WHAT HAPPENS AFTER DEFAULT? STYLIZED FACTS ON ACCESS TO CREDIT

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What happens after default? Stylized facts on access to credit[*]

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Abstract

In this paper we investigate what happens to firms after they default on their bank loans. We approach this question by establishing a set of stylized facts concerning the evolution of default and its resolution, focusing on access to credit after default. Using a unique dataset from Portugal, we observe that half of the default episodes last 5 quarters or less and that larger firms have shorter default periods. Most firms continue to have access to credit immediately after default, though only a minority has access to new loans. Firms have more difficulties in regaining access to credit if they are small, if their default was long and severe, if they borrow from only one bank or if they default with their main lender. Further, half of the defaulting firms record another default in the future. We observe that firms with repeated defaults are, on average, smaller and have experienced longer and more severe defaults.

JEL codes: C41, G21, G32, G33.

Keywords: loan default, firm access to credit, duration analysis

1 Introduction

By granting credit, banks play a crucial role in the economy as liquidity providers (Diamond and Dybvig, 1983). Virtually all loans granted by banks have a positive default probability, which is taken into account by banks in their pricing decisions. While there is a large literature on which factors may lead firms to default on their debts, there is surprisingly scarce evidence on what happens to firms after they default[1]. We aim to fill this gap in the literature by studying two broad questions: What happens to firms post-default? And when are firms able to regain access to financial markets after experiencing an episode of financial distress/ default?

These questions should be interesting in any context, but the increase in bank loan delinquencies and defaults worldwide surrounding the 2007-2010 Global Financial Crisis makes this research even more relevant. How many of these firms will be able to overcome financial distress and regain access to credit? Which factors may be more relevant in this process? Do default characteristics influence the likelihood of regaining access to credit markets? By trying to provide answers to these questions, we hope to provide relevant and timely empirical evidence on this issue. We contribute to the existing literature by establishing a set of stylized facts regarding the trajectory of firms post-default. We focus not only on the duration of financial distress but also on the ability to re-access credit markets.

To answer the questions mentioned above, we use a unique dataset from Portugal, the Central Credit Register (CRC), which covers virtually all bank loans granted to Portuguese firms between 1995 and 2008[2]. This time period captures a full credit cycle with a variety of macroeconomic conditions, including the convergence process to the European Monetary Union and the 2007-2008 financial crisis. The CRC collects information on all loans undertaken by each firm in any financial institution in Portugal. One of its main goals is to support participating credit institutions in the assessment of credit risk. The information shared between banks within the scope of

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[1] For a review of the literature on factors influencing firm default see, for example, Duffie and Singleton (2003) or Saunders and Allen (2002).

[2] We acknowledge that bank credit is not the only source of external financing that is available to Portuguese firms. Nevertheless, and similarly to what happens in the rest of Europe, bank credit is the main source of external financing for Portuguese (and European) firms. According to the results of the ECB "Survey on the access to finance of small and medium-sized enterprises in the euro area" for H2-2009, 70% of Euro area SMEs report using a bank loan, overdraft, or line of credit during the last 6 months, compared to market-based financing (where only 2.2% of SMEs had issued debt or equity securities) and to trade credit (24% of SMEs) (ECB, 2010).

this database should therefore have an important role in reducing the traditional information asymmetry problems between borrowers and lenders[3].

Our results are organized in two parts: 1) the "in default" and 2) the "post default" periods. With respect to the "in default" period we find that i) 50% of default episodes last 5 quarters or less, and of these, half are resolved in less than 1 or 2 quarters; ii) at the same time, we also observe that if a default episode is not solved in less than 1 year it can take several years to be cleared; iii) the duration of the default is linked to its severity, that is, the more significant the default, the longer it takes to be resolved; iv) not all bank loan default episodes generate write-offs for the banks: only 31% of default events lead to write-offs; and v) of those loans that lead to a write-off, the average loss for the bank is 34%.

Regarding the "post default" period our results show that i) in the first quarter after exiting default, 59% of firms have access to credit, but of these, less than one quarter of firms were able to increase their 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 at any given moment is less than 1%; iii) 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, or the longer the default period, the longer the period of exclusion will be; iv) re-access mostly occurs through banks with whom the firm had ongoing lending relationships before the default was resolved; v) there is a high degree of recidivism: after one year of clearing the default, almost 25% of firms had defaulted again on their bank loan(s); and vi) firms that are able to exit default during recession periods regain access to credit faster and are less likely to default again.

The rest of the paper is organized as follows: in Section 2 we review some of the relevant literature, focusing primarily on empirical findings, and in Section 3 we describe the data. Our main results are analyzed 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. Finally, in Section 6 we conclude.

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[3]Jappelli and Pagano (1993, 2006) note that public credit registries have the benefits of: (i) improving banks' knowledge of applicants' characteristics, reducing adverse selection problems; (ii) reducing the "informational rents" that banks could otherwise charge customers; (iii) act as a borrower discipline device; and (iv) eliminate or reduce borrowers' incentives to become "over-indebted", derived from simultaneously borrowing from multiple lenders.

2 Related literature

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[4]. 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 analyze 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% 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 US firms, which, on average, have only 20 employees (Axtell, 2001). 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

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[4]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)).

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 Klapper (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% of firms in the sample operate as going concerns. Secured creditors in the country fare well within the formal bankruptcy regime and 75% of small firms that default subsequently enter formal bankruptcy receivership (Franks and Sussman, 2005), while average bank recovery rates are 75% 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% 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 that the number of employees is the largest determinant of the time profile of the liquidation/ recovery process[5].

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).

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[5]Refer to appendix 1 for a comparison of bankruptcy codes in Portugal and the US.

All in all, most of the existing literature on default and recoveries after financial distress focuses on US publicly traded firms. Evidence on small and medium enterprises, especially outside the US, is also relatively scarce. Moreover, most of this literature focuses on bankruptcy, liquidation and reorganization procedures. Our work makes a contribution to fill both of these gaps in the literature. On one hand, we analyze the entire universe of firms with access to bank loans in a European country. On the other hand, we focus on a broader event related to financial distress: loan default.

3 Data

The main data source used in this paper is the Central Credit Register (CRC), which is held and managed by the Banco de Portugal. Financial institutions granting credit in Portugal are obliged to, on a monthly basis, report to the CRC all loans granted above 50 euros. 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 at least one episode of default during this period[6]. 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)[7]. We consider that there is a default only when a firm records a loan in either

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[6]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.

[7]The borrowers may be in arrears in relation to the principal and/or interest and other costs. For the principal, there is a default if at least 30 days have elapsed from the due date. For interest and other costs, there is a default from the date on which payments should have been made. For further details on this database, please see http://www.bportugal.pt/en-US/PublicacoeseIntervencoes/Banco/CadernosdoBanco/Tumbnails%20List%20Template/Central%20Credit%20Register.pdf.

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[8].

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[9]. 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 analyze only a limited set of publicly traded firms, and allow us to conduct a richer analysis[10].

4   What happens while firms are in default?

During the last decade, the literature on the determinants of firm default increased dramatically, in part driven by the discussion and subsequent implementation of Basel II. However, much less attention has been devoted to the dynamics of the default process in itself and, more importantly, to what happens to firms after they fail to comply with their debt obligations. In this section we explore the richness of information contained in the Portuguese Credit Register dataset to analyze these two issues - the "in default" and "post default" periods. In this section we examine in detail the evolution of default episodes, from their onset until their conclusion. Then, in Section 5, we proceed with our analysis by focusing on what happens to firms after the default episode is considered resolved.

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[8] 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.

[9] We do not have information strictly on a loan-by-loan basis, as banks report information for each borrower aggregated by loan type.

[10] 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.

In general, a default episode can be characterized by three elements: 1) incidence and amount of the default; 2) the length of the default event; and 3) the losses ultimately faced by the financial institution. Understanding better these three elements is of great interest because it has a direct impact on how financial institutions manage their risk exposure and how regulatory agencies design their policies. Below, we analyze each of the three elements.

4.1 Default incidence and amounts

The first question we address is how the default incidence and the corresponding amounts evolved in Portugal during the sample period, 1995 to 2008. In Table 1 we present various statistics regarding the amounts and the incidence of bank loan defaults over time.

Table 1 around here

Several interesting results arise from the analysis of this table. First, 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 increased by an average annual growth rate of 12% during these years, reflecting not only an increase in the amount of loans granted to each firm (column 2), but also an increase in the number of firms with access to credit (column 3). In fact, around 80% of the firms analyzed started to have access to credit after 1995Q1.

Second, at the same time credit expanded in Portugal, the incidence of non-performing loans had a U-shaped path (column 5). Between 1995 and 2000 there was a significant decrease (from 14% to 9.6%), but between 2000 and 2008 this rate increased almost every year and reached a level higher than what was experienced in 1995. Although the default incidence had a U-shaped path, the default rate had an upward trend, most notably from 2001 onwards, with the period

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average equal to 5.2% (column 11)[11]. Default rates peaked in 2002, possibly reflecting the increase in interest rates and the marked slowdown of economic activity after 2000. Most of these new defaults correspond to smaller firms, as shown by the evolution of amounts in default (column 10). Hence, despite the increase in default frequencies, its aggregate magnitude has actually decreased during most of the sample period (see Antão et al. (2009)).

Third, the average amounts involved in the default episode decreased initially – from 1995 to 2000/2001 – and remained fairly constant for the rest of the period. For the whole period the average amount in default was 105,142 euros (column 6). On average, at the beginning of a default episode, the amount overdue was 31,919 euros (column 10). The decrease of the amounts in default during the sample period does not necessarily suggest that defaults became less severe, as the average firm size in the sample also decreased over time. Therefore, to better evaluate how the severity of default evolves during the sample period, in columns (7) and (8) we depict the credit overdue ratio for firms in default (the latter column includes off-balance sheet liabilities)[12]. This ratio stood, on average, at 64 % (62% if off-balance sheet liabilities are included), having decreased steadily during the first half of the time period under analysis. Hence, even though defaults became more frequent, their size and severity decreased simultaneously during our sample period.

In sum, during the period 1995-2008, Portugal experienced a rapid expansion of credit to firms. In the first half of this period (1995-2000/2001), there was a steady decrease in the incidence rate of non-performing loans, but in the second half of the period it increased to values similar to what was observed in 1995. The default rate had a more volatile behavior, mirroring to some extent overall economic conditions. The year of 2007 marked the beginning of the global financial crisis and, not surprisingly, we observe that since this time there has been an increase in the default incidence rate, as well as an increase of the average amount in default. However, the credit overdue ratios in 2007 and 2008 are not very different from the previous years. As these ratios are defined as the amount of credit overdue as a percentage of total outstanding loans, the increase of the average amount in default suggests that firms in default during this more recent period were slightly larger than before.

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[11]These two variables, default incidence and default rate, have different paths because during the sample period the duration of the "in default" period was not constant.

[12]These off-balance sheet liabilities include, for example, the undrawn amount of credit lines.

4.2 Time in default

The second aspect of the "in default" period we consider is its length. That is, after a firm is declared to be in default with respect to its bank credit, how long does it take until a bank declares that the firm is no longer in default. Figure 1 shows the evolution over time of the default duration.

Figure 1 around here

From Figure 1 we see that the default duration is not extremely long. Overall, more than 50% of firms exit default in 5 quarters or less and more than 25% of firms exit default in 2 quarters or less. Over time, these numbers do not vary significantly for the median duration, ranging between 3 and 6 quarters. The first quartile of the distribution of default durations remains unchanged during the full period. Regarding the rest of the distribution, the story is somewhat different. In particular, the 25% longest default spells are longer than 14 quarters and during the sample period this number oscillated between 11 and 15 quarters.

If severity and length of the default episodes are positively correlated, then it seems that over time, the importance of the least problematic events did not change much. We get to this conclusion because we see that the first quartile of the default duration distribution was fairly stable throughout the sample period. On the other hand, from the variability of the third quartile of the default distribution, it seems that the importance of the more severe cases oscillated significantly during the sample period.

To complement the results in Figure 1, we present estimates of the survival and hazard functions for the "in default" period[13].

Figure 2 around here

Figure 3 around here

From Figures 2 and 3, two important results emerge. First, default spells can be very long. Even though the third quartile of the distribution is less than 14 quarters, more than 10% of episodes last more than 24 quarters (6 years). This result is visible in the survival function (Figure

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[13]The survivor function is defined as the probability of remaining in default until t: $S(t) = \Pr(T \geq t) = 1 - F(t)$. The hazard function is defined as the probability of a firm leaving default in the time interval $[t, t+dt)$, conditional on being in default: $h(t) = \lim \frac{\Pr(t \leq T \leq t+dt | T \geq t)}{dt}, dt \to 0$.

2). Second, the exit rate of default drops sharply in the first 2 years, from around 20% to slightly more than 6%. This is important because it suggests that when a default episode is not resolved in the first four to six quarters, then it takes much longer to be resolved.

An interesting question is to know how the default amounts evolve as default duration increases. Tables 2A and 2B shed light on this question.

Table 2A around here

Table 2B around here

In these two tables we examine two different perspectives on default duration. First, in Table 2A we show what is happening to the amounts in default, the credit overdue ratio and the number of bank relationships as the length of the default period is increasing. Second, in Table 2B we present the same statistics but in this case at the start of the default event, for firms with different default durations. More specifically, in Table 2A each line refers to the *current* default duration of each firm (firms that have been in default so far for 1 quarter, 2 quarters, etc., up to 7 quarters), whereas in Table 2B each line refers to firms with different *total* default durations (i.e., firms that recorded a default episode that lasted for 1 quarter, 2 quarters, etc., up to 8 quarters).

The joint analysis of these two tables indicates two important things: 1) as the default duration increases the situation worsens; and 2) the firms that stay longer in default are those whose initial conditions were worse than those of firms that exit faster. Regarding the worsening of the situation (Table 2A), there is a component that is somewhat mechanic, that is, the amounts overdue accumulate automatically every period. Besides this accumulation effect, there is also a true worsening of situation effect. The amounts overdue and the credit overdue ratio increase significantly with each quarter in default. Moreover, the percentage of bank relationships on which the firm defaults also increases with default duration (firms in default borrow, on average, from more than 2 different banks).

Regarding the conditions firms enter default with (Table 2B), we see that the credit overdue ratios at the start of the event are larger for firms that ended up staying longer in default – this is visible in columns (4) and (5). Also, the total amount outstanding at the start of the default episode is, on average, larger for firms with shorter default episodes, thus suggesting that larger firms are able to leave default earlier (columns 6 and 7).

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From the analysis of the default period, we conclude that the longer a firm stays in default the more complicated its situation becomes. Another important learning is that firms that stay longer in default, are also firms whose conditions at the start of the default were worse. We can re-interpret these results by considering that default events can be originated by temporary or permanent shocks. In the case of temporary shocks it may be more advantageous for both the borrower and lender to engage in negotiations in order to avoid problems becoming unmanageable. In the case of permanent shocks the lender may not have much interest in negotiating as it is less likely that the borrower will ever be able to repay its debt.

4.3 Losses incurred by banks

The third and final aspect of the default period that we analyze relates to the losses generated by the default, that is, how costly can a default episode be for banks. In our dataset, we only observe one component of this cost, i.e., we only observe the amounts that the bank declares to be write-offs. In order to have a better measure of the costs of a default for banks we would need to have information on legal and processing costs and also on collateral and guarantees that mitigate these losses. Despite the caveats that our measure of loss estimates has, we still find it to be sufficiently interesting and informative. Table 3 shows the evolution of bank losses due to written-off loans over time.

Table 3 around here

In this table 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)-(5)). In this case we find that on average any given default will generate a loss due to write-offs of 10.3% of the total amount outstanding at the time the default episode ends. This figure is much lower than the 45% loss given default rate considered for corporate uncollateralized loans in the foundation approach of Basel II. However, as we do not have information on collateral nor on legal costs, this comparison is not clear-cut.

The second statistic is the conditional loss, that is, given all default episodes that lead to a write-off, what is the average loss incurred by the bank (columns (6)-(10)). For this case, the figure is substantially higher, 33.7%, but this large difference comes mainly from the fact that

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most default episodes do not lead to any write-off (only 30% of default events generate a write-off for the bank)[14].

Another interesting result is that, over time, the average unconditional loss has increased gradually (from 3% to 11%), whereas the average conditional loss varied significantly during the sample period (between 26% and 45%). The steady increase of the unconditional loss possibly reflects changes in the strategic behavior of banks, which may have become more prone to writing-off loans from their balance sheet when they consider the likelihood of payment to be very low, instead of keeping bad quality loans in their assets for a long period of time. Nevertheless, to a large extent, the increase in the number of written-off loans over time reflects a mechanical accumulation process, as some banks keep loans classified in this category for a long period.

A final result relates to the duration of the default event and the inflicted loss. In the last 4 columns of Table 3 we show that for loans in default for more than 1 year, the unconditional loss almost doubles (18.2% vs. 10.3%).

5   What happens after exiting default?

A second question we address in this paper is what happens to a firm after leaving default. In particular, we are interested in knowing if firms are able to borrow again, and if so, how long it takes for this to happen; when a firm is able to borrow again does it borrow from the same lender or from a different lender; and finally, do firms tend to default again or not.

In Table 4 we provide a broad picture with respect to some of these questions.

Table 4 around here.

The first three columns of Table 4 show the number of default episodes that are resolved every year. 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 the same timeframe[15]. To compute these numbers, i.e., the number of default episodes resolved and the default "exit rate", we count all firms that were in default in period $t - 1$ and were not in period t, taking into account only the first default episode of each firm during the sample period.

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[14]The percentage of default events is the ratio between the values in columns (6) and (1) from Table 3.

[15]In 2008 the value is substantially lower than for the other years because the last quarter of 2008 was excluded from the analysis.

Once a firm leaves default, there are two main possibilities: either the firm continues to be present in the Credit Register in the quarter after the first default episode has been resolved (column 4); or it ceases to be reported by banks (column 18). In the latter case, the lack of presence in the CRC may reflect the fact that the firm ceased to operate. However, it is also possible that firms survive without having access to bank loans. A rough estimate suggests that at least 12% of the firms that disappear from the CRC after default are still operating afterwards. This may either reflect an inability to regain access to bank credit after default or, alternatively, it may be a decision made by the firms, which may prefer to use internal funds or trade credit to finance themselves. These effects are not easily disentangled[16].

One of the most surprising results we obtain when analyzing post-default behavior is that almost half of the firms that resolve their first default episode record at least one more default episode in the following 3 years (column 7). The intensity of this recidivist behavior is impressive, especially taking into account that information on loan defaults is shared between banks using the CRC. It appears that banks are generally willing to continue to grant loans to firms after they resolve an episode of financial distress, despite facing remarkably high default probabilities. From this data we cannot tell whether recidivism is caused by financial (inability to borrow) or by economic (insolvency) problems. If financial problems are the main reason, then there is mutual interest of the lender and the borrower to overcome the problems that may be originating the default, whereas if the problems are economic then it should not be optimal to lend more to the firm[17].

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

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[16]This estimate was conducted by searching for the firms that are not in the CRC in the 3 years after default (column 8) 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 the 5602 firms that cannot be found in the CRC in the 3 years after the default is cleared (considering only defaults terminated 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%, thus showing that most firms are able to overcome a default episode.

[17]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.

default is cleared (we refer to this definition as "broad access")[18]. 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"). Since 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[19].

Focusing on what happens in the quarter immediately after the firms' first default episode is resolved, we observe that access rates depend crucially on the access definition we use. In the case of strict access, only 13% 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% of firms had access to credit in the first quarter after resolving the default[20]. Hence, most firms do not face a long exclusion from credit markets as a penalty for their past defaults. Over time these two statistics have 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%) and firms only with written-off loans, that is, no access (14%). 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.

5.1   Duration of exclusion

Above we provided some information regarding the process of regaining access to credit after a default is cleared. In this subsection, we add to the previous results by analyzing more aspects of this process. To start, we show non-parametric estimates of the survival and hazard functions of the time it takes for a firm to borrow again. These results refer to the two definitions of access

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[18]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.

[19]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.

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

discussed previously, that is, the ability to borrow more money than before (strict definition) and the ability to keep having some loans (broad definition). Figures 4 and 5 refer to the former, while Figures 6 and 7 refer to the latter.

Figure 4 around here

Figure 5 around here

Figure 6 around here

Figure 7 around here

As is visible in these figures, the two definitions are substantially different: while in one case around 60% of firms never regain access again (the strict definition of access), in the other case, this figure is substantially lower and it is slightly less than 25%. Despite the differences that are found in the right tail of the survival function, when we compare the two hazard functions we see that their shapes are very similar. In particular, we see that the first 4 to 6 quarters after exiting default are fundamental for determining the ability to regain access. When a firm is not able to regain access in this period, the probability of regaining access at any given time becomes very low (almost 0%).

In Table 5 we look at different snapshots of the distribution of possible outcomes after default in different moments in time, namely 1 quarter, 2 quarters and 1, 2 and 3 years after the first default episode of each firm ends. We consider the same set of outcomes depicted in Table 4.

Table 5 around here

Regarding the firms that continue to be observed in the CRC dataset after default, several things happen. First, we see that the percentage of firms with more access and without problem loans is relatively stable over time (column 2). At the same time, the percentage of firms that has access to credit, but less than before, decreases substantially as time goes by – it goes from 46% to 19% in 3 years (column 4). This large variation seems to be directly related to recidivism, as after 6 months around 16% of firms are in default again and after 1 year this value is around 24% (column 10). If we add columns (4) and (10) we see that the sum of the two is relatively stable over time. This suggests that a strong indicator of recidivism may be the inability to borrow more than before. Regarding the other possible outcomes, firms with access but still with written-off loans (columns

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5 and 6) and firms only with written-off loans but no access (columns 7 and 8), we observe that over time the number of firms with access and with written off loans decreases substantially while the number of firms without access and with written-off loans does not change much. Finally, with respect to the firms that are not observed in the CRC we see that this percentage is relatively stable in the first year, but after 2 and 3 years it increases substantially – it goes from around 18% to 30%. This possibly reflects the relatively short life span of micro and small firms, which comprise the bulk of our sample[21].

5.2 Determinants of the duration of exclusion

In order to better understand why some firms are able to regain access relatively fast after exiting default, while other firms are not, we show in Tables 6 and 7 how the severity of the default episode may help explaining these differences.

Table 6 around here

Table 7 around here

In these two tables we compare various default severity measures (credit outstanding, credit overdue, existence of write-offs, duration of default) for firms that were able to regain access after 1 and 3 years and firms that were not. In Table 6 we consider the broader definition of access, whereas in Table 7 we provide similar results for the stricter definition. In all cases we systematically find that the probability of regaining access is lower when the default events were longer and more severe. This is not surprising and to some extent it should be expected. This result reflects not only the fact that banks will punish harder firms that generate more losses but it also reflects the fact that firms that generate more losses are also those with more financial problems and therefore less credit worthy.

We also observe that larger firms regain access to credit more easily than smaller firms. The same is true for firms that hold more bank relationships, though this may also be correlated with firm size. Our interpretation is that large firms are usually perceived as less risky and more stable. Therefore, banks are willing to extend credit faster to large than to small firms. Another result we

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[21] According to Mata and Portugal (1994, 2004), the median life expectancy for Portuguese firms is around 4 to 5 years.

obtain is that firms that default with their main bank lender also face more difficulties in regaining access to bank loans. This result, together with the effect of holding more bank relationships, reflects the costs firms may have when their pool of lenders is not sufficiently diversified. Thus, when the relationship between a borrower and a lender is interrupted due to financial distress, firms will face more difficulties in regaining access to credit if they borrow from one or few banks or if they default with their main lender. This increased difficulty should reflect the destruction of value that had been created with that relationship, as smaller and opaque firms transmit valuable information to their lenders over time, which cannot be easily transferred to a new bank relationship.

In order to test whether the previous results hold in a multivariate setting and at the same time to be able to tell which factors matter more for the speed of re-access, we estimate a Cox proportional hazard model for the time to access, such that:

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

where $\psi(.)$ 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 $\psi(.)$ representing the factor of proportionality. 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 covariates 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 definitions of access) after it has resolved its first default episode.

The estimation results, which are presented in the form of hazard ratios, are shown in Table 8[22]. 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.

Table 8 around here

The results are broadly consistent with those provided by the analysis of Tables 6 and 7. Taking the total amount of credit outstanding as a proxy for firm size, we observe that larger firms regain

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[22]In these regressions, an estimated coefficient lower than 1, should be interpreted as contributing to a longer time until the firm regains access to credit.

access faster (columns (1)-(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)-(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, specially 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[23]. Firms that borrow from more banks take more time to regain access to bank loans. This result is not entirely in line with the insights we gained from Table 6, where we observed that firms with more bank relationships were more likely to regain access. However, this previous result could be somewhat influenced by the strong correlation between firm size and the number of bank relationships. This fact may explain why this result does not hold in a multivariate setting. Indeed, when controlling for the total amount of credit outstanding of each firm, we observe that firms with many bank relationships may actually have more difficulties in regaining access to bank loans. Hence, engaging in single bank relationships may provide some benefits for firms in financial distress[24]. We also find that firms that default 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, with respect to firms that default with their main lender, the results are rather mixed: these firms seem to have more difficulties in having access to new loans, but the opposite happens when the broad definition of access is considered. This result is likely 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

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[23] The results for the stricter definition are not statistically significant at a 5% level.

[24] 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.

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 8 consider essentially the same explanatory variables, with the exception of 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 an adverse situation during adverse times, banks perceive this as being a signal of the quality and strength of the firm[25]. In particular, banks possibly consider that these firms are of higher quality (in terms of credit worthiness) and therefore grant credit faster than if the default resolution had happened in non-recession years[26]. Moreover, these firms are more likely to have defaulted due to an exogenous systematic shock than due to idiosyncratic fragilities, thus supporting this creditworthiness assessment by banks[27].

5.3 Access and bank choice

Thus far, we observed that many firms regain access to credit after they default, even though only a smaller percentage has access to new bank loans. A key issue in this analysis is then to look at which banks are granting these new bank loans. Are firms borrowing from the banks with whom they had ongoing bank relationships before the default or are they borrowing from new banks?

In Table 9 we provide some preliminary results on this question.

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[25] 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 recession is not significant in this specification.

[26] 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.

[27] For robustness purposes, we also estimate probit regressions where the dependent variable is a dummy variable (d_i), indicating whether the firm regains access to credit in the 3 years after leaving default ($d_i = 1$) or not ($d_i = 0$), for both access definitions. The results are qualitatively consistent with those obtained with duration analysis, with the exception of those relating to the recession variable, which has a negative coefficient in the probit regressions. These results are available upon request.

We saw previously that, in the quarter immediately after the default episode is cleared, 13% of firms have access to a new bank loan (Table 4). From this group of firms, almost one third of the firms obtain that new loan from a bank with which they had no relationship when the default was resolved (Table 9). This percentage is higher in the first years of the sample period. When we examine this situation one and three years after default, we observe that the percentage of firms that obtained a loan from a new lender increases markedly: 60% after one year and 80% after 3 years.

These results must be analyzed 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 the firm can observe that. Prospective lenders can also ask to have access to that information, with the firms' consent, which is usually the common procedure. Notwithstanding this, banks seem to be generally willing to give firms a second chance.

In Table 10 we compare firms that regain access through an existing bank relationship to firms that regain access through a new bank relationship. We consider only the strict definition of access, as this analysis is relevant only for obtaining new bank loans. We observe that firms that are able to borrow from a new bank are, on average, smaller, and have fewer bank relationships. This latter result may be somewhat unexpected, but it possibly reflects the fact that banks may be reluctant to lend to firms that defaulted and, simultaneously, have many bank relationships (or, alternatively, firms that already have many bank relationships may find it too costly to engage in additional relationships). Firms that obtain a loan from a new bank are also slightly more likely to have defaulted to their main lender, possibly suggesting that if a firm defaults with its most important provider of funds, it may be more likely that the firm is forced to look for a new lender, as the former main bank may not be willing to extend new loans to a firm that defaulted before. Default duration and severity do not seem to be relevant in explaining why some firms are not able to obtain loans from a new lender.

In order to see if the previous results hold under a multivariate framework, and at the same time to get estimates of the relative importance of each of the factors, we estimate a probit model

for the event of accessing credit through an existing bank relationship or through a new one. The dependent variable in this model is a dummy variable (d_i) indicating whether the firm had access to a new bank loan with the same bank $(d_i = 0)$ or a new bank $(d_i = 1)$. For explanatory variables we consider the same variables presented in Table 8 and add a variable indicating the duration of exclusion (i.e., the time elapsed since the default is cleared until the firm obtains a new loan under our strict access definition). The results are shown in Table 11.

Table 11 around here

These results indicate that the larger the firm is, the less likely it will obtain a loan from a new bank (in line with what we observed in Table 10). The results regarding the number of bank relationships and default with the main bank are also consistent with those of Table 10. Furthermore, we also find that firms that record a higher credit overdue ratio are less likely to establish a new bank relationship after default, even though we find the opposite result for the loss rate. Thus, the results on default severity are not clear cut. The duration of exclusion has a negative impact on the likelihood of obtaining a new loan with a new bank: the longer the firm takes to obtain a new bank loan, the less likely it becomes that the firm is able to do so with a new bank. Finally, the recession variable also plays an important role, in line with the results we analyzed in the previous subsection. When a firm emerges from default during a recessionary episode, it is much easier to obtain a loan from a new bank than otherwise.

5.4 Recidivism

Thus far we have shown that many firms are able to regain access to credit markets after default. The probability of regaining access is especially high in the quarters immediately after the default is resolved. If a firm is not able to regain access during the first few quarters after default, it is very unlikely that it ever will. Many banks are willing to give firms a second chance and some banks may offer a loan to a new customer even if they had a default episode in their recent past.

However, an interesting, and somewhat surprising, result we obtained relates to the high levels of recidivism. Previously, in Table 5, we showed that after 6 months around 16% of firms were in default again, and after 1 year this number increases to 24%. In fact, as shown in Table 4, almost half of the firms default again during the 3 years after their first default episode is resolved.

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In order to understand better why some firms default again while others do not, we conduct an analysis similar to those in Tables 6 and 7, but for the event of a firm defaulting again. The results are presented in Table 12 for the broad access definition.

Table 12 around here

From Table 12 we see that firms that default again are, on average, smaller and their default episode was more severe and longer.

In Table 13, we present the results of Cox regressions, having as dependent variable the time it takes for a firm to default again after having resolved the first default episode.

Table 13 around here

We find that firms are more likely to default again if they are larger, have more bank relationships, and if they have defaulted with their main lender. Quite surprisingly, firms with more severe and longer defaults take more time to default again. However, this last result deserves a more careful analysis. In fact, this repeated default is conditional on regaining access to credit which, as we found previously, is less likely for firms with long and severe episodes of financial distress[28].

As before, we explore the time effects, observing that these are indeed significant. In fact, when we control for whether firms emerged from default during a recession, we observe that if this is the case then the firm is less likely to default again. Thus, if a firm is able to overcome the severe financial distress that led to a bank loan default during a recession, its future default probability declines significantly.

6   Conclusions

In this paper we investigated several questions: 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

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[28]For robustness purposes, we ran the same regressions, but conditional on firms regaining access to new bank loans, i.e., the strict access definition. The results are qualitatively similar, with the exception of default duration: firms with longer distress episodes default faster, conditional on having regained access to a new bank loan after default. The variable number of bank relationships also becomes statistically insignificant. These results are available upon request.

able to overcome financial distress and regain access to bank credit?; Which default characteristics influence these outcomes? To address these questions we used a unique dataset from Portugal, the Central Credit Register, which gathers information on all loans above 50 euros that are granted by any financial institution operating in Portugal.

We began by analyzing what happens while firms are still "in default" and afterwards, in the second part of our paper, we devoted ourselves to examine what happens after firms are no longer classified as "in default".

With respect to the "in default" period, our main findings are:

i) Defaults became more frequent during the sample period, but also became smaller and less severe;

ii) The median duration of default is 5 quarters, and this value had some variation over time;

iii) Default episodes can either be very short-lived or very long. If a default episode is not resolved in less than 1 year it can take several years to be cleared;

iv) The duration of default is positively correlated with its severity. Moreover, firms that stay longer in default are typically firms that entered default in worse conditions than the ones that exit faster;

v) Of all default events that we analyzed, only one third of these lead to write-offs. For those loans that lead to a write-off, the average loss incurred by banks was around 34%, while the average loss when all loans are considered (i.e., with and without write-offs) was slightly above 10%.

Regarding what happens after the default episode is cleared, our main results are:

i) In the first quarter after leaving default, almost two thirds of firms have access to credit again, even though only one quarter was able to have access to a new bank loan;

ii) Exclusion from credit markets is either very short or very long. Firms that are not able to regain access in the first year after exiting default are very unlikely to ever regain access;

iii) The severity of the default impacts the duration of exclusion: the more severe the default was, the longer the firm is unable to borrow. This is true for the amount defaulted on, the amount that was written-off, and the duration of default;

iv) Firms regain access mainly with the banks with whom they had previously ongoing relationships. However, as time goes by, firms are more likely to regain access through new bank relationships;

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v) There is a very high rate of recidivism: one year after exiting default, almost 25% of firms are in default again. We find that recidivism is related to the severity of default;

vi) Firms that leave default during recession periods regain access to credit faster and are less likely to default again.

These results provide valuable empirical evidence on corporate post-default dynamics, an issue that, in our opinion, has not been sufficiently explored in the literature. However, many questions remain unanswered, some of which are raised by the results discussed above. Therefore, future research will focus on understanding whether banks charge higher interest rates after a default event and also on what can explain such a high rate of recidivism.

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Chapter 11 Reorganisation under the bankruptcy code.

Available from http://www.uscourts.gov/bankruptcycourts/bankruptcybasics/chapter11.html.

Chapter 7 Liquidation under the bankruptcy code.

Available from http://www.uscourts.gov/bankruptcycourts/bankruptcybasics/chapter7.html.

Appendix 1

Bankruptcy legislation in Portugal and the US[29]

Portuguese bankruptcy code

The current bankruptcy code in Portugal, Code of Insolvency and Recovery of Undertakings, came into force in 2004. It produced significant differences compared to earlier codes as the focus is now solely on creditor rights. However, since a significant portion of Portuguese firms experienced reorganization prior to 2004, it is important to understand the previous codes.

1993 bankruptcy code (132/1993) - Code of Special Procedures for Recovery and Insolvency of Businesses

The Recovery and Bankruptcy law of 1993 was designed to regulate a firm's recovery and bankruptcy, with the focus placed on recovery. A firm may declare bankruptcy if it is insolvent or facing economic difficulties and must be done within 60 days of a missed payment. The most important innovation introduced in this legislation related to privileged loans. Since the main objective was to save economically-viable businesses and considering that the proliferation of privileges made this more difficult, the number of privileged creditors was reduced. Once bankruptcy was declared, any creditor privileges held by the Government, municipalities, and social security institutions were immediately abolished, and going forward treated as ordinary creditors.

1998 bankruptcy amendment (316/1998) - Extrajudicial Procedure Agreement

The 1998 amendment governs out-of-court rescues of firms that appear to be insolvent or experiencing financial difficulties. The use of out-of-court rescues are intended to anticipate, and if possible, replace the more costly insolvency proceedings and allow the firm to choose which creditors to negotiate with. Either the firm or creditors can approach the Institute for Support to Small- and Medium-sized Enterprises and Investment (IAPMEI) to request mediation in hopes of producing a deal between the two parties. IAPMEI may refuse to mediate recovery talks if it considers: 1) the firm is economically unviable; 2) an agreement between the two parties is unlikely to arise; or 3) the intervention is not seen as effective in the achievement of an agreement.

2004 bankruptcy code (53/2004) - Code of Insolvency and Recovery of Undertakings

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[29]This is based on Davydenko and Franks (2008), Pricewaterhouse Coopers (2006), and European Judicial Network (2007).

The current legislation's focus on creditor rights is designed to provide quick and workable solutions that protect creditor rights as opposed to previous legislation that tried to balance creditor rights with the possibility of rescuing the firm.

A firm is considered insolvent when liabilities clearly exceed their assets, while a firm is classified as being bankrupt if at least one of the following conditions is met:

- The debtor has generally failed to pay due debts;

- The debtor has failed to pay one or more of its debts, where this reveals its inability to pay its debts in a timely manner;

- Shareholders or managers have fled without appointing proper successors, or the debtor's principal place of business has been abandoned;

- There has been dissipation or loss of the debtor's assets, creation of fictitious claims or any other anomalous behavior that reveals the debtor's intention to put itself in a position where it will be unable to fulfill its obligations in a timely manner;

- It has been confirmed in an execution procedure that the debtor has no assets to attach;

- The debtor fails to fulfill the obligations set forth in an insolvency plan;

- Outstanding debts relating to taxes, employee claims, rent, or mortgage payments are at least six months overdue; or

- The latest approved balance sheet reveals an unusual deficit, or the debtor is more than nine months late in approving and depositing its accounts with the Trade Register Office[30].

The debtor is required to apply for a declaration of insolvency within sixty days from the date on which the individual becomes aware of the insolvency. If the debtor is the owner of the firm, there is a legal presumption of awareness of the situation of insolvency three months after a general failure to meet tax or social security obligations or obligations arising under employment or rental contracts.

From the perspective of unsecured or ordinary creditors, the main advantage of triggering a formal bankruptcy procedure is that if the distressed company is restructured through the implementation of an insolvency plan, they may recover more of their claims than they would have had the company been declared bankrupt and subsequently liquidated. An additional advantage

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[30]PricewaterhouseCoopers. 2006. The European Restructuring and Insolvency Guide.

is that the creditors gain access to financial and other information that would otherwise remain undisclosed or unavailable.

Lenders that provide new money or debtor-in-possession financing before a declaration of bankruptcy has been issued have no legal priority, unless the real security granted of their claim is privileged. Lenders that provide new money or debtor-in-possession financing after the declaration of bankruptcy has been issued will obtain preferential priority only if the insolvency plan makes an express provision for this.

Insolvent firms seeking recovery may proceed either via a formal or informal rescue process. When utilizing the formal corporate rescue process, the insolvency plan must be agreed between the debtor and its creditors, and determines how the debtor's assets will be liquidated and the order in which debts will be paid. In principle, the insolvency plan will treat all creditors equally. A plan may be proposed by the administrator, the debtor, or any creditor or group of creditors representing at least 20% of the total amount of unsubordinated claims. Under an informal corporate rescue process, a company whose financial status would require it to file for formal insolvency judicial proceedings, or one of its creditors, can request IAPMEI to conduct a conciliation procedure with the aim of reaching an agreement that provides for its economic recovery and the payment of its debts.

United States bankruptcy code

For contextual purposes, we briefly describe and compare the United States bankruptcy code to Portugal's in order to better understand the importance of the legislation. In the US, bankruptcy legislation consists of two parts: Chapter 11, which covers reorganization and Chapter 7, which covers liquidation.

Chapter 11 proceedings allow for firm reorganization and may be initiated by either the firm (voluntary) or by creditors (involuntary). Chapter 11 reorganization involves the reversal of the absolute priority rule, which states that senior creditors should be satisfied before junior, unsecured creditors, or founders/ managers are allowed to preserve their equity in the reorganization process. Old equity holders can recover some of the pre-petition values of their claims in reorganization if they provide new capital to the firm as new capital always gets priority over old capital in Chapter 11 proceedings since new capital is viewed as essential for firm survival. All claims and interests are

sorted into various classes: secured and unsecured creditors, priority creditors, and equity holders. For a reorganization plan to be accepted, each class needs to have a majority of creditors (2/3 by claim value) approve the plan.

Chapter 7 of the US bankruptcy code covers liquidation of both firms and individuals assets. Under a filing of a Chapter 7 petition, an automatic stay stops more collection action against the debtor or debtor's property and an impartial case trustee is assigned to administer the case and liquidate the debtor's nonexempt assets or possibly operate the firm for a limited period of time if such an operation will benefit creditors and enhance the liquidation value of the estate.

The differences in the Portuguese and US bankruptcy codes are best seen from the perspective of super-priority financing, automatic stays, and the legislation goals in general. The US legislation considers both liquidation (Chapter 7) and reorganization (Chapter 11) and is considered to be debtor friendly. Portugal's newest bankruptcy code of 2004 moved away from debtor protection and now only explicitly considers the liquidation of firms and not the rescue and recovery of firms[31].

As part of this protection of creditors rights, Portugal's legislation does not allow for automatic stays from creditors whereas under US legislation, Chapter 11 allows firms in reorganization to postpone all repayments of capital and interest until reorganization is complete as a way of preserving the company as an operating concern. Finally, super-priority financing under the Portuguese system only occurs if an insolvency plan expressly provisions for this or if the firm has any collateral assets free to bank this potential claim, while under the US system firms can use super-priority financing without such limitations.

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[31] The 1998 amendment covering out of court legislation considers firm recovery.

Main Procedure	Portugal	United States	
	Insolvency & Recovery of Undertakings (2004)	Chapter 11	Chapter 7
Bankruptcy trigger	Debtor applies to the court for a declaration of insolvency	No objective test. Solvent firm may enter Chapter 11	No objective test
Control rights	liquidation: creditors and court-appointed administrator; recovery: debtor, creditors, and administrator	Debtor, creditors collectively, bankruptcy court supervision	Trustee
Automatic stay	No	Unlimited	None
Super-priority financing	Only if real security granted of their claim is privileged; insolvency plan must make an express provision for this.	Yes	None
Dilution of secured claims	Limited	Limited	None

Source: Davydenko and Franks (2008), Pricewaterhouse Coopers (2006), European Judicial Network (2007).

Tables and figures

Figure 1
Number of quarters in default

Quartile distribution
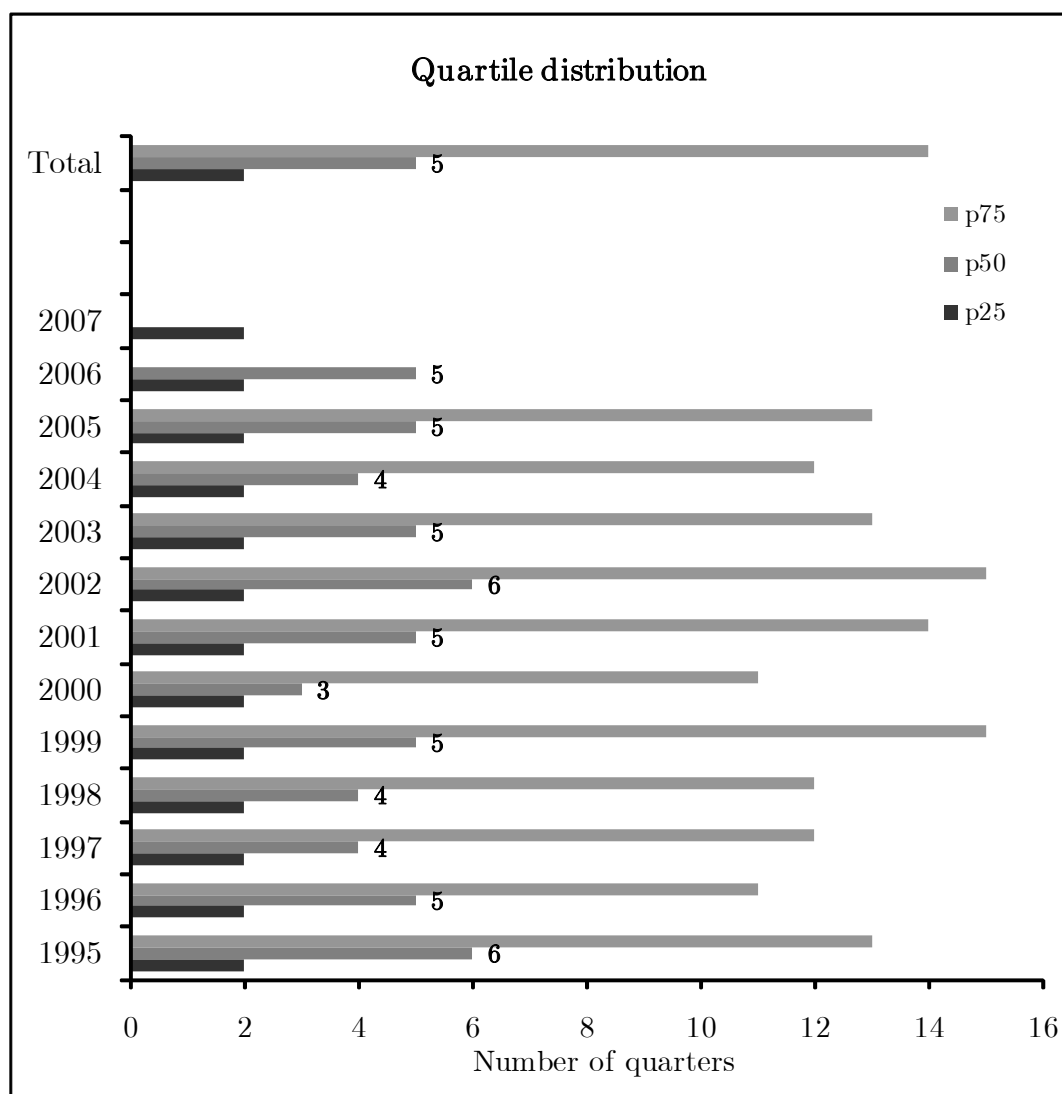
Note: We exclude firms that were in default at 1995Q1 and at 2008Q4. A firm is considered to be in default if it records liabilities with late repayments or loans in litigation for an entire quarter. The quartiles are estimated by using the survivor function, taking into account the first default episode of each firm. The year refers to the beginning of default. In 2006 it is not possible to compute the 3rd quartile and in 2007 it is not possible to compute the 2nd and 3rd quartiles due to censoring.

Figure 2
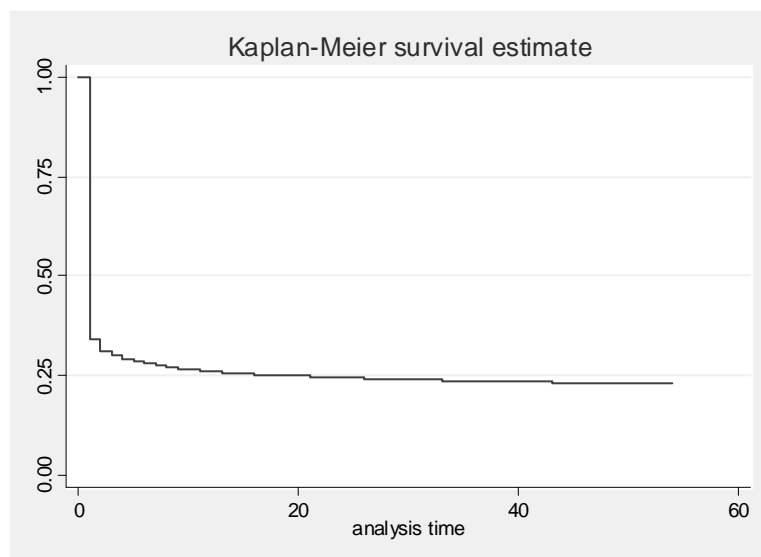## Default duration
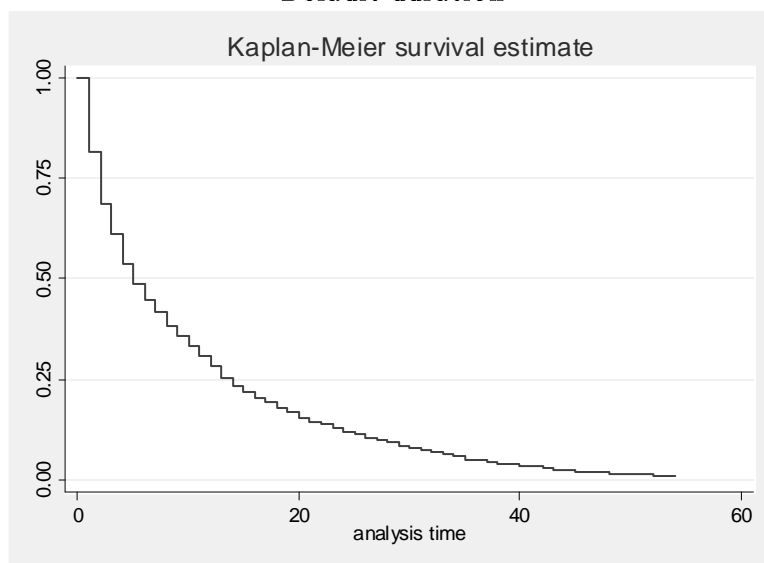
Kaplan-Meier survival estimate

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: $S(t)=\text{Prob}(T>=t)=1 - F(t)$.

Figure 3
Hazard function for time in default
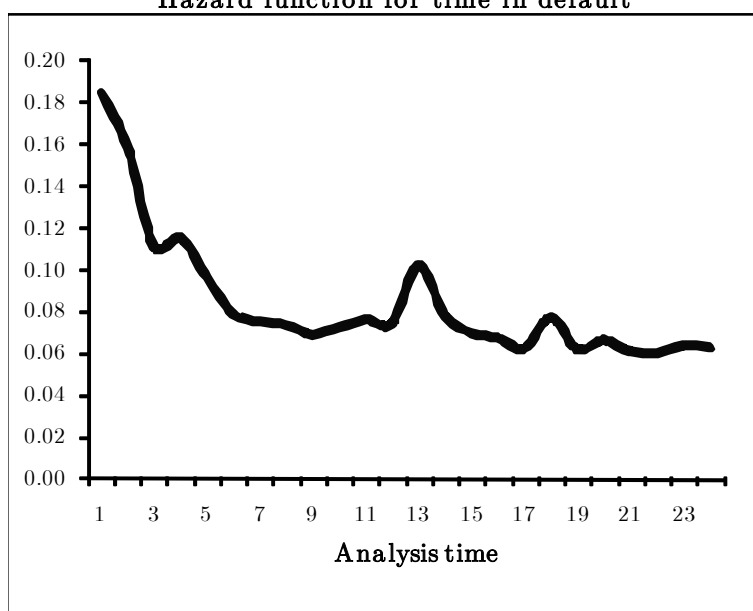
Note: Analysis time defined as quarters since the beginning of the first default episode. The hazard function is defined as the probability of a firm leaving default in the time interval $[t$ $t+dt)$, conditional on being in default: $h(t) = \lim \text{Prob}(t<=T<t+dt \mid T>=t)/dt$, as $dt\text{->}0$. In the figure, the hazard is censored at 24 quarters, covering 95% of all observations.

Figure 4
Hazard function for time until more access
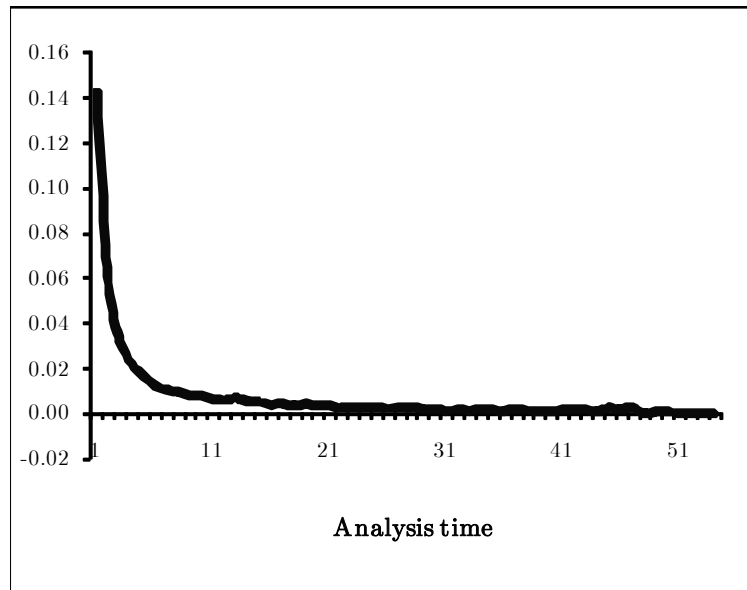
Analysis time

Note: Analysis time defined as quarters since the end of the first default episode. The hazard function is defined as the probability of regaining access to credit in the time interval [t, t+dt), conditional on not being in default: h(t) = lim Prob(t<=T<t+dt | T>=t)/dt, as dt->0. 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.

Figure 5
Time until more access
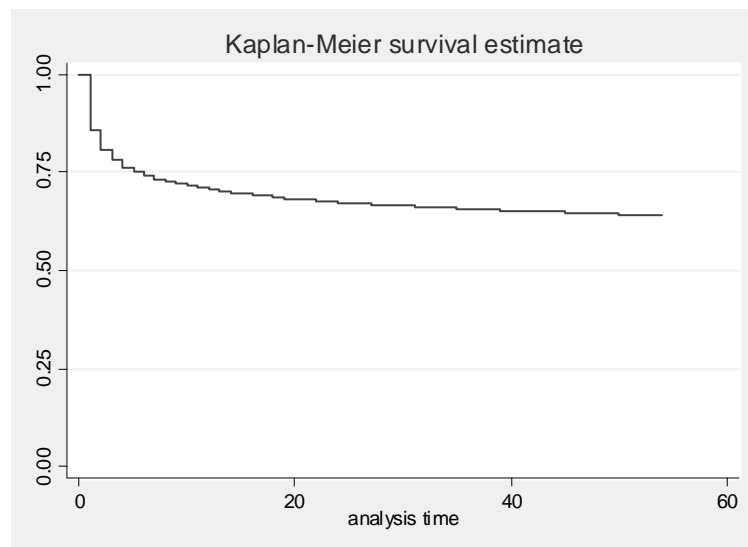
Note: Analysis time defined as quarters since the end of the first default episode. The survivor estimate is defined as the probability of regaining access after default at t: S(t)=Prob(T>=t)=1 - F(t). More access is defined as having a larger amount of outstanding bank loans (including credit lines) than at the end of the default episode and not having any record of default or write-offs.

Figure 6
Hazard function for time until access
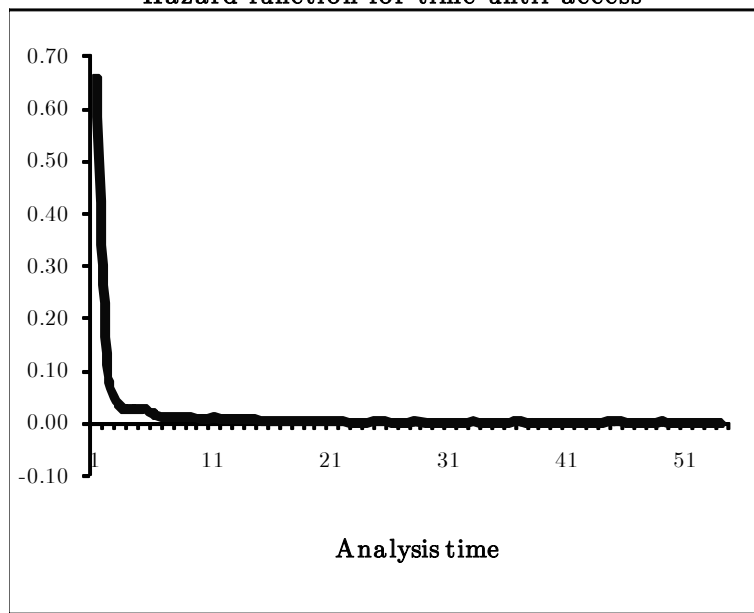
Note: Analysis time defined as quarters since the end of the first default episode. The hazard function is defined as the probability of regaining access to credit in the time interval [t, t+dt), conditional on not being in default: $h(t) = \lim Prob(t<=T<t+dt \mid T>=t)/dt$, as dt->0. Access is defined as having a positive amount of outstanding bank loans (including credit lines) without any record of default or write-offs, after having left default.

Figure 7
Time until access

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: $S(t)=Prob(T>=t)=1 - F(t)$. 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.

Table 1 - Firms in default: some characteristics

	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 ratios for firms in default		New episodes of default		
	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)	(6)	(7)	(8)	(9)	(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	164,463	425,245	26,560	18,854	11.5	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	69.6	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

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. Column (1) refers to the total number of firms with a loan, in each quarter and column (2) shows the average amount outstanding of each firm. Column (3) presents the number of new firms with a loan in each quarter, defined as firms that were not observed in the CRC previously, during the sample period. The firms that were borrowing in 1995Q1 are not considered as new firms in 1995. Column (4) refers to the number of firms that, in each quarter, record any amount in default. 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. The percentage for the total is the weighted average for the whole sample period. Column (6) refers to the average amount in default during the quarter. 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). 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. We exclude firms that were in default in 1995Q1. 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.

Table 2A - Evolution of the firms' situation since the beggining of the default episode

	Number of observations	Amount of credit overdue (euros)		Credit overdue ratio (%)		Amount of total credit outstanding (euros)		Number of bank relationships		Number of relationships in default		Number of bank relations in default (as a % of the total number of relationships)	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Firms in default for: (in quarters)													
1	165,165	31,919	2,870	37.9	13.9	375,300	30,170	2.47	2.0	1.3	1.0	68.9	66.7
2	110,208	48,675	5,000	49.9	36.9	327,402	26,302	2.37	2.0	1.4	1.0	75.2	100.0
3	86,674	63,107	7,071	58.4	67.3	315,105	24,890	2.32	2.0	1.5	1.0	79.2	100.0
4	70,016	77,239	9,510	64.4	88.4	307,386	25,115	2.31	2.0	1.6	1.0	82.0	100.0
5	60,348	87,083	11,220	69.5	98.9	296,448	24,753	2.28	2.0	1.7	1.0	84.3	100.0
6	50,377	96,381	12,450	72.8	100.0	332,136	24,773	2.29	2.0	1.8	1.0	85.9	100.0
7	42,618	106,597	14,690	75.4	100.0	291,051	26,115	2.31	2.0	1.8	1.0	87.1	100.0

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. The number of bank relationships is computed as the number of loans obtained from different financial institutions (including non-monetary financial institutions).

Table 2B - Firm and loan characteristics for default episodes with different total durations

	Number of observations	Amount of credit overdue at start of default (euros)		Credit overdue ratio at start of default (%)		Total amount of credit outstanding at start of default (euros)		Number of bank relationships at start of default		Number of bank relationships in default at start of default		Number of bank relations in default (as a % of the total number of relationships) at start of default	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Total duration of default (in quarters)													
1	54,957	20,958	1,730	26.8	6.6	472,415	34,890	2.6	2.0	1.1	1.0	62.3	50.0
2	23,534	24,666	2,290	33.9	10.8	316,803	28,031	2.4	2.0	1.2	1.0	68.1	60.0
3	16,658	27,249	2,340	43.7	20.0	297,521	19,105	2.2	2.0	1.2	1.0	73.3	100.0
4	9,668	32,193	2,860	40.8	17.5	288,447	24,530	2.2	2.0	1.2	1.0	72.9	100.0
5	9,971	39,706	4,228	53.5	49.0	231,072	21,803	2.1	2.0	1.4	1.0	78.8	100.0
6	7,759	23,755	2,610	54.9	56.1	623,269	14,020	2.0	2.0	1.3	1.0	79.4	100.0
7	5,591	36,689	4,190	50.2	34.9	249,616	21,760	2.2	2.0	1.4	1.0	76.9	100.0
8	4,112	43,909	4,110	46.3	27.2	239,700	26,640	2.2	2.0	1.4	1.0	74.7	100.0

Notes: In this table are depicted firm and loan characteristics for firms with different total durations of default (between 1 and 8 quarters). In each line, the variables refer to the situation at the beginning of the default episode, for firms which default episodes lasted for x quarters. The number of bank relationships is computed as the number of loans obtained from different financial institutions (including non-monetary financial institutions).

Table 3 - Estimates of losses incurred by the banks

	Bank losses due to written-off loans: including all loans					Bank losses due to written-off loans: only including events that originated a write-off					Bank losses due to written-off loans: including all loans whose default was longer than 1 year			
	N	mean	p50	p75	p99	N	mean	p1	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	5,030	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

Notes: Estimates of losses incurred by the banks are based on write-offs and write-downs reported by banks to the Central Credit Register. These losses do not include recovery costs and do not consider collateral. 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 end of the following quarter). As in previous tables, observations refer to pairs firm-quarters, which means that these loss estimates do not refer to a specific loan or bank, but to all outstanding credit liabilities of the firm. We exclude all observations in 2008Q4, the last quarter in the sample, given that these refer to situations still unfolding.

Table 4 - After leaving default

			Firms that continue in the credit register		Firms that record a new default episode in the 3 years after exiting default		Firms that are not in the CRC in the 3 years after exiting default		1 quarter after first default episode ends								Not in credit register	
									In credit register								Without access or closed	
	Default episodes resolved as a % of defaults in each year	Number of default episodes resolved (only first defaults)	Firms that continue in the credit register in the quarter after their first default ends						Firms with more access and without problem loans		Firms with access (but less than before)		Firms with access but still with written-off loans		Firms only with written-off loans (no access)			
Number of default episodes resolved			Number	% of total (col. 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)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1995 5,880	10.6	2,222	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	1,944	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	6,861	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	-	-	-	-	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	5602	9.7	10,552	12.8	38,022	46.1	7,355	8.9	11,252	13.6	15,298	18.5

Notes: A default episode is considered resolved if there is no record of loans with late repayments or in litigation in the end of the following quarter. We exclude firms that were in default in 2008Q4, the last quarter of the sample. The definition of first defaults only takes into account information since 1995. Column (2) considers the number of default episodes resolved as a % of the number of observations in default. In columns (6) to (9) there is no information for the last 3 years given that a 3 year window is used. After default, firms can either continue to be observed in the credit register (columns 4 and 10-17) or they can cease to appear in the CRC (column 18). In the latter case firms can have either ceased to operate or they can still be in operation but without having access to loans from financial institutions. By construction, there are no firms in default in the quarter after the default episode ended. Firms with more access (column 10) 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 less access than before (column 12) are those which have the same or less loans outstandings that at the end of the default episode.

Table 5 - Distributions over time of possible outcomes after leaving default

	In credit register										Not in credit register		Total
	Firms with more access and without problem loans		Firms with access (but less than before)		Firms with access but still with written-off loans		Firms only with written-off loans (no access)		Firms in default		Without access or closed		
	Number	% of total	Number	% of total	Number	% of total	Number	% of total	Number	% of total	Number	% of total	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Time since first default episode ended													
1 quarter	10,552	12.8	38,022	46.1	7,355	8.9	11,252	13.6	-	-	15,298	18.5	82,479
6 months	9,074	11.4	27,435	34.6	4,994	6.3	10,100	12.7	13,003	16.4	14,792	18.6	79,398
1 year	8,292	11.1	20,314	27.2	3,575	4.8	9,069	12.1	17,914	23.9	15,647	20.9	74,811
2 years	7,172	10.9	14,310	21.7	2,116	3.2	7,953	12.1	16,343	24.8	18,057	27.4	65,951
3 years	6,398	11.0	10,799	18.6	1,777	3.1	6,985	12.0	13,245	22.8	18,805	32.4	58,009

Notes: This table depicts snapshots of the distribution of possible outcomes after default in different moments in time (namely, 1 quarter, 2 quarters and 1, 2 and 3 years after default ends). A default episode is considered resolved if there is no record of loans with late repayments or in litigation in the end of the following quarter. We exclude firms that were in default in 2008Q4, the last quarter in the sample, and consider only the first default episode of each firm during the sample period. After default, firms can either continue to be observed in the credit register (columns 1-10) or they can cease to appear in the CRC (columns 11-12). In the latter case firms can have either ceased to operate or they can still be in operation but without having access to loans from financial institutions. By construction, there are no firms in default in the quarter after the default episode ended. 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 less access than before are those which have the same or less loans outstandings that at the end of the default episode.

Table 6 - Characteristics of firms that regain access after their first default episode - broad access definition

	After 1 year								After 3 years							
	Firms with access			Firms without access			Mean difference		Firms with access			Firms without access			Mean difference	
	Obs.	Mean	Median	Obs.	Mean	Median	diff	t-test	Obs.	Mean	Median	Obs.	Mean	Median	diff	t-test
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Default severity																
Credit outstanding	28,606	592,326	48,325	24,716	66,795	7,292	525,532	8.9 ***	17,197	643,922	57,860	25,790	81,531	10,050	562,391	8.1 ***
Credit overdue	28,606	29,743	1,900	24,716	23,310	2,840	6,433	3.2 ***	17,197	33,087	2,020	25,790	22,179	2,644	10,908	4.1 ***
Credit overdue ratio	28,606	20.9	5	24,716	83.5	100.0	-62.6	-230.0 ***	17,197	21.1	5	25,790	69.6	100.0	-48.5	-140.0 ***
Write-offs	28,606	1,774	0	24,716	19,336	0	-17,562	-17.1 ***	17,197	2,183	0	25,790	13,736	0	-11,553	-12.6 ***
Loss estimates (%)	28,606	0.8	0	24,716	14.2	0	-13.5	-69.2 ***	17,197	1.0	0	25,790	10.5	0	-9.5	-55.0 ***
Duration of default	28,606	2.4	1	24,716	7.5	5	-5.2	-94.9 ***	17,197	2.4	1	25,790	5.7	3	-3.3	-72.8 ***
Relationships																
No. of bank relationships	28,606	2.8	2	24,716	1.3	1	1.5	121.36 ***	17,197	3.0	2	25,790	1.5	1	1.5	91.1 ***
No. of bank relat. in default	28,606	1.1	1	24,716	1.2	1	-0.1	-30.71 ***	17,197	1.1	1	25,790	1.2	1	-0.1	-20.9 ***
No. of bank relat. in default %	28,606	54.2	50	24,716	95.0	100	-40.8	-200.0 ***	17,197	51.2	50	25,790	87.8	100	-36.6	-140.0 ***
Default with main bank	28,606	0.5	1	24,716	0.9	1	-0.4	-100.0 ***	17,197	0.5	1	25,790	0.8	1	-0.3	-74.0 ***

Notes: Firms with access are those with outstanding bank loans (including credit lines) and without any record of default or write-offs after 1 year (columns 1 - 3) or 3 years (columns 9-11). Firms without access are those that are not in the credit register after leaving default, as well as those which continue to be present in the credit register, but only with written-off loans. The results for 1 year after default exclude firms that defaulted for the first time in 2008 and the results for 3 years after default exclude firms that defaulted for the first time in 2006, 2007 or 2008. All variables are defined as in previous tables and refer to the last period of default. Mean difference tests are computed assuming unequal variances in the two groups considered. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table 7 - Characteristics of firms that regain access after their first default episode - strict access definition

	After 1 year								After 3 years							
	Firms with more access than before			Firms without access or with less access than before			Mean difference		Firms with more access than before			Firms without access or with less access than before			Mean difference	
	Obs.	Mean	Median	Obs.	Mean	Median	diff	t-test	Obs.	Mean	Median	Obs.	Mean	Median	diff	t-test
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Default severity																
Credit outstanding	8,292	934,087	56,871	45,030	240,940	17,971	693,147	4.5 ***	6,398	696,117	44,875	36,589	238,390	17,550	457,727	3.5 ***
Credit overdue	8,292	29,349	1,490	45,030	26,284	2,490	3,064	1.1	6,398	23,552	1,329	36,589	27,066	2,640	-3,513	-1.5
Credit overdue ratio	8,292	21.4	4	45,030	55.2	63.4	-33.8	-79.8 ***	6,398	23.2	5	36,589	54.9	58.8	-31.7	-64.5 ***
Write-offs	8,292	3,554	0	45,030	11,085	0	-7,531	-6.1 ***	6,398	2,784	0	36,589	10,221	0	-7,437	-7.1 ***
Loss estimates (%)	8,292	1.1	0	45,030	8.1	0	-7.0	-49.7 ***	6,398	1.0	0	36,589	7.6	0	-6.6	-43.3 ***
Duration of default	8,292	2.3	1	45,030	5.2	2	-2.9	-65.8 ***	6,398	2.3	1	36,589	4.7	2	-2.5	-54.9 ***
Relationships																
No. of bank relationships	8,292	3.0	2	45,030	1.9	1	1.1	44.4 ***	6,398	3.0	2	36,589	1.9	1	1.1	37.0 ***
No. of bank relat. in default	8,292	1.1	1	45,030	1.1	1	-0.1	-21.3 ***	6,398	1.1	1	36,589	1.1	1	-0.1	-20.0 ***
No. of bank relat. in default %	8,292	51.1	50	45,030	77.1	100	-26.0	-71.6 ***	6,398	52.3	50	36,589	76.8	100	-24.5	-58.7 ***
Default with main bank	8,292	0.5	0	45,030	0.7	1	-0.3	-44.3 ***	6,398	0.5	0	36,589	0.7	1	-0.3	-37.6 ***

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 after 1 year (columns 1 - 3) or 3 years (columns 9-11). Firms without access or with less access than before are those that are not in the credit register after leaving default, those that continue to be present in the credit register, but only with written-off loans, as well as those that have the same or less loans outstandings that at the end of the default episode. The results for 1 year after default exclude firms that defaulted for the first time in 2008 and the results for 3 years after default exclude firms that defaulted for the first time in 2006, 2007 or 2008. All variables are defined as in previous tables and refer to the last period of default. Mean difference tests are computed assuming unequal variances in the two groups considered. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table 8 - Cox regressions: determinants of time until access

	All firms							
	Failure event: access (broad definition)				Failure event: access (strict definition)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ln Credit outstanding (ln(euros))	1.016	1.015	1.015	1.015	1.010	1.008	1.007	1.008
	9.76	*9.24*	*8.83*	*9.29*	*2.10*	*1.73*	*1.58*	*1.74*
Credit overdue ratio (%)	0.993	0.993	0.993	0.993	0.998	0.997	0.997	0.997
	-61.40	*-63.49*	*-63.61*	*-63.47*	*-6.11*	*-9.83*	*-10.34*	*-9.83*
Loss rate (%)	0.974	0.974	0.974	0.974	0.980	0.980	0.980	0.980
	-37.74	*-37.62*	*-37.73*	*-37.61*	*-20.14*	*-19.99*	*-19.93*	*-19.99*
Duration of default (quarters)	0.937	0.939	0.940	0.939	0.921	0.927	0.928	0.927
	-48.85	*-47.26*	*-46.51*	*-47.24*	*-28.25*	*-26.26*	*-25.79*	*-26.25*
No. of bank relationships	0.957	0.956	0.957	0.956	1.010	1.008	1.007	1.008
	-23.71	*-24.07*	*-23.98*	*-24.09*	*1.85*	*1.45*	*1.40*	*1.44*
No. of bank relat. in default % of total	0.996	0.996	0.996	0.996	0.994	0.994	0.994	0.994
	-31.97	*-31.03*	*-30.87*	*-31.04*	*-15.78*	*-15.22*	*-15.06*	*-15.22*
Default with main bank (binary)	1.058	1.063	1.063	1.063	0.877	0.896	0.898	0.896
	11.86	*12.75*	*12.61*	*12.80*	*-8.02*	*-6.69*	*-6.58*	*-6.68*
Recession (binary)	-	-	-	1.092	-	-	-	1.103
	-	-	-	*6.25*	-	-	-	*1.86*
D_1996	-	1.145	-	1.145	-	1.421	-	1.421
	-	*13.82*	-	*13.82*	-	*10.03*	-	*10.04*
D_1997	-	1.170	-	1.170	-	1.335	-	1.335
	-	*16.00*	-	*16.00*	-	*8.28*	-	*8.28*
D_1998	-	1.159	-	1.159	-	1.424	-	1.425
	-	*14.51*	-	*14.51*	-	*10.59*	-	*10.59*
D_1999	-	0.977	-	0.977	-	1.515	-	1.515
	-	*-2.00*	-	*-2.00*	-	*13.21*	-	*13.21*
D_2000	-	1.010	-	1.010	-	1.326	-	1.326
	-	*0.96*	-	*0.96*	-	*8.47*	-	*8.47*
D_2001	-	1.040	-	1.040	-	1.485	-	1.485
	-	*4.78*	-	*4.79*	-	*14.31*	-	*14.31*
D_2002	-	0.996	-	0.996	-	1.226	-	1.226
	-	*-0.48*	-	*-0.48*	-	*7.37*	-	*7.37*
D_2003	-	1.039	-	0.952	-	0.967	-	0.877
	-	*4.99*	-	*-3.10*	-	*-1.14*	-	*-2.18*
D_2004	-	0.932	-	0.912	-	0.852	-	0.831
	-	*-8.28*	-	*-9.76*	-	*-5.29*	-	*-5.56*
D_2005	-	0.990	-	0.990	-	0.856	-	0.856
	-	*-1.10*	-	*-1.10*	-	*-4.96*	-	*-4.96*
D_2006	-	0.951	-	0.951	-	0.916	-	0.916
	-	*-5.47*	-	*-5.47*	-	*-2.89*	-	*-2.89*
D_2007	-	0.982	-	0.982	-	1.085	-	1.085
	-	*-2.25*	-	*-2.25*	-	*2.92*	-	*2.92*
Quarter dummies	N	N	Y	N	N	N	Y	N
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
Time at risk	384,240	384,240	384,240	384,240	893,125	893,125	893,125	893,125
Log-likelihood	-589,282	-589,180	-589,097	-589,177	-226,434	-226,022	-225,864	-226,020

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 (see Table 6). In columns (5) - (8) it is considered the strict definition of access (see Table 7). All explanatory variables are defined as in previous tables (except recession, which is a dummy variable that takes the value one in recession years) and refer to the last period of default.

Table 9 - Regaining access through new banks

	After 1 quarter			After 1 year			After 3 years		
	Firms with more access	Firms with more access and with a new bank		Firms with more access	Firms with more access and with a new bank		Firms with more access	Firms with more access and with 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

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.

Table 10 - Characteristics of firms that regain access with a new bank after their first default episode (strict definition)

	After 1 year								After 3 years							
	Firms with more access than before and a new bank			Firms with more access than before but not with a new bank			Mean difference		Firms with more access than before and a new bank			Firms with more access than before but not with a new bank			Mean difference	
	Obs.	Mean	Median	Obs.	Mean	Median	diff	t-test	Obs.	Mean	Median	Obs.	Mean	Median	diff	t-test
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Default severity																
Credit outstanding	4,937	451,545	48,400	3,355	1,644,164	73,480	-1,192,619	-3.3 ***	5,079	345,756	42,100	1,319	2,045,234	61,860	-1,699,478	-2.8 ***
Credit overdue	4,937	22,214	1,221	3,355	39,848	2,150	-17,635	-2.9 ***	5,079	21,043	1,180	1,319	33,217	2,245	-12,174	-2.1 **
Credit overdue ratio	4,937	20.9	4	3,355	22.1	4.0	-1.2	-1.6	5,079	23.2	5	1,319	23.1	4.2	0.1	0.1
Write-offs	4,937	3,151	0	3,355	4,149	0	-998	-0.5	5,079	2,351	0	1,319	4,450	0	-2,099	-0.8
Loss estimates (%)	4,937	1.0	0	3,355	1.2	0	-0.1	-0.8	5,079	0.9	0	1,319	1.5	0	-0.6	-2.1 **
Duration of default	4,937	2.3	1	3,355	2.3	1	-0.1	-1.0	5,079	2.3	1	1,319	2.2	1	0.1	0.8
Relationships																
No. of bank relationships	4,937	2.9	3	3,355	3.3	2	-0.4	-7.1 ***	5,079	2.8	2	1,319	3.6	2	-0.7	-7.6 ***
No. of bank relat. in default	4,937	1.1	1	3,355	1.1	1	0.0	-1.5	5,079	1.1	1	1,319	1.1	1	0.0	-0.6
No. of bank relat. in default %	4,937	51.8	50	3,355	50.1	50	1.7	2.5 **	5,079	53.1	50	1,319	49.0	50	4.1	4.3 ***
Default with main bank	4,937	0.5	0	3,355	0.5	0	0.0	1.8 *	5,079	0.5	0	1,319	0.4	0	0.1	3.3 ***

Notes: Firms with more access and a new bank are those with more outstanding bank loans from a new bank (including credit lines) than at the end of the default episode and without any record of default or write-offs after 1 year (columns 1 - 3) or 3 years (columns 9-11). Firms with more access than before but not with a new bank have the same characteristics, with the exception of borrowing from a new bank. The results for 1 year after default exclude firms that defaulted for the first time in 2008 and the results for 3 years after default exclude firms that defaulted for the first time in 2006, 2007 or 2008. Only firms with less than 9 bank relationships are considered. All variables are defined as in previous tables and refer to the last period of default. Mean difference tests are computed assuming unequal variances in the two groups considered. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table 11 - Probit regressions: determinants of the likelihood of obtaining a new loan from a new bank

	Dependent variable: access with a new bank (strict definition)			
	(1)	(2)	(3)	(4)
Ln Credit outstanding (ln(euros))	-0.082	-0.079	-0.082	-0.079
	-9.71	*-9.63*	*-9.99*	*-9.64*
Credit overdue ratio (%)	-0.003	-0.003	-0.003	-0.003
	-7.99	*-8.20*	*-8.51*	*-8.21*
Loss rate (%)	0.003	0.003	0.002	0.003
	2.75	*2.46*	*2.02*	*2.47*
Duration of default (quarters)	-0.004	-0.004	-0.003	-0.004
	-1.31	*-1.23*	*-0.90*	*-1.23*
No. of bank relationships	-0.013	-0.016	-0.014	-0.016
	-1.90	*-2.22*	*-2.02*	*-2.21*
No. of bank relat. in default % of total	0.000	0.000	0.000	0.000
	-0.61	*-0.17*	*0.02*	*-0.17*
Default with main bank (binary)	0.023	0.029	0.036	0.030
	0.99	*1.27*	*1.56*	*1.31*
Duration of exclusion (quarters)	-0.018	-0.016	-0.016	-0.016
	-11.12	*-9.39*	*-9.57*	*-9.39*
Constant	0.871	0.583	0.545	0.583
	9.24	*6.05*	*5.00*	*6.05*
Recession (binary)	-	-	-	0.145
	-	-	-	*2.05*
Year dummies	N	Y	N	Y
Quarter dummies	N	N	Y	N
Number of observations	21,055	21,055	21,055	21,055
Pseudo R2	0.02	0.03	0.04	0.03
Wald test	315.7	609.1	867.2	613.8
Log pseudolikelihood	-14,110	-13,970	-13,836	-13,968

Notes: z-scores in italics. All models estimated using a probit regression using robust variance estimates. The dependent variable is a binary variable that takes the value 1 if the firm is able to obtain a new loan from a new bank within the 3 years after its first default episode is resolved; and takes the value 0 if the firm obtains a new loan in the same situation, but not from a new bank (see Table 10). Only firms with less than 9 bank relationships are considered. All explanatory variables are defined as in previous tables (except for the duration of exclusion, which measures the number of quarters since the default is resolved until the firm obtains a new loan under our strict access definition) and refer to the last period of default.

Table 12 - Characteristics of firms that regain access but default again

	After 1 year								After 3 years							
	Firms again in default			Firms with access and without default			Mean difference		Firms again in default			Firms with access and without default			Mean difference	
	Obs.	Mean	Median	Obs.	Mean	Median	diff	t-test	Obs.	Mean	Median	Obs.	Mean	Median	diff	t-test
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Default severity																
Credit outstanding	17,914	318,697	39,469	28,606	592,326	48,325	-273,630	-4.5 ***	13,245	397,972	57,080	17,197	643,922	57,860	-245,950	-3.2 ***
Credit overdue	17,914	27,630	3,250	28,606	29,743	1,900	-2,112	-1.0	13,245	33,277	4,065	17,197	33,087	2,020	190	0.1
Credit overdue ratio	17,914	36.0	12	28,606	20.9	5	15.1	42.0 ***	13,245	32.4	9	17,197	21.1	5	11.3	26.6 ***
Write-offs	17,914	12,114	0	28,606	1,774	0	10,341	5.8 ***	13,245	14,574	0	17,197	2,183	0	12,392	4.9 ***
Loss estimates (%)	17,914	5.4	0	28,606	0.8	0	4.6	31.8 ***	13,245	4.9	0	17,197	1.0	0	3.9	23.7 ***
Duration of default	17,914	4.1	2	28,606	2.4	1	1.7	38.5 ***	13,245	3.6	2	17,197	2.4	1	1.2	26.1 ***
Relationships																
No. of bank relationships	17,914	2.5	2	28,606	2.8	2	-0.2	-13.1 ***	13,245	2.9	2	17,197	3.0	2	-0.1	-4.5 ***
No. of bank relat. in default	17,914	1.2	1	28,606	1.1	1	0.1	32.8 ***	13,245	1.2	1	17,197	1.1	1	0.1	26.3 ***
No. of bank relat. in default %	17,914	65.2	50	28,606	54.2	50	11.0	36.9 ***	13,245	59.2	50	17,197	51.2	50	8.1	22.4 ***
Default with main bank	17,914	0.6	1	28,606	0.5	1	0.1	22.7 ***	13,245	0.6	1	17,197	0.5	1	0.1	12.9 ***

Notes: Firms again in default are those that record a new default episode after 1 year (columns 1-3) or 3 years (columns 9-11). Firms with access are those with outstanding bank loans (including credit lines) and without any record of default or write-offs after 1 year (columns 4 - 6) or 3 years (columns 12-14). The results for 1 year after default exclude firms that resolved their first default episode in 2008 and the results for 3 years after default exclude firms that resolved their first default episode in 2006, 2007 or 2008. All variables are defined as in previous tables and refer to the last period of default. Mean difference tests are computed assuming unequal variances in the two groups considered. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table 13 - Cox regressions: determinants of time until new default

	Failure event: new default			
	(1)	(2)	(3)	(4)
Ln Credit outstanding (ln(euros))	1.033	1.032	1.032	1.032
	11.02	*10.67*	*10.65*	*10.69*
Credit overdue ratio (%)	0.995	0.994	0.994	0.994
	-29.58	*-32.26*	*-32.64*	*-32.28*
Loss rate (%)	0.997	0.997	0.997	0.997
	-10.58	*-9.98*	*-9.88*	*-9.99*
Duration of default (quarters)	0.987	0.989	0.990	0.989
	-12.30	*-9.84*	*-9.42*	*-9.90*
No. of bank relationships	1.031	1.029	1.029	1.029
	7.02	*6.58*	*6.59*	*6.57*
No. of bank relat. in default % of total	1.002	1.002	1.002	1.002
	8.07	*8.42*	*8.53*	*8.42*
Default with main bank (binary)	1.165	1.176	1.178	1.176
	12.29	*12.90*	*13.05*	*12.90*
Recession (binary)	-	-	-	0.833
	-	-	-	*-4.61*
D_1996	-	1.390	-	1.389
	-	*11.13*	-	*11.12*
D_1997	-	1.502	-	1.502
	-	*16.76*	-	*16.75*
D_1998	-	0.967	-	0.967
	-	*-1.14*	-	*-1.15*
D_1999	-	1.221	-	1.221
	-	*8.40*	-	*8.39*
D_2000	-	0.990	-	0.990
	-	*-0.39*	-	*-0.39*
D_2001	-	1.069	-	1.068
	-	*2.86*	-	*2.86*
D_2002	-	1.110	-	1.110
	-	*5.13*	-	*5.13*
D_2003	-	1.018	-	1.221
	-	*0.85*	-	*4.48*
D_2004	-	0.853	-	0.890
	-	*-7.56*	-	*-5.14*
D_2005	-	0.873	-	0.873
	-	*-6.40*	-	*-6.40*
D_2006	-	0.910	-	0.910
	-	*-4.54*	-	*-4.54*
D_2007	-	1.144	-	1.144
	-	*7.03*	-	*7.03*
D_2008	-	-	-	-
	-	-	-	-
Quarter dummies	N	N	Y	N
Number of subjects	73,980	73,980	73,980	73,980
Number of failures	39,756	39,756	39,756	39,756
Time at risk	681,425	681,425	681,425	681,425
Log-likelihood	-420,012	-419,623	-419,009	-419,613

Notes: Notes: z-scores in italics. All models estimated using a Cox regression that evaluates the time until a new default, using robust variance estimates. An estimated coefficient lower than 1 should be interpreted as contributing a longer time until default. The dependent variable is the time until a new default occurs after the first default episode is resolved. All explanatory variables are defined as in previous tables and refer to the last period of default.

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