Coarse Credit Ratings, Corporate Financing, and Real Outcomes*

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Abstract

We study how third-party rating information influences firms' access to bank financing and real outcomes. We exploit a refinement in the rating scale that occurred in France in 2004. The new rules made some firms upgraded relative to others within each rating class. We find that upgraded firms enjoy greater and cheaper access to bank credit. Such effects are stronger the higher the cost for banks to screen the borrowing firms. Thanks to the greater access to credit, upgraded firms reduce their reliance on equity, increase their investment and hiring, and are less likely to fail. Overall, our findings uncover a new bank lending technology whereby banks rely on indicators based on hard and soft information produced by a third-party entity.

*The views expressed herein are those of the authors and should under no circumstances be interpreted as reflecting those of the Banque de France or the Eurosystem.

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I Introduction

The information on which credit institutions rely for their lending decisions strongly affects firms' availability of credit and real outcomes (e.g., Cingano et al. (2016) and Berger and Udell (2006)). A potential source of information for investors are credit ratings, which are opinions on borrowers' creditworthiness and are produced by third-party agencies. The existing literature focuses on the use of credit ratings by capital market investors, such as bond investors. By contrast, whether banks rely on third-party ratings for their lending decisions is not clear and is less obvious. In fact, credit institutions may use their superior screening and monitoring technologies (Brealey et al. (1977), Diamond (1984)) to internally produce the assessment of borrowers' credit quality, without using external certifications. As a consequence, while the effects of ratings are well understood for large corporations which obtain credit in the bond market, little evidence exists on the effects of credit ratings for firms which mainly borrow bank debt.

This paper fills this gap and studies whether rating information influences firms' access to bank financing and real outcomes. We consider a unique setting in which a large number of firms have a credit rating and such ratings are primarily available to banks. These credit ratings are issued by the Banque de France, the French central bank. We exploit a reform of 2004 that increased the number of notches of the rating scale. The new rules increased the precision of the rating information by making a more stringent classification of firms. The consequence of this exogenous refinement was that within the same rating class some firms got upgraded relative to others, while their fundamentals remained unchanged. Our hypothesis is that if credit institutions do rely on ratings for their lending decisions, such exogenous change in the rating information influences firms' credit availability.

We estimate the effects of the upgrades using a difference-in-difference methodology, and compare the trajectories of upgraded and unaffected firms before and after the reform. We find that exactly when they receive the upgrade, upgraded firms observe greater and cheaper access to bank credit. In turn, they decrease their reliance on equity as a funding source and their cash holdings, increase their investment and their hiring, and pay more dividends. The magnitude of the effects is sizeable: the upgrade leads to an increase in the flow of bank loans of about a quarter of a standard deviation, and to a decrease in the cost of debt of 20 bps. The fact that

upgraded firms receive more and cheaper credit is consistent with the idea that the refinement in the rating information leads to a more precise assessment of borrowers' credit quality and that banks use the third-party certification in their lending decisions.

We also explore the heterogeneity of the effects depending on the type of bank-firm relationship. A priori, banks should rely more on the third-party rating information the higher the cost of screening is. It is especially in those cases, in fact, that the external rating facilitates the lending decision. Measures of the cost of screening and of the degree by which the bank knows the firm include the geographical distance, the number/concentration of the loan products that the firm has with the bank, and the duration of the relationship (Degryse and Van Cayseele (2000), Petersen and Rajan (2002), Dell'Ariccia and Marquez (2004), Cerqueiro et al. (2011), Agarwal and Hauswald (2010), Sette and Gobbi (2015)).

We find that the effect of the exogenous upgrade is stronger when the bank branch and the firm's headquarters are located in different towns and so when they are distant. This confirms that banks more strongly rely on the third-party certification when the cost to access to (soft) information on the borrower, and thus the cost of screening, is higher. To a similar extent, we find that the greater the number of loan contracts that a firm has with a bank, the milder is the effect of the exogenous upgrade. In fact, a firm which borrows through multiple loan contracts provides a bank more accurate information on its ability to repay debts. So, in those cases, the rating carries less information for the bank. Finally, we find that in older bank-firm relationships the upgrade has stronger effects. This result is interesting as it signals that the upgrade solves the hold-up problem linked to old bank-firm relationships. This interpretation is confirmed by another finding that the upgrade triggers an increase in the probability of starting a new bank relationship. Taken together, these two last results indicate that the reform enables upgraded firms to better reveal their quality to new lenders and obtain credit from them, thus reducing the power of incumbent lenders.

Next, we further explore the real effects linked to the upgrade and measure whether the greater access to credit and ability to invest affects firms' soundness. We consider the cohort of firms existing the first year after the implementation of the reform and the cohort of firms existing four years before it. We form groups of *similar* firms. The metric to measure similarity across firms is based on the probability of being upgraded, which depends on the firms'

fundamentals. Within each group, some firms are actually upgraded and some others are not. The reason some firms do not appear as upgraded is either because they operate before the reform is passed, or because they have not been upgraded by the reform. We then estimate the difference in the probabilities of failure, of future downgrade, and of defaulting on trade bill payments, between upgraded and not upgraded firms, within each group of similar firms. We find that upgraded firms are associated to smaller probabilities of failure, of future downgrade, and of defaulting on payments to suppliers. The magnitude of the effects is substantial and, for example, the reduction in the probability of failure reaches 20%.

We conduct several checks to confirm that our results are precisely triggered by the refinement in the rating scale, and thus by the reliance of banks on third-party credit ratings.

First, we derive our results on access to credit, funding mix, and investment from upgraded and non-upgraded firms that have parallel trends before the reform. In fact, we select firms that stay from two balance sheets before the reform until its implementation within the same rating class and the same Banque de France's *class of risk*. The class of risk is a function of the firm's *credit score*, which in turn measures the firm's probability of failure as predicted by an internal model of the Banque de France on the basis of the firm's balance sheet ratios (Bardos (1998)). We also check that from two balance sheets before the reform until its implementation, the analysts in charge of assigning the rating do not report any change in their judgement, even in the absence of a rating change.

Second, we verify that our results are not triggered by the regulatory implications of ratings rather than their informational content (see, e.g., Bongaerts et al. (2012), Ellul et al. (2011), Ambrose et al. (2012), Kisgen and Strahan (2010)). The better access to credit for upgraded firms is not the consequence of changes in the capital requirements for credit institution. Indeed, the credit ratings analyzed in this study started to be used as a tool to assess the adequacy of banks' capital only in 2007, when the Banque de France was recognized as External Credit Rating Institution (ECAI). The effects also do not come from changes in the firm loans' *eligibility* as collateral in Eurosystem refinancing operations. As described by Cahn et al. (2017a), and Mésonnier et al. (2017), (loans to) firms with a sufficiently high Banque de France's credit rating can be pledged as collateral by commercial banks, and changes in the eligibility of the loans may influence the loan supply of credit institutions. However, the refinement of the rating scale

under study did not cause any change in firms' eligibility: all firms which were eligible remain eligible after the reform.

Third, we check that the date of release of the new ratings corresponds to the date of implementation of the reform. Indeed, the new rating of a given firm is not disclosed in advance neither to banks nor to the firm.

Overall, our results highlight one important mechanism for the provision of bank financing. The informational content of external credit ratings matters for bank lending decisions. As a consequence, credit ratings become of crucial importance for firms' real outcomes. In doing so, this paper bridges two strands of literature: the first examines the types of bank lending technologies and their effects, while the second focuses on the real effects of credit ratings.

Relative to the first strand of literature, earlier works mainly focus on two types of technologies (Berger and Udell (2002)): transaction-based lending, under which lending decisions are based on hard information (e.g. credit scoring), and relationship banking, which is based on soft qualitative information acquired by the bank over time. Although our research question shares similarities with other studies on the effects of credit scoring on bank lending (Berger et al. (2005), Albareto et al. (2016)), there is an important difference between small business credit scoring and Banque de France's credit ratings. While credit scores are the result of statistical methods applied to financial information, credit ratings also add qualitative information acquired by the rating analyst during meetings with the firm's management. Credit ratings are thus based on both hard and soft information.

Our analysis uncovers that before the reform is passed, subsequently upgraded firms already appeared more profitable, less risky and had better credit scores than subsequently non-upgraded firms. Credit institutions had access to this information to the same extent that they had access to the credit ratings. Thus, under the hypothesis that banks rely on financial information or do credit scoring for their lending decisions, such firms should have benefitted from a greater access to credit. We observe, instead, that such firms relied more on equity as a funding source and less on bank debt relative to firms that were subsequently not upgraded. They also had a higher cost of debt. Taken together, this suggests that prior to the reform later-upgraded firms were under-rated relative to later-unchanged firms in the same rating class. The fact of being under-rated when banks rely on rating information may indeed induce firms to avoid debt

financing or to use more flexible types of debt so to switch to more favourable debt contracts when positive information is released (Diamond (1991)).

This paper sheds light on a new type of lending technology under which banks (as opposed to investors) rely on both hard and soft information gathered by third-party certifiers. The fact that banks prefer to outsource the assessment of their small- and medium-sized corporate borrowers to rating agencies is a key and novel result. In fact, in addition to having specialized monitoring and certification skills, banks unlike rating agencies have skin in the game.

In the second of the strands of literature listed above, prior studies show how credit ratings increase the availability of debt (Sufi (2007) and Faulkender and Petersen (2005)), how firms' investment and debt change according to the outstanding rating (e.g. Almeida et al. (2017), Lemmon and Roberts (2010) and Chernenko and Sunderam (2011)), and how more precise Moody's rating information impacts the cost of capital (Tang (2009) and Kliger and Sarig (2000)). We contribute to this literature in several ways. First, while the cited studies mainly consider listed or large-sized firms, which issue bonds to obtain funding, we find that credit ratings are vital for small and medium-size enterprises. Second, in addition to the effects of rating information on debt and investments, we empirically highlight the causal link between ratings and future negative credit events (failure, downgrade, and payment incidents). The reduction in payment incidents is new evidence and particularly relevant. In fact, as shown by Boissay and Gropp (2013), defaults on payments may create a liquidity shock to the selling firms which can propagate in a chain of default. Thus, our findings indicate that more precise rating information may reduce contagion in the market. Finally, we focus on a new type of ratings issued by a rating agency whose model has not been studied yet. The French central bank, in fact, does not operate under the issuer-paid model. Although its model shares similarities with the investor-paid model, such as the one of Egan-Jones Rating Company (Xia (2014)) and Rapid Ratings (Cornaggia and Cornaggia (2013)), its objective is not to make profits. A recent debate refers to how the agency's business model affects the information quality of the credit ratings (see, e.g., Stahl and Strausz (2017), Jiang et al. (2012), Bolton et al. (2012)). Our analysis does not aim to compare pros and cons of different business models, but suggests that with a rating agency sharing the Banque de France's characteristics rating information plays a role in the market and may lead to an increase in total welfare.

The paper proceeds as follow. Section II describes the institutional framework underlying the activity of the Banque de France as rating agency and presents a summary of the 2004 reform. Section III describes the data. Section IV presents the empirical results regarding the effects of the release of more accurate information on firms' creditworthiness on the access to credit, cost of debt, and funding mix, as well as probabilities of future downgrade, failure, and of defaulting on trade bill payments. Finally, Section VI concludes.

II Institutional Framework

A The Banque de France's Credit Rating

Since its inception, the Banque de France has performed credit risk analysis. This activity has become particularly important since the creation of the Euro. In fact, by assigning credit ratings to firms, the Bank provides support to the implementation of monetary policy. Monetary and financial institutions can obtain Eurosystem refinancing by pledging as collateral the credit claims that they hold on companies, provided that these have sufficiently high credit ratings.[1] Also, the Banque de France's credit rating can be used by credit institutions to assess the soundness of their corporate loans portfolio, in particular when they calculate their capital requirements to comply with solvency regulation.

All firms whose headquarter is located in France may, in principle, be rated on the initiative of the Banque de France.[2] However, in practice, only firms with total sales greater than 0.75M€ receive a credit rating. Firms do not have to pay to be assigned a rating by the Banque de France. Conversely, credit institutions pay a fee to access firms' credit ratings. The access is made possible by the information system put in place by the Banque de France.

The information system of the Banque de France was designed primarily to meet the needs of the conduct of monetary policy, but was gradually made accessible to the banking sector. In the period we consider, only French banks have remote access to the database FIBEN (*FIchier Bancaire des ENtreprises*), which comprises firm level information, including firms' credit ratings. As a result, FIBEN is used by commercial banks for commercial prospecting and customer risk monitoring.

[1] At the time of the reform we consider in this paper, bank loans represent around 40% of the total volume of collateral pledged by French banks for refinancing operations.

[2] In general, all entities without commercial or industrial activities, the State or local governments, and credit institutions are not rated.

The Banque de France's credit rating is assigned to firms by pools of analysts, who are based throughout the country, and have expertise in the dynamics of their regions. These analysts base their assessment combining hard and soft information. Hard information comprises statistical analysis on accounting and financial data (from tax returns), trade bill payment incident data, bank debt reported by credit institutions (credit register data), and descriptive data on the firm's legal form, managers, and location, etc. Soft information involves, instead, expert judgment on qualitative elements and forecasts that the manager of the company under study may have communicated.

The rating is updated each time a new element is brought to the attention of the analysts. In particular, revisions happen when the statistical analysis highlights significant changes. In fact, firms' financial statements constitute the most important input for the assignment of a rating. Filing financial statements and depositing them to commercial courts are mandatory by law. However, a firm may decide not to deposit its financial accounts. In that case, though, it incurs a fine of 1,500 €.

Until April 2004, the rating scale comprised four rating levels. From the highest to the lowest, the rating classes were named '3', '4', '5', and '6'. To complete the rating scale, a rating '0' was assigned when the analyst had no information to base its assessment.

B The Reform of the Rating Scale of April 2004

In the early 2000's, the Basel Committee started to conduct discussions on how to strengthen the soundness and stability of the international banking system. It appeared the need to define a more appropriate measure of the credit risk borne by banks, with particular attention to the quality of the borrowers. The discussions eventually led to the publication of the set of recommendations of June 2004. After further discussions and amendments, the Basel II guidelines were incorporated in two European Union Directives (Directive 2006/48/EC and Directive 2006/49/EC) that entered into force only on July 20, 2006.

At the time of this process, it arose that the rating scale produced by the Banque de France, while methodologically coherent, was too coarse to be used to compute the McDonough ratio, the new solvency ratio suggested by the Basel Committee. For instance, the firms rated '3' and '4' accounted for nearly 70% of the total of the firms rated. As a consequence, the

Banque de France decided to adapt its rating scale to fit the requirements imposed by the new regulation. This enabled the Bank to be recognized by banking supervisors as an External Credit Assessment Institution (ECAI) in 2007.

The investigations to adapt the rating scale started in 2002. After several contacts with the banking supervisor, it was decided that the methodological changes would be very limited, and the rating scale would keep its global structure. It was also decided that the new ratings would be assigned under the same information set of the old ratings. The new rating scale was presented to the supervisory authorities and to the representatives of the French banking sector, and was finally approved by the Banque de France at the end of 2002. In 2003, the Banque de France's analysts were trained on how to rate firms based on the new rating scale. In the first quarter of 2004, firms were rated according to both scales to perform comparative analysis, but only the old ratings were disclosed. Only in April 2004, the new rating scale was officially announced by the Banque de France, and firms were rated accordingly.

The reform of the rating scale consisted in a refinement of the original rating classes, and the introduction of three new rating levels corresponding to different frequency levels of payment default on trade bills. To achieve the refinement, the analysts employed finer rules to distinguish across firms. Figure 1 illustrates the changes that occurred during the refinement process. After the reform, the rating scale includes eleven positions. The application of the finer rules led to rating class '3' to be split into three new subcategories labelled '3++', '3+', and '3', rating class '4' to be split into two new subcategories labelled '4+', and '4', and rating class '5' to be split into two new subcategories labelled '5+', and '5'. This implied that firms in the new subcategories '3+', '4+', and '5+' appeared to benefit from an exogenous *upgrade*, while the firms in the new subcategories '3++' from an exogenous *double upgrade*, relative to firms in the subcategories '3', '4', and '5'.

III Data

Our empirical analysis exploits different datasets, all contained in the FIBEN database.

The first dataset is the `Service Central des Risques` dataset, which is the French credit register. This register is directly operated by the Banque de France, and collects bilateral credit exposures between resident financial institutions and non-financial corporations. A bank reports

individual credit exposures of all its client firms when the total exposure per firm is larger than 76k €.[3] In our main anaysis, we collapse the register to have a firm-quarter panel. We construct two variables: the quarterly flow of bank loans and the new bank relationship dummy. The first variable is defined as the quarterly change in the amount of bank debt, normalized by lagged total assets. Firms' total assets are recovered from the balance sheet data described in the following.[4] The new bank relationship dummy variable takes the value of one at any occurence in the panel of a new bank-firm relationship. A potential pitfall of this dummy variable comes from the fact that the credit register only reports exposures greater than 76k €. Thus, the first occurence of a bank-firm link in the panel may not be the actual first occurence of the relationship. It might be that a relationship is old but the exposure has been very small until a certain quarter, at which point it is recorded in the credit register. The interpretation of the results should take this possibility into account.

The second dataset used is `FIBEN Bilans`, which includes firm level balance sheet and income statement information. Firms' financial statements are available only for a subsample of the whole population of French firms and are collected when the firm's turnover exceeds 0.75M €. Given this relatively low threshold, this dataset mainly includes small- and medium-sized enterprises (but not sole entrepreneurs and micro enterprises). From this dataset, we extract the following variables. The yearly flows of bank debt, equity, and cash, obtained as yearly changes in the variable of interest, normalized by lagged total assets. The loan rate, obtained as interest payments divided by financial debt. The yearly investment, computed as the yearly difference in tangible assets (mainly property, plant, and equipment), normalized by lagged total assets. The number of new employees, computed as the yearly change in the number of employees, normalized by lagged total assets. The unit of observation of the balance sheet panel is firm-year.

We merge the credit register and balance sheet panels with the firms' 3-digit industry code and date of creation. Moreover, we merge the balance sheet dataset with the firms' *credit score* data. The Banque de France's credit score is an estimation of firms' probability of failure over a 3-year horizon. It is computed by applying statistical methods and is mainly based on the

[3]Total exposure includes drawn and undrawn credit, as well as guarantees granted by the bank.

[4]Since the balance sheet data have yearly frequency, the normalization of the quarterly changes in the amount of bank debt is done with respect to the total assets appearing in the last balance sheet available at the time the observation refers to.

balance sheet information, such as level and cost of financial debt, balance sheet structure, profitability, solvency and growth (Avouyi-Dovi et al. (2009)). The higher the score, the higher is the firm's probability of default. The Banque de France then splits firms in classes of risk depending on how each firm ranks in terms of score within its industry. The number of classes of risk ranges from a minimum of five to a maximum of ten depending on the industry.

Our analysis on the effects of the rating scale reform is based on the following samples. The first sample is derived from the credit register data. Firms are tracked from five quarters before the policy change to four quarters after it. We select firms that until the implementation of the reform stay within the same rating class (i.e. either class '3', '4', or '5'), and for which Banque de France's analysts do not report any change in their appreciation. After the reform, some firms get upgraded while others do not. The second sample is derived from the balance sheet data. In this case, firms are tracked from two balance sheets before the policy change to the first balance sheet after it. Similarly to before, we retain firms that until the reform belong to the same rating class and for which Banque de France's analysts do not report any change in their appreciation. However, we also impose that until the reform selected firms belong to the same class of risk, and therefore do not observe a significant change in their credit score.

We provide the summary statistics in Table I. The table reports the statistics separately for each rating class. Firms in rating class '3' are typically larger and older, with average total assets of about 8.8M € and average age of 24 years. As expected, going from rating class '3' to rating class '5', i.e. going from better-rated to worse-rated firms, firms' profitability and capitalization decrease. Also, the score increases, confirming that firms in rating class '5' have a higher probability of failure.

Our study also employs information on when a firm incurs a legal event. This dataset, which is collected from French commercial courts, records all the different judicial steps leading to a liquidation. Specifically, when a firm is unable to service its short-term debt or reimburse its creditors, it has to suspend its payments and its representatives must report a failure (*cessation de paiements*) to a commercial court.[5] A judge then decides either to start an observation period during which a recovery scheme is investigated (a phase called *redressement judiciaire*), or orders the firm's liquidation (*liquidation judiciaire*) if recovery seems impossible. During

[5]French law introduced in 2005 the possibility for a firm to access judiciary support, mainly under the form of debt rescheduling, before failure occurs (*procédure de sauvegarde*). This procedure is similar to the one allowed by the US Chapter 11.

the recovery period, the firm's liabilities are subject to rescheduling but the firm continues to operate, though under the court's scrutinity. If the firm fails to recover after a certain period, it gets liquidated. Otherwise, the situation goes back to normal. For our analysis, we follow the stricter definition in Cahn et al. (2017b) and consider as failure an event of either *redressement judiciaire* or *liquidation judiciaire*.

Finally, our analysis exploits Banque de France's `Centrale des Incidents de Paiement sur Effets de commerce` dataset, which contains individual trade bill payment default data. This register includes all incidents of payments on commercial paper that have been mediated by French banks. For each payment incident we know the date, the amount unpaid, and the reason the firm does not pay. Motives for nonpayment are classified into two groups: inabilities to pay and claim disputes. For our analysis, we only consider the incidents of payment falling in the former group (but exclude from them those related to the death of the debtor). We thus consider the following motives: insufficient funds, no order to pay, no payment due to a judiciary decision (e.g., in the case of *redressement judiciaire* or *liquidation judiciaire* as mentioned above), procedure of attachment on a bank account, or request for a delay.

IV Results

A Firms' Access to Bank Credit

The main question we ask is whether banks use credit ratings for their lending decisions. We answer this question by studying the effects of the rating scale reform on firms' access to bank credit. Our approach is twofold. We first look at the effects the reform triggers on the quantity of loans supplied: do upgraded firms experience a change in the bank credit they are offered? We then analyze the ability of obtaining credit through new bank relationships: does the upgrade affect the probability of starting new bank relationships?

A.1 Does Bank Loan Supply Increase Following Upgrade?

This subsection focuses on the first of the margins mentioned above: we study if receiving an upgrade or a double upgrade following the reform leads to a change in the bank credit offered. In principle, since each rating class is split in two or three notches, the reform enables credit institutions to better distinguish across firms. However, this might have limited consequences

on banks' loan supply schedules. The reason is that banks have a superior screening technology, and thus did already distinguish across firms within each rating class before the reform. The upgrades and double upgrades may therefore be redundant information.

As a first pass at testing what are the effects of the reform on firms' access to bank credit, we conduct a graphical analysis. We consider the quarterly data on firms' bank debt amounts. The relatively high frequency of this dataset enables us to precisely time the changes in firms' access to credit, and see if they relate to the implementation of the reform. As already described in Section III, we focus on the period that goes from five quarters before the reform to four quarters after it. The rating classes considered are class '3', class '4', and class '5'. Within each rating class, the reform makes some firms upgraded. We group firms depending on whether after the reform they receive an upgrade or a double upgrade. We regress the quarterly flows of bank loans over firm and industry x quarter fixed effects, and take the average of the resulting residuals within each group of firms and quarter.

Figure 2 plots the dynamics for the groups of firms within rating class '3'. The group of firms that will not receive any upgrade is defined by the solid black line. The group of firms that will receive an upgrade is captured by the dashed blue line. Finally, the group of firms that will receive a double upgrade is described by the dotted red line. The vertical red line identifies the implementation of the reform.

Before the policy change, later-upgraded firms (i.e. those later rated '3+' or '3++') receive less credit than later-unaffected firms (i.e. those later rated '3'). After the reform, there is an inversion of the order, and upgraded firms enjoy greater access to credit than unaffected firms. The implementation of the reform is exactly when the inversion takes place. This graphical analysis thus suggests that the refinement in the rating scale has consequences for firms' access to credit. In particular, it says that 1) upgraded firms increase their access to credit following the reform, and 2) banks base their loan supply on the third-party credit ratings.

To properly measure the effects of the reform, we provide the econometric counterpart to the graphical analysis just presented. We structure a difference-in-difference model that writes:

$$\frac{bank\,loans\,flow_{jq}}{total\,assets_{jq-1}} = \beta_1\,upgrade_{jq} + \beta_2\,double\,upgrade_{jq} + \eta_{industry_j;q} + \eta_j \qquad (1)$$

where $\frac{bank\,loans\,flow_{jq}}{total\,assets_{jq-1}}$ is the normalized flow of bank loans. $upgrade_{jq}$ and $double\,upgrade_{jq}$

denote if firm j is upgraded, respectively double upgraded, at quarter q. $\eta_{industry_j;q}$ identifies industry x quarter fixed effects, while η_j is the firm fixed effect.

The parameters of interest of model 1 are β_1 and β_2. They capture the effect of being upgraded, respectively double upgraded, on the firm's flow of bank loans. Their identification works by comparing firms that following the rating scale reform are assigned an upgrade or a double upgrade, with firms that are not upgraded. Note that the upgrades do not depend on changes in the fundamentals, but are due purely to the refinement of the rating scale.

Table II reports the estimated coefficients. Both the upgrade and the double upgrade lead to an increase in the flow of bank loans to the firm. The magnitude of the effect of the double upgrade is the double of the one of the single upgrade. These results confirm that following the implementation of the reform, upgraded firms experience a significant increase in the supply of bank credit. The exogenous upgrades are not redundant information: banks do take them into account when they supply credit.

Such results are at odd with the idea that banks assessed firms' creditworthiness and distinguished across firms within the same rating class on their own. We investigate further this point by looking across bank-firm relationships. The idea is to see if the effects change depending on the screening cost that a bank needs to pay before deciding whether to lend or not. In principle, it should be that the more costly this is, the greater are the effects of the exogenous upgrade and double upgrade. In those cases, in fact, the information produced with the reform is more valuable to the bank and should lead to a greater change in the bank's loan supply.

We consider three measures of the screening cost. The first is the distance between the firm's headquarters and the bank branch. A greater distance implies a higher cost of screening. The second is the intensity of the bank-firm relationship. When a firm borrows through more than one type of loan from the same bank, the bank monitors if the firm repays each loan in due time. Therefore, a relationship in which the firm borrows through multiple loan products implies a greater knowledge of the bank on the firm's creditworthiness. The third is the duration of the bank-firm relationship. The longer the relationship the larger the information generated through the interaction over time. This information is not observable and not easily transferable to outsiders. Note that these two last dimensions of the bank-firm relationship have been analyzed in Degryse and Van Cayseele (2000).

We consider the uncollapsed version of the firm-quarter panel used above: the unit of observation we take now is bank branch-firm-quarter. We use the same difference-in-difference model used above, with two additions. First, we also include bank x quarter fixed effects. In this way, we capture any shock that may affect a given bank's loan supply. Second, we interact the upgrade and double upgrade dummies with the proxies of the degree of information that the bank possesses on the firm. 'bank branch is located in a diff. town' indicates if the firm is headquartered in a different town than where the bank branch is located. 'N products with the bank' is the number of loan products (e.g., leasing contracts, mortgages, etc.) that the firm has with the bank. 'products' HHI with the bank' is the index of concentration (Herfindahl Index) of the loan products that the firm has with the bank. It ranges from 0 to 1: 0 corresponds to a situation in which the firm borrows from the bank through an infinity of different loan products; conversely, 1 represents the case in which the firm borrows from the bank only through one loan product. Finally, 'young bank-firm rel.' denotes whether the bank-firm relationship is at most two years old at the time of the implementation of the reform. Two years corresponds to the value at the first quartile of the distribution of the age of bank-firm relationship.

Table III reports the estimated coefficients. The upgrade and the double upgrade lead to a greater increase in the flow of bank loans to the firm when the cost of sceening the borrower is higher. This is confirmed by the negative coefficient in front of the number of loan products interaction term, and the positive coefficients in front of the interactions with the 'bank branch is located in a diff. town' dummy and the products' Herfindahl Index with the bank. This evidence indicates that the reform facilitated banks' lending decisions by decreasing their screening cost.

However, Table III also reveals that in older bank-firm relationships the upgrade has stronger effects. This result is interesting because older bank relationship are those that suffer more from the hold-up problem: when the bank has information on the borrower generated over time it charges higher rates, which result in less quantity borrowed. When the firm is upgraded, it is easier to signal its creditworthiness to other lenders. This means that the power of the incumbent bank decreases, and the bank is pushed to increase its supply of credit. To test if this mechanism is actually at play, the next subsection analyzes the effect of the upgrade on the probability of starting a new bank relationship.

A.2 Does the Probability of Starting a New Bank Relationship Increase Following Upgrade?

We now study if the exogenous upgrades affect firms' ability to obtain funding from banks they have never done business with. In the previous subsection, we studied the effects of the upgrades on the quantity of loans supplied. Here, we rather focus on the ability to borrow from new lenders. We tackle this question using the following conditional fixed effects Logit model:

$$Pr\left(new\ bank\ rel_{jq} = 1|\cdot\right) = \Lambda\left(\beta_1\, upgrade_{jq} + \beta_2\, double\, upgrade_{jq} + \eta_q + \eta_j\right) \qquad (2)$$

where $new\ bank\ rel_{jq}$ is a dummy that takes a value of 1 when firm j starts a new bank relationship (as defined in Section III) in quarter q, Λ is the Logistic function, $upgrade_{jq}$ and $double\, upgrade_{jq}$ denote if firm j is upgraded, respectively double upgraded, at quarter q, η_q identifies quarter fixed effects, while η_j is the firm fixed effect. Estimating the parameters in the conditional Logit requires that there is variation in the dependent variable within each firm. This means that we have to focus on firms that start at least one bank relationship in the period that goes from five quarters before the reform to four quarters after it. Since considering only those firms might be restrictive, we also estimate the effects of interest through a linear probability model. That model does not require variation in the dependent variable and relates $new\ bank\ rel_{jq}$ to the independent variables above in a linear fashion.

We present the results in Table IV. We find that both the upgrade and double upgrade lead to an increase in the probability of starting a new bank relationship. These results hold with both the conditional Logit and the linear probability model. However, in both cases, only the effect of the upgrade is statistically significant. In terms of magnitude, the effects of both the upgrade and double upgrade is estimated to be around 15% of the standard deviation of the probability of starting a new bank relationship.

We can thus conclude that the exogenous upgrades not only affect the quantity of bank funding available, but also the ability to get it from new banks. The reason is that the information produced with the reform increases banks' knowledge on prospective new borrowes: The cost of screening new borrowers lowers, and firms can borrow from banks they have not done business before with greater ease.

All the results presented so far provide a first indication that banks use credit ratings for

their lending decisions. In the following we further characterize the effects on the availability of credit by looking at how the upgrade affects the loan rate. Moreover, we also investigate what ultimately are the real effects of credit ratings on firms given their effects on the access to credit.

B Cost of Debt, Funding Mix, and Investment

The question we ask in this Subsection is whether the upgrades also affect the cost of bank debt, the funding mix, and the investment. Unfortunately, the analysis of these variables can be conducted only at yearly frequency, when firms report their balance sheet.

Measuring the effect of the rating scale change on the cost of bank debt is crucial to fully characterize the effects of the reform on firms' access to bank credit. We thus start by a graphical analysis similar to the one done in Subsection *A*. We group firms depending on whether after the reform they receive an upgrade or a double upgrade. We then take the average of the loan rates within each group of firms and quarter.

Figure 3 plots the dynamics for the groups of firms within rating class '3'. As in Figure 2, the solid black line identifies firms that will not receive an upgrade, the dashed blue line firms that will receive an upgrade, and the dotted red line firms that will receive a double upgrade. The vertical red line identifies the implementation of the reform.

Before the policy change, later-upgraded firms (i.e. those later rated '3+' or '3++') pay a higher loan rate than later-unaffected firms (i.e. those later rated '3'). After the reform, there is a marked decrease in the loan rate paid by double upgraded and upgraded firms. The three groups of firms converge to a similar level of loan rate.

Similarly to before, we fully explore the effects of the rating scale reform by making use of model 1, and consider as dependent variables the yearly flows of bank loans, equity, and cash, the loan rate, investment, the number of new employees, and the dividends paid. The data have yearly frequency, and we consider firms from two balance sheets before the reform to the one that just follows it. Until the reform is implemented, selected firms have constant fundamentals, they belong to the same rating class and same Banque de France's class of risk. When the reform is implemented, some firms are upgraded or double upgraded, while others are not.

We present the estimation results in Tables V and VI. Estimates confirm that both the upgrade and the double upgrade reduce the loan rate paid by affected firms. In parallel, we also find effects on the yearly flow of bank loans consistent with those obtained exploting the credit register data (Subsection *A*).

The greater and cheaper access to bank credit has important consequences on firms' funding mix and investment. Upgraded firms reduce their reliance on equity as a funding source, and decrease their cash holdings. In turn, they increase their investment, their hiring, and distribute more dividends.[6] All such effects suggest that the greater access to bank credit, as brought by the increase in the detail of the opinions on firms' credit risk, has important effects for firms.

We strenghten our results by considering an alternative econometric approach: instead of the usual difference-in-difference model, we now consider a matching methodology. We aim at comparing firms that are *similar*, but some are actually upgraded and some others are not. The metric to measure similarity across firms is the probability of receiving the upgrade. We thus need to study how upgrades and double upgrades are assigned at the time the reform is passed, and so reconstruct the 'rating function' used to convert old ratings to new ones based on fundamentals.

The decision of whether upgrading or not a firm was based mainly on the last balance sheet that each firm reported. We thus analyze the probability of receiving the upgrade or double upgrade as a function of the firm's characteristics before the reform. We take size (as proxied by log total assets), leverage (equity over total assets), Banque de France's score (representing the probability of failure in the subsequent three years), and industry fixed effects. The model is estimated separately for each rating class. It takes the form of a Multinomial Logit in case of rating class '3' as there are three outcomes: upgrade, double upgrade, or no change. It takes the form of a Logit with just two outcomes (upgrade or no change) for rating classes '4' and '5'. Results appear in Table VII. As expected, more capitalized firms and firms with a lower score are more likely to be assigned an upgrade. The effect of size is less clear and depends on the rating class analyzed.

[6]For robustness, we address the issue that the three rating classes '3', '4', and '5' might follow different trends. We modify Model 1 by adding rating class x period fixed effects. Such fixed effects capture any trend that is specific to a rating class and not to others. The effects of upgrade and double upgrade are identified within each rating class. The results for the balance sheet data are presented in Tables XV and XVI, in the Appendix. The estimated effects are very similar to those obtained in the baseline regressions.

Based on the parameters estimated, we compute the probability of being upgraded or double upgraded for each of the firms that experience the reform. We then form groups of firms with similar probabilities of being upgraded. In the case of rating class '3', since we have two outcomes on top of no change, we split the sample according to both the probability of being upgraded and the probability of being double upgraded. In practice, we form groups of firms falling in a given decile for the probability of being upgraded and in a given decile for the probability of double upgraded. For rating classes '4' and '5', we split the sample according to the percentile of the probability of being upgraded. We term the groups of firms just created 'strata'.

Within each strata, firms share a similar probability of receiving the upgrade but some are actually upgraded or double upgraded and others are not. The idea is then to compare the outcome of those actually upgraded with the one of those with no change, controlling for the average outcome of the strata. Any difference in the outcome is attributed to the upgrade or double upgrade.

We compute the change in the normalized flows and the change in the loan rate from the balance sheet reported before the reform to the one that follows the reform. We regress such changes over the upgrade and double upgrade dummies, and the strata fixed effects. By including the strata fixed effects, the identification of the effects of the upgrade and double upgrade works by comparing firms that are actually upgraded with firms that are not, within groups of firms sharing a similar probability of being upgraded. The resulting estimates appear in Tables VIII and IX. The effects are very similar to those obtained in the baseline regressions. However, relative to them, statistical significance often increases.

C Future Downgrade and Failure

The evidence presented so far suggests that upgraded firms enjoy greater and cheaper access to bank credit, and are then able to invest more. This may lead to a further consequence: greater soundness and resilience. We test this by investigating whether upgraded firms have lower probabilities of future downgrade and failure relative to similar firms that operated in the past.

We conduct this analysis considering two cohorts of firms: firms that existed four years before the reform, and firms existing the first year after the reform. The firms that existed four

years before the reform are clearly not upgraded. However, if the reform was passed earlier, some would have been. The idea is to measure if the fact of being upgraded affects the probability of future downgrade and failure.

The reason we prefer to compare similar firms that operate before and after the implementation of the reform instead of comparing contemporaneous firms that receive or not the upgrade is the following: it is likely that analysts assigned the upgrades based on their superior knowledge on firms' expected probability of failure. If that is the case, two firms that have similar fundamentals but one is upgraded and the other is not have a crucial difference: the upgraded firm has by construction a lower probability of failure (or future downgrade) than the other one. An estimation of the effect of the upgrades is therefore biased because of the endogeneity of the upgrades.

Comparing similar firms that operate before and after the implementation of the reform eases this issue. In fact, the reason two firms with similar fundamentals are one upgraded and the other not-upgraded is mainly because the non-upgraded operates before the reform is passed. Thus, within a group of similar firms, the upgrades are assigned in a rather exogenous way, which depends on the timing of the implementation of the reform.

Our estimation exploits the matching methodology described above. Based on the estimated rating function and the observable fundamentals, we compute the probability of being upgraded or double upgraded for each of the firms existing four years before the reform, and the firms existing the first year after the reform. We form stratas with firms from the two periods based on a similar probability of being upgraded. Within each strata, some firms are actually upgraded or double upgraded and others are not. Finally, we study the effect of actually being upgraded or double upgraded on the probabilities of future downgrade and failure within each strata of matched firms.

This final step is done using the Probit model:

$$Pr\left(firm\ outcome_{jt} = 1|\cdot\right) = \Phi\left(\gamma_1\, upgrade_{jt} + \gamma_2\, double\, upgrade_{jt} + \eta_{strata} + \eta_{industry_j;t}\right) \tag{3}$$

where $firm\ outcome_{jt}$ denotes either downgrade or failure in the following year or the subsequent three years for firm j at year t. $upgrade_{jt}$ and $double\, upgrade_{jt}$ denote if firm j is

upgraded, respectively double upgraded, at year t. η_j is the strata fixed effect, while $\eta_{industry_j;t}$ identifies industry x year fixed effects. $\Phi(\cdot)$ is the cumulative normal distribution function.

The parameters of interest are γ_1 and γ_2. They measure the differential in the probability of interest arising from the fact of actually being upgraded, respectively double upgraded, holding fixed the probability of being upgraded or double upgraded. As model 3 includes strata fixed effects, in fact, the identification is achieved comparing firms that are actually upgraded or double upgraded within the same strata.

By including industry x year fixed effects we absorb any business cycle component that differentiates the two periods under study. Specifically, we control for differences in the average probability of default (or downgrade) within the same rating class between the two periods. Doing this is important since ratings are generally assigned on a 'through-the-cycle' basis, implying that the average probability of default or downgrade within the same rating class may evolve through time and depend on the business cycle. The effects of interest are therefore net of such effects.

Table X reports the results for the probability of future downgrade, distinguishing by rating class. Both the upgrade and double upgrade appear to decrease such probability in all rating classes, and the parameters are strongly statistically significant. The magnitude of the effects is also important. The reduction linked to the upgrade ranges from 10 to 25% relative to the probability of downgrade at median. The stronger effects in relative terms are in rating class '4'. The reduction linked to the double upgrade is also strong, reaching more than 40% of the median probability of downgrade the following year.

Table XI shows instead the results for the probability of failure, distinguishing by rating class. For rating class '4' the upgrade has negative sign, with a strongly statistically significant parameter in the case of the failure within three years. The reduction in the probability of failure at the median is of the order of one fifth. For rating class '3', the estimates are statistically different form zero at 10% only for the effect of the double upgrade on the probability of failure within three years. Finally, for rating class '5', while not statistically significant, the upgrade is found to decrease the probability of failure.

Overall, the estimates of Tables X and XI suggest that the fact of being upgraded or double upgraded increases the firm's soundness and resilence. The result has particular relevance:

it means that credit ratings endogenously affect a firm's probability of future downgrade and failure via the access to bank credit.

D Payment Incidents

A further effect of having greater and cheaper access to credit, investing more, and being overall more sound, may be a greater ability to timely pay trade bills. If in place, this effect may be of particular interest as it would imply that the greater access to bank credit thanks to credit ratings decreases the risk of contagion across firms.

We test if upgraded firms default less frequently and for smaller amounts relative to similar firms not upgraded. We use the approach of Subsection *C* and consider firms that existed four years before the reform, and firms existing the first year after the reform. We reconstruct groups of firms with similar probabilities of being upgraded and double upgraded, i.e. the strata. We then take Model 3 and replace the dependent variable with the probability of defaulting on trade bill payments in the following one year, or three years. Conditional on making at least one payment incident, we also consider as dependent variable the Euro amount over which the firm defaults over the firm's trade payables.

The results appear in Tables XII and XIII. The upgrade is linked to a reduction in both the probability of making a payment incident and, in case the firm makes one, in the quantity over which the firm defaults. Similarly to what found for the probabilities of future downgrade and failure, the effects are statistically more significant and quantitatively more important for rating class '4'. Overall, these findings suggest that refinement in the rating scale led to a reduction in the risk of contagion due to the non-payment of trade bills across firms.

V Policy Implications

Our findings indicate that banks base their lending decisions on third-party credit ratings, and these have in turn important effects on firms' real outcomes. To properly form our policy implications, we first check if the creditworthiness of later-upgraded firms could be identified in advance by banks based on the information available. If that was the case, it would mean that banks really take the credit ratings as main input for their decisions and do not analyze other available information.

We compare firms that later receive the upgrade with firms that later are unaffected, right before the reform is implemented. The comparison is done within each rating class, and is based on information that was available to credit institutions via the FIBEN database. The results are in Table XIV. Later-upgraded firms have a higher Return on Assets and a lower Banque de France's score relative to later-unchanged firms. This suggests that they are more profitable and less risky. To this extent, their greater creditworthiness could be identified by banks.

However, banks did not identified it. Otherwise, they should have offered more credit to later-upgraded firms than to later-unaffected ones. But as already partly shown in Section IV, this is not what we observe. Right before the refinement of the rating scale, subsequently upgraded firms have a lower flow of bank debt, paid at a higher rate. They also rely more on equity as a funding source. The level of tangible assets, and thus the ability to pledge collateral, does not explain the lower reliance on bank credit. Indeed, while upgraded firms in rating class '3' have a lower ratio of tangible assets which may signal more difficulty in raising debt financing (Almeida and Campello (2007)), this is not true for upgraded firms in other rating classes.

Overall, these findings suggest that banks take credit ratings as a main input for their lending decisions, without processing too much the other available information. There are at least two reasons for this. The first is that banque de France's credit rating are a combination of both hard and soft information. So, even if a bank has not directly dealt with a firm, has access to a indicator that goes beyond a score derived from hard information only. The second is that the cost of accessing these credit ratings is minimal, especially if compared to the cost of constructing similar ratings on its own. There are thus two main policy implications: first, credit ratings alter banks' lending schedule by decreasing the cost of accessing and processing the information; second, and relatedly, credit ratings are important for firms' outcomes and the reform of 2004 was welfare improving.

Regarding the first policy implication, in Section IV we found that credit ratings are important especially when banks have little information on the borrowing firms. We interpreted this result as suggesting that the reform decreased the cost of screening borrowers: When ratings get less coarse, banks can better distinguish across firms, and so the cost of screening firms lowers. Smaller costs of screening may then lower banks' market power. Evidence of this is our result on the probability of starting a new bank relationship following the upgrade: More precise ratings

enable firms to obtain credit from banks they have not done business before, by enabling them to reveal their creditworthiness more easily. The number of potential lenders to the same firm increases, thus favoring competition. This means that having a system of credit ratings, which enables to well distinguish across firms, has also effects for the bank market structure and the degree of competition.

The second policy implication builds on the fact that banks use credit ratings for their lending decisions. An interesting aspect of Table XIV is that the smaller quantity of bank debt borrowed by later-upgraded firms does not come with a lower price paid. The reason for this is ratings' coarseness and the fact that banks mainly consider as inputs for their lending decisions firms' credit ratings. With a discrete rating scale, the same rating class includes firms with a relatively lower credit quality, and firms with a relatively higher credit quality (Pagano and Volpin (2010)). If the credit rating reflects the average firm's credit quality in the class, firms with higher credit quality are under-rated. In turn, if credit institutions rely on credit ratings to assess firms' credit risk, these firms face a cost of debt greater than the one they should have. Under-rated firms may thus choose to decrease their level of debt or choose flexible types of debt, so to be able to switch to more favourable debt contacts when new positive information is released (Diamond (1991)). This suggests that firms with a relatively higher credit quality choose debt contracts with short-term maturity, little or no collateral, and no covenants. Such characteristics typically imply a premium to pay, thus explaining the higher loan rate observed.[7]

The existence of a system of credit ratings is thus per se' not sufficient to benefit borrowing firms and the economy. It must be that credit ratings are precise enough to distinguish across borrowers. In fact, the results of Section IV imply that the reform increased the access to credit of relatively better firms and their ability to invest. Such firms had a reduction in their probability of failure and of defaulting on payments in the future, relative to similar firms that operated in the past. This means that the greater rating precision, as brought by the reform of 2004, triggered a better allocation of resources, and thus an increase in total welfare. Such increase in welfare comes from two margins. The first is the one taking firms as independent units: as said, the reform led banks to better allocate credit. The second margin is the one considering the economy as a whole and the link existing across firms: The reform triggered a

[7]Unfortunately, since we cannot observe the details of the bank loan contracts used by each firm, we cannot precisely test what type of loan contract later-upgraded firms choose.

reduction in the probability of making a payment incident for the upgraded firms. This implies that the reform was beneficial also to firms not directly affected by the reform, as their ability to be paid for their products and services increased.

VI Conclusions

We studied how rating information influences small- and medium-sized enterprises' access to bank credit and corporate policies. We exploited a reform implemented by the Banque de France, the French central bank, which increased the number of notches on its credit rating scale. This refinement led to upgrades not on the basis of changes in the firms' fundamentals.

Consistently with the hypothesis that banks base their lending decisions on the third-party ratings, we find that upgraded firms enjoy greater and cheaper access to bank credit. As a result, upgraded firms increase their investment, hiring and pay more dividends. Interestingly, upgraded firms also experience a relevant decrease in the probability of default and of future downgrade relative to firms with similar fundamentals. Overall, our findings reveal the importance of credit ratings for firms' real outcomes and uncover a new bank lending technology whereby banks rely on indicators based on hard and soft information produced by a third-party entity.

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VII Figures

Figure 1
The rating scale reform of April 2004
This figure provides an illustrative comparison of the rating scales before and after April 2004, the official date at which the reform of the rating scale was implemented. The old and the new rating classifications are presented by increasing default probability from left to right.

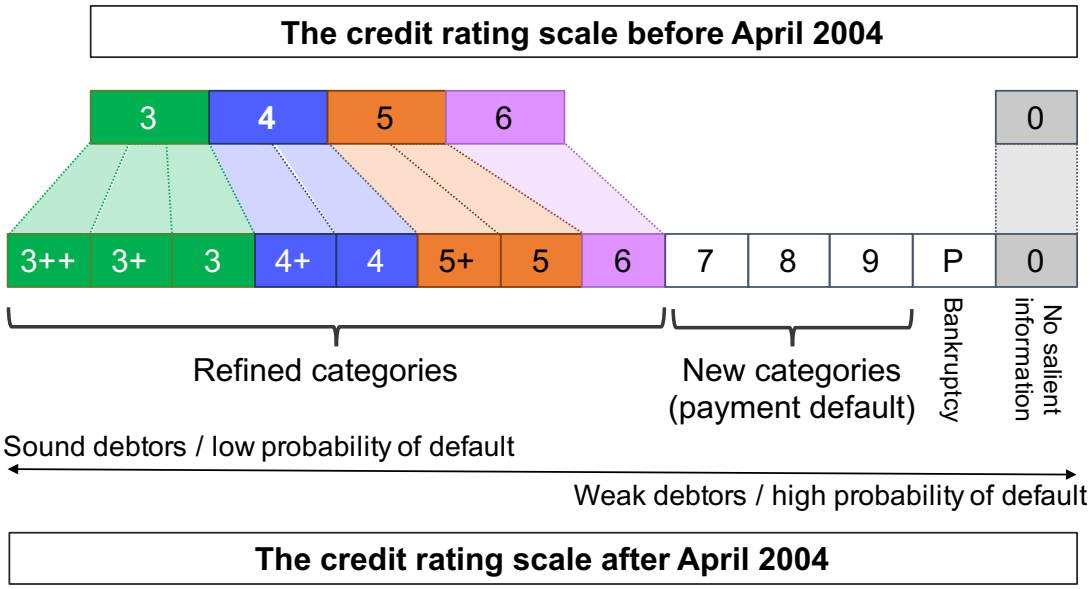


Figure 2
Quarterly flow of bank loans around policy change
This figure plots the average residuals in the quarterly flow of bank loans depending on the distance from the policy change for firms in rating class '3'. The policy change is identified by the vertical red line between quarter 0 and quarter 1. Firms are grouped depending on whether after after the policy change are either 'Double upgraded' (i.e. become '3++'), 'Upgraded' (i.e. become '3+'), or have 'No change' (i.e. they remain '3'). All firms are rated '3' before the policy change. The residuals are obtained with respect to industry x quarter FEs. The figure also reports the 95% confidence bounds.

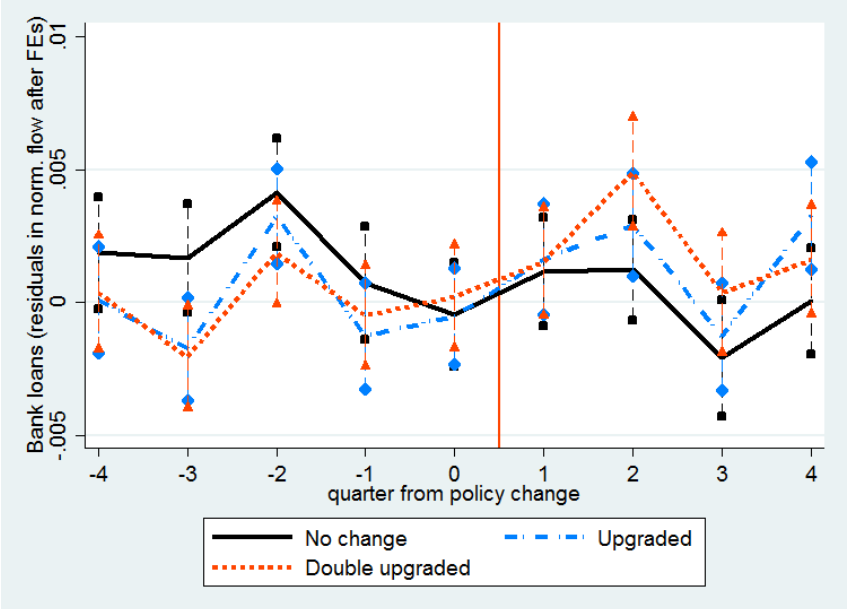
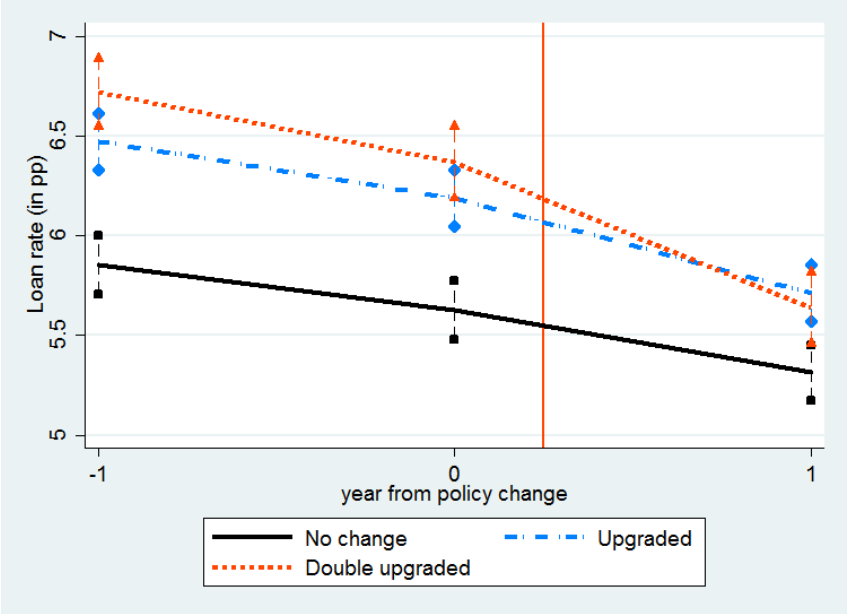


Figure 3

Loan rate around policy change

This figure plots the average loan rate paid by firms in rating class '3' depending on the distance from the policy change. The policy change is identified by the vertical red line between year 0 and year 1. Firms are grouped depending on whether after after the policy change are either 'Double upgraded' (i.e. become '3++'), 'Upgraded' (i.e. become '3+'), or have 'No change' (i.e. they remain '3'). All firms are rated '3' before the policy change. The figure also reports the 95% confidence bounds.



VIII Tables

Table I

Firms' summary statistics

This table displays selected summary statistics for the firms in the sample, distinguishing by rating class. The quarterly flows of bank loans and the 'New bank relationship' dummy are derived from the credit register data. The flows are computed as quarterly changes in the amount of bank debt, normalized by lagged total assets. Instead, the dummy defines if a firm has started a new bank relationship in a given quarter. The unit of observation of the panel is firm-quarter, and firms are tracked from five quarters before the policy change to four quarters after it. All other variables are derived from the balance sheet data. The flows are obtained as yearly changes in the stock of the variable of interest, and are normalized by lagged total assets. In this case, the unit of observation of the panel is firm-year. Firms are tracked from two balance sheets before the policy change to the first balance sheet after it. In both panels, each firm belongs to the same rating class until the implementation of the reform. When the change in the rating scale is implemented some firms are upgraded (or double upgraded), while others are not.

			Rating class: 3		
	N	Mean	St.Dev.	10th pctile	90th pctile
Bank loans (norm. quarterly flow)	54,596	-0.000	0.048	-0.035	0.043
New bank relationship	54,596	0.051	0.220	0.000	0.000
Bank loans (norm. yearly flow)	28,466	-0.001	0.043	-0.040	0.035
Loan rate (in pp)	19,158	6.000	3.637	2.105	11.111
Equity (norm. yearly flow)	28,466	0.036	0.062	-0.029	0.111
Cash (norm. yearly flow)	28,466	0.022	0.097	-0.090	0.143
Tot. investment (norm., yearly)	28,466	0.001	0.043	-0.036	0.042
New employees (norm., yearly)	28,466	0.000	0.001	-0.001	0.002
Dividends paid (norm., yearly)	28,466	0.062	0.067	0.000	0.156
Total assets (in M EUR)	28,466	8.798	147.953	0.696	7.882
Return on Assets (yearly)	28,365	0.201	0.096	0.093	0.332
Equity / Total assets	28,466	0.538	0.179	0.304	0.782
Age (in years)	27,702	24.232	17.415	9.258	44.112
Banque de France's score	28,466	0.822	0.825	0.210	1.990
Banque de France's class of risk	28,466	6.880	1.555	5.000	10.000
			Rating class: 4		
	N	Mean	St.Dev.	10th pctile	90th pctile
Bank loans (norm. quarterly flow)	33,833	-0.001	0.071	-0.069	0.081
New bank relationship	33,833	0.072	0.258	0.000	0.000
Bank loans (norm. yearly flow)	6,820	-0.005	0.064	-0.074	0.067
Loan rate (in pp)	5,302	6.346	3.821	2.251	11.628
Equity (norm. yearly flow)	6,820	0.019	0.046	-0.024	0.069
Cash (norm. yearly flow)	6,820	0.007	0.083	-0.083	0.106
Tot. investment (norm., yearly)	6,820	-0.001	0.049	-0.046	0.047
New employees (norm., yearly)	6,820	0.000	0.002	-0.001	0.002
Dividends paid (norm., yearly)	6,820	0.032	0.058	0.000	0.106
Total assets (in M EUR)	6,820	4.325	40.395	0.502	6.012
Return on Assets (yearly)	6,801	0.126	0.088	0.038	0.241
Equity / Total assets	6,820	0.334	0.167	0.155	0.571
Age (in years)	6,457	22.424	16.838	7.422	43.274
Banque de France's score	6,820	2.130	2.170	0.630	3.830
Banque de France's class of risk	6,820	5.839	1.220	5.000	7.000
			Rating class: 5		
	N	Mean	St.Dev.	10th pctile	90th pctile
Bank loans (norm. quarterly flow)	35,401	-0.007	0.077	-0.086	0.082
New bank relationship	35,401	0.066	0.248	0.000	0.000
Bank loans (norm. yearly flow)	3,326	-0.017	0.081	-0.098	0.073
Loan rate (in pp)	2,778	6.597	3.758	2.795	12.022
Equity (norm. yearly flow)	3,326	0.013	0.052	-0.034	0.062
Cash (norm. yearly flow)	3,326	-0.000	0.061	-0.062	0.060
Tot. investment (norm., yearly)	3,326	-0.007	0.054	-0.065	0.040
New employees (norm., yearly)	3,326	0.000	0.002	-0.002	0.002
Dividends paid (norm., yearly)	3,326	0.021	0.047	0.000	0.081
Total assets (in M EUR)	3,326	5.010	73.685	0.463	5.017
Return on Assets (yearly)	3,317	0.097	0.089	0.013	0.198
Equity / Total assets	3,305	0.184	0.184	0.045	0.388
Age (in years)	3,099	17.837	13.635	5.499	33.767
Banque de France's score	3,326	5.176	5.942	0.650	13.010
Banque de France's class of risk	3,326	4.682	1.414	3.000	6.000

Table II

The effect of upgrade and double upgrade on the quarterly flow of bank loans

This table shows the effect of the upgrade and double upgrade on the quarterly flow of bank loans. The flows are obtained as quarterly changes in the stock of bank debt, and are normalized by lagged total assets. Firms are tracked from five quarters before the policy change to four quarters after it. Until the reform, each firm belongs to only one rating class. When the change in the rating scale is implemented some firms are upgraded (or double upgraded), while others are not. 'upgrade' and 'double upgrade' measure the impact on the flow of bank loans of being upgraded, respectively double upgraded, relative to not being upgraded. Standard errors are clustered at the firm level, and t-statistics are in parenthesis. Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Depedent Variable:	
	(1) Bank loans (norm. quarterly flow)
upgrade	0.002***
	(3.46)
double upgrade	0.004***
	(5.09)
Firm FE	Yes
3 digit industry x Quarter FE	Yes
Observations	123,830
R^2	0.13

Table III

The effect of upgrade and double upgrade depending on the bank relationship characteristics

This table shows the effect of the upgrade and double upgrade on the quarterly flow of bank loans depending on the characteristics of the relationship the firm has with the bank. The flows are obtained as quarterly changes in the stock of bank debt, and are normalized by lagged total assets. Firms are tracked from five quarters before the policy change to four quarters after it. Until the reform, each firm belongs to only one rating class. When the change in the rating scale is implemented some firms are upgraded (or double upgraded), while others are not. The effects of upgrade and double upgrade are differentiated depending on the following bank relationship characteristics. 'bank branch is located in a diff. town' indicates if the firm is headquartered in a different town than where the bank branch is located. 'N products with the bank' is the number of loan products (e.g., leasing contracts, mortgages, etc.) that the firm has with the bank. 'products' HHI with the bank' is the index of concentration (Herfindahl Index) of the loan products that the firm has with the bank. It ranges from 0 to 1: 0 corresponds to a situation in which the firm borrows from the bank through an infinity of different loan products; conversely, 1 represents the case in which the firm borrows from the bank only through one loan product. Finally, 'young bank-firm rel.' denotes whether the bank-firm relationship is at most two years old at the time of the implementation of the reform. Two years corresponds to the value at the first quartile of the distribution of the age of bank-firm relationship. Standard errors are clustered at the firm level, and t-statistics are in parenthesis. Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Depedent Variable:				
	(1) Bank loans (norm. quart. flow)	(2) Bank loans (norm. quart. flow)	(3) Bank loans (norm. quart. flow)	(4) Bank loans (norm. quart. flow)
upgrade	0.000**	0.003***	-0.004***	0.001**
	(2.04)	(8.35)	(-6.11)	(2.55)
— x bank branch is located in a diff. town	0.008***			
	(2.78)			
— x N products with the bank		-0.001***		
		(-7.91)		
— x products' HHI with the bank			0.005***	
			(7.58)	
— x young bank-firm rel.				-0.001**
				(-2.23)
double upgrade	0.001***	0.004***	-0.006***	0.001***
	(3.42)	(6.12)	(-4.29)	(3.76)
— x bank branch is located in a diff. town	–			
— x N products with the bank		-0.002***		
		(-4.21)		
— x products' HHI with the bank			0.008***	
			(5.49)	
— x young bank-firm rel.				-0.001**
				(-2.06)
bank branch is located in a diff. town	0.007			
	(0.71)			
N products with the bank		0.001***		
		(6.50)		
products' HHI with the bank			-0.003***	
			(-7.09)	
young bank-firm rel.				0.003***
				(12.68)
Firm FE	Yes	Yes	Yes	Yes
Bank x Quarter FE	Yes	Yes	Yes	Yes
3 digit industry x Quarter FE	Yes	Yes	Yes	Yes
Observations	270,384	255,598	255,439	270,384
R^2	0.11	0.12	0.12	0.11

Table IV

The effect of upgrade and double upgrade on the probability to start a new bank relationship

This table shows the effect of the upgrade and double upgrade on the probability to start a new bank relationship. The dependent variable 'New bank rel.' indicates whether the firm starts a new bank relationship in the quarter. Firms are tracked from five quarters before the policy change to four quarters after it. Until the reform, each firm belongs to only one rating class. When the change in the rating scale is implemented some firms are upgraded (or double upgraded), while others are not. 'upgrade' and 'double upgrade' measure the impact on the probability to start a new bank relationship of being upgraded, respectively double upgraded, relative to not being upgraded. The column on the left reports the marginal effects obtained with a Logit estimation, while the column on the right the effects obtained with a linear probability model (LPM). The standard errors in the column on the left are clustered at the firm level. T-statistics are in parenthesis. Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Depedent Variable:		
	(1) New bank rel. (Logit)	(2) New bank rel. (LPM)
upgrade	0.037***	0.008***
	(2.90)	(2.83)
double upgrade	0.032	0.007
	(1.23)	(1.57)
Firm FE	Yes	Yes
Quarter FE	Yes	No
3 digit industry x Quarter FE	No	Yes
Observations	46,646	123,830
R^2		0.18

Table V

The effect of upgrade and double upgrade on the cost of debt and funding mix: Diff-in-Diff

This table shows the effect of the upgrade and double upgrade on the cost of debt and funding mix. The flows of bank loans and equity are obtained as yearly changes in the stocks, and are normalized by lagged total assets. Firms are tracked from two balance sheets before the policy change to the first balance sheet after it. Until the reform, each firm has constant fundamentals. When the change in the rating scale is implemented some firms are upgraded (or double upgraded), while others are not. 'upgrade' and 'double upgrade' measure the impact on the variable of interest of being upgraded, respectively double upgraded, relative to not being upgraded. Standard errors are clustered at the firm level, and t-statistics are in parenthesis. Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Depedent Variable:			
	(1) Bank loans (norm. yearly flow)	(2) Loan rate (in pp)	(3) Equity (norm. yearly flow)
upgrade	0.008***	-0.124**	-0.009***
	(5.53)	(-2.04)	(-7.51)
double upgrade	0.012***	-0.243**	-0.023***
	(8.98)	(-2.53)	(-15.21)
Firm FE	Yes	Yes	Yes
3 digit industry x Period FE	Yes	Yes	Yes
Observations	50,643	34,668	50,643
R^2	0.35	0.74	0.57

Table VI

The effect of upgrade and double upgrade on the employment of funds: Diff-in-Diff

This table shows the effect of the upgrade and double upgrade on the flow of cash, investment, the number of new employees, and the dividends paid. All variables are normalized by lagged total assets. Firms are tracked from two balance sheets before the policy change to the first balance sheet after it. Until the reform, each firm has constant fundamentals. When the change in the rating scale is implemented some firms are upgraded (or double upgraded), while others are not. 'upgrade' and 'double upgrade' measure the impact on the variable of interest of being upgraded, respectively double upgraded, relative to not being upgraded. Standard errors are clustered at the firm level, and t-statistics are in parenthesis. Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Depedent Variable:				
	(1) Cash (norm. yearly flow)	(2) Tot. investment (norm., yearly)	(3) New employees (norm., yearly)	(4) Dividends paid (norm., yearly)
upgrade	-0.0031	0.0043***	0.0001*	0.0047***
	(-1.48)	(4.10)	(1.70)	(6.49)
double upgrade	-0.0148***	0.0078***	0.0001***	0.0106***
	(-5.51)	(6.74)	(2.96)	(9.45)
Firm FE	Yes	Yes	Yes	Yes
3 digit industry x Period FE	Yes	Yes	Yes	Yes
Observations	50,643	50,643	50,643	50,643
R^2	0.29	0.39	0.37	0.81

Table VII

Reconstructed rating function

This table reconstructs the 'rating function' used to assign upgrades following the reform based on observable fundamentals. We posit a Multinomial Logit model for the probability of being upgraded or double upgraded as a function of the firm's log-total assets, leverage, Banque de France's score, and industry. We then estimate it using the sample of firms that observe the change in the rating scale. The estimation is repeated for each rating class. t-statistics are in parenthesis. Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Depedent Variable:				
	Rating class: 3		Rating class: 4	Rating class: 5
	(1)	(2)	(3)	(4)
	Upgrade	Double upgrade	Upgrade	Upgrade
log Total assets	0.001**	0.000***	-0.027***	-0.009***
	(2.19)	(5.08)	(-12.89)	(-3.49)
Equity / Total assets	0.317***	0.021***	0.066***	0.079***
	(32.54)	(16.84)	(4.25)	(4.88)
Banque de France's score	-0.007***	-0.001***	-0.032***	-0.024***
	(-9.66)	(-10.96)	(-44.49)	(-52.69)
Industry FE	Yes	Yes	Yes	Yes
Observations	42,179	42,179	41,748	26,718

Table VIII

The effect on the cost of debt and funding mix: matching estimation

This table shows the effect of the upgrade and double upgrade on the changes in the normalized flows of bank loans and equity, and on the change in the loan rate. We first posit a Multinomial Logit model for the probability of being upgraded (or double upgraded) as a function of the firm's log-total assets, leverage, Banque de France's score, and industry. We estimate it using the sample of firms that observe the change in the rating scale, and separately for each rating class (see Table VII). Based on the parameters estimated, we predict each firm's probability of being upgraded and double upgraded. We form groups of firms with homogeneous probabilities of being upgraded and double upgraded, and term such groups "strata". We compute the change in the variables of interest that each firm experienced from the last balance sheet before the policy change to the first after it. We regress such changes on the 'upgrade' and 'double upgrade' dummies, together with the strata FEs. By including the strata FEs, the effects of upgrade and double upgrade are estimated across firms with similar probability of being upgraded or double upgraded. Standard errors are clustered at the strata level, and t-statistics are in parenthesis. Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Depedent Variable:			
	(1) Change in bank loans (norm. flow)	(2) Change in loan rate (in pp)	(3) Change in equity (norm. flow)
upgrade	0.008***	-0.228***	-0.010***
	(6.14)	(-5.14)	(-9.97)
double upgrade	0.012***	-0.521***	-0.020***
	(6.45)	(-4.52)	(-9.76)
Strata FE	Yes	Yes	Yes
Observations	37,565	25,545	37,565
R^2	0.01	0.01	0.02

Table IX

The effect on the employment of funds: matching estimation

This table shows the effect of the upgrade and double upgrade on the changes in the normalized flow of cash, investment, number of new employees, and dividends paid. We first posit a Multinomial Logit model for the probability of being upgraded (or double upgraded) as a function of the firm's log-total assets, leverage, Banque de France's score, and industry. We estimate it using the sample of firms that observe the change in the rating scale, and separately for each rating class (see Table VII). Based on the parameters estimated, we predict each firm's probability of being upgraded and double upgraded. We form groups of firms with homogeneous probabilities of being upgraded and double upgraded, and term such groups "strata". We compute the change in the variables of interest that each firm experienced from the last balance sheet before the policy change to the first after it. We regress such changes on the 'upgrade' and 'double upgrade' dummies, together with the strata FEs. By including the strata FEs, the effects of upgrade and double upgrade are estimated across firms with similar probability of being upgraded or double upgraded. Standard errors are clustered at the strata level, and t-statistics are in parenthesis. Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Depedent Variable:				
	(1) Change in cash (norm. flow)	(2) Change in tot. investment (normalized)	(3) Change in new employees (normalized)	(4) Change in dividends paid (normalized)
upgrade	-0.0073***	0.0047***	-0.0000	0.0029***
	(-3.80)	(5.88)	(-0.82)	(4.80)
double upgrade	-0.0172***	0.0066***	0.0000	0.0081***
	(-4.25)	(5.41)	(0.26)	(5.83)
Strata FE	Yes	Yes	Yes	Yes
Observations	37,565	37,565	37,565	37,565
R^2	0.01	0.01	0.01	0.01

Table X

The effect of upgrade and double upgrade on the probability of future downgrade

This table shows the effect of being upgraded or double upgraded on the firm's probability of future downgrade (i.e. falling of rating class). We first posit a Multinomial Logit model for the probability of being upgraded (or double upgraded) as a function of the firm's log-total assets, leverage, Banque de France's score, and industry. We estimate it using the sample of firms that observe the change in the rating scale, and separately for each rating class (see Table VII). We then cosider firms existing four years before the policy change, and firms existing the first year after the policy change. Based on the parameters estimated, we predict their probability of being upgraded and double upgraded. We form groups of firms with homogeneous probabilities of being upgraded and double upgraded, and term such groups "strata". Within each strata there are firms from the two time periods considered, and some firms are actually upgraded or double upgraded while others are not. Clearly, those firms from four years before the policy change are not upgraded or double upgraded. We finally study the probability of downgrade as a function of the firm being upgraded or double upgraded, strata FEs, and industry x time FEs, with a Probit model. By including the strata FEs, the effects of upgrade and double upgrade are estimated across firms with similar probability of being upgraded or double upgraded. The estimation is repeated for each rating class. Standard errors are clustered at the strata level, and t-statistics are in parenthesis. Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Depedent Variable:						
	Rating class: 3		Rating class: 4		Rating class: 5	
	(1)	(2)	(3)	(4)	(5)	(6)
	downgrade within 1 yr	downgrade within 3 yrs	downgrade within 1 yr	downgrade within 3 yrs	downgrade within 1 yr	downgrade within 3 yrs
upgrade	-0.041***	-0.067***	-0.064***	-0.093***	-0.027***	-0.046***
	(-6.52)	(-10.19)	(-12.84)	(-19.20)	(-6.35)	(-8.14)
double upgrade	-0.113***	-0.173***				
	(-10.33)	(-20.46)				
Proba. of downgrade (at median)	0.266	0.557	0.231	0.482	0.169	0.381
Industry x time FE	Yes	Yes	Yes	Yes	Yes	Yes
Strata FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	106,561	106,533	89,386	89,386	61,411	61,415

Table XI

The effect of upgrade and double upgrade on the probability of failure

This table shows the effect of being upgraded or double upgraded on the firm's probability of failure. We first posit a Multinomial Logit model for the probability of being upgraded (or double upgraded) as a function of the firm's log-total assets, leverage, Banque de France's score, and industry. We estimate it using the sample of firms that observe the change in the rating scale, and separately for each rating class (see Table VII). We then cosider firms existing four years before the policy change, and firms existing the first year after the policy change. Based on the parameters estimated, we predict their probability of being upgraded and double upgraded. We form groups of firms with homogeneous probabilities of being upgraded and double upgraded, and term such groups "strata". Within each strata there are firms from the two time periods considered, and some firms are actually upgraded or double upgraded while others are not. Clearly, those firms from four years before the policy change are not upgraded or double upgraded. We finally study the probability of failure as a function of the firm being upgraded or double upgraded, strata FEs, and industry x time FEs, with a Probit model. By including the strata FEs, the effects of upgrade and double upgrade are estimated across firms with similar probability of being upgraded or double upgraded. The estimation is repeated for each rating class. Standard errors are clustered at the strata level, and t-statistics are in parenthesis. Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Depedent Variable:						
	Rating class: 3		Rating class: 4		Rating class: 5	
	(1)	(2)	(3)	(4)	(5)	(6)
	fail within 1 yr	fail within 3 yrs	fail within 1 yr	fail within 3 yrs	fail within 1 yr	fail within 3 yrs
upgrade	0.001	0.001	-0.001	-0.006***	-0.003**	-0.003
	(0.99)	(0.52)	(-1.61)	(-3.93)	(-2.05)	(-0.87)
double upgrade	0.001	-0.004*				
	(1.63)	(-1.80)				
Proba. of failure (at median)	0.001	0.008	0.006	0.030	0.015	0.058
Industry x time FE	Yes	Yes	Yes	Yes	Yes	Yes
Strata FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	51,749	99,521	65,708	89,158	56,871	61,401

Table XII

The effect of upgrade and double upgrade on the probability of payment incident

This table shows the effect of being upgraded or double upgraded on the firm's probability of making a payment incident. We first posit a Multinomial Logit model for the probability of being upgraded (or double upgraded) as a function of the firm's log-total assets, leverage, Banque de France's score, and industry. We estimate it using the sample of firms that observe the change in the rating scale, and separately for each rating class (see Table VII). We then cosider firms existing four years before the policy change, and firms existing the first year after the policy change. Based on the parameters estimated, we predict their probability of being upgraded and double upgraded. We form groups of firms with homogeneous probabilities of being upgraded and double upgraded, and term such groups "strata". Within each strata there are firms from the two time periods considered, and some firms are actually upgraded or double upgraded while others are not. Clearly, those firms from four years before the policy change are not upgraded or double upgraded. We finally study the probability of making a payment incident as a function of the firm being upgraded or double upgraded, strata FEs, and industry x time FEs, with a Probit model. By including the strata FEs, the effects of upgrade and double upgrade are estimated across firms with similar probability of being upgraded or double upgraded. The estimation is repeated for each rating class. Standard errors are clustered at the strata level, and t-statistics are in parenthesis. Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Depedent Variable:						
	Rating class: 3		Rating class: 4		Rating class: 5	
	(1) payment inc. within 1 yr	(2) payment inc. within 3 yrs	(3) payment inc. within 1 yr	(4) payment inc. within 3 yrs	(5) payment inc. within 1 yr	(6) payment inc. within 3 yrs
upgrade	0.005	0.006	-0.012***	-0.013***	-0.012**	-0.003
	(1.03)	(1.17)	(-3.82)	(-2.95)	(-2.35)	(-0.61)
double upgrade	0.007	0.005				
	(1.06)	(0.76)				
Proba. of payment inc. (at med.)	0.185	0.317	0.191	0.337	0.229	0.384
Industry x time FE	Yes	Yes	Yes	Yes	Yes	Yes
Strata FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	106,517	106,529	89,384	89,384	61,404	61,415

Table XIII

The effect of upgrade and double upgrade on the amounts unpaid in trades

This table shows the effect of being upgraded or double upgraded on the amount unpaid in trades over total payables. We first posit a Multinomial Logit model for the probability of being upgraded (or double upgraded) as a function of the firm's log-total assets, leverage, Banque de France's score, and industry. We estimate it using the sample of firms that observe the change in the rating scale, and separately for each rating class (see Table VII). We then cosider firms existing four years before the policy change, and firms existing the first year after the policy change. Based on the parameters estimated, we predict their probability of being upgraded and double upgraded. We form groups of firms with homogeneous probabilities of being upgraded and double upgraded, and term such groups "strata". Within each strata there are firms from the two time periods considered, and some firms are actually upgraded or double upgraded while others are not. Clearly, those firms from four years before the policy change are not upgraded or double upgraded. We finally study the amounts unpaid in trades over total payables as a function of the firm being upgraded or double upgraded, strata FEs, and industry x time FEs. By including the strata FEs, the effects of upgrade and double upgrade are estimated across firms with similar probability of being upgraded or double upgraded. The estimation is repeated for each rating class. Standard errors are clustered at the strata level, and t-statistics are in parenthesis. Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Depedent Variable:						
	Rating class: 3		Rating class: 4		Rating class: 5	
	(1) AMT unpaid over 1 yr / payables	(2) AMT unpaid over 3 yrs / payables	(3) AMT unpaid over 1 yr / payables	(4) AMT unpaid over 3 yrs / payables	(5) AMT unpaid over 1 yr / payables	(6) AMT unpaid over 3 yrs / payables
upgrade	-0.002	-0.004**	-0.013***	-0.016***	-0.006*	-0.010**
	(-1.50)	(-2.14)	(-5.50)	(-5.01)	(-1.69)	(-2.14)
double upgrade	-0.004***	-0.007***				
	(-3.30)	(-3.83)				
Avg. AMT unpaid	0.014	0.030	0.038	0.073	0.081	0.139
St. dev.	0.045	0.101	0.100	0.188	0.148	0.265
Industry x time FE	Yes	Yes	Yes	Yes	Yes	Yes
Strata FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,560	33,475	16,472	29,396	13,577	23,062
R^2	0.02	0.02	0.05	0.03	0.04	0.03

Table XIV

Differences between to-be upgraded and to-be unchanged firms

This table compares the financial conditions of to-be upgraded and to-be unchanged firms right before the implementation of the reform. The comparison is repeated within each rating class. The sample includes the firms that will be later employed in the difference-in-difference analysis. Standard deviations are in parenthesis. Stars indicate the statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	Rating class: 3				
	To-be unchanged	To-be upgraded	Difference wrt to-be unchanged	To-be double upgraded	Difference wrt to-be unchanged
Bank loans (norm. flow)	0.00	-0.00	-0.01***	-0.00	-0.01***
	(0.06)	(0.04)	(0.00)	(0.03)	(0.00)
Loan rate	5.72	6.21	0.49***	6.38	0.65***
	(3.41)	(3.66)	(0.09)	(3.95)	(0.11)
log Total assets	7.60	7.58	-0.02	7.71	0.12***
	(1.02)	(0.99)	(0.02)	(0.98)	(0.02)
Equity / Total assets	0.37	0.53	0.16***	0.66	0.29***
	(0.13)	(0.14)	(0.00)	(0.14)	(0.00)
Tang. assets / Total assets	0.14	0.12	-0.02***	0.11	-0.03***
	(0.13)	(0.11)	(0.00)	(0.11)	(0.00)
Return on Assets	0.17	0.18	0.01***	0.24	0.07***
	(0.09)	(0.08)	(0.00)	(0.09)	(0.00)
Banque de France's score	1.37	0.79	-0.58***	0.43	-0.94***
	(1.18)	(0.67)	(0.02)	(0.44)	(0.02)

	Rating class: 4		
	To-be unchanged	To-be upgraded	Difference wrt to-be unchanged
Bank loans (norm. flow)	-0.00	-0.01	-0.00**
	(0.06)	(0.07)	(0.00)
Loan rate	6.38	6.66	0.28*
	(3.98)	(3.87)	(0.16)
log Total assets	7.43	7.31	-0.12***
	(1.11)	(0.98)	(0.04)
Equity / Total assets	0.32	0.34	0.02***
	(0.18)	(0.15)	(0.01)
Tang. assets / Total assets	0.11	0.15	0.04***
	(0.12)	(0.14)	(0.00)
Return on Assets	0.07	0.14	0.07***
	(0.06)	(0.09)	(0.00)
Banque de France's score	2.80	2.08	-0.72***
	(3.17)	(1.89)	(0.10)

	Rating class: 5		
	To-be unchanged	To-be upgraded	Difference wrt to-be unchanged
Bank loans (norm. flow)	-0.01	-0.02	-0.01***
	(0.08)	(0.08)	(0.00)
Loan rate	6.81	6.82	0.02
	(4.13)	(3.64)	(0.21)
log Total assets	7.30	7.25	-0.04
	(1.15)	(0.95)	(0.05)
Equity / Total assets	0.13	0.20	0.06***
	(0.20)	(0.16)	(0.01)
Tang. assets / Total assets	0.14	0.18	0.04***
	(0.15)	(0.20)	(0.01)
Return on Assets	0.03	0.11	0.07***
	(0.08)	(0.08)	(0.00)
Banque de France's score	8.48	4.79	-3.69***
	(7.16)	(5.33)	(0.32)

IX Appendix

Table XV

The effect on the cost of debt and funding mix: addition of rating class x period FEs

This table shows the effect of the upgrade and double upgrade on the cost of debt and funding mix, controlling for the rating class x period FEs. The flows of bank loans and equity are obtained as yearly changes in the stock, and are normalized by lagged total assets. Rating class x period fixed effects capture any trend that is specific to a certain rating class and not to others. Firms are tracked from two balance sheets before the policy change to the first balance sheet after it. Until the reform, each firm has constant fundamentals and belongs to only one rating class. When the change in the rating scale is implemented some firms are upgraded (or double upgraded), while others are not. 'upgrade' and 'double upgrade' measure the impact on the variable of interest of being upgraded, respectively double upgraded, relative to not being upgraded. Standard errors are clustered at the firm level, and t-statistics are in parenthesis. Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Depedent Variable:			
	(1) Bank loans (norm. yearly flow)	(2) Loan rate (in pp)	(3) Equity (norm. yearly flow)
upgrade	0.008***	-0.119*	-0.010***
	(5.81)	(-1.93)	(-8.09)
double upgrade	0.012***	-0.275***	-0.020***
	(8.24)	(-2.82)	(-12.66)
Firm FE	Yes	Yes	Yes
3 digit industry x Period FE	Yes	Yes	Yes
Rating class x Period FE	Yes	Yes	Yes
Observations	50,643	34,668	50,643
R^2	0.35	0.74	0.58

Table XVI

The effect on the employment of funds: addition of rating class x period FEs

This table shows the effect of the upgrade and double upgrade on the flow of cash, investment, the number of new employees, and the dividends paid, controlling for the rating class x period FEs. All variables are normalized by lagged total assets. Rating class x period fixed effects capture any trend that is specific to a certain rating class and not to others. Firms are tracked from two balance sheets before the policy change to the first balance sheet after it. Until the reform, each firm has constant fundamentals and belongs to only one rating class. When the change in the rating scale is implemented some firms are upgraded (or double upgraded), while others are not. 'upgrade' and 'double upgrade' measure the impact on the variable of interest of being upgraded, respectively double upgraded, relative to not being upgraded. Standard errors are clustered at the firm level, and t-statistics are in parenthesis. Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Depedent Variable:				
	(1) Cash (norm. yearly flow)	(2) Tot. investment (norm., yearly)	(3) New employees (norm., yearly)	(4) Dividends paid (norm., yearly)
upgrade	-0.0038*	0.0043***	0.0001*	0.0048***
	(-1.79)	(4.12)	(1.80)	(6.52)
double upgrade	-0.0117***	0.0085***	0.0001**	0.0103***
	(-4.14)	(6.88)	(2.08)	(8.71)
Firm FE	Yes	Yes	Yes	Yes
3 digit industry x Period FE	Yes	Yes	Yes	Yes
Rating class x Period FE	Yes	Yes	Yes	Yes
Observations	50,643	50,643	50,643	50,643
R^2	0.29	0.39	0.37	0.81