	Median	Mean	Median	Mean	Median
Firms in default for: (in quarters)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	165 165	31 919	2 870	37.9	13.9	375 300	30 170
2	110 208	48 675	5 000	49.9	36.9	327 402	26 302
3	86 674	63 107	7 071	58.4	67.3	315 105	24 890
4	70 016	77 239	9 510	64.4	88.4	307 386	25 115
5	60 348	87 083	11 220	69.5	98.9	296 448	24 753
6	50 377	96 381	12 450	72.8	100.0	332 136	24 773
7	42 618	106 597	14 690	75.4	100.0	291 051	26 115

Table 2

Sources: Banco de Portugal and authors' calculations.

Notes: In this table are depicted firm and loan characteristics for firms that have been in default for 1 quarter (line 1), 2 quarters (line 2), etc., up to 7 quarters. In each line, the variables refer to the situation in the x quarter after the default episode began.

tion of the loan's terms and conditions with the bank. To shed some light on this issue, in Table 3 we present estimates of losses incurred by banks, based on write-offs and write-downs reported to the Central Credit Register. It should be noted that these losses do not include recovery costs and, more importantly, do not consider collateral, as this information is not available in the CRC for the period considered. Losses are displayed as a percentage of total loans outstanding after the default episode ends (*i.e.*, once the firm does not record late repayments or loans in litigation in the following quarter).

In Table 3 we present two main statistics regarding bank losses due to written-off loans. The first is the unconditional loss, that is, given all default episodes, what is the average loss incurred by the bank (columns (1) to (5)). In this case we find that on average any given default will generate a loss due to write-offs of 10.3 per cent of the total amount outstanding at the time the default episode ends. This figure is much lower than the 45 per cent loss given default rate considered for corporate uncollateralised loans in the foundation approach of Basel II. However, as we do not have information on collateral, this comparison is not straightforward.

The second statistic is the conditional loss, that is, given all default episodes that lead to a writeoff, what is the average loss incurred by the bank (columns (6) to (10)). For this case, the figure is substantially higher, 33.7 per cent, but this large difference comes mainly from the fact that a large majority of default episodes do not lead to any write-off (only 30 per cent of default events generate a write-off for the bank).

Finally, when we consider only default episodes that took longer to resolve (in this case, when the default spell is longer than 1 year), we find that the unconditional loss almost doubles (18.2 per cent vs. 10.3 per cent).

Та	b	le	3

ES	TIMATES	OF LOS	SES IN	ICURR	ED BY ⁻	THE BAN	IKS							
	Bank Io	osses due includi	e to writ ng all lo	ten-off l oans	oans:	Bank lo only ind	osses du cluding ev w	e to writ vents th rite-off	ten-off at origi	loans: nated a	Bank lo loans: in default	sses due cluding a was long	to writ II Ioans er than	ten-off whose 1 year
	Ν	mean	p50	p75	p99	N	mean	р1	p50	p99	N	mean	p50	p99
		%	%	%	%		%	%	%	%		%	%	%
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1995	5 880	2.6	0.0	0.0	86.2	553	28.0	0.01	9.4	99.6	3 861	3.2	0.0	88.9
1996	6 229	6.9	0.0	0.0	97.0	1 235	34.7	0.04	19.4	99.9	3 851	8.9	0.0	98.7
1997	6 778	4.8	0.0	0.0	93.3	1 238	26.0	0.02	10.1	99.7	3 925	6.3	0.0	96.6
1998	8 626	8.7	0.0	0.0	99.3	1 805	41.8	0.00	35.0	100.0	5 889	11.5	0.0	99.8
1999	6 042	9.1	0.0	0.0	99.6	1 215	45.3	0.03	38.1	100.0	3 675	14.4	0.0	99.9
2000	6 382	8.5	0.0	0.0	98.9	1 354	40.1	0.02	26.8	99.9	3 501	12.9	0.0	99.5
2001	10 614	9.8	0.0	0.6	99.9	3 397	30.6	0.00	6.5	100.0	4 906	17.6	0.0	100.0
2002	12 234	9.8	0.0	0.7	99.0	3 840	31.2	0.00	8.6	99.9	6 220	17.8	0.0	99.8
2003	11 956	8.4	0.0	0.4	99.3	3 735	27.0	0.00	4.5	99.9	5 655	15.8	0.0	99.8
2004	13 163	11.1	0.0	1.5	99.7	4 627	31.7	0.00	8.0	100.0	6 740	19.2	0.0	99.8
2005	13 662	14.6	0.0	2.9	99.9	5 0 3 0	39.7	0.00	17.4	100.0	7 000	26.1	0.0	100.0
2006	14 636	15.4	0.0	4.5	99.9	5 761	39.0	0.00	18.3	100.0	7 230	29.0	1.5	100.0
2007	15 166	11.5	0.0	2.6	99.5	5 686	30.7	0.00	8.4	99.9	5 713	27.8	4.2	99.9
2008	12 945	11.2	0.0	3.1	99.6	4 828	30.1	0.01	10.3	99.9	5 327	25.1	4.2	99.9
Total	144 313	10.3	0.0	0.8	99.7	44 304	33.7	0.00	11.1	100.0	73 493	18.2	0.0	99.9

Sources: Banco de Portugal and authors' calculations.

Note: Estimates of losses incurred by the banks are based on write-offs and write-downs reported by banks to the CRC.

5. WHAT HAPPENS AFTER FIRMS LEAVE DEFAULT?

There are two main possible outcomes after firms exit default: the firms can become extinct, entering liquidation, bankruptcy or being acquired; or the firms can survive and overcome the financial distress that eventually led to default. In the latter case, firms can regain access to credit or they can continue to operate without bank loans (either because they prefer to use alternative funding sources or because banks are not willing to give them credit anymore). In Table 4 we analyse these possible outcomes in the quarter immediately after default is resolved.

A default episode is considered to be resolved if there is no record of loans with late repayments or in litigation in the following quarter. We exclude firms that were in default in 2008Q4, the last quarter in the sample, as we do not have information on what happens to these firms afterwards. Column (2) considers the number of default episodes resolved as a percentage of the number of observations in default. Even though the number of default episodes that are resolved each year increased substantially during the sample period, the "exit rate" from default was relatively stable during these years.⁹

A rough estimate suggests that at least 12 per cent of the firms that disappear from the CRC after default are still operating afterwards. This estimate was conducted by searching for the firms that are not in the CRC in the 3 years after default in another dataset, *Quadros de Pessoal*. This database covers all Portuguese firms with more than 10 employees. Hence, the estimate presented is a lower bound for the number of firms that no longer have access to credit markets after default. From

(9) In 2008 the value is substantially lower than for the other years because the last quarter of 2008 was excluded from the analysis.

the 5,602 firms that cannot be found in the CRC in the 3 years after the default is cleared (considering only defaults resolved until 2006), at least 686 firms are found to still be operating, but without having access to bank loans. Given this, the maximum bankruptcy or liquidation rate after default is around 8 per cent, thus showing that most firms are able to overcome a default episode. We also find evidence of a significant recidivism pattern: almost half of the firms that overcome their first default episode record at least another default episode in the following 3 years (column 7).¹⁰

We can distinguish between two types of re-access: i) simple access (summing up columns 10 and 12); and ii) increased access (considering only column 10). In the former case, we consider that the firm has regained access simply if it continues to have access to any bank loans after the default is cleared¹¹ (we refer to this definition as "broad access"). In the latter, we consider a stricter access definition and take into account only those cases in which the firm had access to a new loan after default ("strict access"). As we do not have information on a loan-by-loan basis, we consider all cases in which the total amount outstanding is larger than that observed when the default ended.¹²

Focusing on what happens in the quarter immediately after the firms' first default episode is resolved, we observe that the access rates depend crucially on the access definition we use. In the case of the strict access, only 13 per cent of firms were able to increase their bank credit in the first quarter after default. With respect to the broad access definition, the numbers are substantially different. In this case, 59 per cent of firms had access to credit in the first quarter after resolving the default.¹³ Hence, most firms do not face a long exclusion from credit markets as a penalty for their past defaults. Over time these two statistics had different paths. While in the case of strict access there was a fairly monotone decrease, in the case of broad access there was some volatility during the sample period: instantaneous access rates decreased until 1998, but peaked in 2002. Afterwards, there was a gradual decrease.

We consider two additional possible outcomes after default: firms that have access to loans but still record some written-off loans (9 per cent) and firms only with written-off loans, *i.e.*, no access (14 per cent). These two outcomes lie somewhere between default and access. On one hand, these firms are not technically in default. On the other hand, we cannot consider that the problems generated by the default event are fully overcome.

In Chart 4 we compare the distribution of possible outcomes after default in two different moments in time: 1 quarter (as in Table 4) and 3 years after the first default episode was cleared. The differences are significant. The percentage of firms which is able to obtain new bank loans is one of the few outcomes that remains relatively stable (13 per cent versus 11 per cent). However, when the broad access definition is considered, the percentage of firms with access drops substantially, from 59 to 30 per cent. This decrease is offset by the increase in the percentage of firms which disappear

(13) The 59% figure is the sum of the last row of columns (11) and (13) from Table 4.

⁽¹⁰⁾ Adelino et al. (2009) and Haughwout et al. (2009) find evidence of significant recidivism problems in mortgages (the latter paper focuses on subprime loans). In both papers, the authors examine the interaction between renegotiation and the incentives for repeated defaults.

⁽¹¹⁾ In fact, most firms never lose access to credit completely while they are in default, as firms usually default only in a part of their total outstanding commitments.

⁽¹²⁾ Given that a significant part of loans to firms has short maturities, a firm may have had access to a new loan (or loan renewal) even if the total outstanding amount did not increase. This access definition may then be too strict, thus justifying the need to consider the two alternative definitions.

												19	luarter af	fter first dei	fault epi	sode ends			
												-	n credit ı	register				Not in c regis	redit er
	Number of default episodes resolved	Default episodes resolved as a % of defaults in each year	Number of default episodes resolved (only first defaults)	Firms that the credit the quarte first def	t continue in t register in er after their fault ends	Firms tha a new d episode i years afte defa	t record efault in the 3 r exiting ult	Firms that in the CRC years after defau	are not in the 3 exiting llt	Firms with access without pr loans	and oblem	Firms with (but less befor	access than e)	Firms with but still written-of	access with f loans	Firms on written-of (no acc	ly with f loans :ess)	Without ac close	d d
				Number	% of total (column 3)	Number	% of total	Number	% of total	Number	% of total	Number	% of total	Number	% of total	Number	% of total	Number	% of total
	(1)	(2)	(3)	(4)	(5)	(9)	(7)	(8)	(6)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1995	5 880	10.6	2 2 2 2	1 764	79.4	1 223	55.0	225	10.1	330	20.5	780	48.4	27	1.7	17	1.1	458	28.4
1996	6 229	10.6	3 769	2 624	69.6	2 075	55.1	492	13.1	641	16.5	1 748	44.9	313	8.0	49	1.3	1 145	29.4
1997	6 778	11.4	3 847	2 785	72.4	1 722	44.8	580	15.1	604	16.5	1 692	46.2	176	4.8	130	3.5	1 062	29.0
1998	8 626	14.8	4 978	3 190	64.1	2 586	51.9	477	9.6	538	11.6	1 701	36.7	209	4.5	396	8.5	1 788	38.6
1999	6 042	11.2	3 491	2 793	80.0	1 597	45.7	389	11.1	761	20.0	1 533	40.2	367	9.6	451	11.8	698	18.3
2000	6 382	11.2	3 704	3 036	82.0	1944	52.5	300	8.1	545	15.3	1 624	45.6	238	6.7	487	13.7	668	18.8
2001	10 614	15.5	6 976	5 827	83.5	3 564	51.1	418	6.0	1 189	18.2	3 149	48.2	582	8.9	462	7.1	1 149	17.6
2002	12 234	14.7	6 997	5 985	85.5	3 436	49.1	594	8.5	1 091	16.2	3 713	55.0	471	7.0	466	6.9	1 012	15.0
2003	11 956	12.9	7 014	6 037	86.1	3 472	49.5	655	9.3	957	13.4	3 950	55.3	528	7.4	735	10.3	977	13.7
2004	13 163	13.8	7 578	6 660	87.9	3 202	42.3	694	9.2	752	9.8	3 674	48.0	873	11.4	1 438	18.8	918	12.0
2005	13 662	13.5	7 433	6 359	85.6	3 204	43.1	778	10.5	577	8.6	3 274	49.0	685	10.2	1 076	16.1	1 074	16.1
2006	14 636	14.7	7 942	6861	86.4		'		•	662	7.9	3 149	37.4	1 185	14.1	2 352	27.9	1 081	12.8
2007	15 166	13.6	8 860	7 201	81.3		'		'	985	11.5	3 800	44.4	676	7.9	1 442	16.8	1 659	19.4
2008	12 945	10.0	7 668	6 059	79.0		1		•	920	9.6	4 235	44.4	1 025	10.7	1 751	18.4	1 609	16.9
Total	144 313	12.8	82 479	67 181	81.5	28 025	48.3	5 602	9.7	10 552	12.8	38 022	46.1	7 355	8.9	11 252	13.6	15 298	18.5

Sources: Banco de Portugal and authors' calculations.

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Table 4

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Chart 4

from the CRC after default (from 18 to 32 per cent), as well as by the firms that re-enter default (23 per cent after 3 years have gone by).

In Charts 5 and 6 we depict the survival functions for the two access definitions. In both cases, most firms regain access almost immediately. In the stricter access definition (Chart 5), we observe that the firms that regain access are able to do it very soon after the default ended. Access rates are high during the first quarters and then stabilize at very low values. If the firm does not show an increase in bank loans in the first quarters after the default is cleared, it is very unlikely that it will ever do. In fact, almost 60 per cent of the firms never regain access to new bank loans.

When the broader definition of access is considered, the results are fairly similar. However, in this case the time of exclusion is even shorter. Most firms are able to regain access immediately. The probability of regaining access decreases dramatically in the second quarter after default ended. Around 25 per cent of the firms never regain access to bank loans (Chart 6).

Hence, regardless of the access definition used, we observe that when a firm is not able to regain access soon after the default is cleared, the probability that it will ever be able to do so becomes very low.

In order to better understand why some firms are able to regain access relatively fast after exiting default, we estimate a Cox proportional hazard model for the time until access, such that:

$$h(t, X_i) = k(X_i, \beta)h_0$$

where k(.) is a non-negative function of X_i and β , the vectors of covariates and parameters, and h_0 is the baseline hazard. In this model, the baseline hazard is common to all firms and individual hazard functions differ from each other proportionally, with k(.) representing the factor of propor-

Chart 5



Chart 6



Source: Banco de Portugal and authors' calculations.

Note: Analysis time defined as quarters since the end of the first default episode. The survivor estimate is defined as the probability of regaining access after default at $t:S(t) = \operatorname{Prob}(T \ge t) = 1 - F(t)$. More access is defined as having a larger amount of outstanding bank loans (including credit lines) than at the end of the default episode and not having any record of default or write-offs.

Sources: Banco de Portugal and authors' calculations.

Note: Analysis time defined as quarters since the end of the first default episode. The survivor estimate is defined as the probability of regaining access after default at $t:S(t) = \operatorname{Prob}(T \ge t) = 1 - F(t)$. Access is defined as having a positive amount of outstanding bank loans (including credit lines) without any record of default or write-offs, after having left default.

tionality. One advantage of this method is that it is a semi-parametric approach, thus allowing us to estimate β without specifying the form of the baseline hazard. Under this setup, the regressors do not affect the shape of the overall hazard function, conditioning only the relative failure risk of each firm. The failure risk is defined as the time until a firm regains access to credit (using our two different access definitions) after it has overcome its first default episode.

The estimation results are shown in Table 5. Columns (1) to (4) refer to the broad access definition, whereas columns (5) to (8) consider the strict definition. The columns differ in the time controls used, as discussed below. In these regressions, an estimated coefficient lower than 1 should be interpreted as contributing to a longer time until access (and the opposite for a coefficient above 1).

Taking the total amount of credit outstanding as a proxy for firm size, we observe that larger firms regain access faster (columns (1) to (4)). However, this result is not strongly statistically significant when we consider the time it takes a firm to regain access to a new bank loan after default (columns (5) to (8)). The intensity of the default episode is a key determinant in the process of regaining access: firms that recorded higher credit overdue ratios and higher loss rates take more time to regain access to credit, especially in the broad definition. The impact of default duration goes in the same direction, but now the effect is stronger for the stricter access definition, *i.e.*, a longer default harms the ability of firms to have access to new bank loans.

The choice of the number of bank relationships also seems to influence how easily firms regain access after default, though only in the broader definition.¹⁴ Firms that borrow from more banks take

(14) The results for the stricter definition are not statistically significant at a 5% level.

Table 5

COX REGRESSIONS: DETERMI	NANTS OF	TIME UN	TIL ACCE	SS				
	Failure e	vent: acce	ss (broad d	lefinition)	Failure e	event: acce	ss (strict d	efinition)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ln Credit outstanding (In(euros))	1.016	1.015 9 24	1.015	1.015 9.29	1.010	1.008	1.007	1.008
Credit overdue ratio (%)	0.993	0.993	0.993	0.993	0.998	0.997	0.997	0.997
Loss rate (%)	0.974	0.974	0.974	0.974	0.980	0.980	0.980	0.980
Duration of default (quarters)	0.937	0.939	0.940	0.939	0.921	0.927	0.928	0.927
No. of bank relationships	0.957	0.956	0.957	0.956	-28.25	-20.20	1.007	1.008
No. of bank relat. in default % of total	0.996	0.996	0.996	0.996	0.994	0.994	0.994	0.994
Default with main bank (binary)	1.058	- <i>31.03</i> 1.063	-30.87	1.063	0.877	0.896	0.898	0.896
Recession (binary)	-	-	-	12.80	-8.02	-6.69	-6.58 -	1.103
D_1996	-	1.145	-	6.25 1.145	-	1.421	-	1.86 1.421
D_1997	-	13.82 1.170	-	13.82 1.170	-	10.03 1.335	-	10.04 1.335
D_1998	-	16.00 1.159	-	16.00 1.159	-	8.28 1.424	-	8.28 1.425
D_1999	-	14.51 0.977	-	14.51 0.977	-	10.59 1.515	-	10.59 1.515
D_2000	-	-2.00 1.010	-	-2.00 1.010	-	^{13.21} 1.326	-	^{13.21} 1.326
D_2001	-	0.96 1.040	-	0.96 1.040	-	^{8.47} 1.485	-	^{8.47} 1.485
D_2002	-	4.78 0.996	-	4.79 0.996	-	^{14.31} 1.226	-	^{14.31} 1.226
D_2003	-	- <i>0.48</i> 1.039	-	- <i>0.48</i> 0.952	-	7.37 0.967	-	7.37 0.877
D_2004	-	4.99 0.932	-	-3.10 0.912	-	-1.14 0.852	-	-2.18 0.831
D_2005	-	-8.28 0.990	-	-9.76 0.990	-	-5.29 0.856	-	-5.56 0.856
D 2006	-	-1.10 0.951	-	-1.10 0.951		<i>-4.96</i> 0.916	-	<i>-4.96</i> 0.916
_ D 2007	-	-5.47 0.982	-	-5.47 0.982		-2.89 1.085	-	-2.89 1.085
	-	-2.25	-	-2.25	-	2.92	-	2.92
Quarter dummies	Ν	Ν	Y	Ν	Ν	Ν	Y	Ν
Number of subjects	73 980	73 980	73 980	73 980	73 980	73 980	73 980	73 980
Number of failures	54 282	54 282	54 282	54 282	21 055	21 055	21 055	21 055
Log-likelihood	-589 282	-589 180	-589 097	-589 177	-226 434	-226 022	-225 864	-226 020

Sources: Banco de Portugal and authors' calculations.

Notes: z-scores in italics. All models estimated using a Cox regression that evaluates the time until access using robust variance estimates. An estimated coefficient lower than 1 should be interpreted as contributing a longer time until access. In columns (1) - (4), the dependent variable is the time until access using the broad definition. In columns (5) - (8) it is considered the strict definition of access. All explanatory variables are defined as in previous tables and refer to the last period of default.

more time to regain access to bank loans. Hence, engaging in single bank relationships may provide some benefits for firms in financial distress.¹⁵ Moreover, firms that were defaulting on a larger percentage of existing bank relationships take more time to regain access to credit, which may also be regarded as evidence that more severe default episodes lead to a more prolonged exclusion from credit markets.

Finally, in what concerns defaulting with the firms' main lender, the results are rather mixed: firms that default with their main bank seem to have more difficulties in having access to new loans, but the opposite is seen when the broad definition is considered. This result is probably driven by the way we define access in the latter case: as mentioned before, we consider that a firm regains access when it records a positive amount of credit outstanding without having any problem loans. Thus, if a firm defaults for a given period of time and at some point it is able to repay the debt overdue, we consider that the firm has regained access. As we observe that most firms actually default with their main lender, the time it takes to regain access may be mechanically driven by this feature of the data.

As mentioned above, the different columns in Table 5 consider essentially the same explanatory variables, with the exception of the time controls. Time effects seem to play a relevant role: firms that emerged from default in the earlier years of our sample took less time to regain access to credit than firms that defaulted in more recent years. In order to better explore these effects, in columns (4) and (8) we include a binary variable for recession years. We find that firms that exit default during recessions are able to regain access to bank loans sooner, controlling for all other default and loan characteristics. This is an interesting result, as it may suggest that when a firm is able to resolve a default during adverse times, banks perceive this as being a signal of the quality and strength of the firm.¹⁶ In particular, banks possibly consider that these firms are of higher quality (in terms of creditworthiness) and therefore grant credit faster than if the default due to an exogenous systematic shock than due to idiosyncratic fragilities, thus supporting this creditworthiness assessment by banks.

The shapes of the survival functions (Charts 5 and 6) show that there is significant right-censoring in our data, especially in the stricter access definition: around 25 per cent of the firms never regain access to loans after default and almost 60 per cent never regain access to new bank loans. This pattern suggests that we are dealing with defective risks or infinite durations, as some firms will never be able to regain access. As noted by Addison and Portugal (2003), the presence of defective risks may lead to inconsistent estimates of the hazard regression coefficients. To address this issue, we estimated

⁽¹⁵⁾ For instance, Carmignani and Omiccioli (2007) argue that the overall effect of more concentrated banking relationships is a lower probability of liquidation, but a higher probability of financial distress. In turn, Elsas and Krahnen (1998) show that when there are strong bank-customer relationships, banks provide liquidity insurance to firms in financial distress.

⁽¹⁶⁾ For robustness purposes, we also considered the effect of entering default during a recession on the time it takes until firms regain access to credit, but the results are not statistically significant. In addition, we also tried to consider simultaneously the effect of entering and/or leaving default during a recession, plus an interaction between these two possibilities (*i.e.*, a binary variable that takes the value 1 when the firm enters and leaves default during a recession). If this is the case, firms are able to regain access significantly faster. In contrast, firms that entered default during a recession should take more time to regain access. The effect of leaving default during a not significant in this specification.

⁽¹⁷⁾ Acharya et al. (2007) study the impact of industry-wide distress on the recoveries of defaulted firms in the US and find that defaulting firms that belong to industries in distress are more likely to spend more time in bankruptcy. However, these firms are also more likely to be restructured than to be acquired or liquidated.

all the regressions displayed in Table 5 conditional on the firms regaining access (under each of our access definitions) during the sample period. This amounts to fully eliminating right censoring in our sample: all firms eventually "fail", that is, they reach the failure event with probability one.¹⁸ The results for the broad access definition are not qualitatively different from those obtained with unconditional estimation, but there are some small differences for the stricter definition of access. First, the positive influence of firm size on the reduction of the time until the firm obtains a new loan becomes more economically and statistically significant (whereas with unconditional regressions this variable was significant only at a 10 per cent level). Second, the result regarding firms that default with their main lender changes its sign: conditional on obtaining a new loan, firms that have defaulted with their main lender are able to regain access faster. Hence, defaulting with the main lender affects negatively the likelihood of obtaining a new loan, but not the time it takes for that to happen.

Another dimension of post-default behaviour that deserves to be explored is whether firms regain access with the banks that were previously lending to them or if they are able to establish new bank relationships. In Table 6 we provide some evidence on that issue.

In the quarter immediately after the default episode is cleared, we saw before that 13 per cent of the firms have access to a new bank loan (Table 4). From these firms, almost one third obtains that loan from a new bank (column (3), Table 6). This percentage was higher in the first years of the sample period. When we examine this situation one and three years after default, we observe that the percent-

		After 1 quart	er		After 1 year			After 3 years	6
	Firms with more access	Firms with and with a	more access a new bank	Firms with more access	Firms with and with a	more access a new bank	Firms with more access	Firms with a and with a	more access a new bank
			%			%			%
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1995	330	136	41.2	-	-	-	-	-	-
1996	641	226	35.3	356	210	59.0	-	-	-
1997	604	200	33.1	467	282	60.4	-	-	-
1998	538	214	39.8	529	291	55.0	349	265	75.9
1999	761	227	29.8	534	318	59.6	505	371	73.5
2000	545	223	40.9	469	292	62.3	564	424	75.2
2001	1 189	559	47.0	541	385	71.2	569	481	84.5
2002	1 091	412	37.8	1 239	811	65.5	411	342	83.2
2003	957	262	27.4	766	432	56.4	456	388	85.1
2004	752	188	25.0	670	389	58.1	997	804	80.6
2005	577	171	29.6	630	375	59.5	719	562	78.2
2006	662	160	24.2	547	322	58.9	657	509	77.5
2007	985	266	27.0	652	366	56.1	629	506	80.4
2008	920	177	19.2	892	464	52.0	542	427	78.8
Total	10 552	3 421	32.4	8 292	4 937	59.5	6 398	5 079	79.4

Table 6

Sources: Banco de Portugal and authors' calculations.

Notes: Firms with more access are those with more outstanding bank loans (including credit lines) than at the end of the default episode and without any record of default or write-offs. Firms with more access and with a new bank defined as those borrowing from a bank which was not a lender when the default episode ended. Only firms with less than 9 bank relationships are considered.

(18) The results are not presented in this article but are available upon request.

age of firms that were able to obtain a loan from a new lender increases markedly (60 per cent after one year and 80 per cent after 3 years).

These results must be analysed bearing in mind that the Portuguese Credit Register is designed to be an information sharing mechanism between banks. When a firm defaults on a bank loan, the other banks currently lending to that firm can observe that. Their prospective lenders can also ask to have access to that information, with the firms' consent, what is usually the common procedure. Notwithstanding this, banks seem to be generally willing to give firms a second chance.

6. CONCLUDING REMARKS

In this paper we investigated what happens to firms after they default on their bank loan obligations. What happens to firms while they are in default? How many firms are able to overcome financial distress and regain access to bank credit? Which default characteristics influence these outcomes? We focused our analysis in two different moments: the "in default" and the "post default" periods.

With respect to the "in default" period we find that i) if a default episode is not resolved within the first quarters, then it may take a long time to be overcome; ii) the duration of default is linked to its severity, that is, the more significant the default is, the longer it takes to be resolved; iiii) only 31 per cent of default events lead to loan write-offs; iv) of those loans that lead to a write-off, the average loss for the bank is 34 per cent.

Regarding the "post default" period our results show that i) in the first quarter after exiting default, 59 per cent of firms have access to credit, but of these, only less than one quarter of the firms was able to increase its bank debt; ii) if a firm is not able to regain access to credit in the first year after exiting default then the likelihood of obtaining credit is less than 1 per cent; iii) after three years of resolving the default, almost 25% of firms were again defaulting on their bank loan(s); iv) the duration of exclusion is strongly related to the severity of the default episode. That is, the larger the amount defaulted on, the larger the written-off amount, and the longer the default period, the longer the period of exclusion will be; v) firms that are able to exit default during recession periods regain access to credit faster.

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